

**Southern California Edison**

**PY 2006–08 ETO**

**Process Evaluation**

Study Number SCE0285

Final Report

March 31, 2010

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Southern California Edison

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# Executive Summary

This document presents the methods, results and recommendations of the 2006–08 ETO Process evaluation for the BOC, CLEO, TTC, and MEU programs, as well as an evaluability study for the EDR program and an exploratory effort related to the possibility of expanding the CLEO program to other hard-to-reach groups, starting with African Americans.

This evaluation effort was conducted at the request of the California Public Utilities Commission. The project was managed by Southern California Edison (SCE). It was funded through the public goods charge (PGC) for energy efficiency and is available for download at [www.calmac.org](http://www.calmac.org).

Below is a brief summary of the results and recommendations for the programs addressed in the body of the report, followed by an overview of the methods employed.

## BOC

Key results, synthesized from the findings resulting from the various evaluation methods, are:

- The BOC curriculum does well from a student satisfaction perspective. Participants generally:
  - Are satisfied with the training (e.g., rate it between 4 and 5 on a five-point scale)
  - Feel more confident in their professional interactions as a result of the training
  - Believe they can apply what they learned in the training to their jobs
- In terms of more “concrete” results, which reflect the areas that are of most interest to the utilities, the curriculum does relatively poorly. Participants:
  - Do not recall the SCE programs that can help with projects at their facilities
  - Less than half the time initial projects for which they attribute the motivation to the training
  - Are not always better in O&M activities than similar personnel who have not completed BOC training, though they do usually do better.
  - Do not clearly demonstrate application of more advanced skills in O&M activities as a result of Level II training
- Less positive outcomes likely are due to considerations in the training design and delivery:
  - Limited or no in-class opportunity to apply new information or practice relevant skills (Activities included in the course materials often are skipped during class delivery.)
  - A disconnect between final exams and the generally strong, well targeted learning objectives for each course (Exams typically do not reflect the learning objectives and are unevenly administered.)
  - Lack of meaningful follow-through on class projects (Projects are designed to help ensure application of class concepts to on-the-job requirements, but are not used to provide coaching and feedback to participants.)
  - Little practical information on relevant utility programs (For most classes, relevant utility program information is not presented to participants.)
- Other issues that surfaced during Recommendations regarding marketing from the previous process evaluation have not been fully implemented, and several issues relative to database quality control surfaced during the evaluation process

Table Exec-1 summarizes the major recommendations based on the results above.

**Table Exec-1. Overview of Recommendations for BOC**

Area	Recommendations
<b>Program Design</b>	<ul style="list-style-type: none"> <li>• Implement web-based and evening/weekend classes for employees of small companies</li> <li>• Strengthen ties to and direct support of SCE programs</li> <li>• Clarify what additional knowledge and skills should come with Level II certification</li> </ul>
<b>Program Process</b>	<ul style="list-style-type: none"> <li>• Institute quality control processes for updating the data base</li> <li>• Capture and maintain individuals' responses on exit surveys</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Ensure instructors fulfill in-class activities as designed</li> <li>• Implement “debriefs” of practice assignments (homework)</li> <li>• Improve final exam and how instructors “coach” so passing the test is meaningful</li> </ul>
<b>Marketing</b>	<ul style="list-style-type: none"> <li>• Increase efforts to market to smaller firms</li> <li>• Increase efforts to leverage existing marketing channels, as intended after last evaluation</li> </ul>

## CLEO

Key results relative to the CLEO process evaluation, synthesized from the findings resulting from the various evaluation methods, are:

- There are distinct differences in results among ethnic groups. Reasons for differences may vary, and may include differences:
  - Among the target audiences' background knowledge, areas of interest, and cultural factors
  - Ways in which the seminar is marketed and delivered
- The seminar generally does well in terms of:
  - Overall participant satisfaction
  - Fostering recall for HEER and Income-Qualifying programs
  - Increasing EE behavior
- Seminar does relatively poorly in terms of:
  - Fostering participation in programs
  - Facilitating recognition of HEES and its value
  - Helping participants understand “what to do next”
- Less positive outcomes likely are due to considerations in the seminar design and content
  - Benefits (other than rebates) of program participation are not highlighted
  - HEES is addressed only at the end of the seminar, and in the context of filling out the “short-form” survey
  - Recommended actions (EE measures and practices) are not positioned in terms of costs and likely benefits, nor is it clear which are most appropriate for owners vs. “everyone”
- Several considerations re. the design of the exit survey, tracking exit survey data, and maintaining seminar participant contact information surfaced during the evaluation.

Table Exec-2 summarizes the major recommendations based on the results above.



**Table Exec-2. Overview of Recommendations for CLEO**

Area	Recommendations
<b>Program Design</b>	<ul style="list-style-type: none"> <li>• Tailor seminar content to accommodate differences in target audiences' baseline knowledge of energy efficiency</li> </ul>
<b>Program Process</b>	<ul style="list-style-type: none"> <li>• Keep exit survey data in a usable format with ethnicity information tied to each survey</li> <li>• Revise exit survey to conform to standard Likert scale (equal weight positive/negative)</li> <li>• Create and maintain sign-in sheets effectively (contact info, which entries are same family)</li> <li>• Implement QC to assure presenter quality</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Address HEES at beginning (as well as end) of seminar; include HEES “success stories”</li> <li>• Provide clear guidance for “next steps” <ul style="list-style-type: none"> <li>○ Include typical financial benefits for EE measures and practices</li> <li>○ Highlight typical implementation considerations (cost, effort)</li> <li>○ Distinguish between actions for all vs. most appropriate for owners</li> </ul> </li> </ul>

Key results relative to the CLEO exploratory study are:

- The current position of the African American customer group is very similar to that of other SCE customer groups in terms of:
  - Knowledge and attitudes re. EE
  - Familiarity with EE programs
  - Commitment to EE in the home
- Compared to the current CLEO target audiences (customers from the Chinese, Korean, and Vietnamese communities), the African American customer group tend to be:
  - Better educated (formal education)
  - More knowledgeable about energy efficiency
- Preferences for learning formats are TV, mail, and web — though customers who showed the most interest in learning more about energy efficiency tended to prefer the “seminar” format.
- Areas of greatest interest include learning about the following EE measures and practices: “turning things off,” energy efficient appliances, and energy efficient lighting.

Recommendations from the exploratory study include:

- Take differences in key characteristics into account
- Carefully consider preferred learning format

# TTC

Key results relative to the TTC process evaluation, based on an exit surveys and a review of materials for TTC courses taught at the energy centers, are:

- TTC course designs did significantly better than EC courses in several areas assessed:
  - Encouraging Action
  - Support of Customer Segments
  - Obtaining learner buy-in and building on what learners know (two of the adult learning principles)
  - Learner centricity, content decision, interactive activities, and learning facilitation (four of the adult learning practices)
  - Indirect support of energy efficiency programs
- TTC scored significantly lower than the EC courses on the lesson plan criteria (one of the adult learning practices)
- TTC and EC courses were roughly equivalent in the other aspects evaluated relative to these program goals, including:
  - Helping overcome market barriers
  - Impact on participants’ knowledge and likely impact on EE purchases and behaviors (as reported in the exit surveys)
  - Engaging learners, setting them up for success, and letting them apply what they’ve learned (three of the adult learning principles)
  - Direct support of energy efficiency programs
  - Participants’ desire to learn about the utility audit service and energy efficiency programs (reported in the exit surveys)
  - Participant satisfaction as indicated on the exit surveys

Table Exec-3 summarizes the major recommendations based on the results above.

**Table Exec-3. Overview of Recommendations for TTC**

Area	Recommendations
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Include more practice and “check your understanding” opportunities in each course</li> <li>• Makes the ties to relevant utility programs more overt, including specifics on how to take advantage of the programs and what the programs do and do not include</li> <li>• Consistently provide information about the financial and non-financial benefits of the relevant measures and practices</li> <li>• Include risk assessment and risk mitigation information when appropriate</li> </ul>
<b>Training</b>	<ul style="list-style-type: none"> <li>• Train instructors in adult learning principles and practices</li> </ul>

# MEU

The results from analysis of MEU lead card data and event data are:

- About 6% of the MEU contacts resulted in a completed lead card.  
On a little over half (55%) of the cards, customers requested information about more than one program.
- HEES was the program of most interest (20% of all requests).  
EARTH (school/outreach), Energy Centers, and Energy Management Solutions for Business were the least popular (between 3% and 1%).
- Follow-up on leads by other program personnel is slow and relatively uneven.
- There were some minor quality control issues in the MEU data, and other areas of interest — such as the relationship between literature distributed and leads generated, number of leads generated relative to number of event attendees, and leads generated relative to type of event — were not evaluable given the type of data available.

Table Exec-4 summarizes the major recommendations based on the results above.

**Table Exec-4. Overview of Recommendations for MEU**

Area	Recommendations
<b>Program Design</b>	<ul style="list-style-type: none"> <li>• Establish a method to help ensure timely and appropriate follow-up on leads that are handed off</li> </ul>
<b>Program Process</b>	<ul style="list-style-type: none"> <li>• Track literature distributed by event — or monthly — that can be correlated to events</li> <li>• Integrate lead card data with Event Log (reduce re-keying and associated errors)</li> <li>• Implement basic data validation</li> </ul>
<b>Marketing (data collection)</b>	<ul style="list-style-type: none"> <li>• Get post-event estimates of event attendees</li> <li>• Categorize and track event sponsors and focus</li> </ul>

# EDR

The results from the EDR evaluability assessment are:

- Program goals and strategies as they stand provide inadequate guidance for an evaluation since they are so general that they do not set standards against which program success may be measured.
- Useful program theory — identifying measurable goals, barriers to achieving them, and strategies for overcoming the barriers in order to achieve the goals — seems not to have been developed.
- Numerous significant changes have been made to the EDR website since the last evaluation. However most of the changes that were recommended in the last evaluation were not implemented and most of the changes lack a context to evaluate whether they have helped achieve program-specific goals.
- Major contributing factors to the issues identified above appear to be:
  - The dispersed program staffing structure across multiple IOUs (Pacific Gas and Electric Company, Sacramento Municipal Utility District, San Diego Gas & Electric, Southern California Edison, and Southern California Gas)
  - Lack of clarity regarding task responsibilities across the IOUs responsible for EDR
  - Lack of overall clear program management focus and leadership

These factors, in turn, appear likely to be the result of lack of funding and resources devoted to the program.

Recommendations stemming from these results are:

- Develop a program theory with measurable goals, and strategies for achieving them, and for overcoming identified barriers.
- Set up an agreed-upon structure for management of the program, especially indicating who is to take the lead in bringing issues to closure and implementing decisions.

This will facilitate implementing the first recommendation.
- Provide adequate funding and a permanent home for this program. One of the energy centers would be appropriate given the focus of this program on education and training.

Implementing this recommendation would support implementing the others.
- Postpone expanding the website to other sectors until a firm management structure is in place, and the focus and goals of the website are agreed upon.
- Make website content, tools, and training fully accessible to evaluators.

# Methods

Table Exec-5 summarizes the various methods the evaluation team employed during this process evaluation.

**Table Exec-5. Major Methods Used in 2006–08 Process Evaluation**

Method	Description	BOC	CLEO	TTC	MEU	EDR
<b>Review of program documentation</b>	To establish the context for the evaluation focus, the Program Implementation Plan (PIP) and related program documentation (e.g., Program Theory and Program Logic diagrams) were reviewed.  Based on this documentation, the evaluation team identified specific program goals and strategies, which served as the basis for the evaluation goals and strategies.	YES	YES	YES	YES	YES
<b>Yardsticks for assessing course design and delivery</b>	Based on evaluation tools established during the 2006–08 Energy Center process evaluation, the yardsticks are sets of evaluation criteria to address key dimensions relative to support of SCE programs, support of behavior change, adherence to adult learning principles and practices.  The yardsticks were used in three ways: review of course materials, in-person audits of classes, and interviews with instructors.	YES	YES	YES <sup>1</sup>	na	na
<b>Exit Surveys</b>	Exit surveys from BOC, CLEO, and TTC events were analyzed. When appropriate results were compared to those for the Energy Center classes held during 2006–08	YES	YES	YES	na	na
<b>Telephone Surveys</b>	Telephone interviews were conducted in order to assess program participants' AKA-B (awareness, knowledge, attitude, and behavior) in areas relevant to program goals and strategies. When appropriate elements from previous evaluation interview protocols were incorporated in order to facilitate comparisons across groups	YES	YES	YES	na	na
<b>Staff Interviews</b>	Interviews with program staff and third-party implementers focused on issues related to implementation, marketing, and responses to past recommendations.	YES	YES	YES	YES	na
<b>Lead card and event data</b>	The evaluation effort for MEU focused on assessing the results from the MEU Lead Card Pilot that was started near the beginning of this evaluation effort. Lead card data was analyzed in relationship to other available data about the events at which the lead cards were collected.	na	na	na	YES	na

<sup>1</sup> Due to other, concurrent evaluation efforts, the yardsticks were used only during a review of course material for the TTC evaluation.

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# Building Operator Certification (BOC)

## Overview of Results and Recommendations

The evaluation team identified specific evaluation questions based on the program goals and strategies. Table BOC-4 summarizes the relationship between program goals and strategies and evaluation questions and methods.

Table BOC-1 summarizes what we found in answer to the evaluation questions. Table BOC-2 summarizes the resulting recommendations. Results and methods employed for the BOC evaluation are further discussed on pages 16 to 33. Recommendations are further discussed on pages 34 to 36.

**Table BOC-1. Summary of Evaluation Questions and Results**

Program Goal	Results
<p>Goal 1: Increase participants' ability to identify areas for reductions in energy consumption and demand and to design projects to accomplish this</p>	<p>The yardstick for support of behavior change and adherence to adult learning principles and practices indicate:</p> <ul style="list-style-type: none"> <li>• Courses are generally fairly well designed to support behavior change and adult learning</li> <li>• Delivery (how courses are implemented in the classroom) falls short of the design</li> </ul> <p>The yardstick for support of SCE programs indicate:</p> <ul style="list-style-type: none"> <li>• The materials are not designed to support SCE programs</li> <li>• Instructors and SCE reps add little program support</li> </ul> <p>Telephone interviews with participants indicate:</p> <ul style="list-style-type: none"> <li>• Participants are more confident in their professional interactions and share their knowledge as a result of the training</li> <li>• Areas of impact in operations and maintenance (O&amp;M) are limited, inconsistent, and the degree of impact usually is small</li> <li>• Most students' facilities initiate EE projects after BOC training, but less than half indicate that the projects were influenced by BOC</li> <li>• Students do very poorly in recalling SCE programs after the training</li> </ul> <p>In general, related items on the BOC exit survey support the results from the yardsticks and telephone interviews</p>
<p>Goal 2: Overcome barriers that inhibit participation in BOC training offerings</p>	<p>Telephone interviews with participants indicate:</p> <ul style="list-style-type: none"> <li>• BOC certification is important to participants — and probably more so to their supervisors</li> </ul> <p>Interviews with program staff indicate:</p> <ul style="list-style-type: none"> <li>• Existing marketing channels (SCE reps and EC calendars) are poorly leveraged</li> <li>• There are no vehicles for increasing access to the training for employees of small companies, and no assessment of the potential for Spanish-speaking audiences has been conducted.</li> </ul>
<p>Goal 3: Generate satisfied participants (inferred goal)</p>	<p>Both the telephone interviews with participants and the exit surveys indicate participants are satisfied to very satisfied with the training.</p> <p>Pre-work and reminders to supervisors have little impact on satisfaction.</p>

**Table BOC-2. Overview of Recommendations for BOC**

<b>Area</b>	<b>Recommendations</b>
<b>Program Design</b>	<ul style="list-style-type: none"> <li>• Implement web-base and evening/weekend classes for employees of small companies</li> <li>• Strengthen ties to and direct support of SCE programs</li> <li>• Clarify what additional knowledge and skills should come with Level II certification</li> </ul>
<b>Program Process</b>	<ul style="list-style-type: none"> <li>• Institute quality control processes for updating the data base</li> <li>• Capture and maintain individuals' responses on exit surveys</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Ensure instructors fulfill in-class activities as designed</li> <li>• Implement “debriefs” of practice assignments (homework)</li> <li>• Improve final exam and how instructors “coach” so passing the test is meaningful</li> </ul>
<b>Marketing</b>	<ul style="list-style-type: none"> <li>• Increase efforts to market to smaller firms</li> <li>• Increase efforts to leverage existing marketing channels, as intended after last evaluation</li> </ul>



# Background

## Program Overview

The Building Operator Certification Program (BOC) is a nationally recognized energy efficiency training and certification program founded on the principle that trained and motivated operators can reduce energy consumption by 5 to 15%.

BOC combines classroom training, exams, and in-facility project assignments to train and certify building engineers and O&M technicians in the practice of energy-efficient building operations and maintenance.

The targeted program participants are commercial and industrial end users who seek certification and who value the importance of efficient building technologies for their ongoing business. Typical program participants would require their employers to make an investment in this education. SCE program funding does not cover 100% of the cost of certification. The balance of the required funding is contributed by the prospective employers.

This program’s activities are designed to influence and impact participants’ awareness, knowledge, attitude, and behavior (AKA-B).

The Northwest Energy Efficiency Council (NEEC), extending efforts initiated by the Washington State Energy Office and the Idaho Building Operators Association, developed the Building Operators Certification program for the Northwest Energy Efficiency Alliance (NEEA) in 1997.

The NEEC BOC training is now offered in about twenty states. Detailed participant satisfaction studies and impact evaluations have been conducted in two regions where the training has been offered for multiple years: the Pacific Northwest (Northwest Energy Efficiency Alliance) and the Northeast (Northeast Energy Efficiency Partnerships—NEEP). The California utilities licensed the training from NEEC and have contracted with NEEC for its delivery.

The subject of this process evaluation is the PY2006–08 program cycle, as supported by Southern California Edison (SCE). Therefore, only students taking SCE-supported courses offered in the 2006–08 period are included. Table BOC-3 summarizes the program outputs that are relevant to this process evaluation. The figures cited in the table come from the program database and from published class schedules.

**Table BOC-3. BOC Program Outputs Subsidized by SCE for PY2006-08**

Factor	Count
Students taking classes	748
Students certified at Level I	416
Students certified at Level II	226
Courses offered	131
Level I courses offered	96
Level II courses offered	35

## **Program Theory and Logic**

While there was no program theory developed for BOC for the 2006–08 program cycle, the basic elements of a theory were contained in the Program Implementation Plan (PIP). In addition, the program design and thinking represented in the PIP is consistent with the logic diagram prepared for PY10–1 2 (Figure BOC-1).

The PIP, together with conversations with program personnel, made it possible to describe program goals, market barriers, and strategies to overcome the barriers.

## **Program Goals and Evaluation Focus**

The BOC program goals and strategies identified in the 2006–08 PIP and related program documentation formed the basis for the evaluation focus. Table BOC-4 summarizes the relationship between program goals and strategies and evaluation questions and methods. “CLEO Program Goals and Strategies” in Appendix A-1 (p. B-2) provides more information about the relevant program goals and strategies.

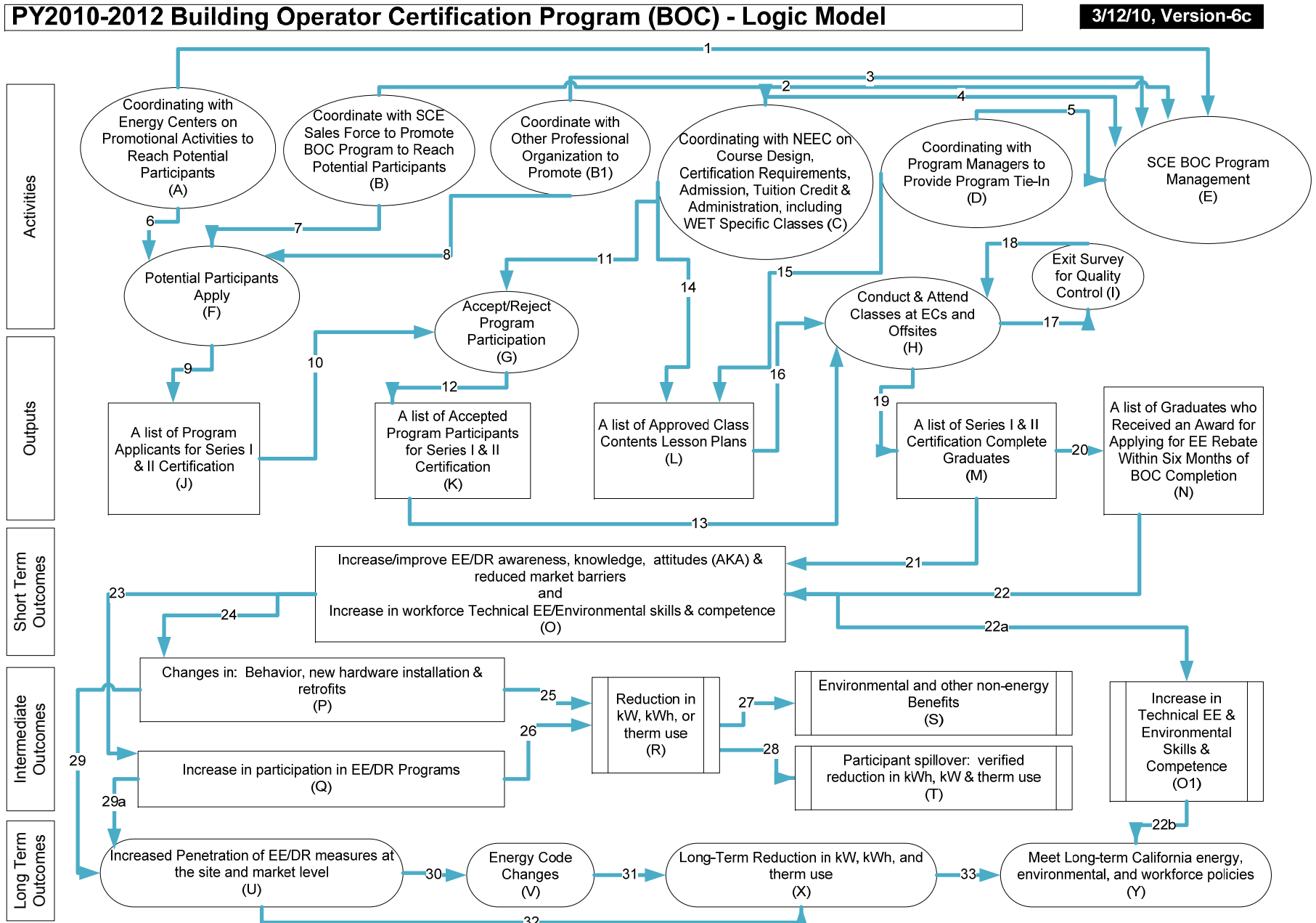
**Table BOC-4. Summary of Program Goals and Strategies; Evaluation Questions and Methods**

Program Goal2	Program Strategies2	Evaluation Questions	Evaluation Methods
<b>Goal 1 Increase participants' ability to identify areas for reductions in energy consumption and demand and to design projects to accomplish this</b>	<ul style="list-style-type: none"> <li>• Use curriculum and teaching techniques that increase AKA-B (awareness, knowledge, attitudes, and behaviors), including identifying EE potential and adult learning principles</li> </ul>	1-1. How well do course design and delivery support behavior change and adult learning?	<ul style="list-style-type: none"> <li>• Class design and delivery yardstick: Support of Behavior Change Adult Learning               <ul style="list-style-type: none"> <li>○ Review of class materials</li> <li>○ In-person audit of classes</li> <li>○ Instructor interviews</li> </ul> </li> </ul>
	<ul style="list-style-type: none"> <li>• Guide participants into utility programs that will help them accomplish EE and demand reduction projects in their facilities               <ul style="list-style-type: none"> <li>○ Ensure utility programs are introduced in the training sessions</li> <li>○ Increase utility presence at classes offered outside of the utility energy centers</li> </ul> </li> </ul>	1-2. How much influence do classes have on participants' AKA-B?  1-3. How well do course design and delivery support utility programs?  1-4. Do participants remember and take advantage of SCE programs after class?	<ul style="list-style-type: none"> <li>• Telephone interviews with students</li> <li>• Class design and delivery yardstick: Support of Programs               <ul style="list-style-type: none"> <li>○ Review of class materials</li> <li>○ In-person audit of classes</li> <li>○ Instructor interviews</li> </ul> </li> <li>• Telephone interviews with students</li> </ul>
<b>Goal 2 Overcome barriers that inhibit participation in BOC training offerings</b>	<ul style="list-style-type: none"> <li>• BOC completion credentials</li> </ul>	2-1. Is certification seen as valuable?	<ul style="list-style-type: none"> <li>• Telephone interviews with students</li> </ul>
	<ul style="list-style-type: none"> <li>• Leverage existing channels to market the BOC classes               <ul style="list-style-type: none"> <li>○ List the BOC training on calendars of events that are sent to customers</li> </ul> </li> </ul>	2-2. Have previous recommendations re. marketing channels been acted on?	<ul style="list-style-type: none"> <li>• Staff interviews</li> </ul>
	<ul style="list-style-type: none"> <li>○ Include mention of the training in widely publicized calendars of training events</li> <li>○ Ask account reps to market the program</li> </ul>	2-3. How many participants learned of the program through existing channels?	<ul style="list-style-type: none"> <li>• Telephone interviews with students</li> </ul>
	<ul style="list-style-type: none"> <li>• Address logistical constraints of employees of small companies ( who cannot leave work to attend class) through web-based training and "swing shift" training</li> </ul>	2-4. To what degree have web-based and swing-shift training been implemented?	<ul style="list-style-type: none"> <li>• Staff interviews</li> </ul>
	<ul style="list-style-type: none"> <li>• Assess the potential market for Spanish-speaking building operators</li> </ul>	2-5. Has potential for Spanish-speaking audience been assessed?	<ul style="list-style-type: none"> <li>• Staff interviews</li> </ul>

2 See "CLEO Program Goals and Strategies" in Appendix A-1 (p. B-2) for more information about the relevant program goals and strategies.

Program Goal2	Program Strategies2	Evaluation Questions	Evaluation Methods
<b>Goal 3 Generate satisfied participants</b> [Inferred]	[Inferred]	3-1. What is participant satisfaction immediately following class?	<ul style="list-style-type: none"> <li>Exit Survey</li> </ul>
	[Inferred]	3-2. What is participant satisfaction when time has elapsed after class?	<ul style="list-style-type: none"> <li>Telephone interviews with students</li> </ul>
	<ul style="list-style-type: none"> <li>Address suggestions made by participants</li> <li>Provide students with materials to study before each class</li> </ul>	3-3. Are “pre-work” materials distributed?	<ul style="list-style-type: none"> <li>Staff interviews</li> <li>Telephone interviews with students</li> </ul>
		3-4. What effect does “pre-work” have on participant satisfaction?	<ul style="list-style-type: none"> <li>Telephone interviews with students</li> </ul>
	<ul style="list-style-type: none"> <li>Send supervisors class reminders and follow-up information on certification</li> </ul>	3-5. Are reminders and follow-ups sent to supervisors?	<ul style="list-style-type: none"> <li>Telephone interviews with students</li> </ul>
		3-6. What effect do supervisor reminders and follow-ups have on satisfaction?	<ul style="list-style-type: none"> <li>Telephone interviews with students</li> </ul>

Figure BOC-1. PY2010–12 BOC Program Logic Diagram



# Methods

This section describes the methods used for addressing the evaluation questions listed in Table BOC-1. Additional detail on the methods is found in Appendix A-1 (p.A-2).

## Telephone Interviews of BOC Student Participants

The research plan called for 61 interviews of dropout- and 61 non-dropout-students based on a power analysis designed to achieve 90% confidence and 10% precision for each group. The following section describes the efforts to meet that goal.

### Sampling

BOC program staff provided the evaluation team with a database of all program participants, their contact information, class enrollment, class completion, grades, and certification records. The evaluation team reviewed the available data to identify BOC participants who completed SCE-sponsored Level I and Level II courses in the PY2006–08 program cycle. Several issues with the data created a challenge in establishing an appropriate sample. (See Table xA-1 in Appendix A-1 for the summary of the sample definition.) For example:

- For almost a third (32%) of the student records, we were unable to match contact information with information about which courses the students completed.
- There is no specific field indicating who sponsored courses taken (e.g., SCE-funded courses), so we considered participants whose zip codes indicated they worked in SCE territory

After sorting through the above issues, we identified 734 BOC participants who fit our target profile: 243 dropouts and 491 non-dropouts. (We defined “dropouts” as those who had not completed the series of courses and had not taken a cause in six months.) From this group, we tried to complete interviews with 61 dropouts and 61 non-dropouts, but the actual, achieved sample consisted of 35 dropouts and 66 non-dropouts (101 total completed interviews). (See Table xA-2 in Appendix A-1 for the student interview sample disposition.)

Considering the 35 individuals identified as dropouts, 25 of them told interviewers that they did not intend to leave the program: they just had been unable to attend due to scheduling issues. This left only 10 “real” dropouts, so we eliminated this distinction from the analysis.

The final combined sample consisted of 101 interviews, which exceeds the planned 90/10 criteria for confidence and precision.

See “Telephone Interviews with CLEO Participants” in Appendix A-1 (p. B-3) for additional information on the sampling for the BOC telephone interviews of participants.

### Student Interviews

The evaluation goals required that information be gathered on professional and facility background characteristics, satisfaction, AKA, energy efficiency behavior, O&M practices, and program process.

The questions pertaining to these areas can be seen in the interview protocol, which is included in Appendix A-3 (p. A-53).

All interviews were conducted in English.

## Yardsticks for Class Design and Delivery

The evaluation team used two “yardsticks” to determine how well the BOC class design and delivery:

- Support behavior change and adhere to adult learning principles and practices
- Support SCE energy efficiency programs

These “yardsticks” were based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes during the 2006–08 Energy Center Process Evaluation. The evaluation team updated these criteria to reflect the specific requirements of the 2006–08 ETO Process Evaluation and the updated yardsticks were reviewed by program staff.

See “Structure, Use, and Scoring for Yardsticks” in Appendix A-1 (p. A-5) for details.

The yardsticks were applied in three different ways:

- Review of class material
  - There are a total of 14 BOC classes offered in SCE territory: seven Level I classes and seven Level II classes.
  - The evaluation team reviewed (and applied the yardsticks to) all available materials for each of these courses. (See Table xA-4 in Appendix A-1 for a listing of reviewed courses.)

- In-person audits

The evaluation team attended two Level I courses and two Level II courses, taught by a total of four different instructors. (See Table xA-4 in Appendix A-1 for details.)

- Instructor interviews

The evaluation team interviewed all but two of the instructors that were identified as BOC instructors teaching classes in SCE territory.

(See Table xA-5 in Appendix A-1 for a summary of instructors interviewed. See Appendix A-4 for the interview guides we used to structure these conversations.)

## Exit Surveys

The available exit survey data was compiled by event in Microsoft Word™ documents. (Because the results were compiled, we were unable to do rigorous analysis of the data.) Exit survey data reflected events held in SCE territory in 2006–08.

When feasible, we compared the results from the BOC exit surveys to comparable items on the SCE Energy Center exit surveys collected during the same period. (See “Exit Surveys” on p. A-10 for more information on the exit survey method. See Appendix A-5, p. A-75, for the mapping of BOC and SCE EC exit surveys.)

## Staff Interviews

To gain a broader perspective of the context in which the BOC program operates and to address specific questions regarding how actual implementation unfolded, the evaluation team conducted telephone interviews with the Program Director and the Site Coordinator for BOC Classes.

See Appendix A-6 (p.A-81) for the staff interview guide and summary of interview results.

# Results

The body of this report highlights the major results from the evaluation, organized by program goals. Additional details — including results for the program response to prior evaluation recommendations and background characteristics of BOC students and their facilities — are in Appendix A-2.

## Goal 1: Increase participants' ability to identify areas for reductions in energy consumption and demand and to design projects to accomplish this

Evaluation questions related to Program Goal 1 fall into two main categories based on stated program strategies (Table BOC-1): Influencing AKA-B and guiding participants to utility program.

The following notes the evaluation questions in both categories and summarizes the associated results:

- **Influence on awareness, knowledge, attitude, and behavior (AKA-B)**, addressed by evaluation questions:

*1-1: How well do course design and delivery support behavior change and adult learning?*

- Courses are generally fairly well designed to support behavior change and adult learning (Table BOC-5 and Table BOC-6)
- Delivery (how courses are implemented in the classroom) falls short of the design (Table BOC-5, Table BOC-6, and Table BOC-7)

*1-2: How much influence do classes have on participants' AKA-B?*

- Participants are more confident in their professional interactions and share their knowledge as a result of the training. (Table xA-27 and Table xA-29 in Appendix A-2)
- Most students' facilities initiate EE projects after BOC training, but less than half of those students indicate that the projects were influenced by BOC. (Figure BOC-2)
- Areas of impact in operations and maintenance (O&M) are limited, inconsistent, and the degree of impact usually is small. (Figure BOC-3 and Figure BOC-4)

- **Guiding participants to relevant utility programs**, addressed by evaluation questions:

*1-3: How well do course design and delivery support utility programs?*

- The materials are not designed to support SCE programs, though some courses do address measures and practices the program encompass. (Table xA-46 and Table xA-47 in Appendix A-2)
- Instructors and SCE reps add little program support

*1-4: Do participants remember and take advantage of SCE programs after class?*

- Students do very poorly in recalling SCE programs after the training (Figure BOC-5 and Figure BOC-6)
- Less than half the students whose facilities undertook EE projects after the BOC training said they received a rebate for that project (Table xA-30 in Appendix A-2)



## Influence on AKA-B

### *1-1: How well do course design and delivery support behavior change and adult learning?*

The following summarizes major strengths and concerns relative to the BOC training design and delivery, followed by the average scores on the various yardstick dimensions.

#### **Strengths**

The evaluation team's initial review of the BOC training materials using the yardstick for support of behavior change and adult learning identified several important strengths in the curriculum design:

- There appears to be a logical progression from Level I to Level II courses: from relatively basic information and lower-level objectives to relatively advanced content and higher-level performance objectives
- Most courses have objectives that reflect appropriate learning levels given the class goals and focus.  
(Often the objectives weren't worded appropriately as specific, observable, and measurable behavioral objectives; but the evaluation team did not consider this to be a significant issue in the overall context of this evaluation.)  
(See Appendix D-2, p.D-2, for a brief description of learning levels.)
- Many of the courses include directions and worksheets for in-class activities focused on:
  - Discussions with peers regarding considerations for applying concepts to one's own environment
  - Hands-on practice applying content and concepts addressed in the class
  - Quick practice with applying information in class (e.g., given this diagram, identify the parts; given this situation use the formula to calculate...)
- Most courses have a class project (homework) assignment designed to bridge the gap between in-class theory and in-field application.

#### **Concerns**

During the evaluation process, we learned that the way in which the training is implemented differs significantly from the apparent design intent. These differences between "what's designed on paper" and "what's delivered in the real world" dilute the effectiveness of training relative to meeting class objectives, supporting behavior change, and meeting the criteria for adult learning principles and best practices.

- In all four of the classes that we observed, the instructors omitted every one of the in-class activities — including Table group (peer) discussions and hands-on activities.  
(In two instances, the instructor walked through an activity, essentially "doing it for the students." This is not accomplishing the same thing as having students practice.)
- Although the course learning objectives address relatively high-level behaviors, the final exams for each course do not.

A student's passing the final exam does not mean that the student has met the course objectives.

The majority of final exam items are on a "recall" or "recognize" level (level one), while the majority of the objectives are on an "understand," "apply," "analyze," or "evaluate" level (levels two through five). (See Appendix D-2, p.D-2, for a brief description of learning levels and the types of objectives associated with them.)

**Results**

- In all four of the courses that we observed, the instructors “coached to the exam.” The degree of coaching varied by instructor, ranging from:
  - “Pay attention to this slide; you’ll probably see a question like this on the exam.”to
  - “For those of you who didn’t have your pencils out earlier when I went through this, let’s do it again. The smart ones will write this down... The answer to question one on the final exam is ‘a;’ question two is ‘c’...” (through all the exam items)

According to program staff interviews, NEEC is interested in improving testing procedures in the classes, because they recognize that instructors provide varying levels of support and coaching during testing, and some instructors go too far in helping students. This is supported by results from the instructor interviews, in which some instructors indicated that there was “a lot of controversy” about the type and quantity of exam-specific coaching instructors provide.

In addition, the evaluation team had some concerns about the appropriate construction of many of the exam items.

- Many questions were simple true-false items, which do not test comprehension or application effectively.
- Many questions used a negative (or even double negative) construction, included non-parallel answer options, or included answer option constructions such as “a and c only.” All of these are test item designs that most training assessment professionals would recommend avoiding.

However, the assessment of the final exams' design, reliability, and validity is outside the scope of this process evaluation and is not further addressed in this report. (Nor did it affect the scoring of the classes when we applied the various yardsticks.)

- Class projects seem not to serve as a vehicle for testing students’ ability to apply what they have learned in the class to their own environment, nor do they appear to serve as a platform for providing feedback and guidance to improve their performance.
  - The class projects are graded (pass/fail) by the site coordinator.

According to program staff interviews, the site coordinator is given a checklist for what should be included in the assignment, but he does not evaluate the “correctness” of the homework.
  - Typically the only feedback that students receive on these assignments is whether they have passed or failed.

The projects do not serve as a basis for in-class activities and discussion, nor do they serve as an opportunity to provide students with meaningful feedback and guidance.

In short, the projects appear to exist outside the framework of the actual training experience, and the instructors who are qualified to evaluate the work and provide appropriate feedback rarely, if ever, look at the results.

- The connection between what is taught in class and specifically what students can do on-the-job to affect positive change in their environment is not evident in the class materials.

The class projects, if implemented as a way to provide guidance and coaching could close this gap. However, as noted above, this is not the way the projects are used. Therefore, students are “on their own” in figuring out “what this means to me in my work environment.”

The scores for the BOC classes on the specific yardstick criteria noted below reflect this essential disconnect between the apparent intent of the design and the actual implementation of the curriculum.

In addition, comments students entered in the exit surveys for the BOC classes support the assertion that students would benefit from a greater emphasis on practical application of the information taught:

“There is so much information, maybe more emphasis on things we can actually do.”

“Need more real world analogies”

“Bring more samples to class”

“More demonstrations to gather data for retrofit or redesign calculations”

“Not sure class captured the importance and cost involved with proper lighting.”

### Scores on Major Dimensions of Yardstick

Table BOC-5 to Table BOC-7 show the average scores for BOC Level I and Level II courses on the major dimensions of the yardstick for support of behavior change and adult learning. All three methods of evaluation are indicated (instructor interviews, review of materials, and observation). The percentages shown in the tables can be interpreted as follows:

0%	to	35%	Very Poor
36%	to	55%	Poor
56%	to	70%	Fair
71%	to	85%	Good
86%	to	100%	Very Good to Excellent

It is interesting to note that — in general:

- Scores from the instructor interviews tend to be much higher than the other scores.
- Scores from observing the actual classes tend to be lower than those from interviews and reviewing the materials.

Average scores for support of behavior change are mostly poor to very poor (Table BOC-5). Details on the scoring used for this portion of the yardstick are in Appendix A-2, beginning on page A-17.

**Table BOC-5. Overall Score for Support of Behavior Change**

Dimensions of Supporting Behavior Change	Level I			Level II		
	Interv	Material	Observ	Interv	Material	Observ
Encouraging Action	80%	57%	50%	47%	40%	0%
Helping Overcome Common Market Barriers	53%	37%	0%	15%	14%	0%

Average scores for adult learning principles ranged from very good to very poor, with Level I courses doing slightly better than Level II (Table BOC-6). The extreme difference in scores for Review of Materials and Observation on one of the dimensions (let learners apply what they have learned) is due to the fact that none of the class activities were delivered in the classes we observed. Scoring details for adult learning principles is in Appendix A-2, beginning on page A-19.

**Table BOC-6. Overall Score for Adult Learning Principles**

Dimensions of Adult Learning Principles	Level I			Level II		
	Interv	Material	Observ	Interv	Material	Observ
Obtain Learner Buy-in	75%	58%	60%	80%	55%	53%
Build on What Learners Know	56%	50%	35%	63%	34%	55%
Engage the Learners	62%	43%	23%	33%	36%	20%
Set Up Learners for Success	66%	66%	55%	69%	61%	40%
Let Learners Apply What They Have Learned	83%	79%	20%	65%	66%	20%

Average scores for adult learning practices ranged from very good to very poor, with Level I courses doing slightly better than Level II (Table BOC-7). It's important to note that all courses scored well for learning facilitation; the instructors we observed and those we interviewed were respectful of the students and created a "safe" environment.

**Table BOC-7. Overall Score for Adult Learning Practices**

Dimensions of Adult Learning Practices	Level I			Level II		
	Interv	Material	Observ	Interv	Material	Observ
Lesson Plan	NA	61%	40%	NA	52%	40%
Content Decisions	88%	85%	65%	83%	79%	55%
Interactive Activities	64%	64%	23%	79%	58%	23%
Learner Centricity	48%	38%	48%	50%	40%	33%
Learning Facilitation	87%	NA	75%	84%	NA	65%
Practice Opportunities	58%	55%	20%	43%	41%	20%
Feedback	68%	NA	33%	75%	NA	33%
Assessments	60%	59%	23%	80%	42%	25%

## 1-2: *How much influence do classes have on participants' AKA-B?*

When considering influence on participants' awareness, knowledge, and attitude it appears that the BOC training does well. The majority of participants interviewed indicated that —as a result of their BOC training — they:

- Were more likely to encourage EE actions at their facility
- Were more confident in their professional interactions with others
- Share knowledge with others

See “Effect on Professional Interactions” and “Influence of Students on Others” in Appendix A-2 (beginning on p. A-29) for details.

When considering influence on participants' behavior, the results are mixed:

- Application of knowledge: 91% of the students interviewed said they used or applied concepts or methods learned in BOC training (Table xA-29 in Appendix A-2).
- Effect on projects: Less than half the respondents reported initiating BOC- influenced energy efficiency projects (Figure BOC-2).
- Effect on O&M practices: Differences in operations and maintenance (O&M) practices between BOC participants and nonparticipants — and between Level II and Level II participants — were mixed and most were relatively small (Figure BOC-3 and Figure BOC-4).

The following discusses the last two bullets in more detail.

### **Effect on Projects**

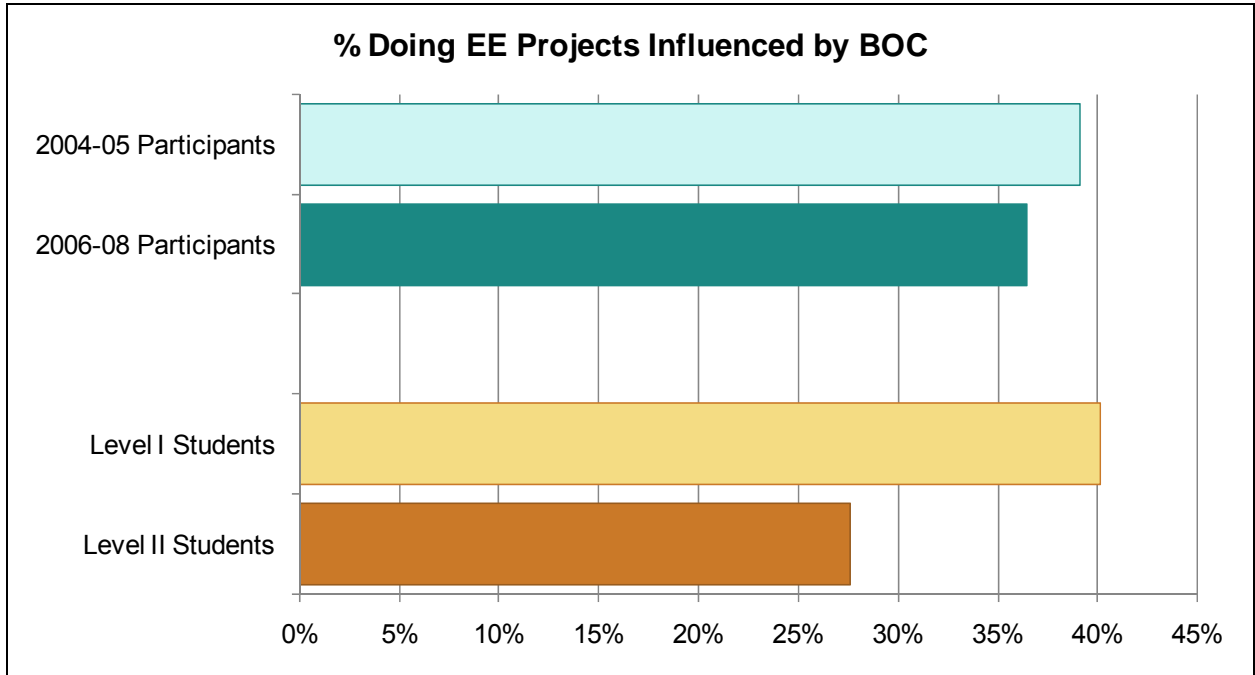
The majority (85%) of 2006–08 BOC participants interviewed reported that they initiated energy efficiency projects during the program cycle. This is almost identical to the 2004-05 cycle. The projects tended to be dominated by lighting measures, even more than in the previous group (77% overall, compared to 60% for the earlier group). However, the 2006–08 students also report more non-lighting projects than their earlier counterparts.

As seen in Figure BOC-2:

- Less than half (36%) of the participants interviewed attributed the BOC training as having a significant influence on the decision to initiate EE projects.
- Fewer students Level II reported BOC training having an influence on their facility's EE projects than did Level I students (27% compared to 40%)

See “Projects Initiated” in Appendix A-2 (p. A-31) for details on the types of project initiated and interviewee's reports on the influence of the BOC training on initiating projects.

**Figure BOC-2. Percent of Students Who Responded 4 or 5 on a 5-point Scale When Asked about BOC Training’s Influence on Their Facilities Projects**



### Effect on O&M Practices

Respondents were asked about a series of 12 operation and maintenance (O&M) activities and how often they conducted them. The questions were exactly the same as those asked in the PY2004-05 study, enabling comparisons with that time period, including the non-participants interviewed at that time.

A mechanical engineer subject matter expert helped us identify the frequency that was “good” or “best” for each of the activities.

As shown in Figure BOC-3, comparing 2006–08 participants to 2004-05 non-participants, we found:

- For five of the O&M activities, significantly more 2006–08 participants performed the activities with appropriate frequency.
- For two of the O&M activities, significantly fewer 2006–08 participants performed the activities with appropriate frequency.
- For the remaining five activities, 2006–08 participants performed better on some and worse on other activities, but the difference was not statistically significant.

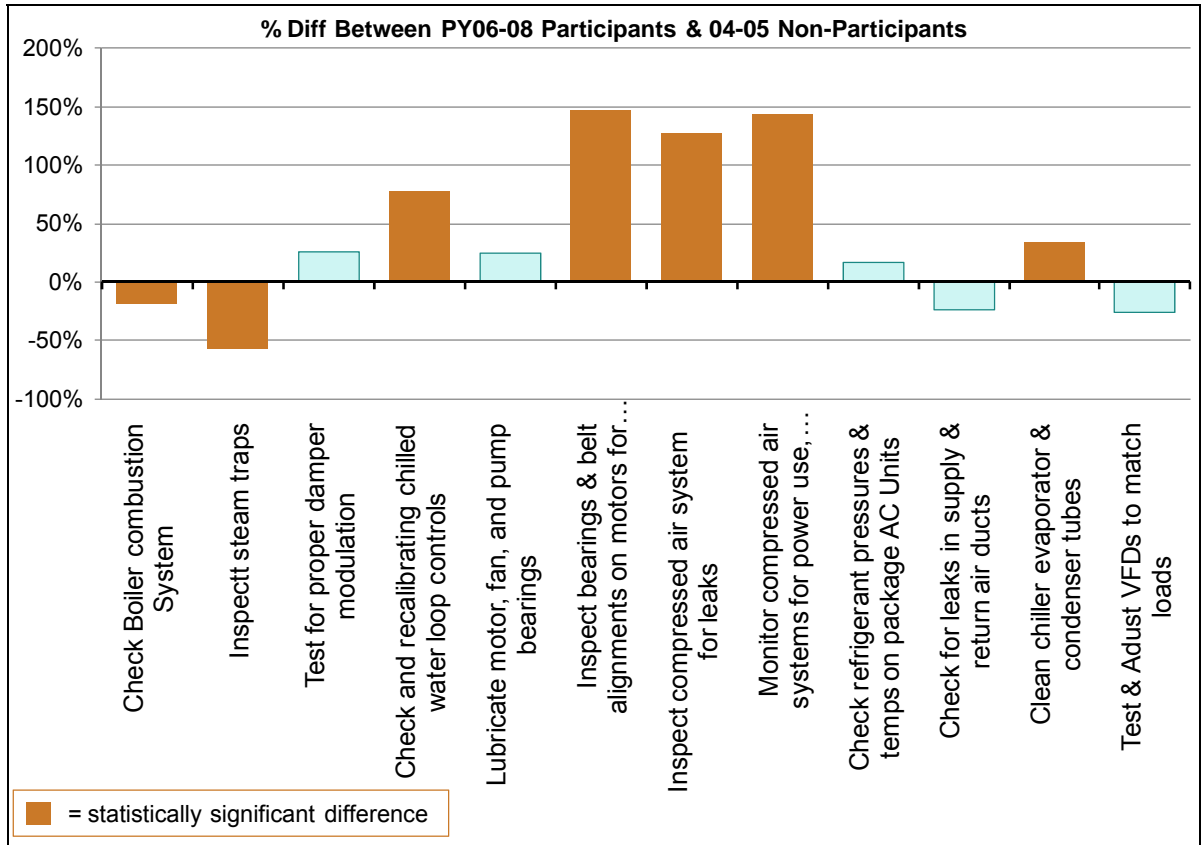
As shown in Figure BOC-4, comparing Level I and Level II participants, we found:

- For a few O&M activities Level II participants performed significantly better than Level I.
- For three-fourths of the activities, there was no significant difference between the two groups.

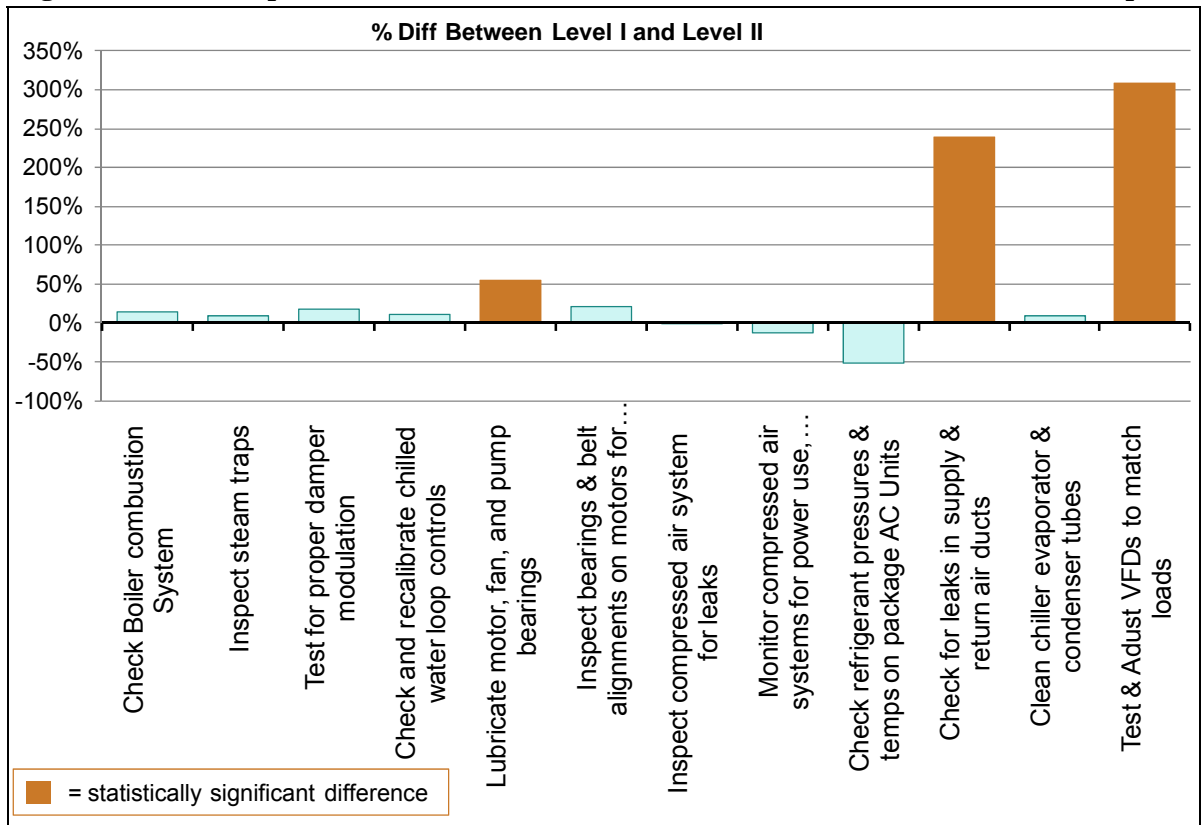
For one of the O&M methods — repeated benchmarking or indexing — Level II significantly outperformed Level I. On the other methods explored, results are inconclusive (Table xA-32 in Appendix A-2).

See “O&M Practices” in Appendix A-2 (p. A-32) for details on how the effect on O&M activities were determined, including the scores for each response for each activity. Also seen there are results of analyses on the specific O&M methods employed.

**Figure BOC-3. Comparison of O&M Practices between BOC Participants and Nonparticipants**



**Figure BOC-4. Comparison of O&M Practices between BOC Level I and Level II Participants**



**Results**

## Guiding Participants to Utility Programs

### *1-3: How well do course design and delivery support utility programs?*

The evaluation team first identified the courses that had a “high tie-in” (strong logical relationship) to one or more SCE EE programs. (See “Tie-in between Courses and Programs” in Appendix A-2, p. A-41.) We then determined whether the course design and delivery supported the high tie-in program(s).

We considered both direct support (addressing issues specifically related to the program) and indirect support (addressing measures and practices the program encompasses). We found:

- BOC course materials are not designed to directly support SCE EE programs, which is understandable given the nation-wide focus of the curriculum.

All courses scored 0% on all dimensions related to direct support of programs. (See Table xA-46 in Appendix A-2.)

- The relatively few courses with high-ties to programs, did a great job of indirect support of programs.

All courses scored 100% on all dimensions related to indirect support of programs. (See Table xA-47 in Appendix A-2.)

- Most instructors were unfamiliar with SCE programs, and those who were did not address them when delivering BOC courses.
- Although SCE reps are scheduled once per Level I and Level II series to address the class relative to SCE programs, the coverage is uneven (sometimes addressing numerous programs at a high level, sometimes addressing one relatively small program in great detail).

See “Details for Support of Programs” in Appendix A-2 (p. A-41) for more information.

### *1-4: Do participants remember and take advantage of SCE programs after class?*

Three areas in the telephone interview with participants addressed utility programs: recall of programs, recognition of programs when prompted, and taking advantage of programs for EE projects.

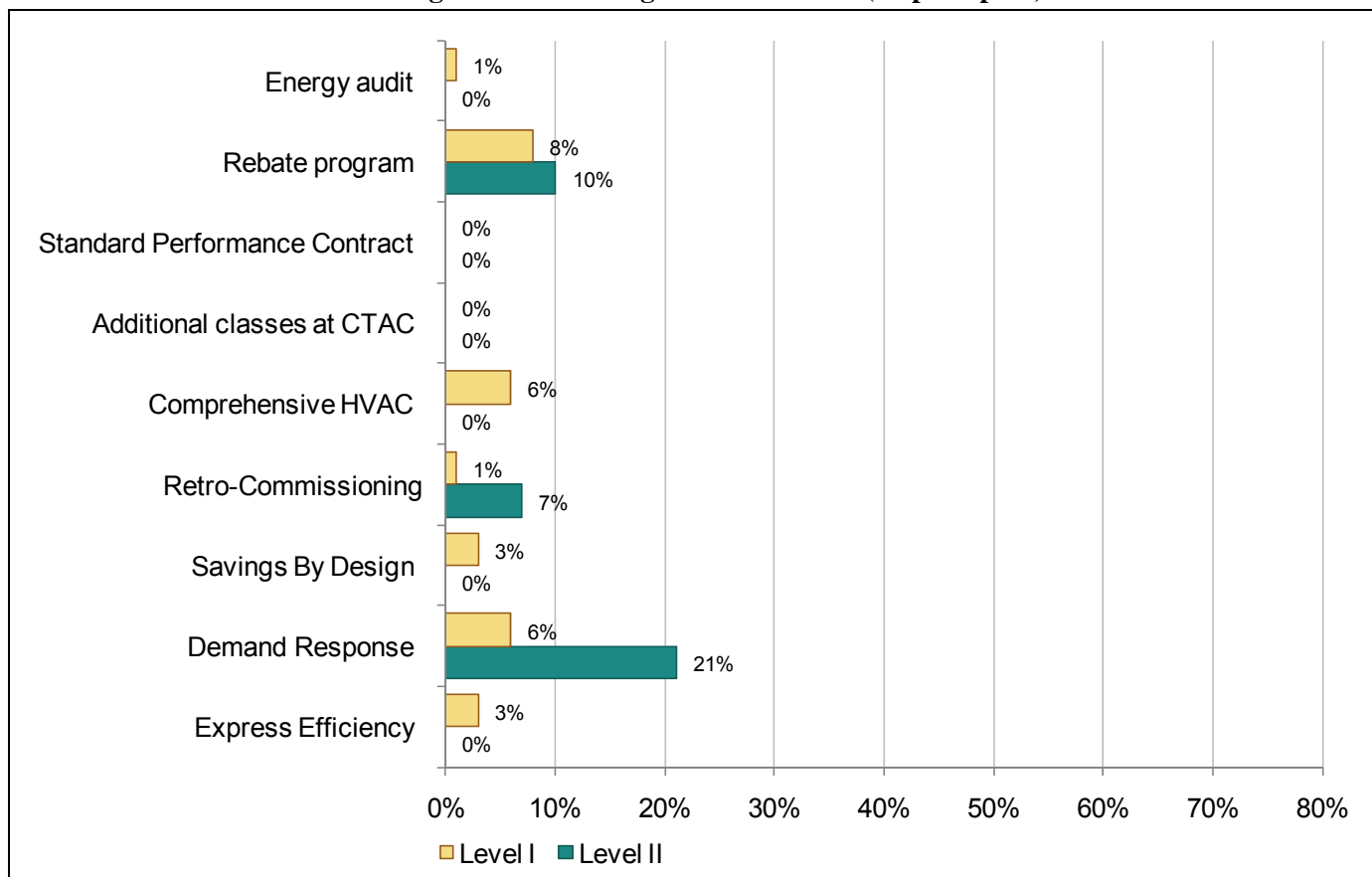
- Students tended not to be able to recall the names or descriptions of programs (Figure BOC-5 and Figure BOC-6)
  - The overall average for program recall is 3%, with Demand Response and “Rebate program” being the most-often recalled (10% and 9% respectively) and other programs ranging from 0% to 4%.
  - In general, Level II students tend to be better at recall, especially for the demand response program.
- Of course, recognition is more successful than recall. (See Figure BOC-6.)
  - The overall program recognition rate when prompted is 30%, with Retro-Commissioning scoring highest (44%) and Express Efficiency scoring lowest (5%).
  - Again, in almost all categories, the Level II students were more successful than Level I students. This would seem to indicate that continued exposure (or opportunities for exposure) to this content has a cumulative effect.
- Less than half (41% overall) of the participants whose facilities initiated EE projects after the BOC training reported that they received a rebate on the project. (See Table xA-30 in Appendix A-2.)

45% of Level I students and 33% of Level II students indicated that they received a rebate for the EE projects their facility began or completed after the BOC training.

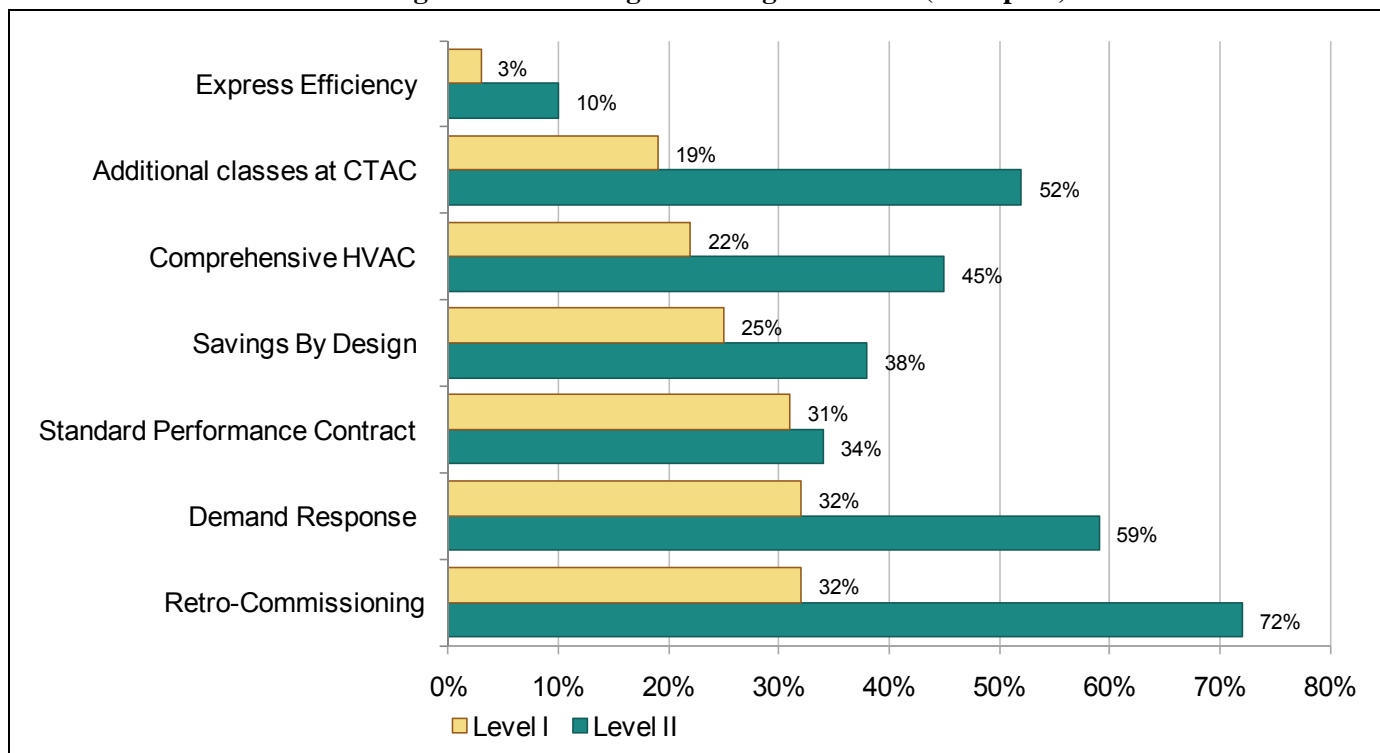
See “Details for Remembering and Taking Advantage of Programs” in Appendix A-2 (p. A-44) for more information.



**Figure BOC-5. Program Recall Rate (Unprompted)**



**Figure BOC-6. Program Recognition Rate (Prompted)**



## Goal 2: Overcome barriers that inhibit participation in BOC training offerings

There were five evaluation questions related to Program Goal 2 (based on program strategies; see Table BOC-1), grouped into three areas. The following notes those questions and summarizes the associated results:

- **Perception of BOC certification**, addressed by evaluation question:
  - 2-1: *Is certification seen as valuable?*  
 Participants generally see certification as important; and they tend to believe their supervisors value it even more. (Table BOC-8)
- **Leveraging of existing marketing channels**, addressed by evaluation questions:
  - 2-2: *Have previous recommendations re. marketing channels been acted on?*  
 Little progress has been made to leverage existing marketing channels, as recommended in the prior evaluations. (“Leveraging of Existing Marketing Channels” below)
  - 2-3: *How many participants learned of the program through existing channels?*  
 Most participants learn of BOC training through BOC training calendars sent to themselves or their supervisors. (Figure BOC-7)
- **Overcoming other market barriers to participation in BOC training**, addressed by evaluation questions:
  - 2-4: *To what degree have web-based and swing-shift training been implemented?*  
 Neither web-based nor swing-shift training has been implemented to facilitate participation by employees from small companies.
  - 2-5: *Has potential for Spanish-speaking audience been assessed?*  
 The potential for Spanish-speaking audiences has not been assessed.

The following sections provide more detail in these three areas.

### Perception of BOC Certification

#### 2-1: *Is certification seen as valuable?*

We asked respondents in the telephone interviews of students about the importance of the training and the certification. The results are seen in Table BOC-8:

- A majority (57%) of student respondents felt that the actual certification itself was important to them.
- A much larger majority had the impression that the certification itself was important to their employers, with 77% choosing 4 or 5 on a 5-point scale to indicate importance.
- A similar percentage felt that their employers take the training seriously. It is surprising that the participants consider the certification important less often than they think their employers do.

**Table BOC-8. Importance of Certification and Training**

Certification Issue	Percent Choosing 4 or 5 on a 5-Point Scale
How important to you is certification beyond the actual training?	57%
How important is the certification to your employer	77%
How seriously does your employer take the training?	73%

## Leveraging of Existing Marketing Channels

### 2-2: *Have previous recommendations re. marketing channels been acted on?*

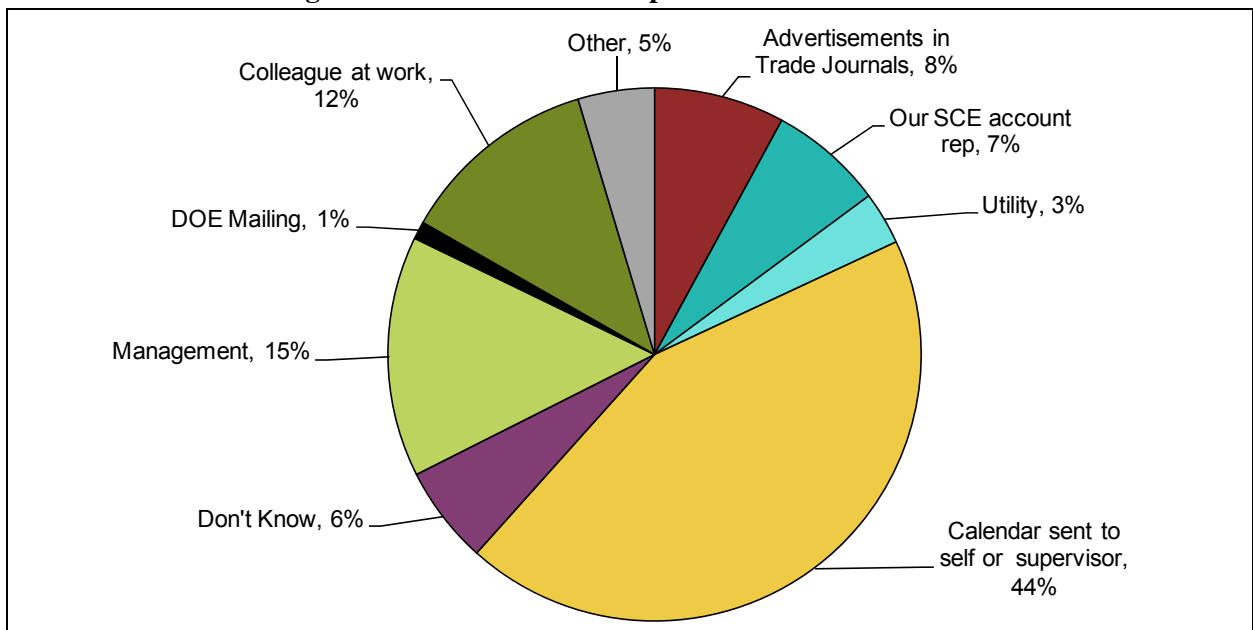
During the staff interviews, the evaluation team learned that some progress has been made toward leveraging existing channels — specifically NEEC works with SCE customer account reps to build awareness and support for the program so that the reps will promote and support it with their customers.

We also learned that the BOC training has not been incorporated into SCE’s Energy Center calendars, although some BOC classes are held at the Energy Centers. Rather, BOC publishes its own calendar which is available at the ECs and through the customer account reps. (NEEC would like to more thoroughly integrate the two calendars and their distribution.)

### 2-3: *How many participants learned of the program through existing channels?*

Few of the participants interviewed learned of the BOC courses through SCE account reps (and none from SCE EC calendars, since the courses are not published on those calendars). BOC calendars sent to the participant or participant’s supervisor was the most common channel through which participants learned of BOC courses. See “Details for Leveraging Existing Marketing Channels” in Appendix A-2 (p. A-46) for more information.

**Figure BOC-7. Where Participants Learned about BOC**



## Overcoming Other Market Barriers to Participation in BOC Training

Prior evaluation recommendations highlighted two other barriers to participation in BOC training. Neither of these issues were addressed in the 2006–08 program cycle:

- Employees of small companies often face logistical constraints that prevent them from attending BOC training — being unable to leave work to attend classes.

Web-based training or “swing shift” training could make BOC courses more available to these building personnel. However, neither approach has yet been implemented in BOC.

- Language is another potential market barrier, since many of the potential target audience for the training speaks Spanish.

Interviews with program staff indicate that the Spanish-speaking audience potential for BOC has not yet been assessed.

### Goal 3: Generate satisfied participants

There were five evaluation questions related to Program Goal 3 (based on program strategies; see Table BOC-1), grouped into three areas. The following summarizes those questions and associated results:

- **Overall Satisfaction**, addressed by evaluation question:
  - 3-1: *What is participant satisfaction immediately following class?*
  - 3-2: *What is participant satisfaction when time has elapsed after class?*

Participants tend to be satisfied to very satisfied immediately after class and after time has elapsed (Figure BOC-9 and Figure BOC-10).
- **Effect of Suggestions from Participants in Prior Evaluation: Pre-work and Supervisor Reminders**
  - 3-3: *Are “pre-work” materials distributed?*
  - 3-4: *What effect does “pre-work” have on participant satisfaction?*
  - 3-5: *Are reminders and follow-ups sent to supervisors?*
  - 3-6: *What effect do supervisor reminders and follow-ups have on satisfaction?*

Although participants who have received pre-work and whose supervisors have received reminders and follow-ups tend to appreciate it, these measures seem to have little impact on overall participant satisfaction (Table BOC-9).
- **Participant Interest in Future Offerings**

This question was added at the request of program administration, and showed that most students were interested in refresher courses, learning more about SCE programs, and taking web-based training (Table BOC-10).

The following provides more information on the results for these three areas of exploration.

#### Overall Satisfaction

##### 3-1: *What is participant satisfaction immediately following class?*

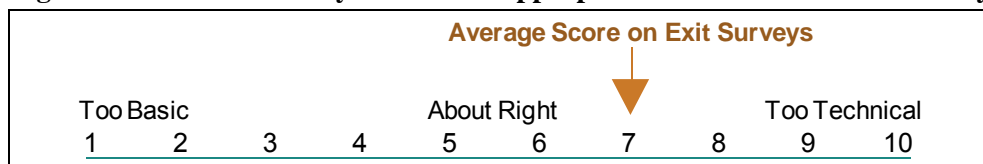
Both Level I and Level II courses did well to very well on exit survey items that addressed general satisfaction issues, and — in general — BOC scores were similar to those for SCE Energy Center courses (Figure BOC-9).

An exit survey item where satisfaction level might be considered significantly “below par” is the one addressing the appropriateness of the technical level of the content addressed. As noted, above, for this item, a “perfect” score would be 55%, so the score of 70% for both Level I and Level II respondents indicates that students tended to think the content presented tended toward being “too technical” (see Table xA-52).

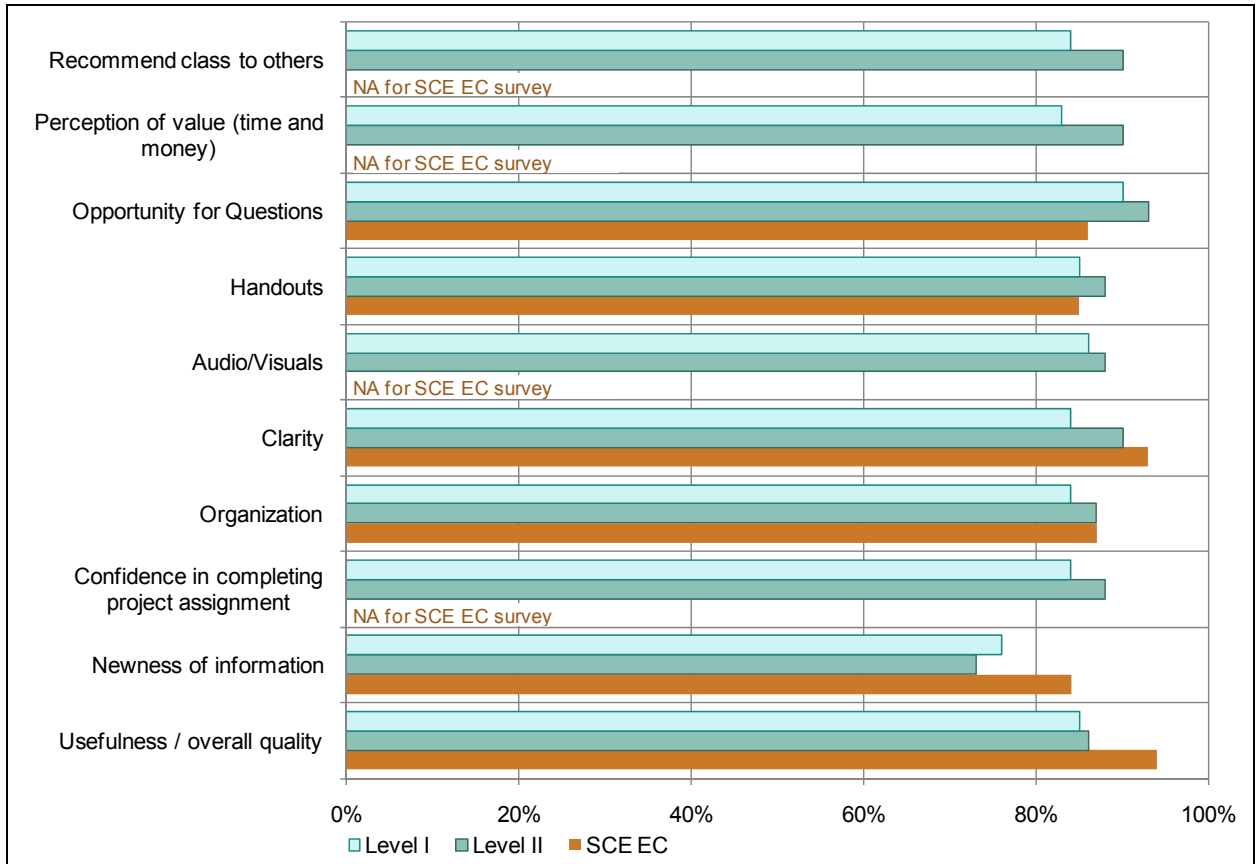
From comments on the exit surveys, it appears that people who think the content is too technical may be particularly frustrated by technical terms used in the training. (This is conjecture: because we received only compiled exit survey data, we cannot relate specific comments to individuals’ ratings on an item.)

See “Immediately After Class (Exit Survey Results)” in Appendix A-2 (p. A-48) for more information.

**Figure BOC-8. Exit Survey Results on Appropriateness of Technical Difficulty**



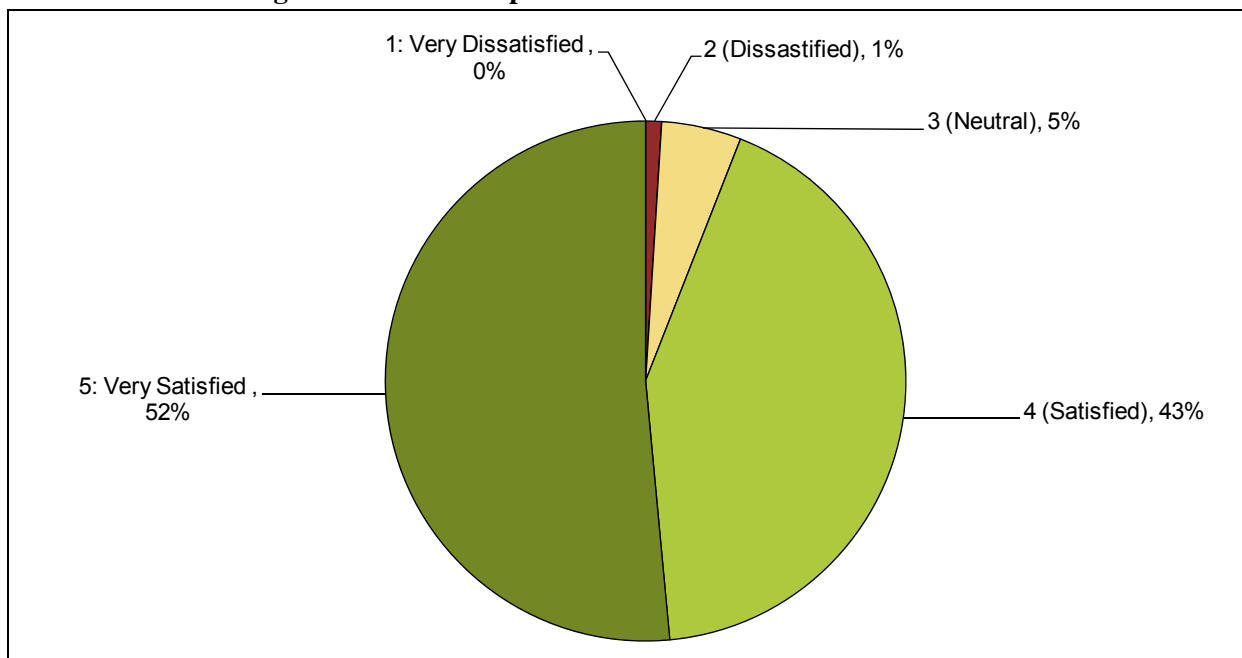
**Figure BOC-9. Exit Survey Results on General Satisfaction Issues**



**3-2: What is participant satisfaction when time has elapsed after class?**

The vast majority of students interviewed were satisfied to very satisfied with their BOC training experience (Figure BOC-10). In addition, few participants had suggestions for improving the courses. See “After Time Has Elapsed (Telephone Interview Results)” in Appendix A-2 (p. A-50) for details.

**Figure BOC-10. Telephone Interview Results on Satisfaction**



**Results**

**Effect of Suggestions from Participants in Prior Evaluation**

Two participant suggestions that surfaced in previous evaluations have to do with preparation for class:

- Providing materials for participants to review before class
- Engaging participants’ supervisors with reminders of upcoming classes and follow-up communications after class.

Neither of these measures had a significant impact on overall satisfaction, though those who received them appreciated them.

Table BOC-9 shows that only a small percentage (20%) received pre-class materials for any classes, but of those who did receive them, 95% experienced them as helpful. This finding seems to contradict what we learned from the staff interviews, where it was said that no pre-class materials were sent. Given the small percentage of students who claimed they did receive some, it may be that some instructors send some material out, if not the actual workbook. Future researchers might want to go into this in more depth.

On the other hand, 59% said their supervisors had been reminded of upcoming classes in advance, and 94% of those people thought this was helpful. In this case as well, there is an apparent contradiction between student reports and program staff reports. However, it may be that students interpreted the question more broadly than staff; supervisors may have reminded their employees on the basis of the calendar of events that was sent as part of marketing.

**Table BOC-9. Preparation for Class**

Question	Percent Saying "Yes"
Did you receive advance or pre-class materials for any of the classes?	20%
Was it helpful to receive the materials?	95%
Did program staff remind your supervisor of classes in advance?	59%
Was it helpful that your supervisor was reminded?	94%

Independent-sample t-tests were performed to see if those who received materials were more satisfied than those who didn’t, and to see if those whose supervisors were notified were more satisfied than those who weren’t. In neither case were the two groups statistically significantly different on satisfaction. It may be too much to expect that satisfaction is significantly impacted by these small administrative details. Most likely, class content and delivery are the primary drivers of satisfaction.

## Participant Interest in Future Offerings

At the request of program administrators, the evaluation team asked an additional question generally related to participant satisfaction: How interested are students in several additions to course offerings?

Table BOC-10 summarizes the results for this question:

- Most students (83%) said they would be interested in a refresher course on advances in energy efficiency that would be offered every other year.

This is a clear opportunity to strengthen the program and stay in contact with past students.

- A strong majority (69%) would be interested in a one- to two-hour module added to a class where SCE account managers come to discuss energy efficiency programs, rebates, incentives, and services.

This could help address the fact that most BOC students are unfamiliar with SCE programs and do not take full advantage of them.

- A similar majority (68%) would be interested in taking classes in a web format.

This could be a means of addressing some of the concerns expressed by students, and the reasons for some dropouts.

**Table BOC-10. Interest in Future Offerings**

Possible Offering	Percent Saying "Yes"
Interested in a refresher course on advances in energy efficiency that would be offered every other year?	83%
Interested in a 1-2 hour module added to a class where SCE account managers come to discuss energy efficiency programs, rebates, incentives & services?	69%
Interested in taking classes in a web format?	68%

# Recommendations

## Program Design Considerations

- Accommodate needs of potential participants who find it difficult to attend classes offered during “office hours.”
  - Implement web-based classes to reduce dropout and recruit students from smaller organizations.
    - By far, the most common reason for dropout is lack of time to go to classes (See Table xA-56 in Appendix A-2).
    - The size of the facilities sending students to classes appears to be getting larger rather than smaller. (See bottom of Table xA-8 in Appendix A-1 for the only available comparison to the last program cycle — in this case, number of square feet in the facility.)
  - Almost half the facilities represented by student interviewees were more than one million square feet. This may reflect what was found in the earlier study, that small firms have more difficulty allowing their building operators to take time off of work to attend classes.
  - Add classes offered in the evenings and weekends for the same reasons.
- Establishing stronger links to SCE programs in the curriculum
  - Very few students could spontaneously recall any SCE programs (Figure BOC-5).
  - Even when prompted with the names of SCE programs, less than half the students recognized programs that were named (Figure BOC-6). The Level II students did substantially better on this task than Level I students, pointing to the value of multiple exposures to the information.
  - Most of the students whose facilities implemented EE programs after BOC training indicated that they did not receive a utility rebate for the project (Table xA-30 in Appendix A-2).
- Clarify and strengthen the differentiation between Level I and Level II courses.

The difference between Level I and Level II was described as just going into more depth in the same areas, rather than developing more advanced skills and practical knowledge, or any other appropriate specification whose results could be measurable.

- Level II students showed little or no additional confidence in their professional interactions compared to Level I (Table xA-27 in Appendix A-2).
- The methods used for 12 common O&M activities were not consistently better among Level II students, although overall, they were more likely to choose the best methods than Level I students. (Figure BOC-4).

It could be that the activities measured were not those best suited to distinguishing Level II from Level I; however, this points to the need to be clearer in the differences expected. This clarity could be translated into curriculum.

## Program Process Considerations

- Institute quality control processes for updating the database.
  - There were many blank fields and records that couldn't be matched up across MS Access Tables. Classes supported by SCE could not be reliably identified and in almost a third of the cases, contact information could not be matched with course information, or there was no course information, or incomplete course information for the student (Table xA-1 in Appendix A-1).
- Consider maintaining a database (or spreadsheet) capturing individuals' responses on the exit surveys.

An appropriate electronic format would eliminate the need to rekey the data in order to analyze survey responses, and more detailed information (individual responses) would make possible more robust analysis of exit survey data (“Exit Surveys” in Appendix A-1, p. A-10).



## Program Marketing Improvement

- Increase efforts to market the program to smaller firms (see above)
- Increase efforts to strengthen existing marketing channels as intended after the last evaluation
  - BOC classes are not included in the standard SCE Energy Center calendars, though mailings of BOC calendars of events has yielded results — 44% of participants learned of BOC through this channel (Figure BOC-7).
  - Very few participants learned of BOC through SCE representatives (Figure BOC-7).

## Training Design and Delivery

Two recommendations regarding training design and delivery have to do with capitalizing on the strengths of the BOC curriculum materials:

- Encourage instructors to fulfill the in-class activities as they are designed.

Adult learning theory — supported by educational research and practical experience — indicates that people learn by doing; not by being lectured to.

[See Appendix D-3 for a summary of how teaching styles and delivery modes (essentially “tell” versus “do” issues) affect what students retain from the training they take.]

In addition, while it is only in a minority of students surveyed, some expressed feelings that the instructor was not enthusiastic and presented material in a boring manner. This is reflected in the 23% of participants who provided suggestions indicated that they would like to see better instructional methods (see Table 39, Table 40 and the associated quotations from students interviewed).

- Implement a meaningful “debrief” of practice assignments (homework); use the debrief as a way for experts (instructors) to provide meaningful guidance to students, for students to share their ideas, thoughts, and challenges amongst themselves, and for individuals to develop personal action plans to implement what they’ve learned.

The recommendations to fulfill in-class activities and to integrate practice assignments in a meaningful way are supported by students’ feedback in the exit surveys (see p. 21 ).

It also is supported by results from the telephone surveys of students:

- Over half of those offering suggestions asked for more depth or detail in class content (Table xA-55 in Appendix A-2).
- Sometimes only a minority of students report completing the appropriate level of O&M activities (Figure BOC-4).

The third recommendation relative to training design and delivery focuses on an issue already identified by NEEC personnel:

- Improve the final exam and related process so passing an exam clearly indicates that a student has met the objectives for that class.
  - Consider conducting a reliability and validity assessment of the exam items to ensure they appropriate reflect the targeted objectives.
  - Discourage instructors from specifically “giving away” the answers during the class presentation.

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# Custom Language Efficiency Outreach (CLEO)

## Overview of Results and Recommendations

The evaluation team identified specific evaluation questions based on the program goals and strategies. Table CLEO-4 summarizes the relationship between program goals and strategies and evaluation questions and methods.

Table CLEO-1 summarizes what we found in answer to the evaluation questions. Table CLEO-2 summarizes the resulting recommendations. Results for the CLEO evaluation are further discussed on pages 45 to 54. Recommendations are further discussed on pages 61 to 62.

In addition, the evaluation team conducted an exploratory study to help identify considerations associated with expanding CLEO to new communities, beginning with African Americans. The methods, results, and recommendations from this exploratory survey are describe on pages 55 to 60

**Table CLEO-1. Summary of Goals and Results for CLEO**

Program Goal	Results
Goal 1: Increase awareness and knowledge of energy efficiency and CLEO seminars	<p>Telephone interviews with participants indicate:</p> <ul style="list-style-type: none"> <li>• The dominant channel for participants learning of the seminar varied by ethnic group (reflecting the different marketing tactics for the groups).</li> <li>• The seminar appears to have a positive effect on awareness and knowledge.</li> </ul>
Goal 2: Increase awareness of energy efficiency programs offered by SCE and participation in energy efficiency programs	<p>Telephone interviews with participants indicate:</p> <ul style="list-style-type: none"> <li>• Program awareness is high among CLEO participants, but program participation is extremely low.</li> </ul> <p>The yardstick for support of SCE programs indicate:</p> <ul style="list-style-type: none"> <li>• The seminar excels at communicating the program-specific information, especially for rebates.</li> <li>• The seminar does poorly at explaining the benefits of the technologies encompassed by the programs and does not help participants identify the equipment and measures that would be most appropriate for them.</li> </ul>
Goal 3: Increase energy efficiency behaviors in target communities	<p>Telephone interviews with participants indicate:</p> <ul style="list-style-type: none"> <li>• The seminar had a positive influence on participants' behavior, with significant differences among the ethnic groups.</li> </ul> <p>The yardstick for support of behavior change and adherence to adult learning principles and practices indicate:</p> <ul style="list-style-type: none"> <li>• The seminar excels at providing actionable "tips" for EE practices, but doesn't help participants understand the issues around those practices (cost/benefit).</li> <li>• Most relevant adult learning principles and practices are reflected in the seminar design, but could be improved on learner-centric dimensions.</li> </ul>

Program Goal	Results
Goal 4:Generate satisfied participants	<p>Telephone interviews with participants and exit survey data both indicate:</p> <ul style="list-style-type: none"> <li>• Participants are generally satisfied to very satisfied with the seminar.</li> <li>• Understanding “what to do next” is the short-coming identified in the interviews.</li> </ul>
Goal 5:Expand the program to other hard-to-reach groups, starting with African Americans	<p>The exploratory study found that the African-American customer group:</p> <ul style="list-style-type: none"> <li>• Is very similar to other SCE customer groups in terms of knowledge, attitude, and commitment to energy efficiency as well as familiarity with EE programs</li> <li>• Tends to be better educated (formal education) and more knowledgeable about energy efficiency than the current CLEO customer groups</li> <li>• Prefer TV, mail, and web as learning formats — though those who are most committed to EE action tend to prefer a seminar format</li> </ul>

**Table CLEO-2. Overview of Recommendations for CLEO**

Area	Recommendations
<b>Program Design</b>	<ul style="list-style-type: none"> <li>• Tailor seminar content to differences in baseline knowledge of energy efficiency</li> </ul>
<b>Program Process</b>	<ul style="list-style-type: none"> <li>• Keep exit survey data in a usable format with an ability to connect the each survey with ethnicity</li> <li>• Revise exit survey to conform to standard Likert scale (equal weight positive/negative)</li> <li>• Create and monitor sign-in sheets (contact info, which entries are same family) with individual telephone numbers for all participants</li> <li>• Implement QC to assure presenter quality</li> </ul>
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Address HEES at beginning (as well as end) of seminar; include HEES “success stories”</li> <li>• Provide clear guidance for “next steps” <ul style="list-style-type: none"> <li>○ Include typical financial benefits for EE measures and practices</li> <li>○ Highlight typical implementation considerations (cost, effort)</li> <li>○ Distinguish between actions for all vs. most appropriate for owners</li> </ul> </li> </ul>
<b>Exploratory Study for African-American Community</b>	<ul style="list-style-type: none"> <li>• Take higher education level and more “baseline” EE knowledge into account</li> <li>• Focus on areas where prior effort is weak, but interest is high (insulation, appliance purchases, heating/cooling purchases)</li> </ul>

# Background

## Program Overview

SCE’s Custom Language Efficiency Outreach (CLEO) program is a third-party effort aimed at bringing the message of energy efficiency to communities whose first language is not English. The program offers multiple components toward that end:

- Print media campaign in Chinese, Vietnamese, Korean, and Indian language newspapers and other media
- Classroom-style interactive seminars presented at locations with easy access by the target customers
- Displays and Exhibits: information presented through graphics, text and hands-on exhibits
- Booths at community events
- Phone Consultations: one-on-one discussions between customers and a technical specialist about energy efficient technologies and their application(s)
- Free energy audits that include hands-on customer training in the area of common energy saving strategies
- Schools Programs that aim to create awareness and participation through a free drawing and contests, “Energy Quiz,” and other events
- Energy Center Facility Tours: overview of energy efficiency technologies and applications
- Volunteer “Green Community Ambassadors” who work to increase local government participation
- Multi-language CLEO Website with links to [www.sce.com](http://www.sce.com)

During the 2004-05 program cycle, CLEO included only Chinese-speaking groups. The program was expanded in the 2006–08 cycle to add Korean- and Vietnamese-speaking customers.

No savings are claimed for this program. Its effects are indirect, acting to raise customer awareness and direct them to other programs.

For this program cycle, only one of these components was evaluated: the classroom-style interactive seminars.

Table CLEO-3 summarizes the program outputs that are relevant to this process evaluation.

**Table CLEO-3. CLEO Program Outputs Funded by SCE for PY2006-08**

Language	Number of Participants Served				Number of CLEO Events			
	2006	2007	2008	Total	2006	2007	2008	Total
Korean	0	384	99	483	0	5	3	8
Vietnamese	0	580	179	759	0	12	2	14
Chinese	0	1,205	762	1,967	0	17	6	23
<b>Total</b>	<b>0</b>	<b>2,169</b>	<b>1,040</b>	<b>3,209</b>	<b>0</b>	<b>34</b>	<b>11</b>	<b>45</b>

## **Program Theory and Logic**

While there was no program theory developed for CLEO for the 2006–08 program cycle, the basic elements of a theory were contained in the Program Implementation Plan (PIP).

The PIP, together with conversations with program personnel, made it possible to describe program goals, market barriers, and strategies to overcome the barriers.

These goals and strategies have guided the development of this evaluation. A specific program theory and logic diagram was not developed for the PY2006–08 cycle, but the logic diagram developed for the PY2010-12 cycle reflects the general process for both cycles. Figure CLEO-1 shows that logic.

## **Program Goals and Evaluation Focus**

The CLEO program goals and strategies identified in the 2006–08 PIP and related program documentation formed the basis for the evaluation focus. Table CLEO-4 summarizes the relationship between program goals and strategies and evaluation questions and methods. “CLEO Program Goals and Strategies” in Appendix B-1 (p. B-2) provides more information about the relevant program goals and strategies.

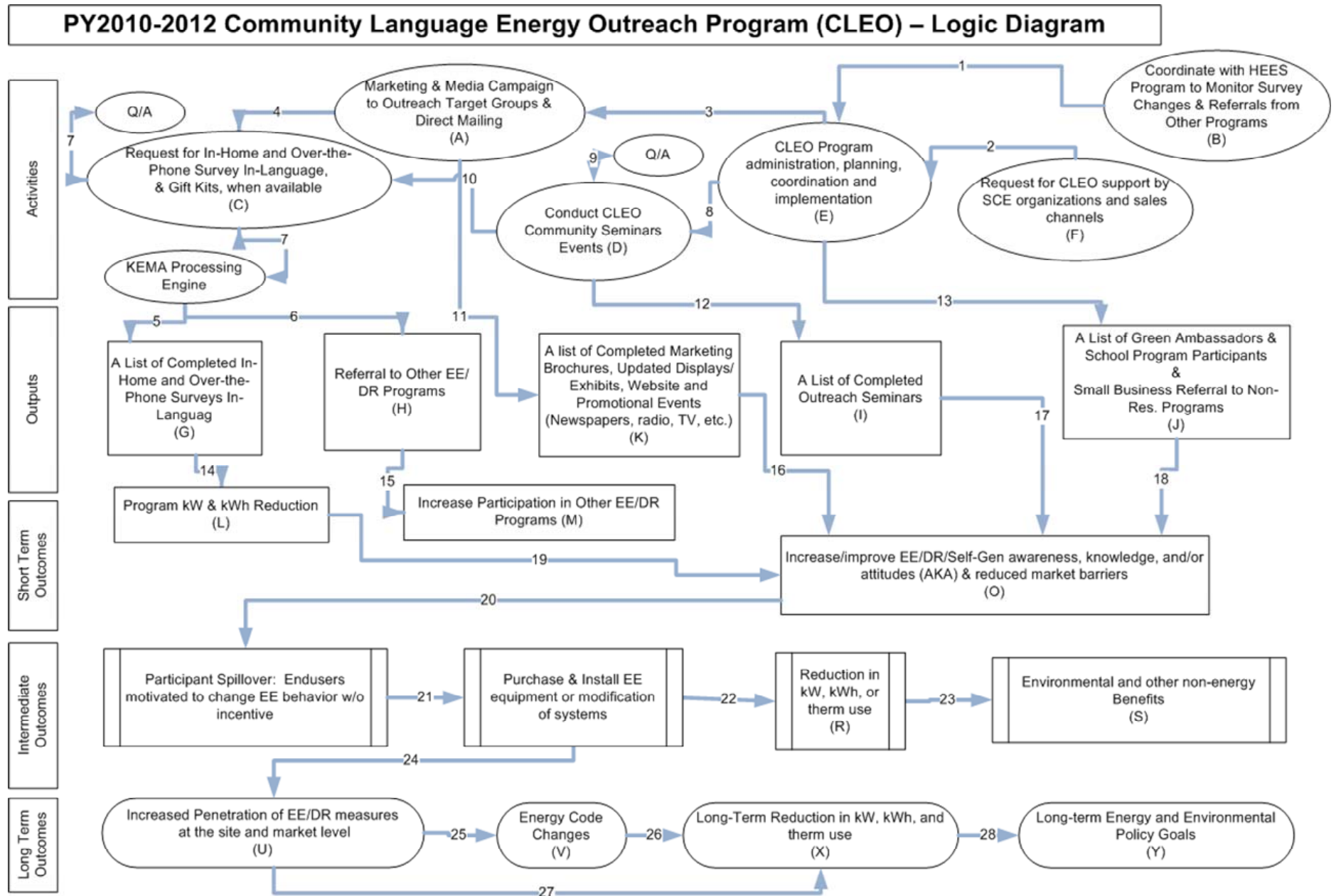
**Table CLEO-4. Summary of Program Goals and Strategies; Evaluation Questions and Methods**

Program Goal	Program Strategy	Evaluation Questions	Evaluation Method
<b>Goal 1</b> <b>Increase awareness and knowledge of energy efficiency and CLEO seminars</b>	<ul style="list-style-type: none"> <li>• Offer information in native languages in local communities with high concentrations of target customers:               <ul style="list-style-type: none"> <li>○ In-language radio and TV advertising</li> <li>○ In-language print media advertising</li> <li>○ Booths with in-language displays and literature at local community events</li> <li>○ In-language seminars held in local communities</li> </ul> </li> </ul>	1-1. How did CLEO participants learn of the CLEO seminar?  1-2. What are CLEO participants' awareness and knowledge of EE? How does this compare to other groups not targeted by CLEO?	<ul style="list-style-type: none"> <li>• Telephone interviews of CLEO seminar participants</li> </ul>
<b>Goal 2</b> <b>Increase awareness of energy efficiency programs offered by SCE and participation in energy efficiency programs</b>	<ul style="list-style-type: none"> <li>• Same strategies as for Goal 1</li> </ul>	(Focusing only on one element of program strategy: the seminars)  2-1. How aware are CLEO participants of SCE EE programs?  2-2. What is the rate of EE program participation — especially for HEES — among CLEO participants?  2-3. How well do seminar design and delivery support program awareness?	<ul style="list-style-type: none"> <li>• Telephone interviews of CLEO seminar participants</li> <li>• Class design and delivery yardstick: Support of Programs               <ul style="list-style-type: none"> <li>○ Review of seminar materials</li> <li>○ In-person audit of seminar</li> <li>○ Instructor interviews</li> </ul> </li> </ul>
<b>Goal 3</b> <b>Increase energy efficiency behaviors in target communities</b>	<ul style="list-style-type: none"> <li>• Same strategies as for Goal 1</li> </ul>	(Focusing only on one element of program strategy: the seminars)  3-1. What change in EE behavior do CLEO participants attribute to the seminar?  3-2. How well do seminar design and delivery support behavior change and adult learning?	<ul style="list-style-type: none"> <li>• Telephone interviews of CLEO seminar participants</li> <li>• Class design and delivery: yardstick: Support of Behavior Change and Adult Learning               <ul style="list-style-type: none"> <li>○ Review of seminar materials</li> <li>○ In-person audit of the seminar</li> <li>○ Instructor interviews</li> </ul> </li> </ul>
<b>Goal 4</b> <b>Generate satisfied participants</b>	<ul style="list-style-type: none"> <li>• Same as for Goal 1</li> </ul>	4-1. How satisfied are participants immediately after the seminar?  4-2. How satisfied are participants longer term?	<ul style="list-style-type: none"> <li>• Exit survey</li> <li>• Telephone interviews of CLEO seminar participants</li> </ul>

Program Goal	Program Strategy	Evaluation Questions	Evaluation Method
<b>Goal 5</b> <b>Expand the program to other hard-to-reach groups, starting with African Americans</b>	<ul style="list-style-type: none"> <li>Do an exploratory study to evaluate the needs of African Americans</li> </ul>	5-1. What is the current position of African Americans on energy efficiency?  5-2. What do members of the community want to learn about energy efficiency?  5-3. What learning formats do these customers prefer?  5-4. How does this group's characteristics compare to existing CLEO customers?	<ul style="list-style-type: none"> <li>Exploratory telephone interviews in areas high in African-American customers</li> </ul>



Figure CLEO-1. PY2010–12 CLEO Program Logic Diagram



# Methods

## Telephone Interviews of CLEO Seminar Participants

CLEO program staff provided the evaluation team with a spreadsheet that contained participant contact information collected via the sign-in sheets used at the seminars. Eliminating incomplete entries and duplicate entries (multiple people from the same family), we had a final sample frame of 1,717. A power analysis indicated that an appropriate sample size would be 183 (61 from each language group: Chinese, Vietnamese, and Korean). The final sample achieved was 334, though the Korean group was lower than our target (52 rather than 61) because many (35%) of the Korean entries lacked phone numbers (Table xB-1 in Appendix B-1).

Program staff reviewed the interview protocol we developed (Appendix B-3) before we translated it into the participants' languages. Interviews were conducted in-language. See "Telephone Interviews with CLEO Participants" in Appendix B-1 (p. B-3) for details on the sampling and interviews.

## Yardsticks for Class Design and Delivery

The evaluation team used two "yardsticks" to see how well the CLEO seminar class design and delivery:

- Support behavior change and adult learning — Appendix D-1 (p. D-2) includes a copy of the yardstick used to evaluate support of adult learning and behavior change.
- Support SCE energy efficiency programs — Appendix D-1 (p. D-2) includes a copy of the yardstick used to evaluate support of programs.

These "yardsticks" were based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes in the 2006–08 Energy Center Process Evaluation. The evaluation team updated these criteria to reflect the specific requirements of the 2006–08 ETO Process Evaluation and the updated yardsticks were reviewed by program staff.

The yardsticks were applied in three different ways:

- Review of seminar material — The evaluation team reviewed (and applied the yardsticks to) the English version of the CLEO seminar presentation file (the only seminar materials)
- In-person audits — The evaluation team attended one CLEO seminar (in Chinese), following along with the English version of the seminar materials to observe the session dynamics and time spent on various topics.
- Instructor interviews — Program staff identified three CLEO instructors. We were able to interview one of these instructors (one cancelled and was unable to reschedule due to family issues; one cancelled each of several scheduled calls). In addition, we interviewed the third-party provider who is responsible for training and managing the instructors

See "Structure, Use, and Scoring for Yardsticks" in Appendix B-1 (p. B-4) on the "yardstick" method.

## Exit Surveys

The evaluation team initially planned to analyze the individual exit surveys that are completed by participants at the end of a CLEO seminar. However, program staff informed us that the individual exit survey data was unavailable.

The only exit survey data available to the evaluation team was the composite results of 568 exit surveys collected in 2008, and these figures were not broken down by ethnicity. This information is reported in the Results section; a copy of the CLEO exit survey is in Appendix B-6

# Results

The body of this report highlights the major results from the evaluation, organized by program goals. Additional details — including results for responding to prior evaluation recommendations and CLEO participants’ background characteristics — are in Appendix B-2 (p. B-8).

## Goal 1: Increase awareness and knowledge of energy efficiency and CLEO seminars

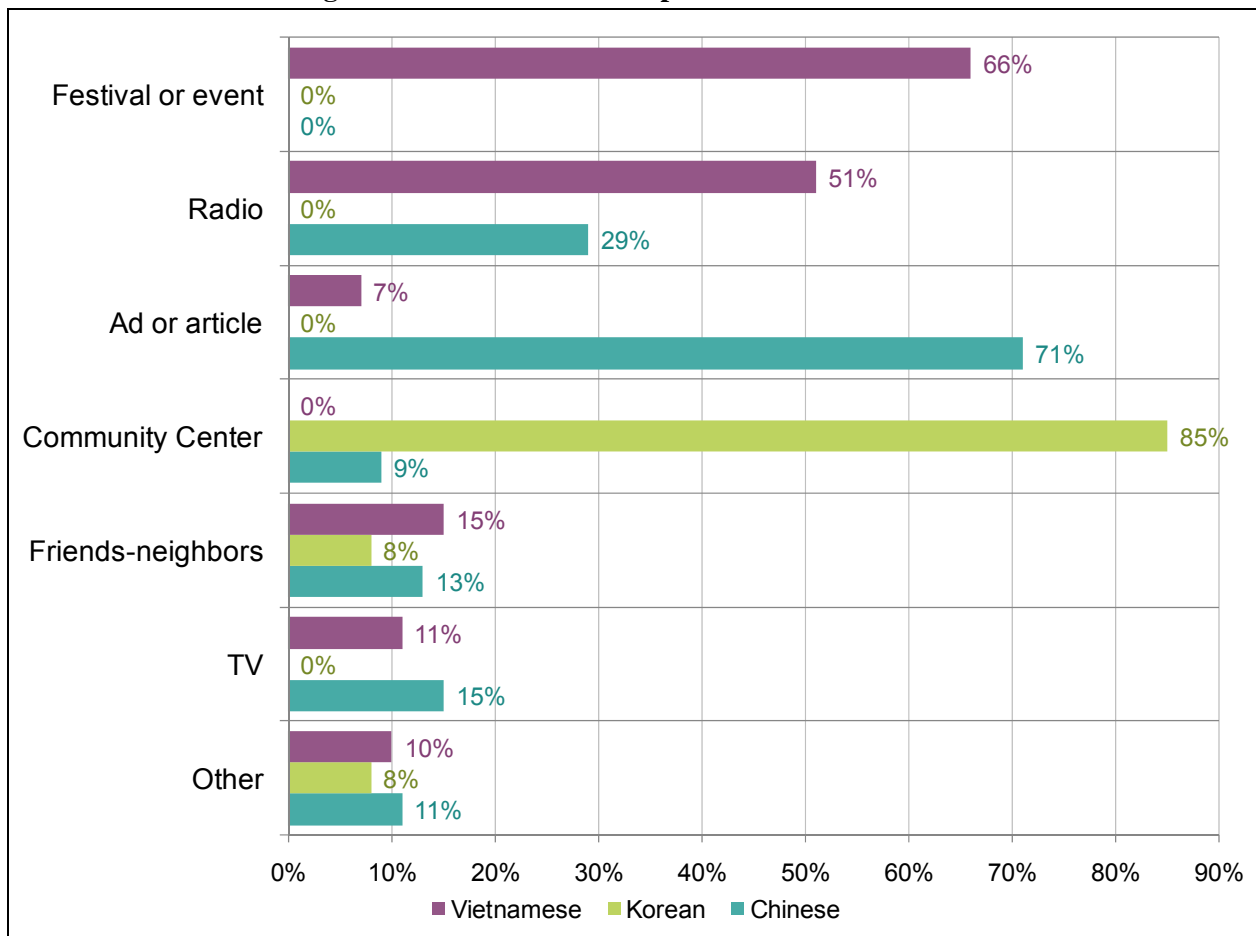
### 1-1: How did CLEO participants learn of the CLEO seminar?

Telephone interviews with participants indicate that the way in which CLEO participants learned of the seminar varied by ethnic group (Figure CLEO-2). Interviews with program staff confirm that this difference is consistent with the different marketing strategies employed for the different target audiences.

- The Chinese group most often learned of the seminar from advertisements or articles
- The Korean group most often learned of it through a community center
- The Vietnamese group most often learned of CLEO at festivals and events

See “How Participants Learned of the CLEO” in Appendix B-2 (p. B-10) for details.

**Figure CLEO-2. How Participants Learned of CLEO**



**Results**

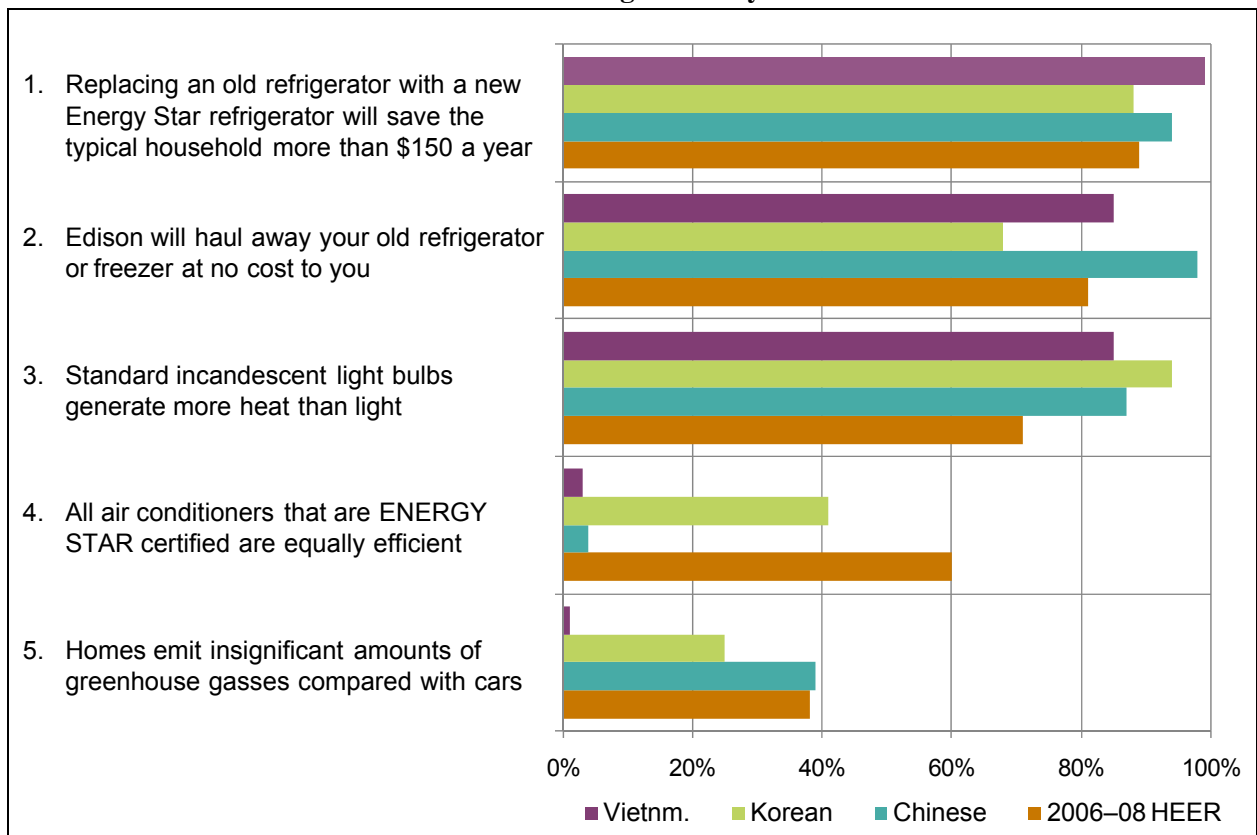
*1-2: What are CLEO participants' awareness and knowledge of EE?  
How does this compare to other groups not targeted by CLEO?*

In order to compare CLEO participants' EE knowledge to that of non-participants, we asked them five questions that were used in a previous HEER evaluation study (Figure CLEO-3). The first three questions address topics in the CLEO seminar; the last two address topics are not addressed in the seminar materials. The results indicate that the seminar had a positive effect on participants' awareness and knowledge of energy efficiency.

- CLEO participants did better at answering questions that were addressed in the CLEO seminar than did non-participants.
- Non-participants did better answering the questions that were not addressed in the seminar.

See "Participants' EE Awareness Compared to Other Groups" in Appendix B-2 (p. B-11) for details.

**Figure CLEO-3. Comparison of CLEO and Non-CLEO Knowledge of EE Information: Percent Answering Correctly**



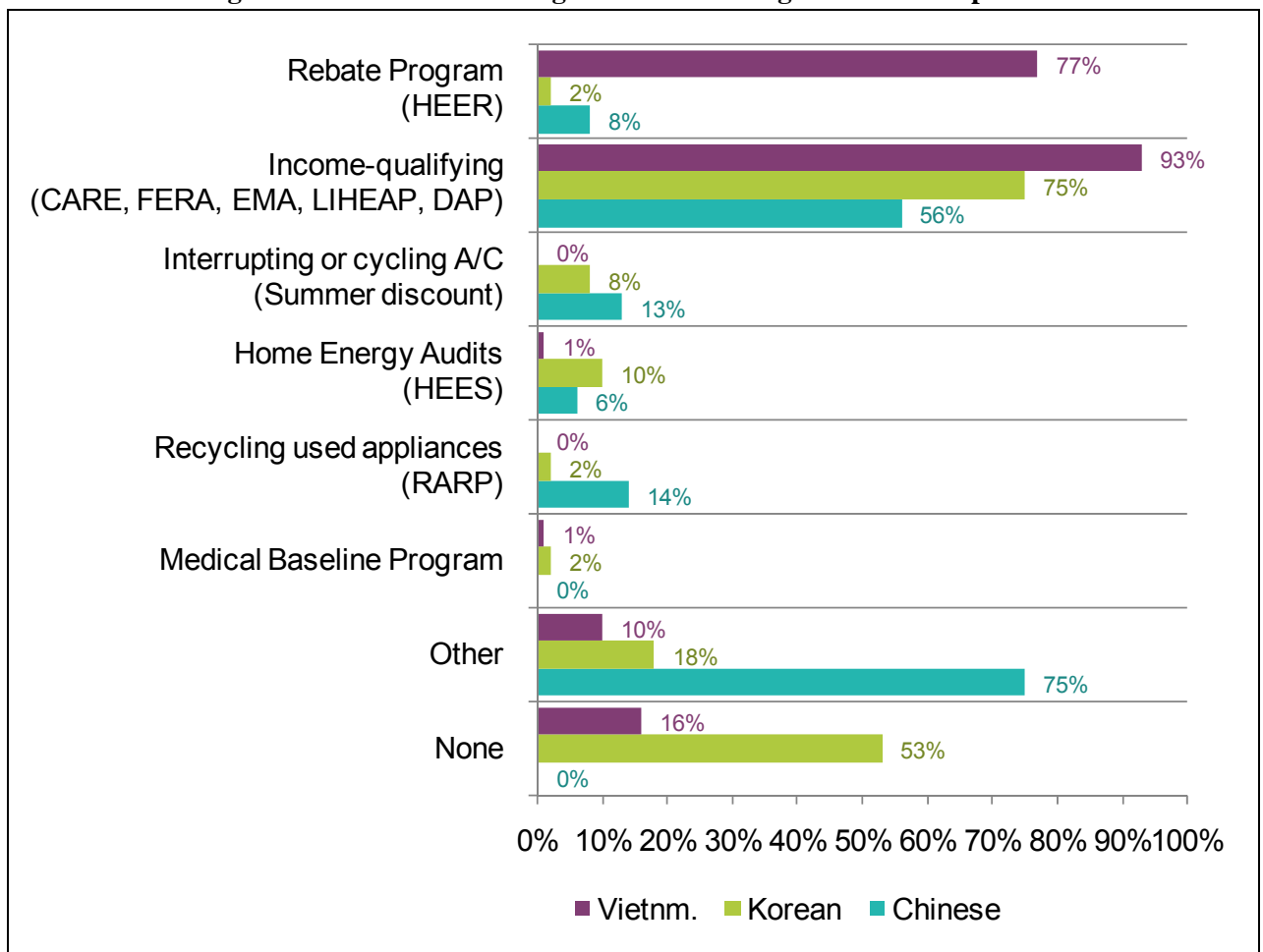
## Goal 2: Increase awareness of energy efficiency programs offered by SCE and participation in energy efficiency programs

### 2-1: How aware are CLEO participants of SCE EE programs?

When asked in the telephone interviews what programs they had heard of, most (81%) CLEO seminar participants were able to recall one or more SCE program. Program recognition varied by ethnic groups:

- The Vietnamese group most often recalled HEER (rebates).
- The Chinese group tended to give responses that could not be categorized, and tended to best recall the Direct Assistance Program.
- The Korean group was least able to recall programs and recalled LIHEAP better than other programs.

**Figure CLEO-4. Rate of Program Recall among CLEO Participants**



**Results**

In general, these results are consistent with the amount of seminar time that is spent on the various programs, with two exceptions:

- Little time is allocated to income-qualifying programs, but an average of 45% of the participants recalled one or more income qualifying programs.
- Participants actually complete the HEES short form during the class, but comparatively few participants recalled HEES or participated in the long version after the seminar.

See “Recall of Programs” in Appendix B-2 (p. B-12) for details.

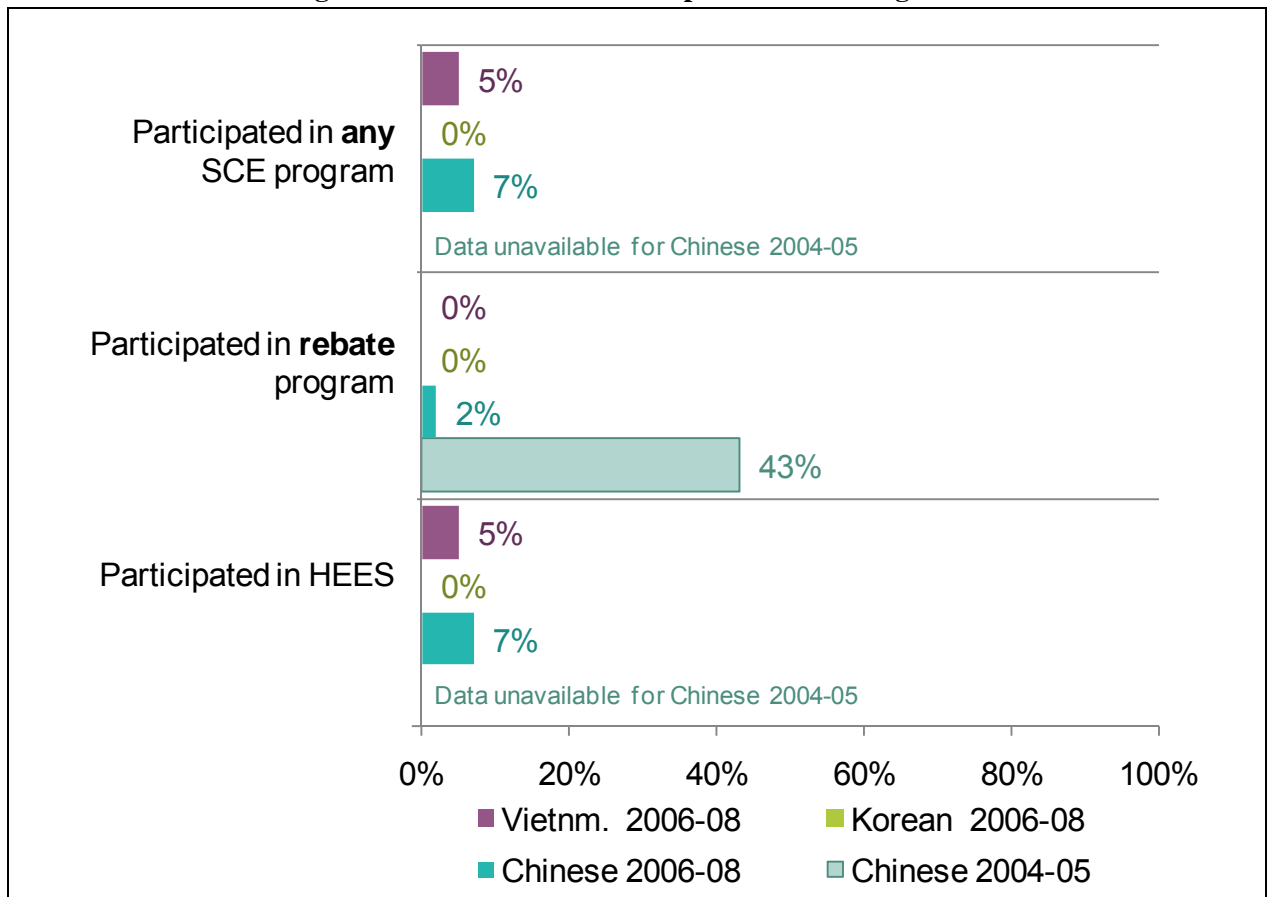
**2-2: What is the rate of EE program participation — especially for HEES — among CLEO participants?**

Very few CLEO participants from 2006–08 participated in any SCE program, and rebate program participation rates are much lower in 2006–08 than for 2004–05.

Reported participation in HEES post seminar was extremely low, which appears inconsistent with the seminar design: Participants complete a short-form HEES survey at the end of the seminar, which this result did not measure (Table xB-11).

See “Participation in Programs” in Appendix B-2 (p. B-13) for details.

**Figure CLEO-5. Rate of Participation in EE Programs**



2-3: *How well do seminar design and delivery support program awareness?*

The seminar does a great job of “direct support” of programs, scoring 100% on all relevant criteria the Support of Programs yardstick, which includes areas such as:

- Program goals/objectives, features, and benefits
- How to pursue program offerings, next steps, contact info
- Distinguishes variations that are included and excluded

The seminar does a very poor job of “indirect support” of programs, scoring 0% on all relevant criteria on the Support of Programs yardstick, which includes areas such as:

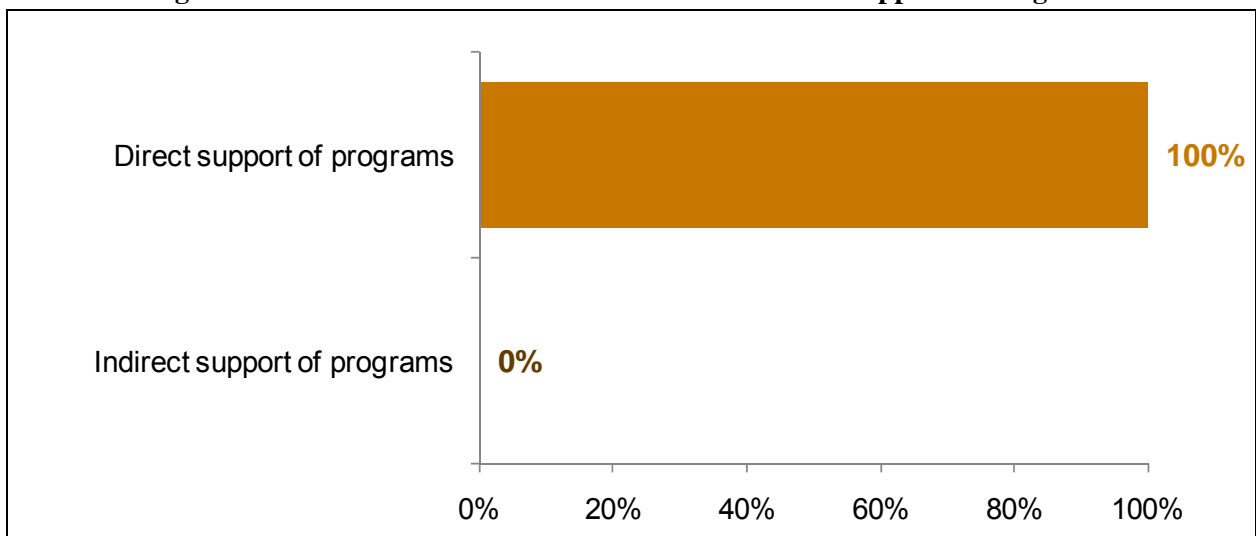
- Benefits of program-relevant technologies or practices
- Considerations and specific guidance for implementing

Essentially, this means that the seminar:

- Notes the specific benefits of the programs it addresses (e.g., rebates available for energy efficient equipment purchases)
- Rarely touches on “why bother” and “what this means to me” topics related to the programs (e.g., what long-term cost benefits you might anticipate from more energy efficient equipment)

See “Seminar Support of Programs (Yardstick)” in Appendix B-2 (p. B-15) for details.

**Figure CLEO-6. Seminar Score for Direct and Indirect Support of Programs**



### Goal 3: Increase energy efficiency behaviors in target communities

#### 3-1: What change in EE behavior do CLEO participants attribute to the seminar?

The overall rate of installing EE equipment after the seminar is high — but not as high as it was for the PY04-05 Chinese group (Figure CLEO-7):

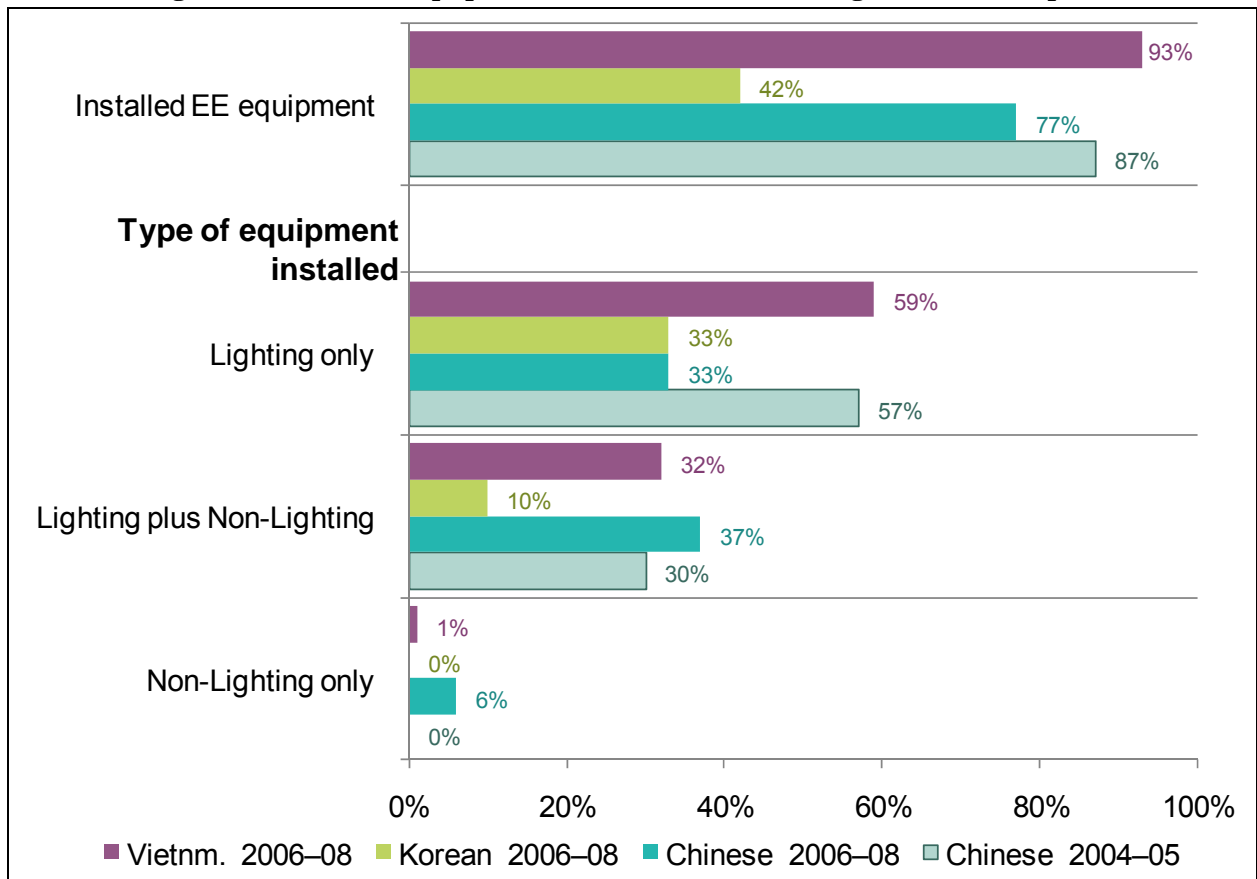
- There are significant differences in installation rates among the ethnic groups
- There was more variety in the type of equipment installed for the 2006–08 group than for the 2004–05 group.

When those who installed EE equipment were asked whether CLEO seminar had an influence on their decision, results were mixed (Figure CLEO-8):

- Almost all Vietnamese installed equipment motivated by CLEO (mostly lighting)
- Other groups were less likely to attribute motivation to the seminar, but still quite a few did CLEO-inspired installations

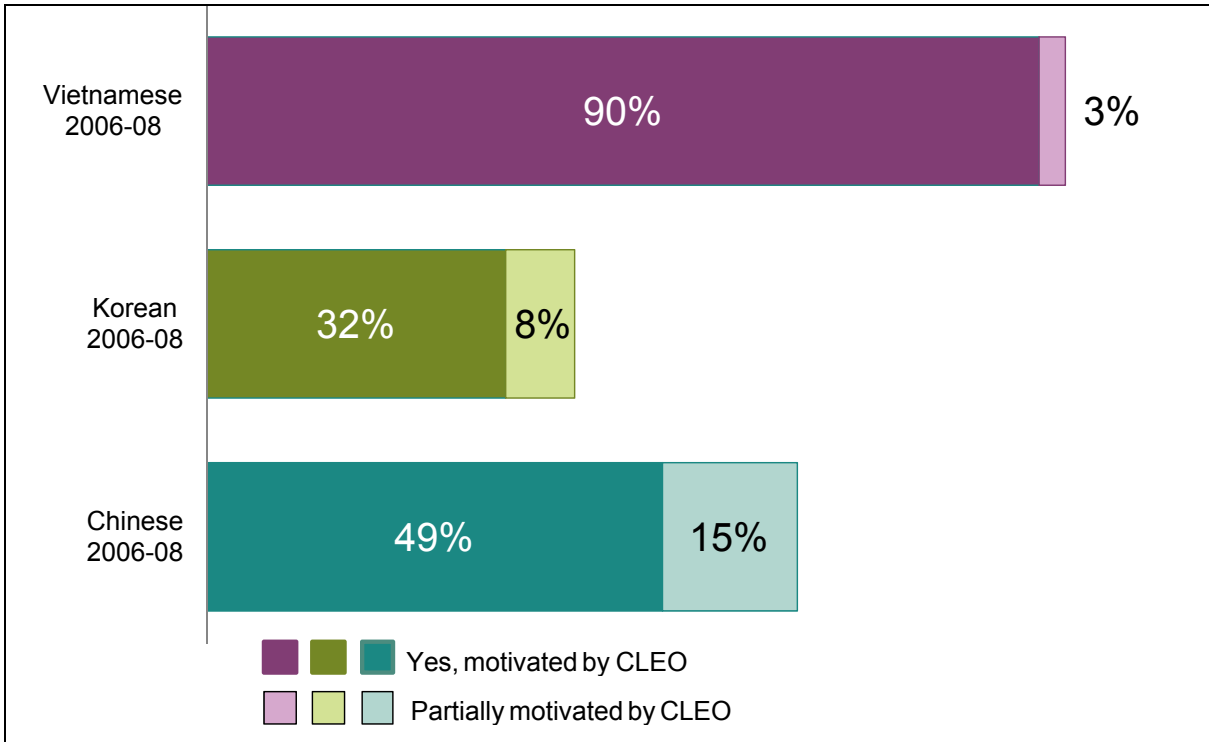
See “Behavior Change Post-Seminar (Participant Interviews)” in Appendix B-2 (p. B-18) for details.

**Figure CLEO-7. EE Equipment Installation Rates among CLEO Participants**





**Figure CLEO-8. Rates of EE Equipment Installation Influenced by CLEO Seminar**



3-2: *How well do seminar design and delivery support behavior change and adult learning?*

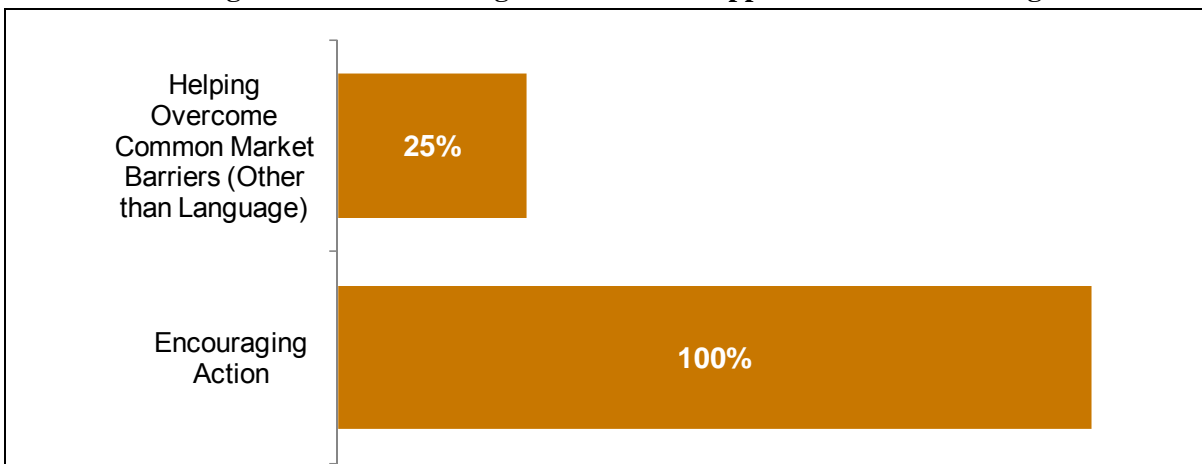
**Support of Behavior Change**

The seminar scored “perfectly” in encouraging action, but very poorly in overcoming market barriers other than language (Figure CLEO-9). This is because:

- About half the seminar is spent on “tips” for energy efficient behavior (encouraging action)
- Rarely are the tips positioned in terms of information that will help participants select the options that are appropriate for their own situations (helping overcome market barriers through information on cost, benefit, and other issues associated with selecting an appropriate course of action).

See “Support of Behavior Change” in Appendix B-2 (p. B-22) for details.

**Figure CLEO-9. Scoring for Seminar’s Support of Behavior Change**



**Results**

**Adherence to Adult Learning Principles and Practices**

Because of the special nature of the CLEO seminar, many of the criteria typically considered when assessing adherence to Adult Learning Principles and Practices were considered NA. Considering the relevant adult learning criteria, seminar scored well on most dimensions — and in several instances the materials themselves resulted in lower scores than instructor interviews and the in-person audit of the seminar (Table CLEO-5).

See “Adult Learning Principles and Practices” in Appendix B-2 (p. B-23) for details

**Table CLEO-5. Scores for Seminars Adherence to Relevant Adult Learning Principles/Practices**

<b>Dimensions of Adult Learning</b>	<b>Interview</b>	<b>Materials</b>	<b>Observation</b>
Obtain Learner Buy-in	100%	30%	90%
Engage the Learners and Set Them Up for Success	80%	20%	20%
Learning Facilitation	93%	NA	100%
Content Decisions	100%	75%	80%

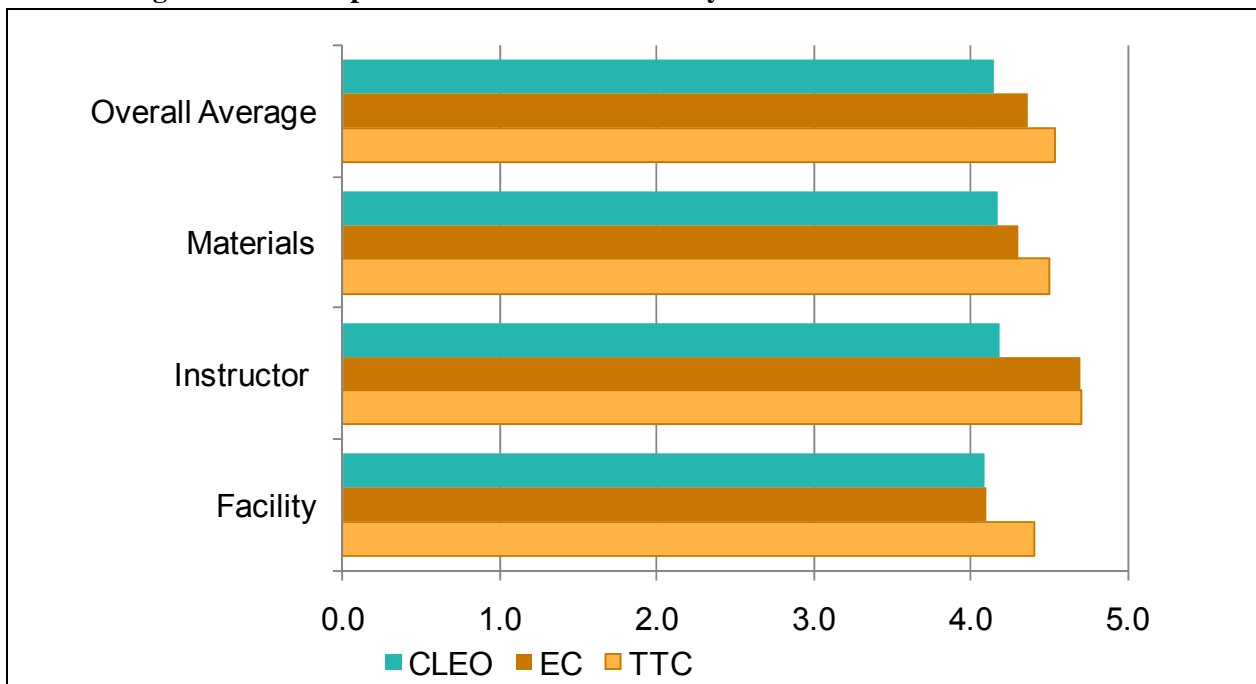
## Goal 4: Generate satisfied participants

### 4-1: *How satisfied are participants immediately after the seminar?*

As noted in the Methods section of this report, the individual results of the Exit Surveys administered during the 2006–08 CLEO seminars were unavailable. In addition, the scale is skewed toward the positive end of the continuum (excellent, very good, good, fair, and poor).

If we look simply at the numeric value of the scores, we see that the seminar scored between 4.1 and 4.2 on a scale of 1 to 5, which is quite a bit lower than average satisfaction score for courses offered at the SCE energy centers, which have an average score of 4.4 to 4.5 on similar items. See “Exit Survey Results re. Satisfaction” in Appendix B-2 (p. B-26) for details.

**Figure xB-1. Comparison of CLEO Exit Survey Satisfaction Scores to EC Scores**



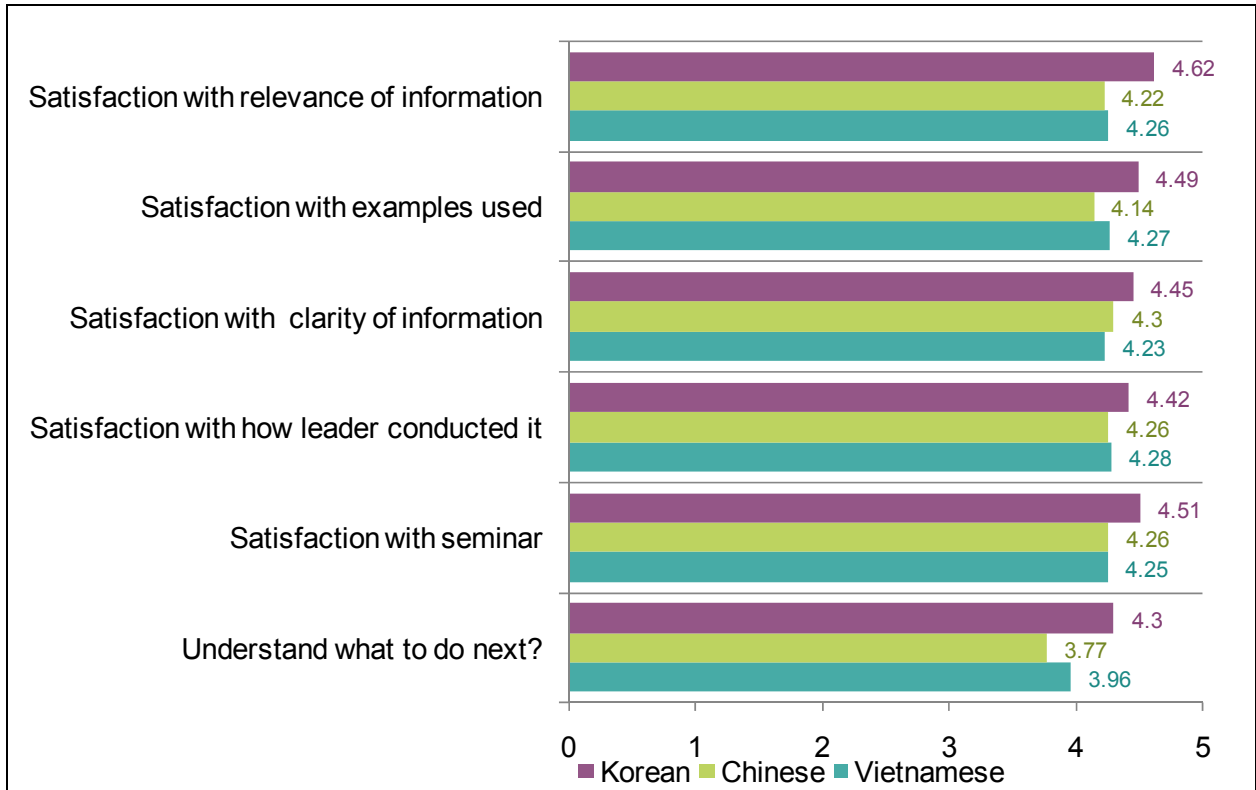
### 4-2: *How satisfied are participants longer term?*

Longer-term satisfaction ratings are satisfied to very satisfied— except for understanding next steps (Figure CLEO-10).

There were statistically significant differences among ethnic groups in four of the six dimensions of satisfaction. The two aspects of the seminars that did not show significance were clarity of information and how the leader conducted the seminar. For all other aspects, the Korean-speaking groups showed more satisfaction than the others.

See “Participant Interview Results re. Satisfaction” in Appendix B-2 (p. B-27) for details.

Figure CLEO-10. Satisfaction Scores from Telephone Interviews



# CLEO Exploratory

The scope of the ETO study included an exploratory investigation of what the needs of the African-American community are in the area of energy efficiency.

As indicated by Program Goal 5, the intention of CLEO has been to expand the scope of the program beyond just communities whose first language is not English. It will be conceptualized more as a program to reach hard-to-reach communities. This could include the African-American community, and that was the focus of the study during this cycle.

This section of the report will be treated as a self-contained description of the investigation of these research questions noted below since the research questions for the exploratory study are quite different than those in the rest of the study.

## Method

The evaluation team completed 100 telephone interviews with individuals in nine ZIP codes that were identified from the US Census as being 50% or more African-American. Of the 100 interviews, 77 of the interviewees identified themselves as African American (Table xB-41 in Appendix B-3). The interview protocol was designed to focus on issues directly related to the exploratory investigation goals.

See “Method of CLEO Exploratory Investigation” in (p. B-32) for details on the investigation method. See Appendix B-8 (p. B-65) for the interview protocol.

## Results

The results from the CLEO exploratory investigation address the evaluation questions centered around Program Goal 5: *Expand the program to other hard-to-reach groups, starting with African Americans.*

### 5-1: *What is the current position of African Americans on energy efficiency?*

The African-American group revealed a position on energy efficiency that is similar to “general population’s” position — which is improving over time. One of the strongest energy efficiency attitudes is about taking personal responsibility for energy use (“I feel guilty if I use too much”)

As seen in Figure CLEO-12, in terms of knowledge about energy efficiency, the African-American group is:

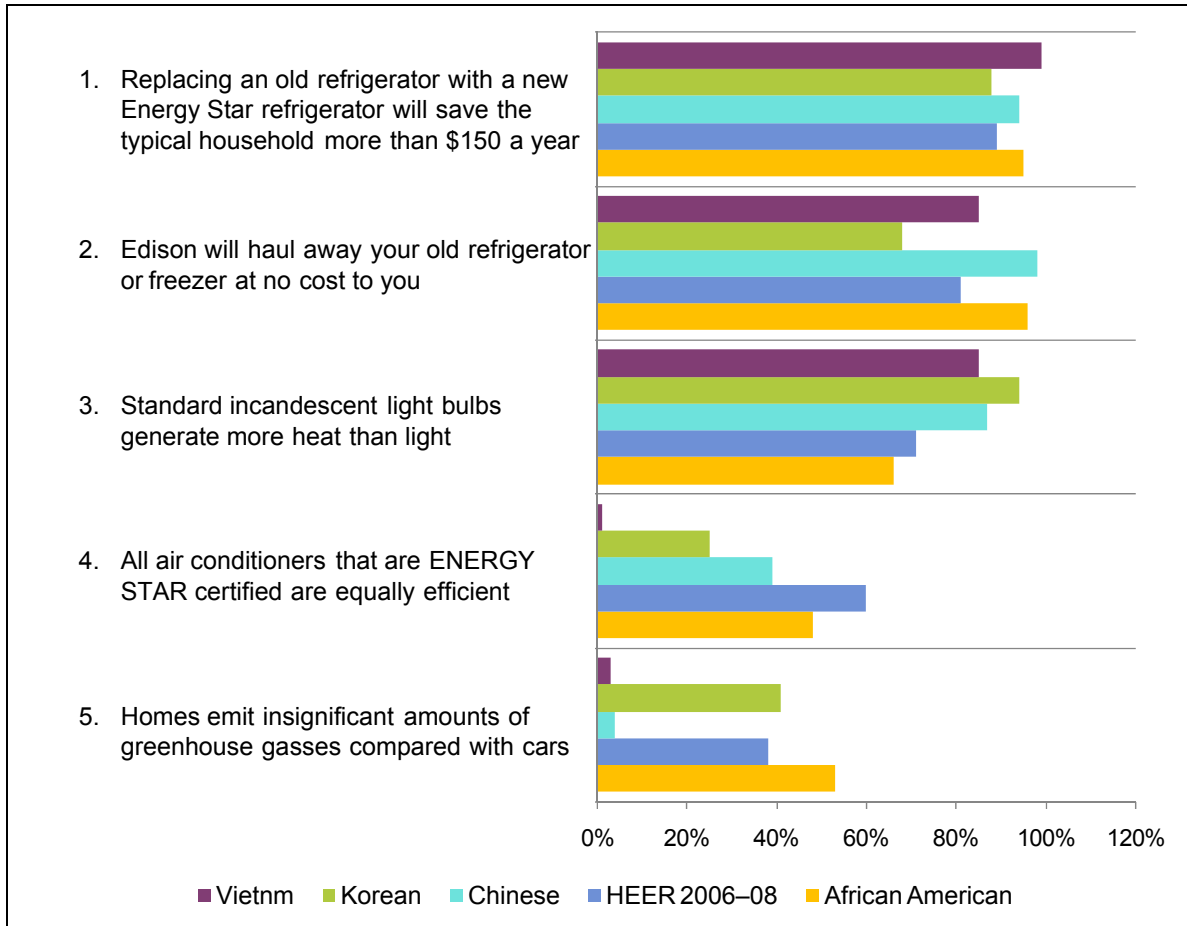
- Very similar to that of the HEER participants (except for the question about ENERGY STAR).
- Roughly equal to that of CLEO seminar participants on areas addressed by the seminar  
(The first three questions are topics addressed in the current CLEO seminar.)
- Generally more knowledgeable than CLEO participants on EE topics not addressed by the seminar, which we interpreted to indicate better baseline knowledge

(Questions 4 and 5 are topics not addressed in the CLEO seminar.)

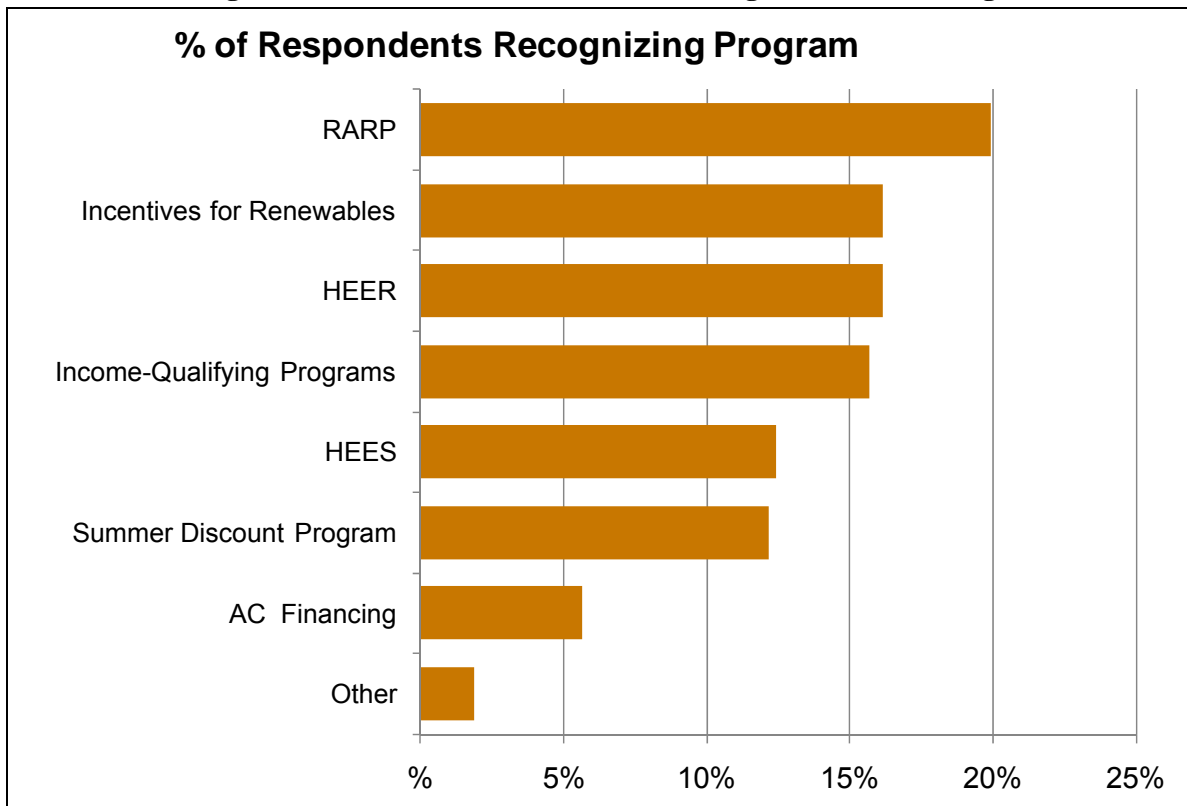
The exploratory interview respondents also appear to be more familiar with SCE programs than the current CLEO population, with 98% of respondents recognizing at least one program when a list is read to them, and 66% recognizing at least 4 programs. See Figure CLEO-12. (We cannot draw a direct comparison to the CLEO participants interviewed in the process evaluation as they were asked to recall programs, rather than recognize them when mentioned. However, the very low recall rate of CLEO participants and the very high recognition rate of the exploratory group imply that there probably is an important difference between the two groups.)

See “Current Position on Energy Efficiency” in Appendix B-3 (p. B-37) for details.

**Figure CLEO-11. Comparison of African Americans' EE Knowledge to Other Groups**



**Figure CLEO-12. African Americans' Recognition of SCE Programs**



5-2: *What do members of the community want to learn about energy efficiency?*

Areas of greatest interest relative to learning about energy efficiency include “turning things off,” energy efficient appliances, and energy efficient lighting (Figure CLEO-13).

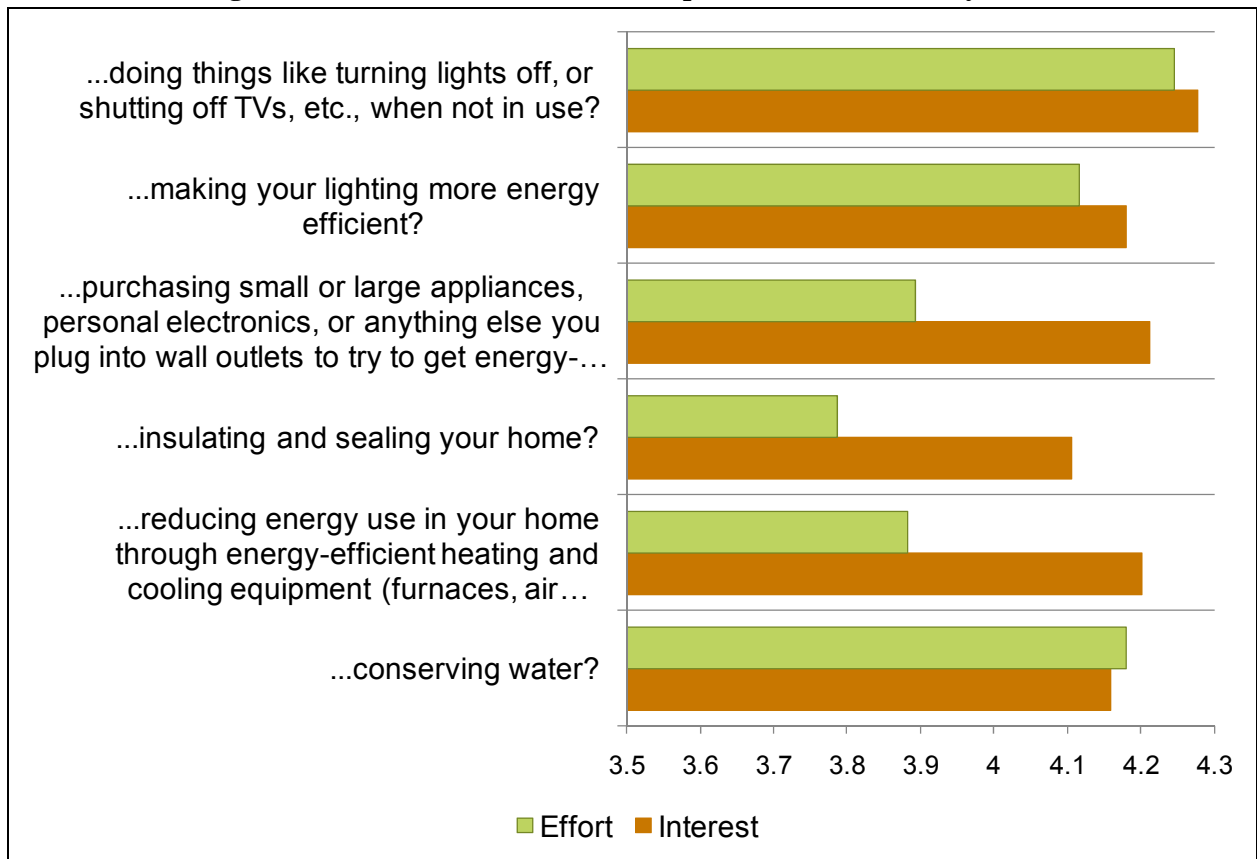
Some of these interest levels are similar to the level of effort already invested in these areas. For example, for “turning things off” and energy efficient lighting, the respondents indicated both a high level of interest and a high level of effort already invested in this practice.

On the other hand, there are relatively large differences between interest and effort already invested for other areas. For example, they expressed a high level of interest in energy efficient appliances, insulation, and HVAC equipment, but the actual effort already invested in these measures is relatively low.

This indicates that the additional information and guidance relative to these “high interest / low effort” areas may be particularly fruitful.

See “Interest in Learning about Energy Efficiency” in Appendix B-3 (p. B-43) for details.

**Figure CLEO-13. Interest Levels Compared to Effort Already Made**



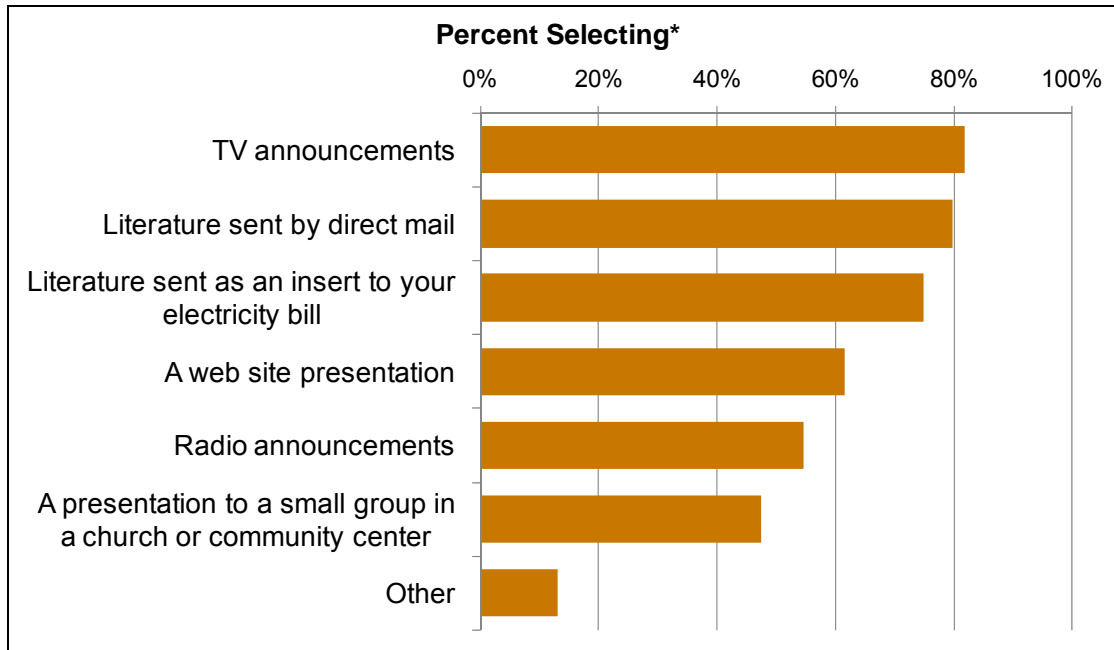


5-3: *What learning formats do these customers prefer?*

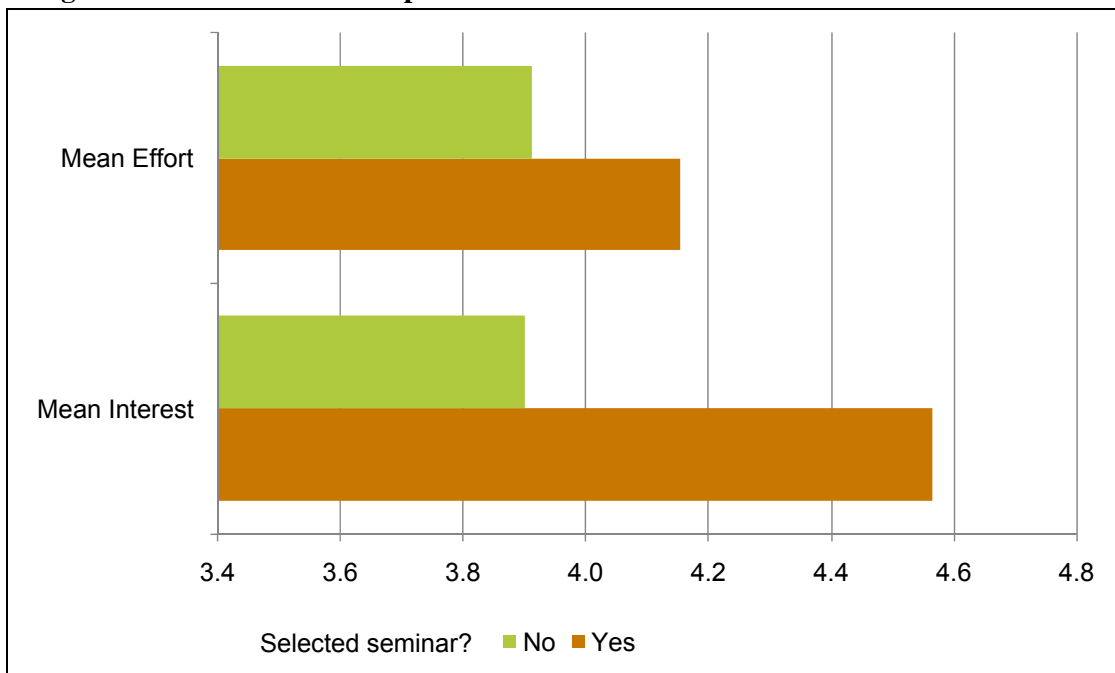
TV ads & direct mail are most-liked formats for learning more about energy efficiency, when considering the whole group interviewed (Figure CLEO-14).

However, those selecting seminar format are most committed to energy efficiency practices (as indicated by level overall interest in measures and practices) are more interested in learning in the “seminar” format (Figure CLEO-15 in Appendix B-3).

**Figure CLEO-14. Preferences for Learning Formats**



**Figure CLEO-15. Relationship between Commitment to EE and Interest in Seminar**

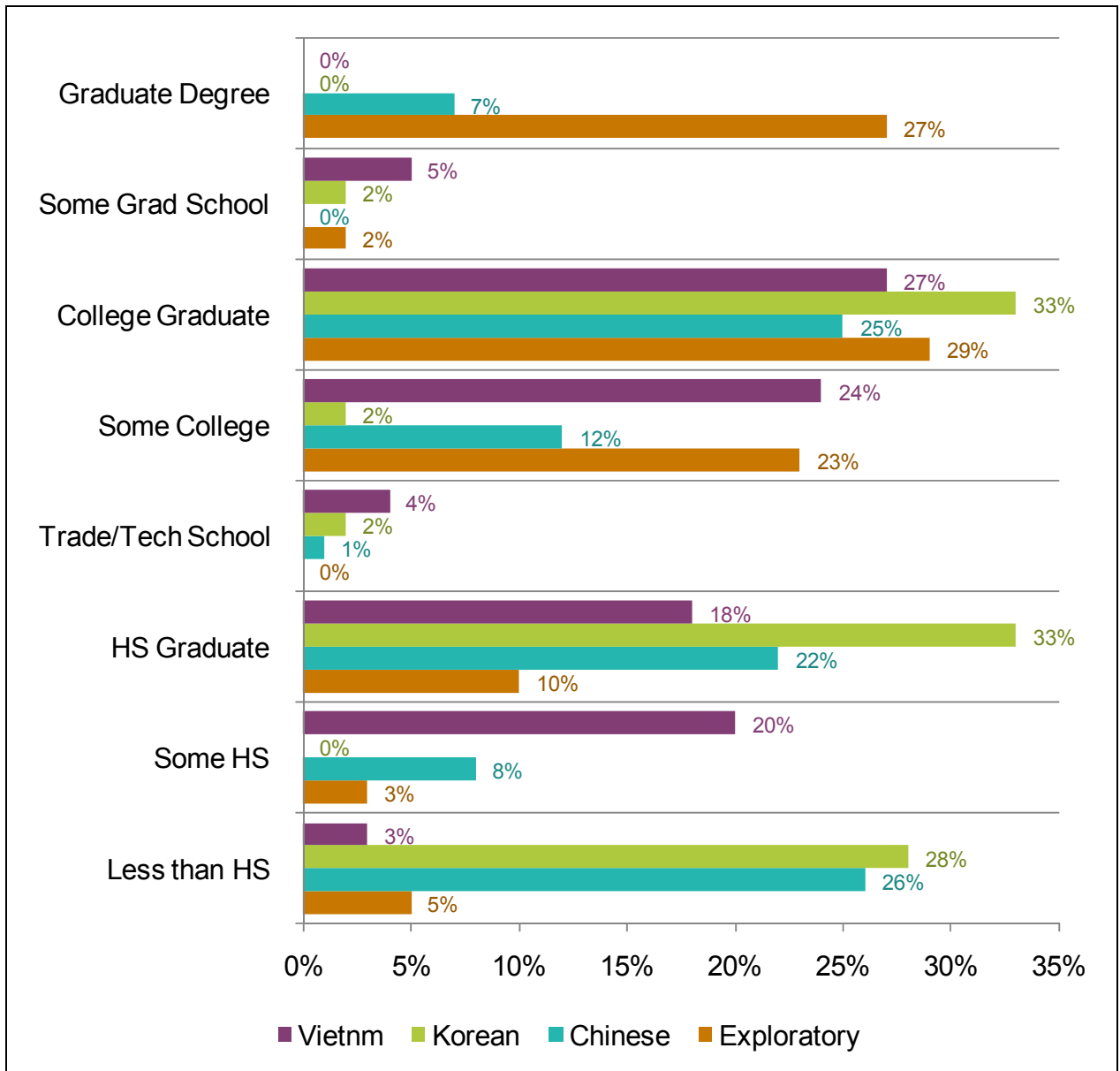


5-4: *How does this group’s characteristics compare to existing CLEO customers?*

As noted under question 5-1 above, the exploratory group’s “baseline knowledge” of energy efficiency issues is generally higher than that of CLEO participants on **topics not addressed by the CLEO seminar** (Figure CLEO-11), and they seem to be more familiar with SCE EE programs than CLEO participants (Figure CLEO-12).

In addition, as shown in Figure CLEO-16, the African American group shows a noticeable trend toward higher education than the existing CLEO participants (58% with College or Graduate degrees compared to 32-35% for CLEO).

**Figure CLEO-16. Comparison of Education Levels**



# Recommendations

All of the recommendations from this work flow directly from study results. They are listed below, organized by recommendation focus, and each is accompanied by the data results on which the recommendation is based.

## Program Design Considerations

- Consider tailoring seminar content to differences in baseline knowledge of energy efficiency.

There were misunderstandings of ENERGY STAR, especially among the Chinese-speaking and Vietnamese-speaking groups and about home emissions, especially among the Vietnamese-speaking (Figure CLEO-3).

- Address HEES upfront in the seminar, rather than at the end when participants are distracted with receiving their gifts and preparing to leave. Include some example success stories (“Following through on HEES recommendations saved this person...”). Consider using the HEES framework for general rules of thumb re. energy savings.

Very few of the participants interviewed recalled the HEES program — even though they had filled out the HEES short-form survey as part of the seminar (Figure CLEO-4). It therefore seems reasonable to assume that participants do not have a good understanding of HEES and the benefits it can provide them.

- Address the “why” behind the “tips and to-dos” presented in the seminar. Succinctly note the ongoing benefits (likely savings over time; not just rebates) — and relate them to SCE programs — so participants see the larger context of the recommended measures and practices.

Although participants report a relatively high rate of energy efficiency practices, and credit the CLEO seminar with influencing their practices (Figure CLEO-7 and Figure CLEO-8), there is a very low rate of program participation (Figure CLEO-5).

If participants better understood the overall benefits of the recommended practices and measures — and saw how SCE programs could support them — they likely would demonstrate even greater participation in energy efficiency practices and measures.

- Put more focus on “what to do next,” sorting out next steps that are appropriate for both renters and owners and those that typically are appropriate specifically to owners. Help participants weigh alternatives based on likely payback. Consider an “action planning” worksheet that relates the “to dos” to the rebates/incentives.
  - This was the lowest rating area in the satisfaction questions (See Figure CLEO-10).
  - There was very low program awareness among the participants (Figure CLEO-4).

## Recommendations

### Program Process Considerations

- Keep exit survey data in a usable format with an ability to connect the information with ethnicity. Revise the exit survey so it conforms to a conventional Likert scale (e.g., Excellent, Good, Fair, Poor, Very Poor). (See “Exit Surveys” in the Methods section, p.44).
- Develop a quality control process for creating and maintaining sign-in sheets with contact information, and the ability to determine which entries belong to the same family.  
  
A large percentage of possible interviewees were lost due to these problems. (See “Sampling” in Appendix B-1, p. B-3).
- Consider a QC process to assure presenter quality.
  - The Chinese-speaking group had the most variation in satisfaction (Figure CLEO-10) and the most complaints and suggestions (Table xB-38 and Table xB-39 in Appendix B-2), including the complaint that the session was chaotic, which was also mentioned by some Vietnamese-speaking participants.

### Exploratory Study for African-American Community

- When planning a program for the African-American Community, take into account the higher education level (Figure CLEO-16) compared to historical CLEO populations, and the higher “baseline” knowledge of energy efficiency (Figure CLEO-11).  
  
More detail will likely be called for in seminars aimed at African-Americans compared to ethnic groups historically the focus of CLEO.
- Program content might best be focused on the areas that have been weakest in prior efforts and higher in expressed interest (insulation, appliance purchases, and heating/cooling purchases) (Figure CLEO-13)
- Just short of half the sample expressed interest in the seminar format, but they were the most motivated group (Table xB-51 in Appendix B-3).

# Technology and Testing Center (TTC)

## Overview of Results and Recommendations

The evaluation team identified specific evaluation questions based on the program goals and strategies. Table TTC-3 summarizes the relationship between program goals and strategies and evaluation questions and methods.

Table TTC-1 summarizes what we found in answer to the evaluation questions. Table TTC-2 summarizes the resulting recommendations.

**Table TTC-1. Summary of Evaluation Questions and Results for TTC**

Program Goal	Results
Goal 1: Increase customer AKA-B (Awareness, Knowledge, Attitude and Behavior)	<ul style="list-style-type: none"> <li>• TTC courses score better in several areas than do EC courses:               <ul style="list-style-type: none"> <li>○ Encouraging action</li> <li>○ Support of customer segments</li> <li>○ Six key adult learning principles and practices (build on what learners know, obtain learner buy-in, learning facilitation, learner centricity, interactive activities, and content decision)</li> </ul>               There is still significant room for improvement in these areas.             </li> <li>• TTC and EC courses score about the same in:               <ul style="list-style-type: none"> <li>○ Helping overcome market barriers</li> <li>○ Three adult learning principles (let learners apply what they have learned, set learners up for success, engage the learners)</li> </ul>               There is significant room for improvement in these areas             </li> <li>• TTC courses do not do as well as EC courses on one adult learning practice (lesson plan)</li> </ul>
Goal 2: Align TTC goals and procedures with other ETO programs	<ul style="list-style-type: none"> <li>• TTC courses do a great job at indirect program support (providing information on program-related technologies and measures)</li> <li>• TTC courses do a very poor job of direct program support (providing program-specific information)</li> </ul>
Goal 3: Engender participant satisfaction	<ul style="list-style-type: none"> <li>• TTC exit survey satisfaction scores are aligned with those for EC courses in the areas of:               <ul style="list-style-type: none"> <li>○ Overall quality and overall satisfaction</li> <li>○ Instructor skills and knowledge</li> </ul> </li> <li>• TTC courses score better than EC courses on satisfaction items related to:               <ul style="list-style-type: none"> <li>○ Content</li> <li>○ Interactivity</li> </ul> </li> </ul>

**Table TTC-2. Overview of Recommendations for TTC**

Area	Recommendations
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Include more practice opportunities</li> <li>• Make ties to EE programs more overt; include specifics:                             <ul style="list-style-type: none"> <li>○ How to take advantage of the programs</li> <li>○ What technology variations are and are not encompassed</li> </ul> </li> <li>• Consistently include specifics on financial and non-financial benefits</li> </ul>
<b>Training</b>	<ul style="list-style-type: none"> <li>• Train instructors in adult learning principles and practices; encourage application</li> </ul>

# Background

## Program Overview

SCE's Technology and Test Centers (TTCs) consist of two components, focusing on end use technologies where there is a significant opportunity for energy efficiency improvements:

- Refrigeration and Thermal Testing Center (RTTC)
- Southern California Lighting Test Center (SCLTC)

The TTC program was developed as a stand-alone program for the PY2006-2008 program cycle. Prior to 2006, TTC-like activities were part of the Emerging Technology Program. Funding for TTC is provided by more than one program:

- O&M and training efforts are funded by ETO
- Specific projects are funded by ET

Technologies tested during the 2006-08 program period include A/C for hot-and-dry climates, advanced rooftop A/C, vending machines, ice machines, refrigerated display cases, air curtains, lighting for freezers with doors, and anti-sweat technologies. The purpose for testing these technologies was two-fold: proof of concept and to inform rebate programs.

In addition, TTC shares their test results through a variety of channels; results of TTC tests are shared with other IOUs in California through the ET programs or codes and standards, were posted on the TTC website, and through networking and informal contacts. TTC results also have been incorporated into ASHRAE technical handbooks, and TTC develops technology fact sheets for CTAC.

TTC staff also teach classes at the Energy Centers, and at selected customer locations, to inform interested parties of their test results. These classes are attended by:

- O&M contractors
- SCE customer reps
- Energy efficiency staff

During the period that this process evaluation was being conducted, Opinion Dynamics was conducting an in-depth assessment<sup>3</sup> that encompassed TTC. In order to avoid duplication of effort — and to be sensitive to TTC staff's time (which was already called for to support the Opinion Dynamics effort) — this evaluation team:

- Focused specifically on TTC training offerings at the Energy Centers
- Largely confined our methods to those that could be accomplished by a review of the training materials and analysis of the exit surveys

<sup>3</sup> *Indirect Impact Evaluation of The Statewide Energy Efficiency Education and Training Program*, prepared by Opinion Dynamics Corporation for California Public Utilities Commission Energy Division

## Program Theory and Program Logic

The program theory supporting TTC activities revolves around a key market barrier: the lack of reliable, actionable, unbiased information about relevant technologies. In particular, performance uncertainties are often the key barriers for decision makers to try new energy efficiency strategies.

- TTC’s testing projects establish the information that can help overcome this market barrier.
- Disseminating their test results through multiple channels — and offering training focused on the technologies they have tested — gets the information to the decision makers who need it.

This approach to overcoming a key market barrier is reflected in the TTC program logic diagram (Figure TTC-1).

## Program Goals and Evaluation Focus

The program goals and strategies that are the focus of this evaluation form a relatively small portion of TTC’s overall goals and activities. The logic diagram (Figure TTC-1) highlights the activities and outputs that are relevant to this process evaluation effort.

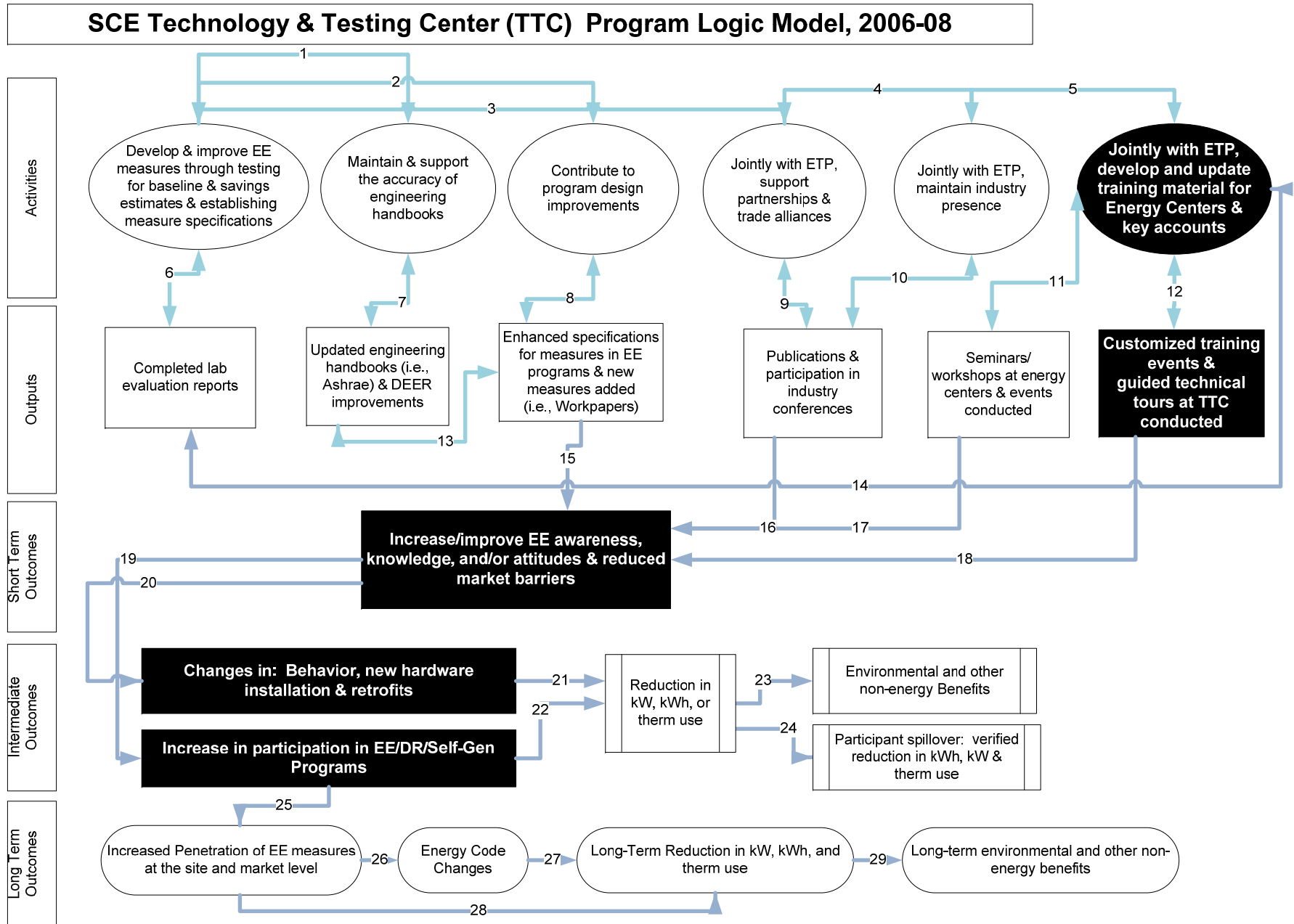
The TTC program goals identified in Table TTC-3 are based on information in the 2006–08 PIP and related program documentation. Table TTC-3 also summarizes the relationship between program goals and strategies and evaluation questions and methods. “TTC Program Goals and Strategies” in Appendix C-1 (p. C-2) provides more information about the relevant program goals and strategies.



**Table TTC-3. Summary of Program Goals and Strategies; Evaluation Questions and Methods**

Program Goal	Program Strategies	Evaluation Goals	Evaluation Methods
<b>Goal 1</b> <b>Increase customer AKA-B (Awareness, Knowledge, Attitude and Behavior)</b> <i>[Inferred]</i>	<ul style="list-style-type: none"> <li>Incorporate adult learning principles into training</li> <li>Encourage energy efficiency behavior in participants</li> </ul> <i>[Inferred]</i>	1-1. How well do courses support behavior change and adhere to adult learning principles and practices?	<ul style="list-style-type: none"> <li>Class design and delivery yardstick: Support of Behavior Change and Adult Learning                             <ul style="list-style-type: none"> <li>Review of class materials</li> <li>Comparison of results to those for EC</li> </ul> </li> <li>In-person audit of one class (conducted as part of the previous 2006–08 Energy Center process evaluation)</li> <li>Exit survey (items A through D)</li> </ul>
	<ul style="list-style-type: none"> <li>Train TTC instructors in adult learning principles</li> </ul>	1-2. Have TTC instructors been well trained in adult learning?	<ul style="list-style-type: none"> <li>Staff interview (one interview with program manager)</li> </ul>
<b>Goal 2</b> <b>Align TTC goals and procedures with other ETO programs</b>	<ul style="list-style-type: none"> <li>Train TTC instructors in adult learning principles</li> <li>Incorporate adult learning principles into training</li> </ul>	<ul style="list-style-type: none"> <li>Addressed under Goal 1</li> </ul>	<ul style="list-style-type: none"> <li>Addressed under Goal 1</li> </ul>
	<ul style="list-style-type: none"> <li>Guide participants into utility energy efficiency programs</li> </ul> <i>[Inferred]</i>	2-1. How well do courses support SCE EE programs?	<ul style="list-style-type: none"> <li>Class design and delivery yardstick: Support of Programs                             <ul style="list-style-type: none"> <li>Review of class materials</li> <li>Comparison of results to those for EC</li> </ul> </li> <li>Exit survey (items E through G)</li> </ul>
<b>Goal 3</b> <b>Engender participant satisfaction</b> <i>[Inferred]</i>	<ul style="list-style-type: none"> <li>Meet or exit survey satisfaction scores typical for EC courses</li> </ul> <i>[Inferred]</i>	3-1. How do TTC classes compare to EC classes on exit survey results?	<ul style="list-style-type: none"> <li>Exit survey (items 1 through 11)</li> </ul>

Figure TTC-1. PY2006–08 TTC Program Logic Diagram



# Methods

## Yardsticks for Class Design and Delivery

The evaluation team used two “yardsticks” to see how well the CLEO seminar class design and delivery:

- Support behavior change and adult learning — Appendix D-1 (p. D-2) includes a copy of the yardstick used to evaluate support of behavior change and adult learning.
- Support SCE energy efficiency programs — Appendix D-1 (p. D-2) includes a copy of the yardstick used to evaluate support of programs.

These “yardsticks” were based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes in the 2006–08 Energy Center Process Evaluation. The evaluation team updated these criteria to reflect the specific requirements of the 2006–08 ETO Process Evaluation and the updated yardsticks were reviewed by program staff.

Scoring for the criteria on the Support of Adult Learning and Behavior Change yardstick is the same as it was for the 2006–2008 Energy Center Process Evaluation.

The yardsticks were applied in to TTC courses in two different ways:

- Review of course material — The evaluation team reviewed (and applied the yardsticks to) the TTC course materials for five courses (Table xC-1 in Appendix C-1).
  - In the 2006–08 Energy Center Process Evaluation, we did not fully apply both yardsticks while reviewing course material. Elements of the yardsticks that we did apply to a review of materials are:
    - Support of behavior change criteria on the yardstick for support of behavior change and adult learning
    - All criteria on the support of programs yardstick
  - We considered 56 courses (Table xD-5 in Appendix D-1) when applying the yardstick during the review EC course materials.
  - Adult learning criteria were evaluated solely during in-person audits.
  - As a result, the data available to compare TTC courses to courses taught by EC staff and contractors is not exactly parallel. (For TTC courses, we have scores adult learning based on a review of materials. This information is unavailable for the EC courses.)
- In-person audits — During the 2006–08 EC process evaluation, we audited five classes, one of which was a TTC course (*Lighting Fixture Maintenance Workshop*, taught by Doug Avery at AgTAC).

The results of that audit are incorporated into this report.

Instructor interviews were excluded from this effort due to the other, in-depth (Opinion Dynamics) evaluation taking place concurrently with this project, and in order to be sensitive to TTC staff time.

See “Yardsticks for Class Design and Delivery” in Appendix C-1 (p. C-4) for details on the “yardstick” method.

## Exit Surveys

The evaluation team had the exit survey data for TTC courses in our database of Energy Center exit surveys. During this evaluation project we:

- Updated our database to include both TTC and EC exit surveys for 2008
- Distinguished between courses that are primarily TTC responsibility (developed and typically delivered by TTC staff) and primarily EC responsibility (delivered by EC staff or instructors under contract to the EC)
- Conducted the same analyses on the TTC courses as we had conducted for the Energy Center courses in the 2006–08 EC process evaluation
- Conducted additional analyses specific to participant satisfaction so we could compare the results for TTC classes to those of EC classes

In the Energy Center 2006–08 Process Evaluation, we focused specifically on the exit survey items associated with likely behavior change (items A to G on the exit survey)

We did not report on the exit survey items that addressed participant satisfaction issues (items 1 to 11 on the exit survey) because the Energy Center already runs regular reports on this data.

However, we did consider these items during this project, separating TTC courses from courses that are taught by EC staff or contractors for the purpose of comparing results between the two groups.

See Appendix A-5 for a copy of the EC exit survey, which is used for both EC classes and TTC classes taught at the Energy Centers.

## Staff Interview

To gain a broader perspective of the context in which the TTC program operates and to address the question whether TTC staff instructors have been trained in adult learning principles, the evaluation team conducted a telephone interviews with the TTC program manager.

See Appendix C-3 (p C-23) for a brief report of the conversation.

# Results

The body of this report highlights the major results from the evaluation, organized by program goals. Additional details are in Appendix C-2 (p. C-8).

## Goal 1: Increase customer AKA-B (Awareness, Knowledge, Attitude and Behavior)

*1-1. How well do courses support behavior change and adhere to adult learning principles and practices?*

### Support of Behavior Change

TTC courses outperform EC courses on two dimensions supporting behavior change (Figure TTC-2):

- Encouraging action, which includes providing students with guidance on next steps, including worksheets and checklists to help them consider their options and plan relevant activities, and find appropriate resources to help them take action.
- Support of customer segments, which includes addressing considerations, benefits, success stories, and case studies for specific customer groups.

TTC and EC courses score very similarly for the third dimension for supporting behavior change: helping overcome market barriers, which include providing information on financial and non-financial benefits and risk assessment and risk mitigation for relevant technologies and measures.

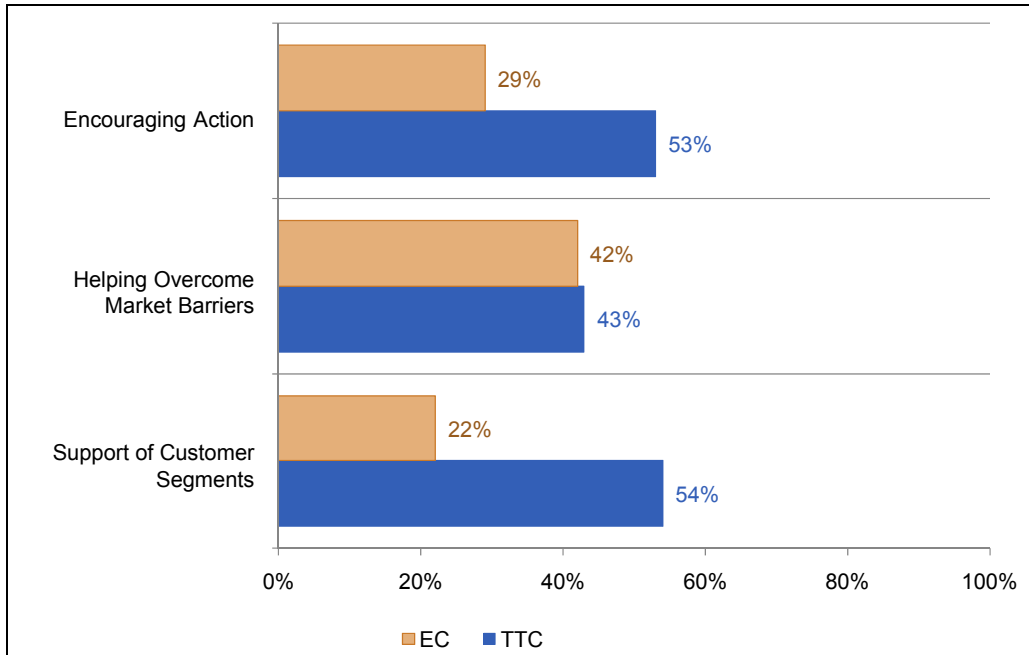
Although generally outperforming EC courses on support of behavior change, there still is room for significant improvement on these dimensions. It also is important to keep in mind that the scoring is based solely on a review of the available course materials. It is possible that instructors add information and guidance during delivery that is not reflected in these results.

It's also important to note that there was a very large difference in scores among the individual TTC courses.

- Some courses scored very high on the criteria for support of behavior change — 90% to 100% on most criteria.
- Some scored very low — 0% to 20% on many of the criteria.
- Few were in the “middle range” depicted in the figures below.

See “Support of Behavior Change” in Appendix C-2 (p. C-8) for details.

**Figure TTC-2. TTC and EC Score for Support of Behavior Change**

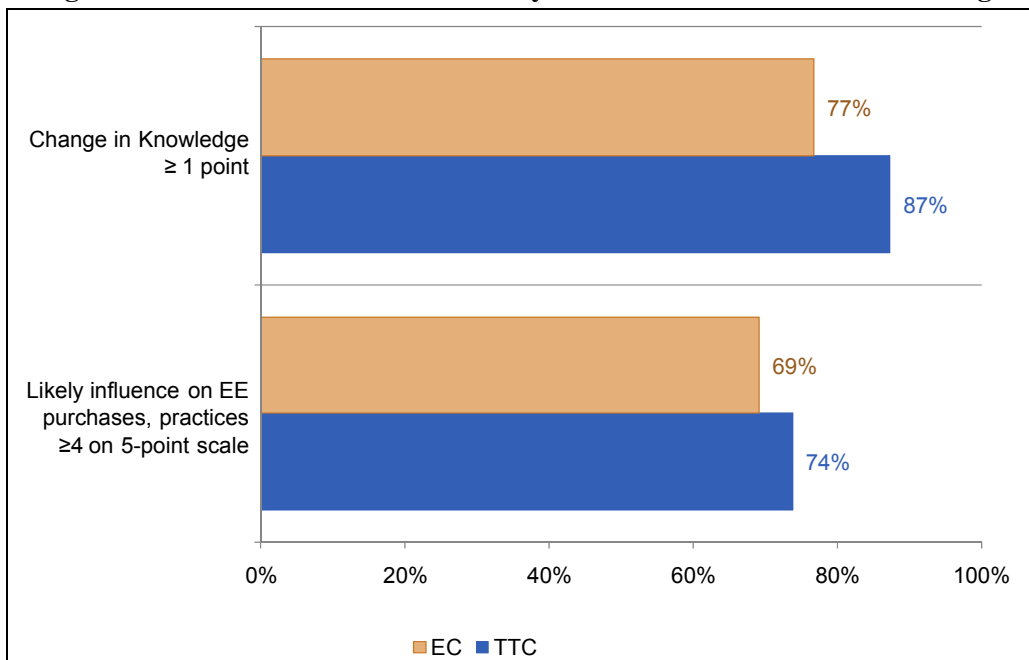


The exit surveys have two items that also reflect considerations re. behavior change:

- Participants’ assessment of their relevant knowledge before and after a class — an EC objective indicated that they wanted to have 50% of class participants show a change in knowledge of one point or more
- The likely influence of the class on participants’ future EE purchases and practices — an EC objective indicated that they wanted 50% of class participants to rate this item 4 or 5 (on a 5-point scale)

While both TTC and EC courses exceed the objectives, the TTC courses did somewhat better on both of these behavior-related exit survey items. See “Exit Survey Results Related to Support of Behavior Change” in Appendix C-2 (p. C-10) for details.

**Figure TTC-3. TTC and EC Exit Survey Results Related to Behavior Change**



## Adult Learning Principles and Practices

Adhering to the principles and practices of effective adult learning is another way in which courses can help achieve the desired “real world” change in class participants’ behavior.

The TTC and EC scores for the major dimensions on adult learning principles and practices (Figure TTC-4 and Figure TTC-5) are based on two different sources:

- The in-person audits that were conducted as part of the earlier 2006–08 EC process evaluation
- A review of TTC class materials

It is interesting to note that the review of materials yielded consistently lower results than the in-person audit of the class. (Observation scores are largely in the fair to excellent range, while materials scores are largely in the very poor to fair range.)

This means it’s likely that instructors added group discussions — and perhaps activities — that were not reflected in the course materials. It also means that the courses may benefit from capturing key elements of the value added by instructors to help ensure consistent delivery.

See “Adherence to Adult Learning Principles and Practices” in Appendix C-2 (p. C-12) for details.

**Figure TTC-4. TTC and EC Scores for Adult Learning Principles**

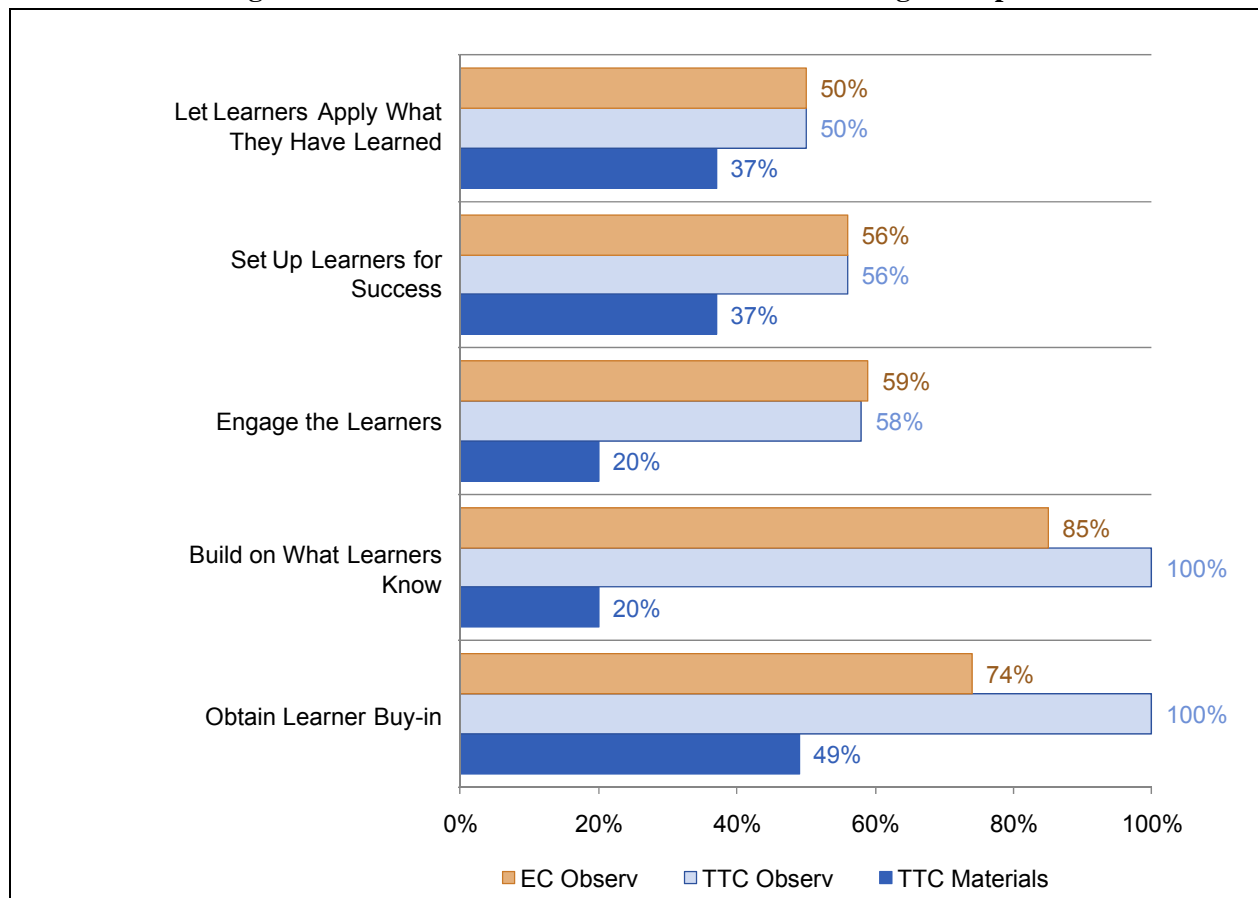
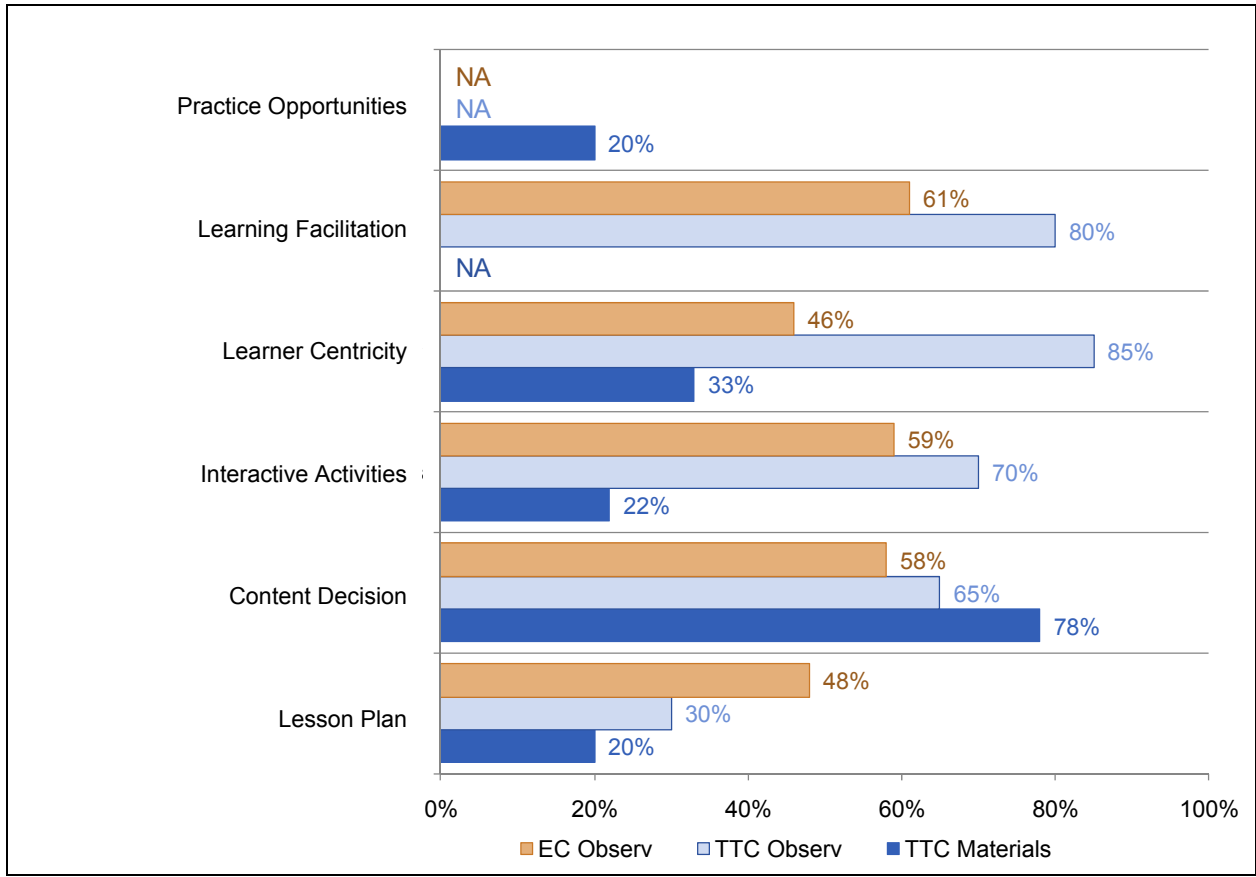


Figure TTC-5. TTC and EC Scores for Adult Learning Practices



*1-2. Have TTC instructors been well trained in adult learning?*

While one of the TTC instructors, who has been teaching multiple courses for many years, may have pursued professional development in the adult learning arena, there has been no formal effort to ensure that TTC staff who teach courses are well grounded in adult learning principles and practices.

Staff interviews indicate that:

- TTC instructors have not been systematically trained in adult learning principles and practices
- Adult learning typically not a major focus for feedback and coaching



## Goal 2: Align TTC goals and procedures with other ETO programs

### 2-1. How well do courses support SCE EE programs?

The evaluation of how well TTC courses support SCE programs is based solely on a review of the course materials, in the context of 16 programs that account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW savings.

When a course was considered logically tied to a program (addressed equipment or measures that the program encompassed), we reviewed the course to see whether it provided direct and indirect support of the relevant program.

- Direct support refers to program-specific information (e.g., program benefits, how to apply for program participation, where to go for more information about the program)
- Indirect support refers to information that would affect implementation of equipment or measures that the program addresses.

#### Direct Support

While TTC courses scored better than EC courses on direct support of programs, both groups of courses scored very poorly (Figure TTC-7). This may, in part, be due to instructor reluctance to commit program information “to paper” since the specifics of how a program is implemented is relatively volatile. It is possible that instructors address program information relatively informally during class delivery.

However, it seems likely that all courses could reasonably have high-level references to relevant programs that instructors could use as a springboard for more detailed discussion (and perhaps distribution of appropriate program material). In fact, two of the courses reviewed did include such high-level program information, which explains why the direct-support scores are as “high” as they are. (Most courses made no mention of any programs.)

#### Indirect Support

All of the TTC courses did an excellent job of indirect program support, and overall TTC courses significantly outperformed EC courses in this area (Figure TTC-7).

#### Exit Survey Results Related to Programs

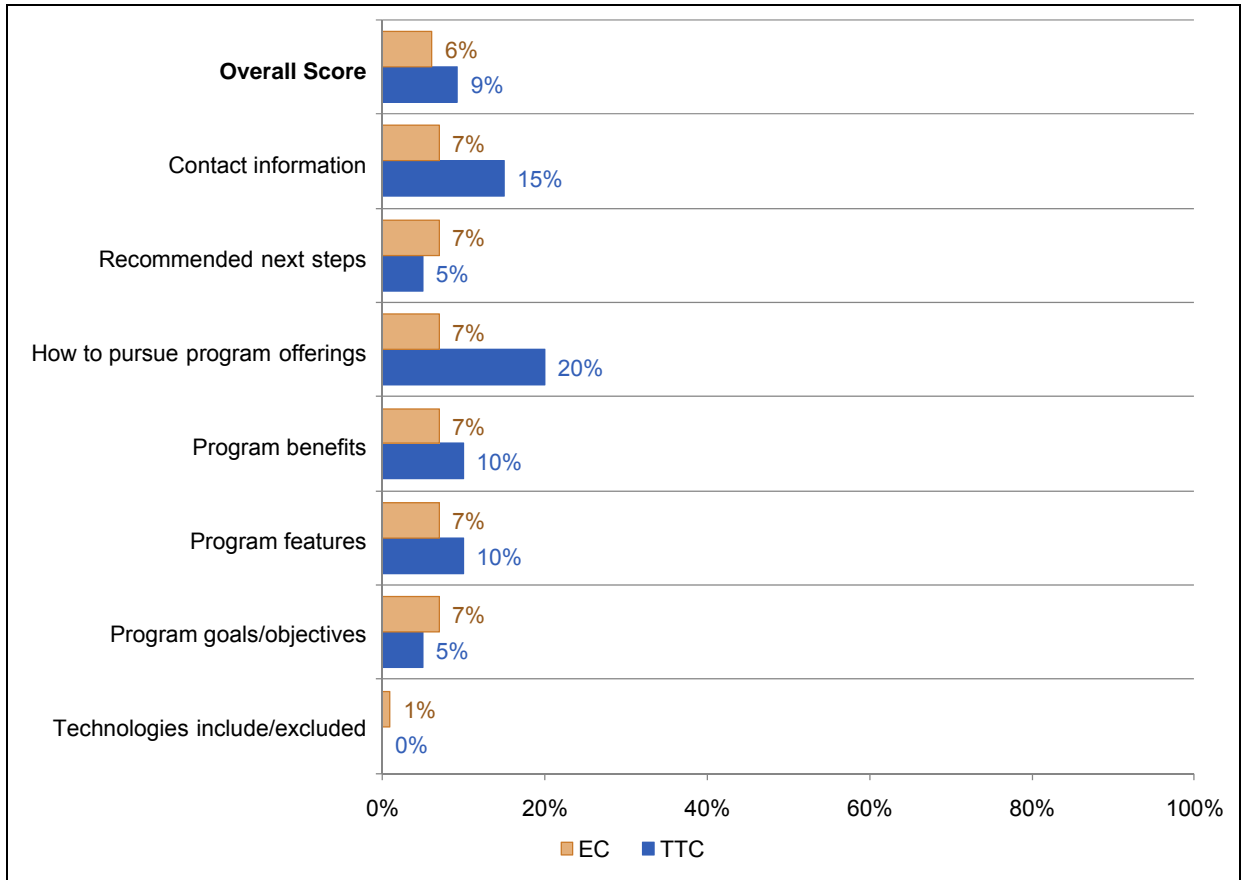
Two items on the EC exit survey ask if participants want SCE to follow-up with them to provide them with more information on EE programs and the Energy Audit Service.

Figure TTC-8 shows that a somewhat larger percentage of TTC class participants are interested in learning more about SCE programs compared to EC class participants. The distinction between “full yes” and “partial yes” has to do with the way participants completed the exit survey:

- If a participant requested more information and provided personal contact information (e.g., phone or email) that was considered a “full yes.”
- If a participant requested more information, but did not provide personal contact information, that was considered a “partial yes” because there was no way for SCE to actually follow up on the request.

See “Support of Programs” in Appendix C-2 (p. C-19) for details.

**Figure TTC-6. TTC and EC Scores for Direct Support of Programs**



**Figure TTC-7. TTC and EC Scores for Indirect Support of Programs**

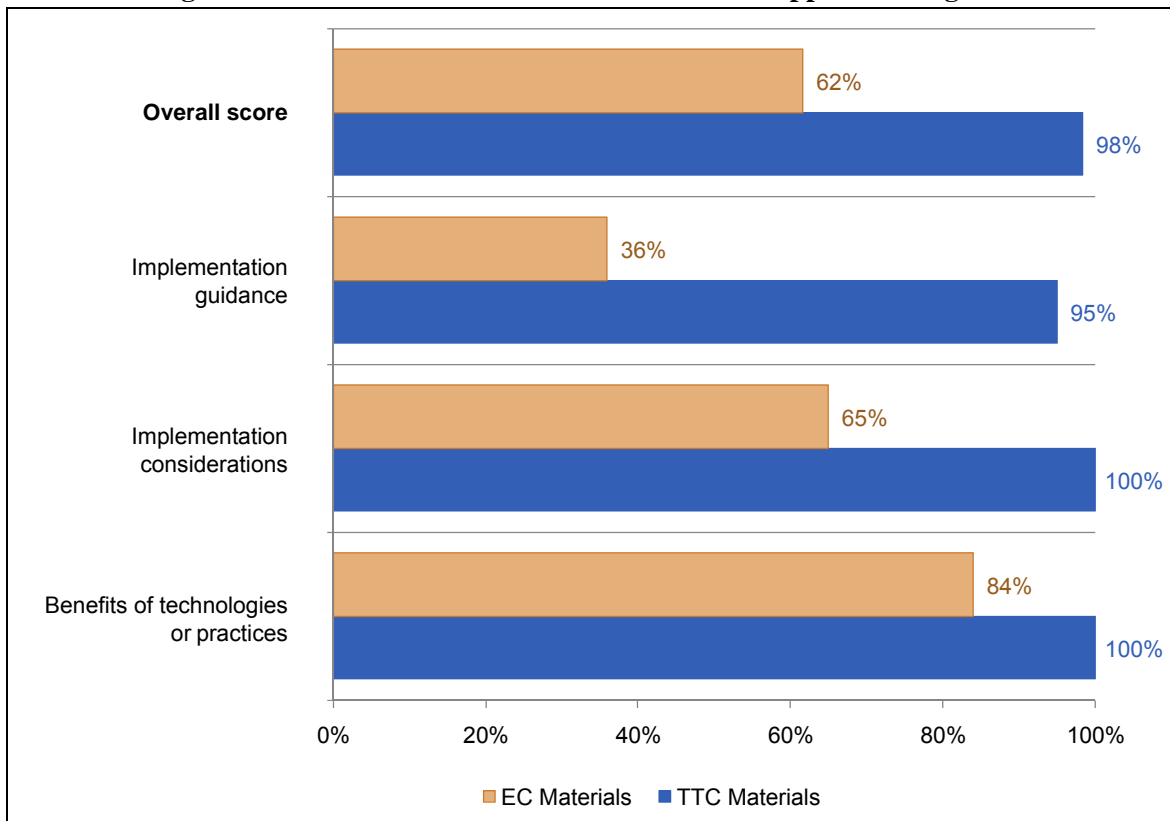
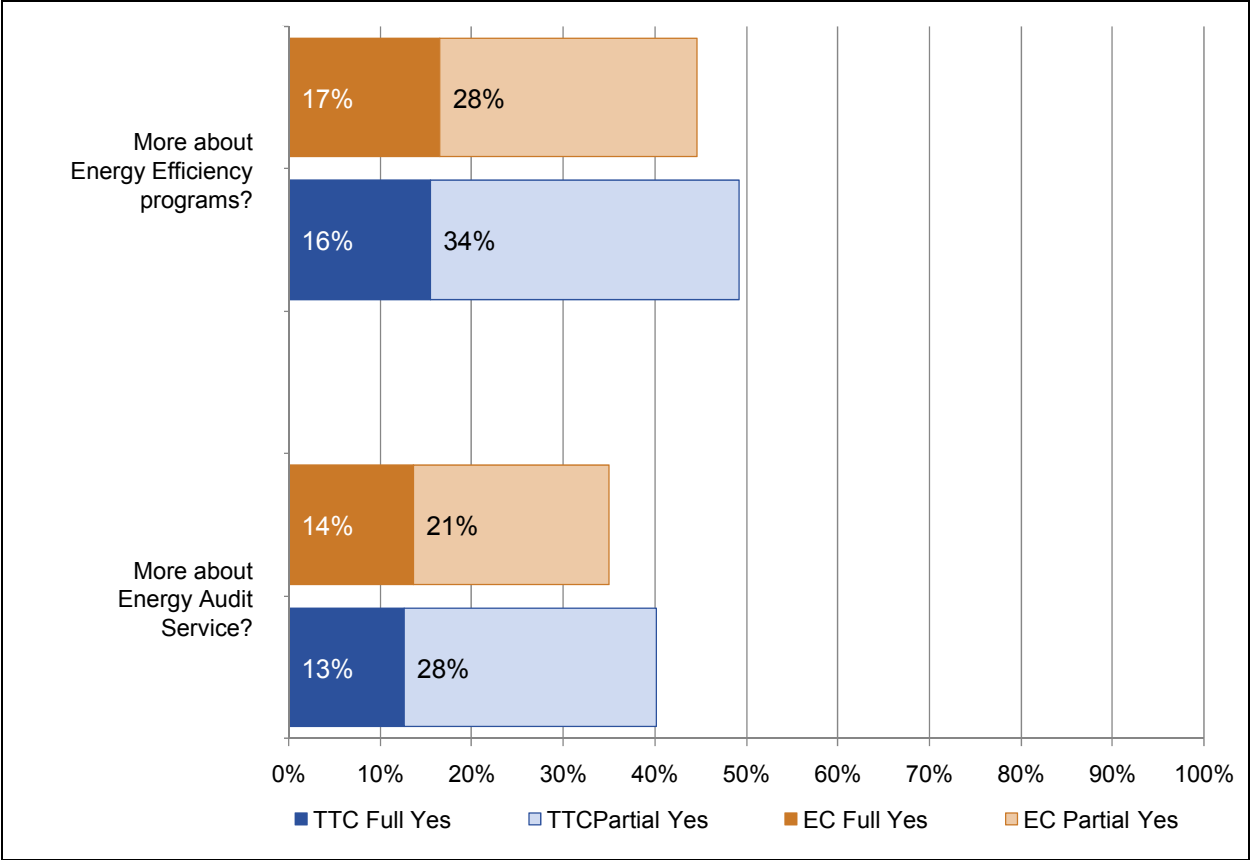


Figure TTC-8. TTC and EC Exit Survey Results Related to Programs



**Goal 3: Engender participant satisfaction**

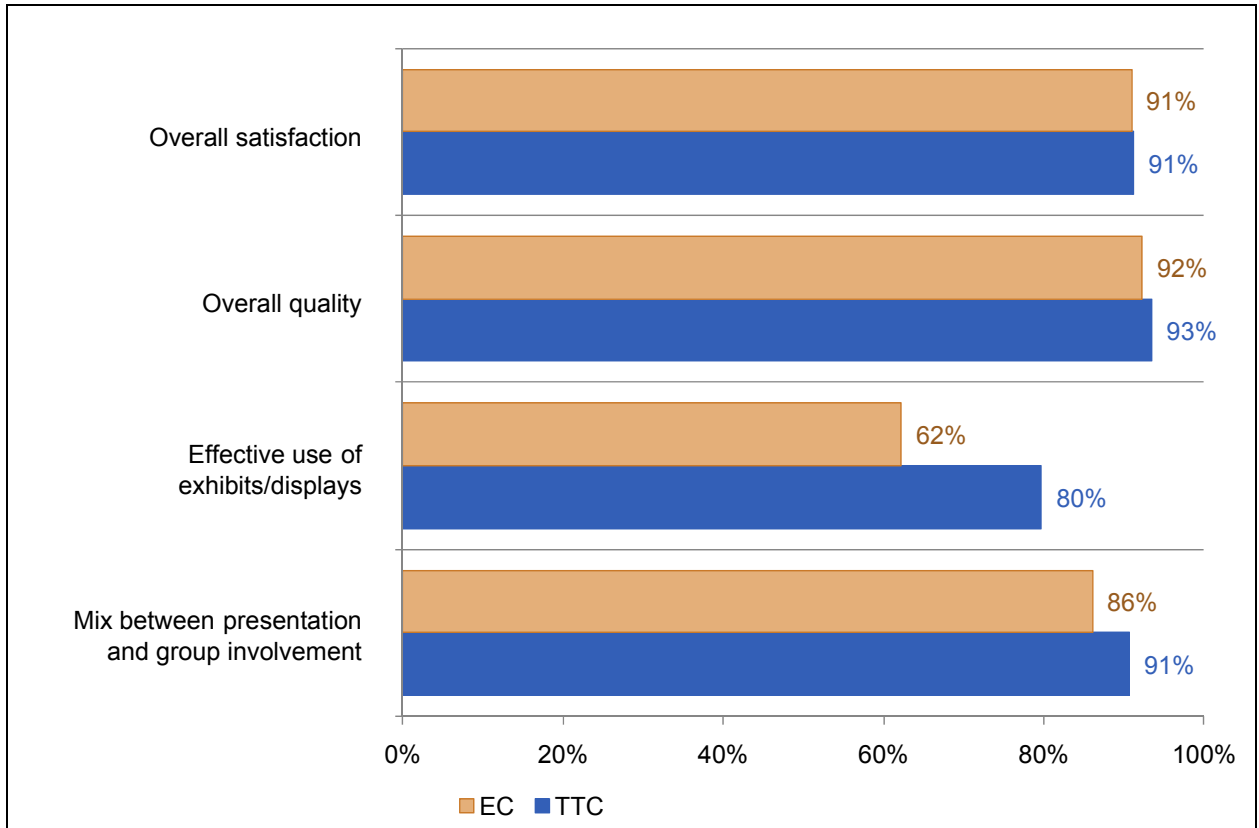
*3-1. How do TTC classes compare to EC classes on exit survey results?*

The EC exit survey has 11 questions that specifically address satisfaction issues.

- TTC courses tend to do better than EC courses on the items related to content (Figure TTC-11) and interactivity (Figure TTC-9).
- TTC courses and EC courses perform very similarly on items related to overall satisfaction (Figure TTC-9) and instructor skills and knowledge (Figure TTC-10).

See “Participant Satisfaction” Appendix C-2 (p. C-22) for details.

**Figure TTC-9. TTC and EC Exit Survey Scores on Related to Overall Satisfaction and Interactivity**



**Figure TTC-10. TTC and EC Exit Survey Scores Related to Satisfaction with Instructor**

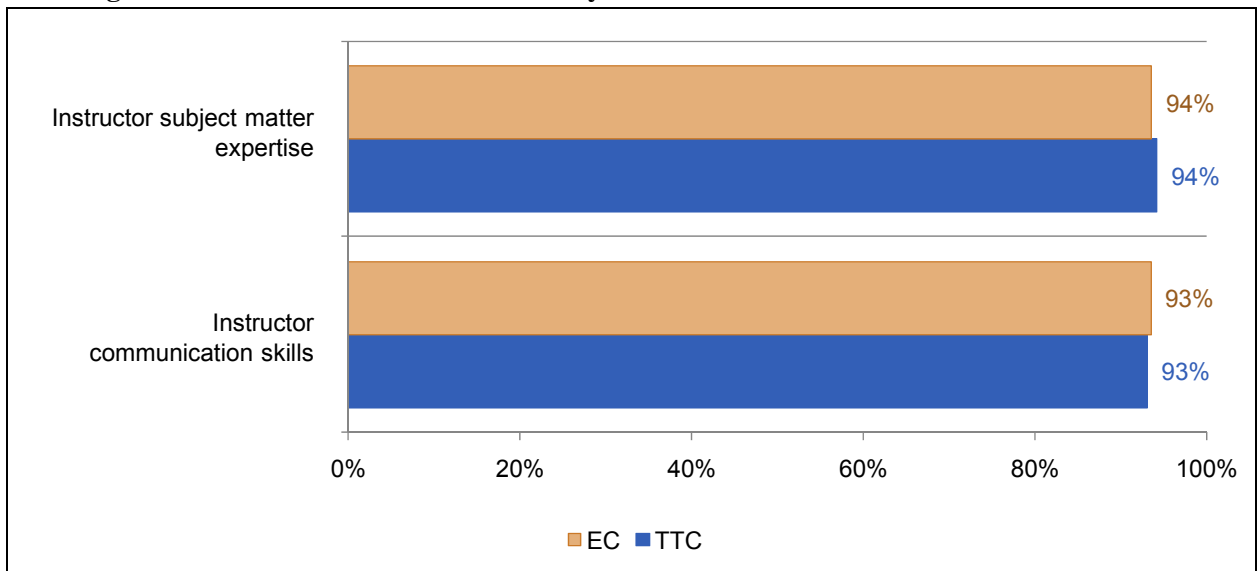
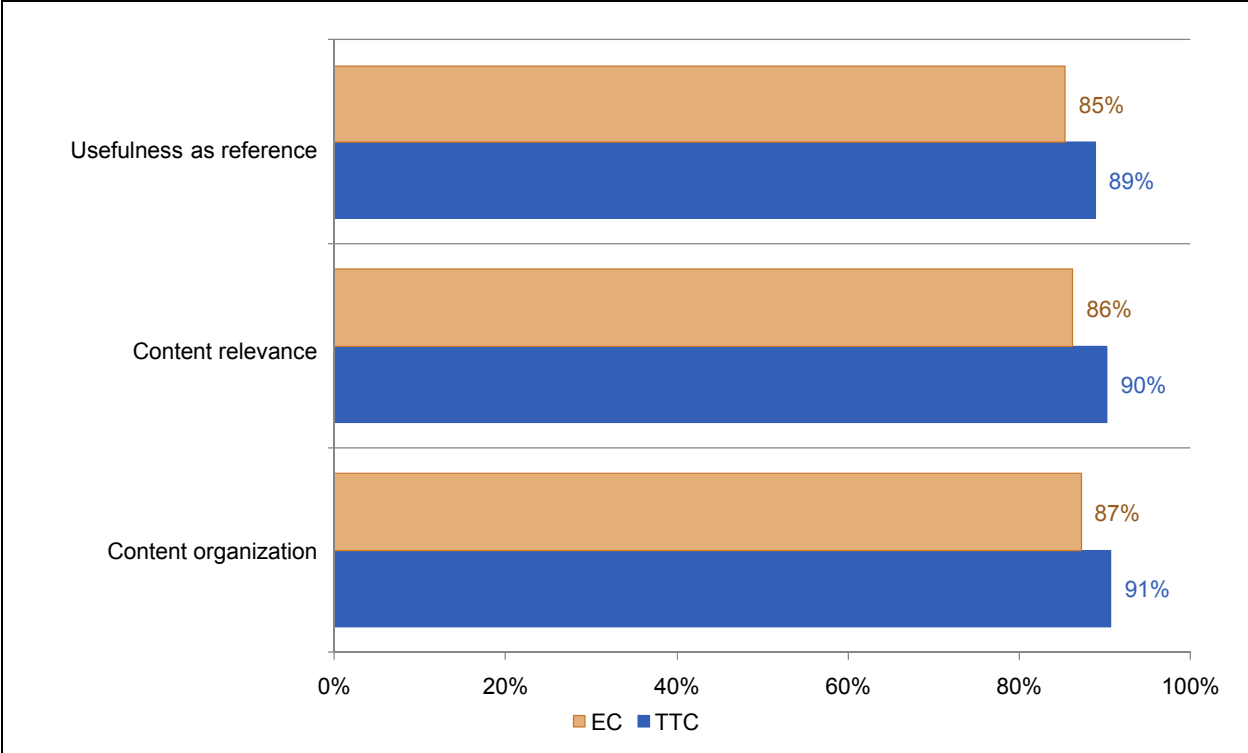


Figure TTC-11. TTC and EC Exit Survey Scores Related to Satisfaction with Content



# Recommendations

## Program Implementation

- Include more practice opportunities to ensure participants accomplish the desired performance objectives for the training.

Active practice and application is essential to acquiring new skills and knowledge and bridging the gap between the classroom and the “real world” (Appendix D-3) — and this is one of the areas where both TTC and EC courses perform poorly, at least in terms of what can be found in the course materials (Figure TTC-4 and Figure TTC-5).

Opportunities to work “hands on” with new information and ideas — and begin applying these to their own on-the-job environment — can have a strong positive impact on what participants do “in the field.”

- Make the ties to the relevant energy efficiency programs more overt; include specifics regarding how to take advantage of the programs and what technology variations are and are not encompassed by the programs.

Although scoring extremely well in indirect program support, the review of TTC course materials indicate that the courses do not provide much direct support of programs (Figure TTC-6).

Even simple mentions of program names, high-level benefits, and contact information can have a big effect on participant awareness of, and likely participation in, relevant SCE programs. By avoiding documenting program details in the course materials, TTC could avoid the concern of frequent updates due to program volatility.

- Consistently include specific information about financial and non-financial benefits of relevant energy efficiency equipment and practices; provide participants with specific guidance on appropriate actions.

TTC courses generally scored “fair” at best on the criteria associated with support of behavior change (Figure TTC-2) — yet this is the underlying goal of the training that TTC offers.

Clear, quantifiable benefits of the relevant equipment and measures can provide important motivation to act, and specific guidance on how to prioritize, organize, and pursue logical next steps to implement the measures can help participants take appropriate action on the job.

## Training

- Train instructors in adult learning principles and practices and apply these skills and concepts.

This was a success criterion identified in the program theory documentation that was not met during the 2006–08 program cycle.

Effective training in adult learning principles and practices will help instructors see the advantages of — and learn relatively simple techniques for — including more opportunities for practice and application of the information addressed in the training, which in turn can have significant positive effect on the students “real world” behavior.

# Mobile Education Unit (MEU)

## Background

### Program Overview

The purpose of the MEU, a marketing and outreach vehicle, is to promote SCE’s residential and non-residential programs by increasing awareness of SCE’s programs and services. During the 2006–08 program period MEU served the entire SCE service territory, attending major events using two formats:

- A converted 35-foot Winnebago recreational vehicle (RV) equipped with program literature, educational materials and energy efficiency technologies and displays
- An indoor or outdoor “tent” display (booth), which features technologies and showcases SCE energy efficiency rebate and incentive programs

During the 2006–08 period, MEU targeted primarily hard-to-reach residential customers. However, if there were an internal request for MEU to attend a small-business event, MEU would go.

The events MEU attended were identified by incoming requests, both from within SCE and from community event organizers. The program required that there would be at least 250 attendees at any event, and that the event be focused on energy efficiency. Aside from those minimal requirements, scheduling was on a first-come, first-served basis, and the RV attended the first event scheduled. If other events requested MEU attendance on a day that the RV was scheduled, the MEU fielded tents/booths at those events.

Most events occurred on weekends, and MEU is equipped to attend three to four events on the same day. Examples of events that MEU attended include community fairs and home shows.

When customers visited the RV or tents, they received brochures with EE tips, applications for incentives and rebates, mail-in energy surveys, the residential energy guide, the website address, and the SCE call center phone number. During the 2006–08 program period, there was no follow up with customers who visited MEU.

For 2009-2011, the MEU has been incorporated into the Integrated Marketing and Outreach Program as program activity instead of a standalone program. In 2009 MEU initiated a pilot program of lead cards designed to capture information about SCE customers who are interested in various utility programs. That lead-card pilot is the focus of this process evaluation. Table MEU-1 summarizes the program outputs that are relevant to this evaluation. The source for this information is the MEU Event Log for 2009, provided by program staff.

**Table MEU-1. MEU Program Outputs**

Program Year	2009
<b>Events</b>	
Total number of events, 2009	142
Total number of event days, 2009	167
Goal for event days, 2009	100
Percentage of goal achieved for event days, 2009	167%
<b>Customer Contacts</b>	
Total number of customer contacts, 2009	43,180
Goal for customer contacts, 2009	40,000
Percentage of goal achieved for customer contacts, 2009	108%

## Program Theory and Logic

The central program theory for the MEU is that there are underserved populations in SCE territory who are unaware of the available energy efficiency opportunities and the benefits these opportunities offer. Specifically some communities in remote areas and diverse cultures may not have access to mass media that permeates more populated areas, or have not been acculturated to issues outside of their immediate communities, thereby missing the energy efficiency message and opportunities.

By visiting these areas, the MEU provides target audiences with information about energy efficiency options and programs — helping underserved communities recognize that:

- There are opportunities for energy conservation and efficiency both at home and in their businesses
- By saving energy they lower operating expenses and save money

Since the MEU activities are designed to increase visitor awareness of the various investor-owned utility (IOU) programs, it is unrealistic to expect MEU to have a significant direct effect on visitors’ AKA-B.

Rather, it is more appropriate to expect the MEU to generate leads — driving MEU visitors to the IOU programs that are relevant to the visitor’s situation, needs and interests.

There was no program logic diagram developed for the MEU program in the 2006–08 program cycle. However, the lead card pilot was the focus of this evaluation effort and this element of the MEU program is evident in the 2010–12 Activity Process Diagram. (See Figure MEU-1.)

## Program Goals and Evaluation Focus

### Goal 1: Generate leads/referrals to other programs

Although the primary goal of MEU is to stimulate interest in — and drive visitors to — energy efficiency and demand side management programs, there was no vehicle for tracking the leads MEU generated, nor for following up with visitors who expressed interest in one or more programs.

In March 2009, the MEU program manager established a lead-card system that lets visitors indicate the programs they are interested in. MEU then passes along these leads to the appropriate program staff.

Since the lead-card system is the key strategy for meeting the MEU program goal, and the system began its pilot period at the time this process evaluation began, the evaluation team focused on this pilot effort.

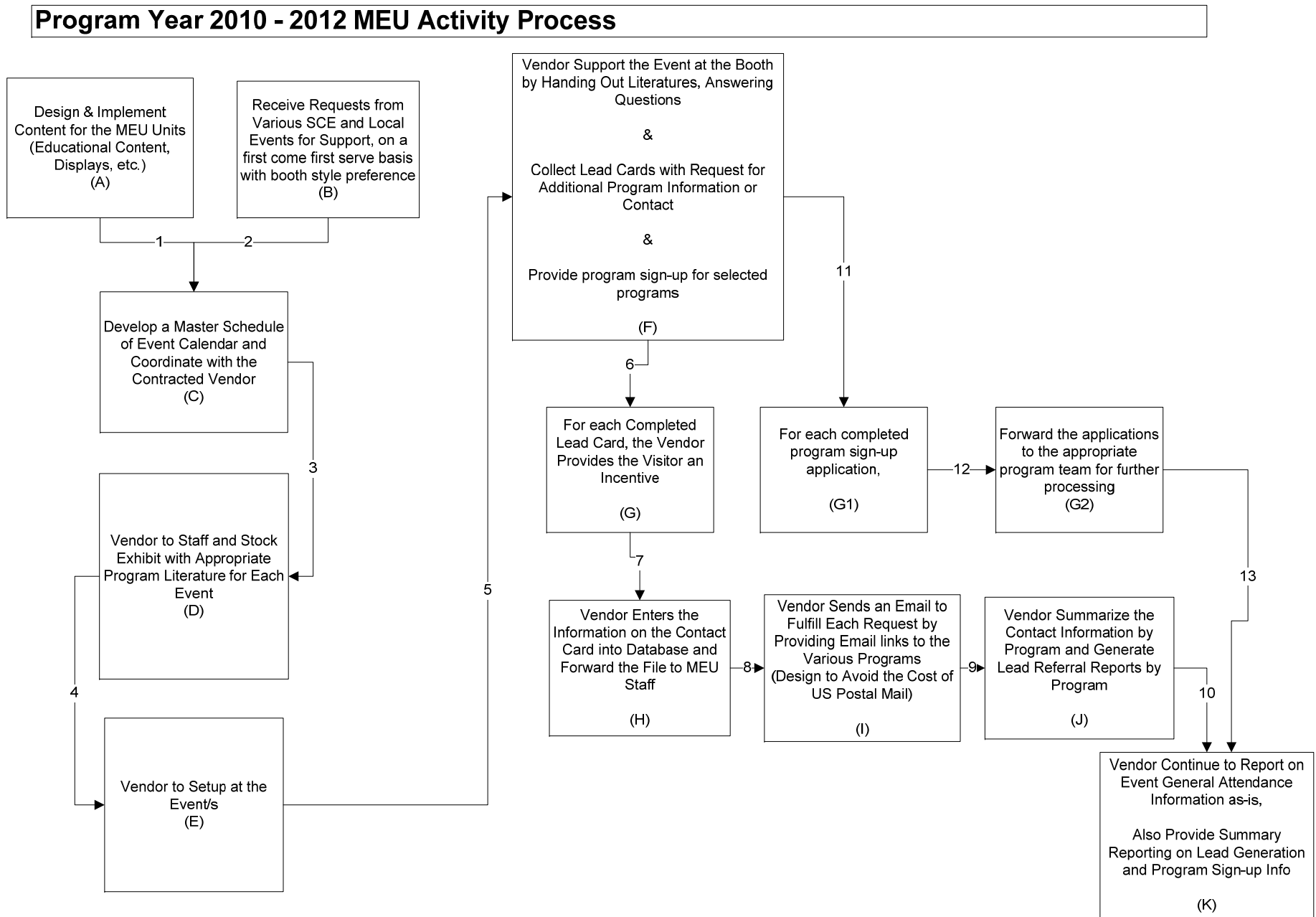
The CLEO program goals and strategies identified in the 2006–08 PIP and related program documentation formed the basis for the evaluation focus. Table MEU-2 summarizes the relationship between program goals and strategies and evaluation questions and methods.

**Table MEU-2. Summary of Program Goals and Strategies; Evaluation Questions and Methods**

Program Goal	Program Strategies	Evaluation Goals	Evaluation Methods
<b>Goal 1</b> <b>Generate leads/referrals to other programs</b>	<ul style="list-style-type: none"> <li>• Implement lead/referral card system at all MEU events</li> </ul>	1-1. Determine how many program-specific leads were captured via the MEU lead/referral card system  1-2. Identify the programs that generated the most interest	<ul style="list-style-type: none"> <li>• Event and lead card data</li> </ul>



Figure MEU-1. PY2010-12 MEU Activity Process Diagram



# Methods

Near the beginning of the evaluation project, MEU staff provided the evaluation team with a copy of the MEU lead card (see Appendix E-2) and the spreadsheet in which MEU was tracking the lead cards generated at various events.

The evaluation team reviewed the MEU data collection tool to determine enhancements that would be facilitate management and analysis of the data collected. We provided the MEU program manager with our recommendations for revising the data collection tool, and worked with MEU staff to ensure clear communication about the requests and the rationale for them. Initial recommendations included suggestions such as the following:

- Incorporation of a unique event identifier (Event ID) so that lead card data could be readily mapped to other data relevant to MEU events, leads could be easily sorted by event, and lead cards from future events would not be confused with those from earlier events of the same name
- Elimination of logically redundant fields that didn't appear to serve a function and caused conflicting data (e.g., Service Account Yes/No and Service Account Number: sometimes "yes" entered, but no SA provided; sometimes "no" entered, but SA provided)
- Separation of "composite" fields into discrete fields (e.g., Customer First Name and Customer Last Name as two separate fields)
- Clear definition of the type of data to be included in each field (e.g., use a comments field for program staff comments or for customer comments; not both)
- Incorporation of fields for data points on the lead cards (the lead cards had been updated; the data collection tool needed to be updated to include fields for all the programs as listed on the current lead card)

MEU staff incorporated the recommended revisions and provided the evaluation team with updated lead card data. Again the evaluation team reviewed the data in the data collection tool and made suggestions for a few additional enhancements based on what we learned about the way the data was entered. For example: use a separate field for customer number if customer number may occasionally be used in lieu of service account number; use separate fields (not customer first and last name fields) for business name if that data is occasionally collected from a lead card.

MEU provided the evaluation team with periodic updates to the lead card data and the evaluation team entered the current data into our project database. We also requested additional information from MEU that we thought might provide some interesting insights into the MEU lead generation process. Specifically we asked for:

- Data about the MEU events that generated the lead cards
- Data about the amount and type of literature distributed at different events

We integrated data about MEU events into our project database (mapping lead cards to event data via the unique Event ID established at the beginning of the project). We were unable to integrate data about the amount and type of literature consumed as the format of that information and the specific data available did not lend itself to this application.

# Results

## Program Goal 1: Generate leads/referrals to other programs

Generating leads/referrals to other programs is the only MEU goal that this evaluation focused on. The two evaluation goals that were encompassed by this project were to determine how many leads were captured and identify which programs received the most leads. We also took an informal exploratory look at some other questions of interest described below.

### 1-1: Determine how many program-specific leads were captured via the MEU lead/referral card system

Comparing lead cards and leads to the total number of MEU contacts, we find (Figure MEU-2):

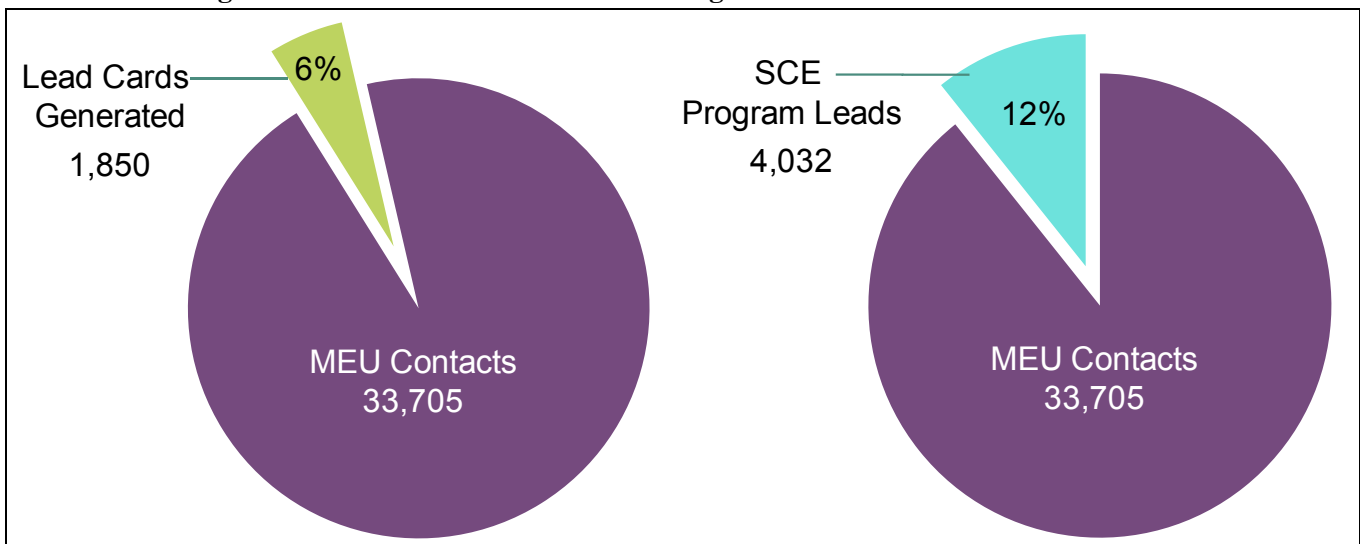
- There were 1,850 lead cards generated, which represents about 6% of the MEU contacts.
- Those lead cards represent 4,032 SCE program leads (many customers asked for information on multiple programs), which is 12% of the MEU contacts.

Looking at the number and type of leads on the lead cards, we find:

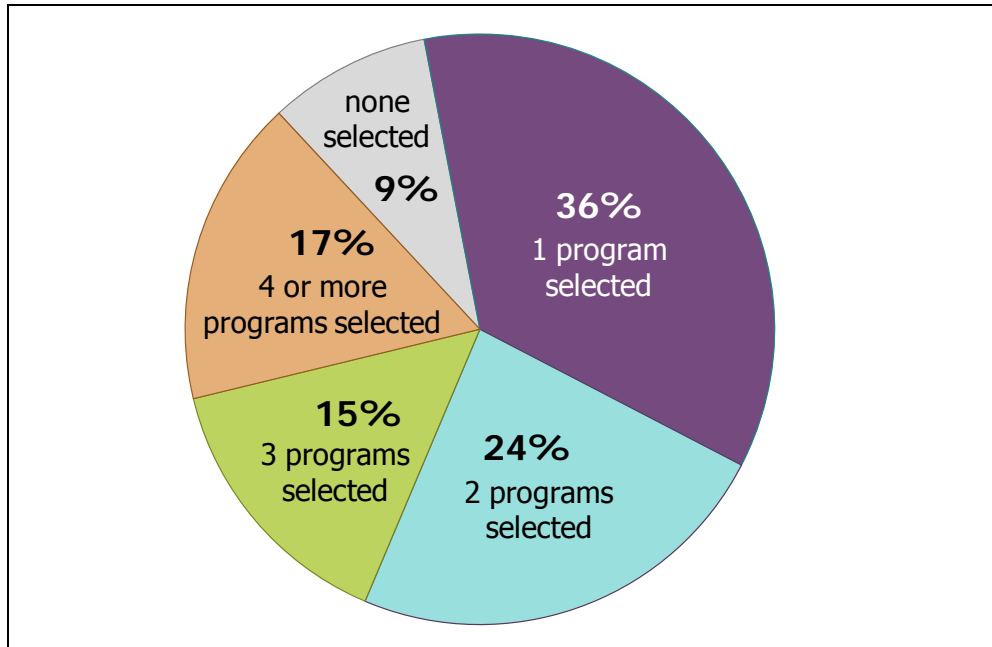
- More than half (56%) of the customers who completed lead cards requested information about more than one program (Figure MEU-3).
- Quite a few lead cards contained requests for information on gas or water programs, quite a few contained comments or special requests, and a few were totally blank (Figure MEU-4).

See “Identifying Leads” in Appendix E (p. E-4) for details.

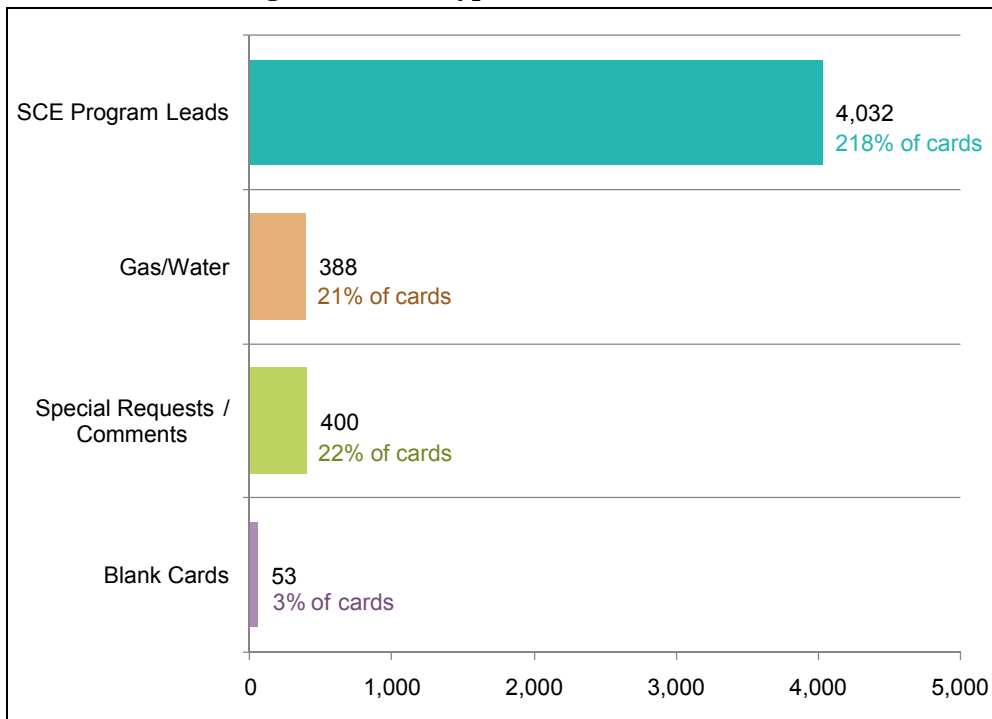
**Figure MEU-2. Lead Cards and SCE Program Leads Generated from MEU Contacts**



**Figure MEU-3. Number of Leads per Lead Card**



**Figure MEU-4. Types of Leads Generated**



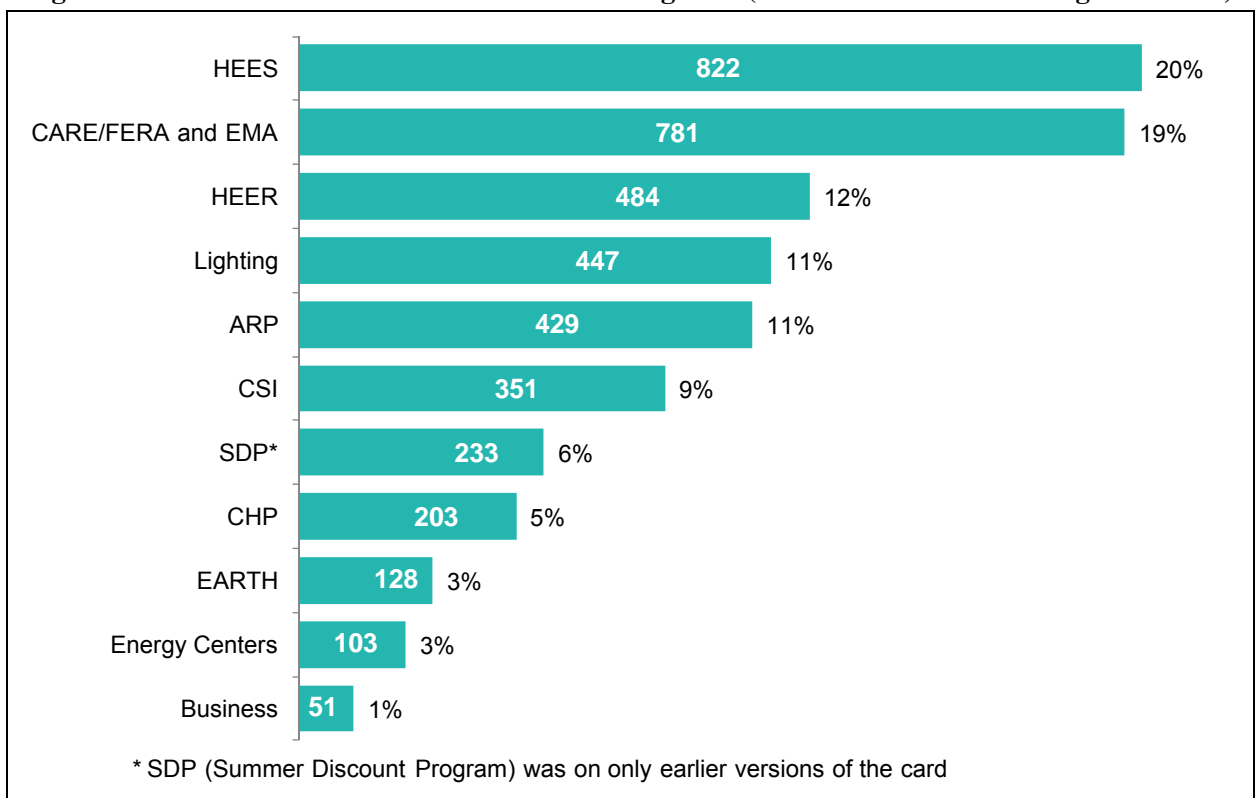
*Evaluation Goal 1-2: Identify the programs that generated the most interest*

As noted above, most of the lead cards had more than one program marked, with a total of 4,032 programs checked on 1,850 cards. Figure MEU-5 shows the distribution of leads among the various programs.

- HEES was the most popular program, representing 20% of all the program-specific leads.
- CARE/FERA (12%) combined with EMA (7%) is a close second, at 19%
- HEER, Lighting, and ARP have similar results to CARE/FERA alone — around 12%.
- Energy Management Solutions for Business was the least popular, representing only 1% of the total SCE program leads generated.

See “Identifying Program-specific Leads” in Appendix E-1 (p. E-5) for details.

**Figure MEU-5. Number of Leads for Different Programs (Percent of Total SCE Program Leads)**



## Results

# Other Issues of Potential Interest

There were several areas of potential interest that the evaluation team tried to pursue relative to the MEU lead card pilot, but were unable to due to issues with the type and quality of data available. The following briefly describes some of these areas.

## Issues with the Data

- As noted under Methods, the evaluation team was interested in exploring the relationship between literature (brochures, flyers, etc.) distributed at an MEU event and the number and type of leads generated.

However, the data about the literature is not collected or maintained in such a way that it can be related to the MEU events.

- As described under Evaluation Goal 1-1, we would have liked to relate the number of MEU contacts and leads at an event to the total number of event attendees.

However, the attendee information that is maintained is pre-event estimates provided by the event organizer or sponsor, and often does not represent an even roughly accurate estimate of the number of people who actually attended.

- Another area that the evaluation team briefly explored was whether we could determine if the type of event was a good predictor of the number or type of leads generated. We attempted to categorize the events by type of sponsor (e.g., local government, non-profit, commercial business, education, etc.) and the type of event (e.g., festival, educational, “green” awareness).

However, there was inadequate information available in order to do this. Sometimes the event name was sufficient to determine the type of sponsor (e.g., “Chino Basin Water Conservation District Earth Day”), other times an Internet search could indicate the desired information (e.g., “Walnut family Festival”) and other times we were unable to determine either the category of event sponsor or the type of event (e.g., “Tri City”).

- In addition, during our data analysis we noticed that there were “disconnects” between different sources of data about MEU events and leads.

For example, the number of events and number of leads found in the lead card database are somewhat different than those found in the MEU log.

## Follow-up on Leads

It also should be noted that follow-up on leads by SCE program staff outside the MEU program is relatively slow and uneven. (See Table xE-6 in Appendix E-1.)

- Of the 12 SCE programs listed on the lead card, the leads have been followed up for only four programs:
  - HEES
  - ARP
  - CARE/FERA
  - EMA
- The percentage of leads processed by these program staff ranges from 5% (ARP) to 100% (EMA).
- The completion rate also varies widely, ranging from 1% (HEES) to 82% (EMA).

# Recommendations

## Program Process Considerations

- Strengthen the lead follow-up process to help ensure that customers who request program information do indeed receive it. (“Follow-up on Leads”, p. 88)
- Monitor the volume of marketing collateral distributed at events — or monthly in a manner that can be compared to the number of MEU contacts and leads generated (“Issues with the Data”, p. 88)  
Compare the type and amount of collateral distributed to the number and type of leads generated to determine whether unmonitored collateral distribution is cost-effective relative to the leads generated.
- Establish event categories indicating the general category of event sponsor and the focus of the event; assign each event to the appropriate category — for future analysis of the types of events to “market” to. (“Issues with the Data”, p. 88)
- Integrate tracking of pre-event estimated attendance, post-event estimated attendance, number of contacts made, with tracking of lead cards. Reduce re-keying of data as much as possible to avoid errors. (“Issues with the Data”, p. 88)
- Revise the lead card data collection spreadsheet to include basic data validation — for example avoid “yes” in a field that typically has “X” or “1.” (“Issues with the Data”, p. 88)

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# EDR

## Background

Energy Design Resources (EDR) began in 1998 as a stand-alone market transformation program to provide information and tools to encourage energy efficient design among non-residential new construction projects. It was developed to educate architects, engineers, lighting designers, developers, builders, and building operators about techniques and technologies that contribute to energy efficient new construction.

In PY2002, EDR was incorporated into the Savings By Design (SBD) program, which encourages energy efficient designs for new non-residential buildings by offering incentives for proven energy savings. EDR, therefore, has been used to complement and/or supplement the SBD program by offering additional tools to assist with the design of energy efficient new buildings.

The current EDR program is still linked to the outreach efforts of the Savings By Design Program — with the EDR web site ([www.energydesignresources.com](http://www.energydesignresources.com)) directly offering an array of energy design tools, informational resources, and training opportunities to the primary decision makers in new construction projects.

EDR is administered by Pacific Gas and Electric Company, Sacramento Municipal Utility District, San Diego Gas & Electric, Southern California Edison, and Southern California Gas, under the auspices of the California Public Utilities Commission.

## Target Audience

The market actors targeted for this program include:

- Building owners
- Architects
- Engineers
- Contractors
- Builders
- Developers
- Energy consultants and designers

At the time of the most recent survey of EDR users in 2009, 5650 active users were identified. This compares to 2300 during the last full evaluation in 2003.

## Communication Channels

The primary vehicle of the EDR program is the EDR website [<http://www.energydesignresources.com>]. Resources available through the website include:

- Publications
  - Design guidelines
  - Design briefs
  - Case studies
  - Technology Overviews
  - e-Newsletters

EDR  
Background

- Software tools
  - eQUEST® — A building energy use analysis tool; supports detailed analysis of building design using building energy use simulation without requiring extensive experience in building performance modeling
  - eVALUator — A financial analysis tool; calculates the lifecycle benefits of investments that improve building design
  - SkyCalc™ — Microsoft Excel™ spreadsheet application; helps building designers determine the optimum skylighting strategy that will achieve maximum lighting and HVAC energy savings for a building
  - Commissioning Assistant — web-based reference designed to provide project specific commissioning information to the design team
  - SPOT™ — Sensor Placement + Optimization Tool; helps designers quantify the existing or intended electric lighting and annual daylighting characteristics of a given space and establish the optimal photosensor placement for the space relative to annual performance and annual energy savings
  - Green Building Studio — A web-based energy analysis service intended to help architects and designers perform whole building analysis, optimize energy efficiency, and work toward carbon neutrality earlier in the design process
  - EDR Charrette — An online tool; supports investigation of the energy impacts of various design scenarios on a typical building, including a graphical display of analysis results
- On-line training modules
  - Online courses — a set of 12 modules or courses to be completed over a 12-week period, including midterm and final exams
  - Virtual workshops — a set of six “workshops;” slide-based presentations displayed online, with a final exam after each
  - Webinars — slides used during live webcasts done several years ago

This entire suite of resources also is available on EDR resource CDs that are distributed directly to interested parties at industry events and related training events.

Non-web-based offerings of the EDR program include educational opportunities held at easily accessible locations and provided in concert with industry organizations such as AIA, USGBC, ASHRAE, and IES:

- On-site seminars
- Workshops
- Charrettes<sup>4</sup>

<sup>4</sup> In contrast to the EDR Charrette software tool, these charrettes refer to a collaborative session in which a group of designers drafts a solution to a design problem. Often the group is divided into sub-groups representing diverse perspectives (e.g., architects, engineers, builders) in order to quickly generate a design solution that integrates and addresses the needs, interests, and areas of expertise of these sub-groups.

# Introduction to the Current Project

This report is not an evaluation of the EDR program. The last evaluation of this program was completed in 2003. It was not clear whether sufficient changes in the program, its delivery, and its theoretical underpinnings have occurred to warrant a full evaluation; therefore this evaluability assessment was undertaken to determine whether resources should be dedicated to a full evaluation of the program. What is appropriate at this time is to complete a PY2006-08 program theory and logic model document, and to do an evaluability assessment based on the program theory.

The project goals that were set were to:

- Identify and describe the program theory as program staff see it
- Identify research questions appropriate to the theory
- Assess the feasibility of answering those questions

A program theory describes the goals of the program, the barriers to reaching those goals, and the strategies that were implemented to overcome the barriers. The elements of the theory are tied to the links in a logic model that represent the connections between program activities, outputs and outcomes. The final piece of program theory presented in this report identifies the research questions that are raised by the program goals, barriers and strategies as they are embedded in the program links.

The evaluability assessment analyzes the research questions and determines what would be required to address them adequately, and whether it makes sense to address the research questions empirically. Several situations can lead to a recommendation that a program is not evaluable:

- Lack of program theory
- Lack of change in program since last evaluation
- Lack of data or inaccessibility of data needed for evaluation

Each will be briefly described below.

## Possible Reason to Postpone an Evaluation: Lack of Program Theory

If a program has not been planned with specific goals, careful consideration of the barriers to meeting the goals, and development of strategies to overcome barriers, it will be impossible for an evaluation to determine if the goals have been met and barriers overcome. If a program lacks a theory, there is little point in evaluating it. In addition, the EDR program was evaluated in 2003, and recommendations were made for identification of barriers and strategies to overcome them. Those recommendations are used in this assessment to suggest future directions for program theory.

## Possible Reason to Postpone an Evaluation: Lack of Change in Program since Last Evaluation

If there has been a full evaluation of a program in the past, but there have been no changes in program theory or implementation, or minimal changes, it is probably not advisable to use scarce resources to mount another expensive evaluation. Evaluation funds are never unlimited, so priorities need to be set.

As noted above, the EDR program was evaluated in 2003. If the program has not seen substantial changes in goals and strategies of implementation have not occurred since that time, it is likely that the funds to evaluate the program again would be better used elsewhere. This evaluability assessment studies the responses to the past evaluation observations and recommendations, and makes further recommendations

## Possible Reason to Postpone an Evaluation: Lack of Data or Inaccessibility of Data

There may be a useful program theory, and there may have been changes since the last evaluation, but if data on the participants and on implementation are not available, the program would be considered unevaluable. If participants cannot be contacted, this would severely limit the usefulness of an evaluation. If the website or its contents are inaccessible to evaluators, or if they require special expertise, this aspect of the program could be unevaluable, or could require special resources.

## Results

The results of this assessment are organized by the aspects of evaluability identified above.

- First, we present the program theory — as we were able to construct it from program documentation and interviews.

Within that framework, we assess the evaluability of the program and provide suggestions for potential improvements to the program's theory.

- The second section describes the program changes that have occurred since the last evaluation. On the basis of these findings, we assess the program's evaluability on each evaluability dimension.
- The third section describes the availability of data and the kinds of data would be needed for a meaningful evaluation.

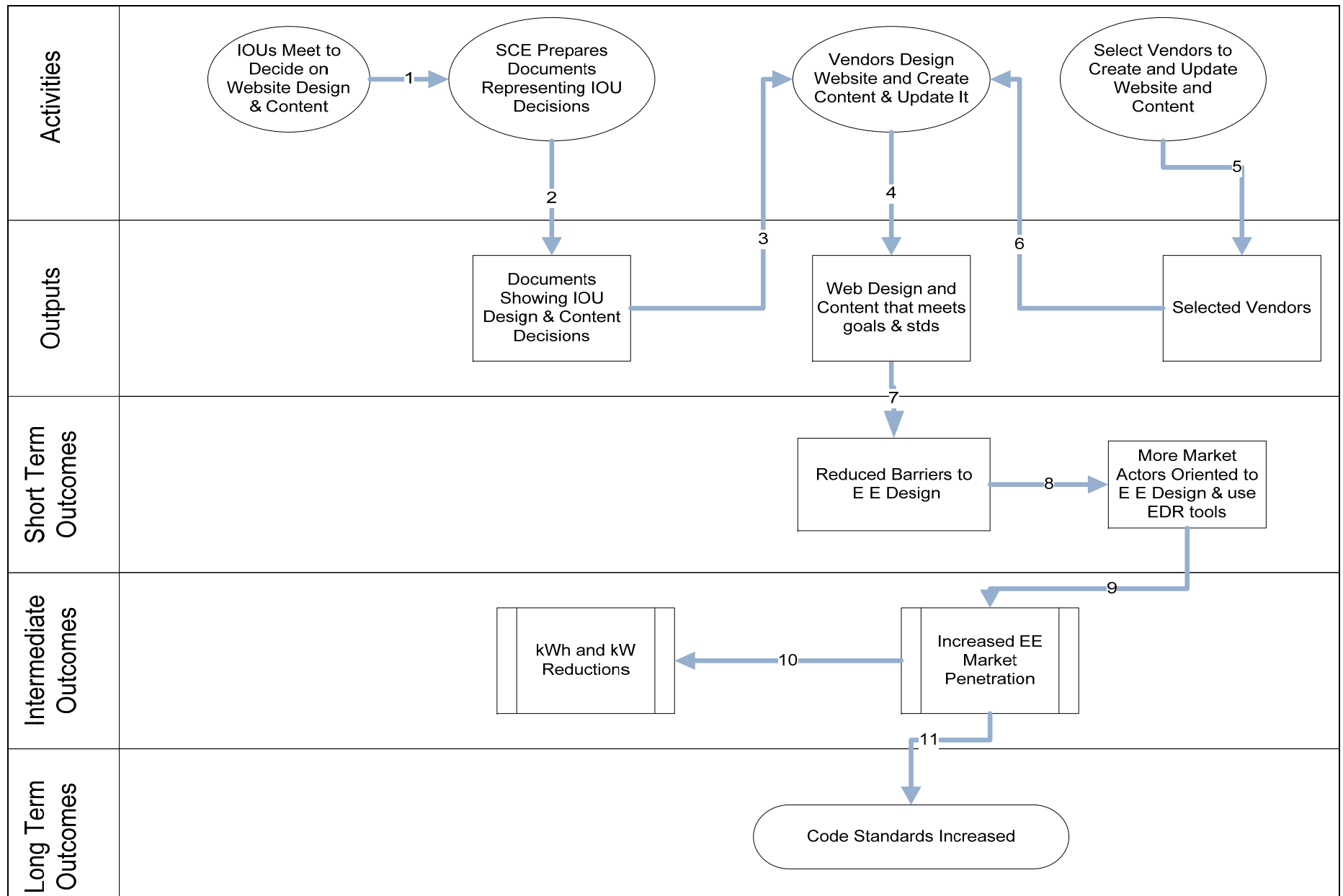
Of course, embedded in that description is the assessment of evaluability in terms of data needs.

- Finally, we summarize the evaluability assessment overall, and our recommendations.

## Program Theory

Figure EDR-1 is the logic model that reflects the basic logic of the program and how it operates.

Figure EDR-1. Logic Diagram for EDR Program



## Program Goals

The program goals, as currently stated in the PIP and in interviews with program personnel, are very general. They are:

- Educate architects, engineers, lighting designers, and developers about techniques and technologies that contribute to energy-efficient facilities.
- Increase the number of buildings designed for energy efficiency.
- Facilitate transition to California's new energy efficiency standards for residential and nonresidential buildings (Title 24, 2008) which became effective January 1, 2010.

## Barriers

The project team could not find barriers identified in the PIP.

## Strategies

Some activities were promised in the 2006-08 PIP that could be construed as strategies, and others were stated as strategies but were not connected to stated goals or attached to overcoming specific barriers. In addition, two of the three goals stated above (the first and the third) are not stated in a way that facilitates the formation of useful strategies. Following are some quotations from the PIP that could be turned into strategies connected to specific goals and/or barriers:

- "When designers and developers understand that energy efficiency will add value to new facilities and thus are desired by their clients, they will be more open to incorporate these goals in their work in order to increase their competitive edge. As more designers regularly produce efficient facilities, it will become an obligation for all."
- "...the state again tightened its energy standards for nonresidential new construction in 2005. The EDR program strategy will help make it as easy as possible for customers to transition to these new regulations. More importantly, program planners also want to help customers exceed these standards to create more efficient facilities that will be less expensive to own and operate."
- "Additionally, the program will continue to provide, update, and expand robust and reliable design tools that reduce the time designers spend evaluating the energy use impact of their design decisions, at no cost."
- "The program strategy is to offer an up-to-date, complete resource that serves architects, engineers, lighting designers, developers, building operators, and facility managers with multiple avenues and resources to reduce the barriers to the inclusion of energy efficiency criteria in standard design and operation and maintenance practices. The areas of influence include design practices and processes, proven energy reduction and demand response strategies, and new and emerging energy efficiency technologies."
- "Continued development and expansion of existing information and tools will be undertaken in 2006 through 2008, as appropriate to enhance the value and usefulness of the EDR resources."
- "Adapting and expanding the resource base for use by designers of non-commercial businesses and building operators focused on existing buildings will efficiently leverage the solid foundation of tools now provided to the new construction market."
- "For 2006-2008, an additional focus will be to expand the resources to include information about effective energy efficiency applications in industrial, agricultural, residential, and existing commercial buildings to add to the rich variety of resources currently available in the area of design practices and energy efficient technologies for nonresidential new construction."

While these statements, gleaned from the 2006-08 PIP, are relevant to program theory, they have not been organized in a way that produces a coherent picture of program thinking. They do not lend themselves to systematic consideration of what the program was trying to accomplish during this program cycle, what barriers existed to achieving specific goals, and what strategies might be possible to overcome the barriers to reaching the goals.

## Evaluability Assessment Based on Program Theory

The goals stated above are the closest this team could come to identifying the overall goals of the program without creating them ourselves. As they stand, the first and third goals are so general that, as they are currently stated, the only way the program could fail to achieve the goals would be to fail to have a web site at all, or fail to do any updates. The second goal is more specific, but it is not supported with strategies that are geared to achieving it specifically. Goals that are useful in guiding program activities and program evaluations would be more specific, and would set standards that could be used to evaluate the program's success, and would be connected to specific strategies for overcoming the barriers to achieving them.

The goals and strategies, as they stand, would not provide adequate guidance for an evaluation. This is because it would be virtually impossible to judge program success or failure either in achieving the goals or in assessing the effectiveness of the program theory for how to achieve them. As a result, any evaluation results would not provide feedback about the thinking behind the program, and whether it was correct or not. That is, were the strategies the correct ones, and/or were they implemented effectively? These questions couldn't be answered as things now stand.

One factor underlying the problem is likely that program managers are not well coordinated in terms of identifying the overall lead. In addition, there are (perhaps unidentified) disagreements about the focus and direction of the program. A contributing factor to this situation is a lack of resources devoted to the program. Without resources it is difficult for people to devote the necessary time to develop the program thinking systematically, or to follow up on agreements made within the program team.

### *Possible Theory Extensions Based on 2003 Evaluation*

In 2003 an evaluation of the EDR program by Opinion Dynamics Corporation was published. It was quite thorough, and can be useful for extending program theory. It identified several problems that the program faced. They are summarized here:

- Architects reflect the desires of the end users because they have the most direct contact with them and are paid by them. This leads to a priority being placed on aesthetics and first cost, with energy efficiency being far behind in priority. Thus, the actor closest to the design process and that has the most influence on it, does not place energy efficiency at a high priority.
- EDR users tend not to use multiple products on the website, largely because they don't know about others. The site is not designed to maximize accessibility or recognition of useful tools by each segment of the target population.
- Few market actors besides architects and engineers make use of the site, e.g., lighting designers, building owners and managers, developers, and space designers

In addition, two major barriers were identified by that team:

- Asymmetrical information barriers exist because market actors don't have confidence that promised savings will be realized as a result of incorporating energy efficiency measures into new building design.
- Split incentives barriers exist because operators reap the benefits of energy-efficient designs, but designers, who would incorporate them do not.

The areas identified by the 2003 evaluation can be the basis of some additional goals for the program, as well as some strategies that arise as we reflect on the goals and barriers identified in the findings. These goals and strategies are only suggestions, meant to facilitate thinking about developing useful goals that can guide future program activities and evaluations. Following are some goals and strategies that flow from that report.

- Increase the understanding architects have of the value of energy efficiency to their clients by XX.
- Provide more information to architects specifically directed at convincing them of the value of energy efficiency to their clients.
- Increase the number of users who use multiple tools by XX%.
- Cross-promote tools based on potential usefulness to each target user group
- Organize the website to facilitate recognition of all tools pertinent to each target user group
- Increase the number of users that are not architects or engineers by XX%.
- Cross-promote tools based on potential usefulness to each target user group
- Organize the website to facilitate recognition of all tools pertinent to each target user group

### *Summary of Evaluability Assessment Based on Program Theory*

- Useful program theory seems not to have been developed.

Useful program theory includes measurable goals, barriers that might impede achieving them, and strategies to overcome the barriers and achieve the goals.

Evaluating programs based on these elements provides feedback on the accuracy and effectiveness of program thinking.

The most useful result of a process or impact evaluation is that strategies are supported or discredited as a result, leading the way to new program thinking and planning. Without strategies being identified, an evaluation cannot serve this useful function.

- Lack of program theory may be related to program staffing structure.

While some task responsibilities are clear, overall responsibility for coordinating ideas and opinions and moving things forward seems lacking. This may be due to inadequate funding.

Thus, the conclusion of this dimension of evaluability is that there is insufficient program theory specified by the program to make an evaluation a useful exercise.



## Changes since Last Evaluation

Some program changes can be undertaken in response to past evaluations, and some can take place independent of those recommendations. Both are equally legitimate, but for purposes of this report, they will be analyzed separately.

### Changes Recommended by 2003 Evaluation

The 2003 evaluation recommended several changes in the EDR program to maximize the reach of the program. While the recommendations were not labeled as recommendations, the intent was clear, and they are summarized here.

- Increase the reach of the program to all market actors, especially lighting designers by increasing advertising in trade journals, associations, and links from other key websites that attract new construction market actors. Lighting designers are singled out because of their unusually low representation among website users. Architects also require more education and awareness of energy-efficient options.
- The second group of suggested changes is aimed at addressing the fact that most users use only one tool where multiple tools may be applicable. The evaluation team suggested the program should:
  - Organize the website to better inform users about what the tools are best used for and the value they offer.
  - Cross-reference tools so that those appropriate to a user of one tool might be informed of the possibility of using another.
  - Organize the website by market-actor category so those who might benefit from multiple tools will find them in one place.
  - Provide additional support and trainings to encourage use once awareness is established.
  - Conduct market research to better understand the needs of the market in relation to the existing tools, and to identify possible changes and additions.

### Changes Considered Outside of Evaluation Recommendations

In 2008 program staff conducted a review of website content to determine what changes and updates were called for. The review was focused on updates, particularly pertaining to changes in Title 24. The updates were undertaken and are scheduled to be completed by the end of March 2010.

Program staff also triggered other changes. For instance, our interviews revealed new thinking: "...as the market for green buildings has grown, things have changed. There are now sites that provide better tools for architects, but EDR has used the world's best engineering consultants to build the engineering software on the site, so it's the go-to site for engineers. Architects used to function as general managers for these green projects, but they've taken a smaller role in recent times, leaving the general project management to the engineers, so more engineers are using EDR resources, while fewer architects need them." Note that this represents a different orientation than expressed in the PIP, and goes in an opposite direction from the recommendations of the 2003 evaluation.

Based on reports from GeoPraxis (the company that operates the website), following is a summary of the changes that have been made to the site in the last two years, divided into three areas:

#### *Updated site design and user interface*

- New "look and feel" to make site more appealing and inviting
- Enhancements to make tools and content easier to find (navigation update, site-wide search, "Featured" section)

- New capabilities to engage users and integrate with other sites (feedback and support email links, calendar of events with entries from various organizations, social bookmarking new links to other sites and RSS/email feeds)

### *New and updated content*

Some of the new content is targeted to the original group of market actors; some is targeted to the residential segment (new to EDR). In addition, some of the new content may be intended to strengthen appeal to engineers instead of architects. However, this cannot be seen in the actual report. Types of content added or updated are:

- Publications (briefs, case studies, e-News)
- Tools/software (updated versions of eVALUATOR and eQUEST; bug fix to Charrette)

### *“Back office” changes*

- Better support for program staff and vendors to facilitate management of and contributions to the site, (process and workflow improvements, issue tracking, site analytics, file management, and repository)
- Platform, architecture, and other “plumbing” changes (migration to new OS, disaster recovery system, increased security)

## Evaluability Assessment Based on Changes since Last Evaluation

An impressive amount of work has been done on the EDR website since the beginning of the 2006-08 program cycle. The question, though, is whether it would be cost effective to evaluate the results of those changes at this time. The kinds of changes that would form the basis for a useful evaluation would be those that would be expected to have an impact on participant mix, a change in level or pattern of use by some audiences, or a change in awareness, knowledge, attitudes, and behavior of participants. In some cases, anticipated changes such as these could justify an evaluation in the absence of being guided by program theory.

The changes in “Updated site design and user interface” and “New and updated content” might be expected to produce changes in participant mix, etc. Some overall changes have been measured by a 2009 survey of users conducted by GeoPraxis. Historically, 40% of users were architects, and a much smaller percent were engineers. The 2009 survey indicates that current users are 40% engineers and 13% are architects. This pattern certainly represents a change, and program staff attributes the change to the idea that engineers are much more involved in building decisions now and that there are better tools available for architects than are available on the EDR website.

What is not known is whether this redirection was a result of a deliberate decision made by the management group, or whether the site drifted in that direction when there was less active involvement in the site by some IOUs. This distinction is important in view of the fact that one of the results of the 2003 process evaluation was the suggestion that more effort be put into overcoming the barriers to architects designing for efficiency. Orienting architects to energy efficiency would require a focused effort to overcome those barriers. Going in the opposite direction is an important decision that should be expressed in the statement of program theory. Understanding this process would be a precursor to conducting a useful evaluation. If this new thinking were incorporated into program theory, we would expect to see architects disappearing from the program’s stated target audience, but that has not happened, so there is uncertainty about program thinking. If program managers make a decision to exclude architects from website planning, this should be based on a determination that the job of convincing architects of the benefits of energy-efficient building is being handled by elsewhere, and this would be an important part of the statement of program theory.

## Summary of Evaluability Assessment based on Changes since Last Evaluation

- Changes have been made to the EDR website since the last evaluation, falling into three categories”
- Updated site design and user interface
- New and updated content
- Back office changes

Changes in the first two categories could affect participant mix, usability, number of users, and other outcomes that would be of interest in an evaluation.

- One of the changes has refocused from an emphasis on architects to an emphasis on engineers.

This was not reflected in program plans. In addition, this change represents a reversal from the recommendations of the most recent evaluation, so introduces some uncertainty about the direction of the program and the theory underlying it.

- Apparently none of the changes recommended by ODC in the 2003 evaluation have been implemented.

In summary, given that most recommended changes have not occurred, and one change involves a refocus not planned or recommended, and other changes lack a context to evaluate whether they have helped achieve program-specific goals, an evaluation would likely not yield optimally useful results.

## Data Issues

An appropriate evaluation design would be based on the research questions that arise from program theory. There is no developed program theory at this point, so research questions wouldn't be anchored in it. Thus, any discussion of data needs and their adequacy must be general at this point. It can reasonably be predicted that the main categories of data needs would be:

- The ability to identify participants for surveys
- The ability to get access to website content to judge how well it conforms to program theory, to current industry standards, and to current understandings of the best practices of online training

## Access to Participants

Over 5600 participants were accessed for the 2009 user survey. About 26% of them were non-registered users. The main ways to access users is through email addresses or links on the website. These methods were successfully used, although the response rate was only about 6%. The ability to detect repeat users using IP addresses is also available.

## Access to Content

Access to publications is straightforward. It is possible to provide access to the site's software tools that support energy calculation and training modules, but there is a practical limitation as things are now designed. The online training does not allow random access to each part of the module. Anyone evaluating the training modules is required to go through the process from beginning to end, including passing technical quizzes. This may not present a problem for subject matter experts (SMEs) evaluating the content for conformance to industry standards or Title 24 standards, but it would pose a problem for an expert in instructional design, who might be evaluating the training for conformance to best practices in online training or adult learning principles, or for an SME in accessibility and usability of websites. In short, easy, offline access to all resources on the website would be important, and this not always the case now.

## Summary of Evaluability based on Access to Data

Access to participants is available. Access to site content will present a problem for certain types of SMEs since full and random access is not possible at this time. As things now stand, some of the important aspects of an evaluation could be compromised unless the problems are addressed.

## Future Directions of Program Theory and Research

Probably the most serious impediment to conducting a useful evaluation of this program is the lack of program theory. The direction of the program and the reasons for the direction are very unclear.

The final section of this report is a set of suggestions for how program theory might be developed, the research questions that would flow from this approach, and the resources that would be required to address the research questions. This approach is not meant to do the work of program planners, as only they can develop the theory that guides the program and its evaluation. It is provided here to be a starting point for thinking through the issues raised here.

We have identified five possible program goals that have been extracted from our reading of the PIP, and from the past evaluations of the program:

1. Increase the number of buildings designed for energy efficiency.
2. Increase the number of architect participants from XX to XX, the number of engineer participants from XX to XX, the number of lighting designer participants from XX to XX and developer participants from XX to XX.
3. Assure that XX% of the tools, articles, and training on the site are up-to date-by (Date).
4. Assure that XX% of the tools and software comply with the current California Building Energy Efficiency Standards (Title 24) by (Date).
5. Engender and increase participant satisfaction.

These goals are represented in Table EDR-1, along with some strategies that might be employed to meet them. Then, the research questions that arise from the goals and strategies are shown together with the links in the logic diagram in Figure EDR-1 that they address. Finally, the last column lists the resources that would be required to answer the research questions.

**Table EDR-1. Suggested Program Goals, Strategies, Research Questions, Methods, and Resources**

Possible Program Goals	Possible Strategies	Possible Research Questions	Possible Methods and Resources
<p><b>Goal 2 Increase the number of buildings designed for energy efficiency.</b></p>	<p>2-1. Increase customers' aka-b relative to measures that exceed Title 24 standards to create more efficient facilities that will be less expensive to own and operate</p> <p>2-2. Broaden the target audience by adding tools, articles, and training appropriate to additional sectors to the website, including residential new construction, and residential and non-residential retrofits</p>	<ul style="list-style-type: none"> <li>• What are the barriers to exceeding T24 standards and to energy-efficient building generally? (L7)</li> <li>• What are customers' AKA-B re. benefits of exceeding T24 and re energy efficiency building generally? (L7)</li> <li>• How well are EDR (web-based) resources designed and implemented to help overcome identified barriers to goal? (L7)</li> <li>• Have EDR resources influenced target audiences perceptions re. "inhibitors" and "motivators" for EE design (and O&amp;M practices)? (L7)</li> <li>• Are there sufficient tools, articles and training available for all targeted sectors? (L4)</li> </ul>	<p><b>Identifying barriers</b></p> <ul style="list-style-type: none"> <li>• Interviews with (one or more) SME representative for each target audience (architects, engineers, lighting designers, and developers) to answer: <ul style="list-style-type: none"> <li>○ What are likely (commonly "known") market barriers? (prelim listing)</li> <li>○ What are the sources of contact info (mailing lists, etc.) for bodies of each target audience?</li> <li>○ Do questions in surveys/interview protocols make sense?</li> </ul> </li> </ul> <p><b>Measuring success in overcoming barriers &amp; in improving AKA-B</b></p> <ul style="list-style-type: none"> <li>• Telephone interviews with sample of target audience members addressing their AKA-B, what they perceive as barriers and what would help overcome them</li> <li>• Online survey of (larger sample) of target audience members addressing their AKA-B, what they perceive as barriers and what would help overcome them</li> <li>• Yardstick addressing criteria re. overcoming barriers identified above with SME help to: <ul style="list-style-type: none"> <li>○ Help asses per some of the criteria</li> <li>○ Help sort out which EDR resources are targeted to which audiences</li> </ul> </li> <li>• Phone survey with EDR users from each target audience — and "control" group on: <ul style="list-style-type: none"> <li>○ Perceptions re. inhibitors and motivators for EE design (and O&amp;M practices)</li> <li>○ What factors have affected these perceptions over past ___ (year or two)</li> <li>○ Influence of EDR site on these perceptions (EDR users only)</li> </ul> </li> </ul>

Possible Program Goals	Possible Strategies	Possible Research Questions	Possible Methods and Resources
<p><b>Goal 3 Increase the number of architect participants from XX to XX, the number of engineer participants from XX to XX, the number of lighting designer participants from XX to XX and developer participants from XX to XX.</b></p>	<p>3-1. Increase customers' AKA-B relative to measures that exceed Title 24 standards to create more efficient facilities that will be less expensive to own and operate</p> <p>3-2. Improve usability and effectiveness of the EDR website, especially by making it easy for specific audiences to see all products relevant to them.</p> <p>3-3. Provide and update robust and reliable design tools that reduce the time designers spend evaluating the energy use impact of their decision decisions at no cost.</p> <p>3-4. Increase the confidence in estimated savings produced by tools and software</p>	<ul style="list-style-type: none"> <li>• For 2.1, same as for 1.1</li> <li>• What changes have been made to the site to improve usability and effectiveness (L4)</li> <li>• What effect have the changes had on users' perceptions and use of the site? (L7)</li> <li>• How do target groups perceive the EDR-provided tools in terms of: <ul style="list-style-type: none"> <li>○ Reliability</li> <li>○ Ease of use</li> <li>○ Ability to perform desired functions (kinds of reports, analyses, customizations, etc.)(L7)?</li> </ul> </li> <li>• Does the site conform to "industry standards" for usability and accessibility? (L4)</li> <li>• Are there "hidden" costs associated with using the design tools? (L4)</li> <li>• Is the time required to evaluate energy use impact with the EDR-provided tools less than what is required by other common methods? (L4)</li> <li>• How confident are architects, engineers, and designers in the estimates provided by EDR tools? Has it changed recently? (L7)</li> <li>• What are usage levels for each target group? Has it changed?(L8)</li> </ul>	<p><b>What changes have been made to improve usability and effectiveness?</b></p> <ul style="list-style-type: none"> <li>• Staff interviews</li> <li>• Review of "before" and "after" site documentation</li> </ul> <p><b>What effect have these changes made on usage patterns, perceptions, and confidence?</b></p> <ul style="list-style-type: none"> <li>• Interviews with long-time users in each target group</li> <li>• Interviews with current users in each target group</li> <li>• Review of historical site-usage data</li> </ul> <p><b>How well does it conform with "industry (web) standards" for usability (and accessibility)</b></p> <ul style="list-style-type: none"> <li>• Yardstick for usability (and accessibility) To develop the yardstick: <ul style="list-style-type: none"> <li>○ Review of current literature on web site usability</li> <li>○ SME input (there are web usability SMEs — folks whose whole professional lives are dedicated to this)</li> <li>○ Applying the yardstick, once developed, would take no special content skills/knowledge.</li> </ul> </li> <li>• (Alternatively or in addition) review and report of site by usability expert</li> <li>• SME reports of time required for use of each energy calculation tool &amp; other comparable tools.</li> </ul>

Possible Program Goals	Possible Strategies	Possible Research Questions	Possible Methods and Resources
<b>Goal 4 Assure that XX% of the tools, articles, and training on the site are up to date by [date]</b>	4-1. Update the site to be current	<ul style="list-style-type: none"> <li>• What percent of the tools, articles, and trainings are current?(L4)</li> </ul>	<ul style="list-style-type: none"> <li>• Review by SMEs               <ul style="list-style-type: none"> <li>○ Full access to all components of tools and training required for this. Access should not require the reviewer to pass content tests.</li> <li>○ SMEs would need to be expert in all target audiences and their needs (could be separate SMEs for each audience).</li> <li>○ SMEs would need to be expert in current energy efficiency technologies and techniques.</li> <li>○ SMEs would need to know the current technologies and methods specific to the tools (e.g., EnergyPro, Micropas).</li> </ul> </li> </ul>
<b>Goal 5 Assure that XX% of the tools and software comply with the current version of Title 24 by [date].</b>	5-1. Update the site to be consistent with 2010 Title 24 requirements	<ul style="list-style-type: none"> <li>• What percent of the tools, articles, and trainings are consistent with 2010 Title 24 requirements? (L4)</li> </ul>	<ul style="list-style-type: none"> <li>• Review by SMEs (as above)</li> </ul>
<b>Goal 6 Engender and increase participant satisfaction (Added)</b>	<p>6-1. Increase the confidence in estimated savings produced by tools and software by XX</p> <p>6-2. Improve usability and effectiveness of the EDR website.</p>	<ul style="list-style-type: none"> <li>• What is the satisfaction level of each target group? (L7)</li> <li>• How has satisfaction level changed over the recent past? (L7)</li> </ul>	<ul style="list-style-type: none"> <li>• Interviews with long-time users in each target group</li> <li>• Interviews with current users in each target group</li> </ul>

# Recommendations

- Develop a program theory with measurable goals, and strategies for achieving them, and for overcoming identified barriers.
- Set up an agreed-upon structure for management of the program, especially indicating who is to take the lead in bringing issues to closure and implementing decisions. This will facilitate implementing the first recommendation.
- Adequate funding and a permanent home for this program should be provided. One of the energy centers would be appropriate given the focus of this program on education and training. Implementing this recommendation would support implementing the others.
- Expanding the website to other sectors should be postponed until a firm management structure is in place, and the focus and goals of the website are agreed upon.
- Make website tools fully accessible to evaluators even if they are not trained in the engineering content.



# **Appendix A: Supporting Information for BOC Process Evaluation**

# Appendix A-1: Details for BOC Goals and Evaluation Methods

## BOC Program Goals and Strategies

A program theory specifies goals, both overarching and detailed. They are grouped here in a way that facilitates the organized presentation of results from this study. Table BOC-4 in the body of this document (p. 13) provides a summary of relevant program strategies for each goal and the evaluation questions and methods employed in this project.

### Goal 1: Increase participants' ability to identify areas for reductions in energy consumption and demand and to design projects to accomplish this

The program strategies that were designed to accomplish BOC Program Goal 1 include:

- Using a curriculum and teaching techniques (including adult learning principles) that are aimed at increasing student AKA-B (awareness, knowledge, attitudes, and behaviors) focused on identifying energy efficiency opportunities
- Guiding participants into SCE programs that will facilitate energy efficiency projects at their facilities.  
This strategy implies that utility programs are introduced in the training sessions, and this can be accomplished by increasing utility presence at classes.

An implied strategy to intensify AKA-B in BOC students was adding the Level II series and certification.

- If the strategy were successful, Level II students may be stronger in these areas than Level I students, and the current cohort of students may be stronger than the PY2004-05 group.
- The idea of the Level II series is to cover material similar to Level I but in more depth.

This would lead us to expect stronger energy efficiency knowledge and behaviors, as well as awareness of energy efficiency programs.

Following this line of reasoning, the main comparisons in this study were between Level I and Level II, between PY2006–08, and between PY2006–08 with the PY2004-05 non-participant group, where data are available on them.

This last comparison has less to do with establishing improvement over time, and more to do with establishing that BOC trainees are more advanced in energy efficiency than those who have not been trained by the program.

### Goal 2: Overcome barriers that inhibit participation in BOC training offerings

There are several barriers that inhibit participation in the BOC training. These include:

- \$21,000 per series tuition  
Providing tuition credits through a third-party vendor was identified as an approach to help overcome this barrier.
- The difficulty students find in getting time off to attend classes, especially in smaller companies

The potential for web-based training and after-hours classes was identified as an approach to overcome this barrier.

- Lack of familiarity with the program and class schedule by the relevant actors

Approaches to overcoming this barrier include:

- Expanding and deepening marketing channels — mail BOC training calendars to prospective participants and their managers and leverage existing channels by having SCE account reps to market the program and incorporating BOC classes on the standard SCE energy center calendar of training events
- Identifying under-served geographical areas, and exploring the potential market for Spanish-speaking building operators

### Goal 3: Generate satisfied participants

While there is no formally stated goal or strategy for promoting customer satisfaction, this is an implied, perennial goal for training offerings. Program strategies supporting this goal include:

- Addressing suggestions made by participants in the last program cycle process evaluation including:
  - Provide students with materials to study before class
  - Send supervisors class reminders and follow-up on certification
- Gathering new student suggestions for improvement as part of the current BOC program process evaluation

## Sampling for Telephone Interviews of BOC Participants

As noted in the body of this report, identifying BOC participants who completed SCE-sponsored Level I and Level II courses in the PY2006–08 program cycle was a challenge. Many students had no or limited course information in the database. In addition, there is no specific identifier for SCE-sponsorship in the program records. Further, student participation often straddled program periods. For the latter issue, a student was defined as participating in the PY2006–08 period if s/he took at least one class in that period.

The data received consisted of a file with contact information, in which there were 6812 cases, and one for course information, in which there were 4636 cases. Of the 6812 cases with contact information, 2176 did not have course records; of the 4636 that did, only 2125 had at least one course in the 2006–08 period. Since the focus was on SCE-subsidized courses, it was necessary to identify the students who took those courses. The first method to determine this was to indentify the classes that SCE funded using the published course schedule. However, there were numerous courses taken by people who worked in the SCE territory, but the classes they took had not been flagged as SCE-supported. To minimize the chance that some relevant students would be overlooked, those without SCE-designated courses, but who worked in zip codes that are in SCE territory were also retained at this stage, as well as those who didn't qualify based on class and zip code designations, but worked in southern California (excluding San Diego County) and/or had flags showing that their utility was SCE, SCG, or LADWP. The final sample of 748 was comprised of 702 students identified as SCE-connected based either on class-designation or 46 with a work zip code in SCE territory. Table xA-1 shows the numbers associated with various stages of the sample frame definition process. The final sample frame of 748 was taken as the outgoing sample since even using all cases in the frame would likely result in an achieved sample that was smaller than the design called for, which was 61 dropouts and 61 non-dropouts.

**Table xA-1. Summary of Sample Frame Definition**

Number	Description
6812	Students in file
2176	No match of contact information and course information
4636	Matched contact and course information
2511	No courses recorded in the 2006–08 program period
2125	At least one course recorded in 2006–08 period
907	Had SCE-designated class or zip code or missing that info (in 2006–08 period)
205	Not flagged as SCE class or zip but works in CA (in 2006–08 period)
702	Had SCE-designated class or zip code (in 2006–08 period)
46	Not flagged as SCE course or zip, but works in southern California, not San Diego area (in 06-08 period)
748	Final Outgoing Sample

Because some of the research questions posed by the program theory called for a comparison of some results by those students who either had completed the program or who were currently taking classes to those who had dropped out of the program, it was necessary to define “dropout.” Those who had taken some courses in the program period, had not yet reached certification at the level of the last class, and who had not taken a course in 6 months were defined as dropouts. By this definition, 256 of the 748 (34%) were dropouts, and 492 were not. A few more students (14) were lost to lack of a phone number, or a phone number with too few or too many digits. Of the remaining 734 students interviewers attempted to complete interviews with 61 of the 243 dropouts, and 61 of the 491 non-dropouts. However, the actual, achieved sample consisted of 35 dropouts and 66 non-dropouts, for a total of 101 complete interviews.

While the outgoing sample was stratified by dropout status, and this could have resulted in an oversample of dropouts, the final result was an achieved sample that mirrored the outgoing sample in proportion of dropouts. Thus, the need for weighting was obviated. In addition, during the interview, the 35 interviewees who were initially classified as dropouts were asked to confirm that they had decided to leave the program. Only 10 said that they had. The rest intended to continue. This means that it was not reasonable to treat the 35 as a dropout sample, so this distinction was dropped from the analysis. However, it was necessary to include the concept here in order to fully describe the sampling process. The resulting combined sample of 101 exceeds the planned 90/10 criteria for confidence and precision. Table xA-2 shows the disposition of all 734 cases in the sample frame that had adequate telephone numbers.

Table xA-2. Student Interview Sample Disposition

Disposition	Non-Dropout	Dropout	Total
Total Callable Sample	491	243	734
Completed Interviews	66	35	101
Refused to Participate	10	6	16
Disconnected Number	34	22	56
Spanish	1	0	1
Wrong Number	46	51	97
Modem	2	3	5
Other Non - Interview	4	0	4
Did not take classes in the BOC program	0	2	2
Does not conduct, direct, administer operations at facility	11	6	17
Remaining callable sample	317	118	435

## Structure, Use, and Scoring for Yardsticks

As noted in the body of this report, the evaluation team used two “yardsticks”— based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes during the 2006–08 Energy Center Process Evaluation — to determine how well the BOC class design and delivery:

- Adhere to adult learning principles and practices and support behavior change
- Support SCE energy efficiency programs

Related to both yardsticks is background information collected about classes to help put the criteria in context. For example:

- A class’s support of SCE energy efficiency programs is evaluated only in terms of those programs to which it is logically tied.  
A class doesn’t get “scored down” for not mentioning a program’s benefits, etc., if that program isn’t related to the topics the class addresses.
- A class’s support of customer segments (one of the dimensions in Support of Behavior Change) is evaluated in only terms of those customer segments that are an appropriate target audience for that class.  
For example, a class doesn’t get “scored down” for not including information relevant to agricultural applications if the class is geared to commercial and industrial customers.

We documented this background information based on a review of the program documentation, interviews with subject matter experts, and a review of the course materials.

See Appendix D-1 (p. D-2) for more information on the yardsticks.

## Support of Behavior Change and Adult Learning Yardstick

The yardstick is based on the yardstick that was used to evaluate CTAC and AgTAC course offerings during the 2006–08 Energy Center Process Evaluation. The only difference in the criteria is that the yardstick used for this ETO Process Evaluation has some new (additional) criteria related to best practices in adult learning.

- Criteria specific to adult learning principles are grouped into five dimensions:
  - Obtaining learner buy-in
  - Building on what learners know
  - Engaging the learners
  - Setting up learners for success

All the criteria in this section of the yardstick are the same as those used in the 2006–08 Energy Center Process Evaluation.

- Criteria specific to best practices in adult learning that we considered in the evaluation of BOC courses are grouped into eight dimensions:
  - Lesson plan
  - Content decisions
  - Interactive Activities
  - Learner Centricity
  - Learning Facilitation
  - Practice Opportunities
  - Feedback
  - Assessments

The last three dimensions above were added to the Adult Learning Best Practices evaluation criteria after the 2006–08 Energy Center Process Evaluation, based on lessons learned in that project and the specific requirements of the ETO Process Evaluation.

- Criteria related to support of behavior change are grouped into three dimensions:
  - Encouraging action
  - Helping overcoming market barriers
  - Support of specific customer segments

All the criteria in this section of the yardstick are the same as those used in the 2006–08 Energy Center Process Evaluation.

Scoring for the criteria on the Support of Adult Learning and Behavior Change yardstick is the same as it was for the 2006–08 Energy Center Process Evaluation:

- Criteria specific to adult learning are rated on a scale of one to five.  
(1 = Not at all or very poor; 5 = Always or excellent)
- Criteria related to support of behavior change are essentially yes/no questions.  
(Yes = 1; No = 0)
- Criteria that are not applicable are marked NA and are not considered in the scoring.  
(For example, criteria related to how an instructor interacts with participants are marked NA when evaluating a class based on a review of the materials.)

## Support of Programs Yardstick

The Support of Programs Yardstick has the same criteria used to in the 2006–08 SCE Energy Center Process Evaluation, and includes two dimensions:

- Direct support of programs, which includes criteria related to how a class addresses information about SCE energy efficiency programs themselves
- Indirect support of programs, which includes criteria on technologies or measures associated with programs

Specific criteria under each dimension are essentially yes/no questions (Yes = 1; No = 0). If a criterion is not applicable to the given situation, that criterion marked NA and is not considered in the scoring.

To maintain a reasonable project scope, we focused primarily on 16 high-impact programs that account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW reductions. Other programs also may be considered if a seminar or class clearly and directly addresses that program.

Tie-in between a class and a program is based on whether the class addresses technologies, measures, or practices that are encompassed by a program.

- If 25% or more of the content covered in a class addresses technologies or measures encompassed by a program, we consider that class to have a high tie-in to the program.  
Also if a class has a specific goal of promoting or encouraging a given program, we consider that seminar or class to have a “high tie-in” to that program.
- If a class addresses technologies or measures encompassed by a program, but that content represents less than 25% of the class, we consider that class to have a “medium to low tie-in” to the program.
- If the class addresses only topics outside the scope of a given incentive or rebate program, we said there is no tie-in between the class and that program.

A class’s support of a program was scored only if the evaluation team identified a tie-in between the class and that program.

## Contexts in which the Yardsticks Were Applied

### *Review of Class Materials*

There are a total of 14 BOC classes offered in SCE territory; seven Level I classes and seven Level II classes.

BOC program staff provided the evaluation team with electronic files of all the class material for the relevant courses. The evaluation team reviewed (and applied the yardsticks) all available materials for each of these courses (Table xA-3).

**Table xA-3. Summary of BOC Courses Reviewed**

Course Code	Course Title
BOC-101:	Building Systems Overview
BOC-102:	Building Energy Consumption Analysis (in some materials, also referred to as “Energy Conservation Techniques”)
BOC-103:	HVAC Systems and Controls
BOC-104:	Efficient Lighting Fundamentals
BOC-105:	Operation and Maintenance Practices for Sustainable Buildings
BOC-106:	Indoor Air Quality
BOC-107:	Facility Electrical Systems
BOC-201:	Preventive Maintenance and Troubleshooting Principles

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BOC-202:	Advanced Electrical Diagnostics
BOC-203:	HVAC Troubleshooting and Maintenance
BOC-204:	HVAC Controls and Optimization
BOC-211:	Motors In Facilities
BOC-214:	Introduction to Building Commissioning
BOC-216:	Enhanced Automation and Demand Reduction

Specific materials available vary from class to class, and typically include:

- Presentation materials (PPT file)
- Participant workbook materials (typically the notes pages of the PPT file)
- Instructor notes (preparation checklist)
- Class outline
- Final exam and answer key
- Project assignment
- Handouts of supporting information



### *In-person Audits of Classes*

Because there may be a significant difference between what class materials indicate is intended to happen during a session, and what actually happens in the “real world,” the evaluation team audited four BOC classes (two Level I and two Level II) to observe how classes actually unfold.

The specific classes selected for audit were determined by:

- When the classes were offered in SCE territory
- Availability of the evaluation team members assigned the class audit task
- The decision to include as many different instructors as possible

(Many instructors teach multiple BOC classes; to get as broad a sample of instructor styles as possible given the scope of four in-person audits, we selected classes taught by four different instructors.)

- The desire to see how classes varied across topic areas
- The desire to see how a Level I and Level II class on the same topic area related to each other.

The classes selected for in-person audits are noted in Table xA-4.

**Table xA-4. BOC Classes included in In-person Audit**

<b>Class</b>	<b>Location</b>	<b>Date</b>
BOC 107: Facility Electrical Systems	Irvine Marriott	10/28/2009
BOC 202: Advanced Electrical Diagnostics	CSU Northridge	10/15/2009
BOC 106: Air Quality	CTAC Irwindale	11/4/2009
BOC 203: HVAC Troubleshooting and Maintenance	CSU Northridge	11/16, 11/17/09

### *Instructor Interviews*

As noted above, there may be significant differences between how a session runs “in theory” (as indicated by the class materials) and how it unfolds in the “real world.” There also may be significant differences between the way individual sessions are run — based on instructor styles and experience as well as the needs or interests of a particular group of session participants.

BOC staff provided the evaluation team with contact information for the 14 instructors who teach BOC classes in SCE territory. The evaluation team conducted telephone interviews with eight of these instructors — in addition to those who were instructors for the four classes we audited — for a total of contact with 12 of the 14 instructors. (One instructor declined to be interviewed, and one instructor did not respond to repeated attempts to schedule an interview with him.)

This resulted in either a phone interview or an in-person observation for an instructor for each of the BOC classes taught in SCE service area (Table xA-5).

It is interesting to note that one of the instructors we contacted declined to be interviewed because he felt that the course which he teaches (Indoor Air Quality) “does not discuss energy or SCE incentives and rebate programs.”

The instructor interview guide (Appendix A-4) included questions designed to address relevant yardstick items.

Table xA-5. Summary of Classes Addressed by Phone Interviews and In-person Audits

BOC Course		Phone Interview	In-person Audit
BOC-101	Building Systems Overview	X	
BOC-102	Building Energy Consumption Analysis	X	
BOC-103	HVAC Systems and Controls	X	
BOC-104	Efficient Lighting Fundamentals	X	
BOC-105	Operation and Maintenance Practices for Sustainable Buildings	X	
BOC-106	Indoor Air Quality		X
BOC-107	Facility Electrical Systems	X	X
BOC-202	Advanced Electrical Diagnostics		X
BOC-203	HVAC Troubleshooting and Maintenance	X	X
BOC-204	HVAC Controls and Optimization	X	
BOC-211	Motors In Facilities	X	
BOC-214	Intro to Building Commissioning	X	
BOC-216	Enhanced Automation and Demand Reduction	X	

## Exit Surveys

The BOC team provided the evaluation team with exit survey data BOC classes taught in the SCE service territory during 2006, 2007, and 2008.

The information was compiled, by event, in Microsoft Word documents. The evaluation team re-keyed the information to get it into our SCE Process Evaluation data base.

The exit survey used in BOC classes is different from the exit survey that SCE uses for their Energy Center classes. In addition, there are variations among the BOC exit surveys based on the type of class and the year in which the class was offered.

- Exit surveys for some classes ask respondents to include information about their facilities (HVAC equipment, air systems, control systems and lighting equipment and controls); exit surveys for other classes do not.
- Exit surveys from 2008 (and one from 2007) include questions that ask about the equipment purchase plans; exit surveys from 2006 and 2007 (with one exception) do not.

Because the evaluation team was interested in comparing BOC exit survey results to the exit survey results from SCE Energy Center classes, we also “mapped” the BOC exit survey items to the SCE Energy Center exit survey items. The intent of the mapping was to allow us to compare results for similar items between BOC classes and Energy Center classes.

See Appendix A-5 for the mapping of BOC and SCE EC exit surveys.

# Appendix A-2:

## Details for BOC Evaluation Results

### Responding to Prior Evaluation Recommendations

As mentioned in the Methods section, the evaluation team conducted telephone interviews with BOC program staff to learn, among other things, the status of prior process evaluation recommendations. Table xA-6 summarizes these results.

**Table xA-6. Summary of Prior Evaluation Recommendations and Results**

Prior Evaluation Recommendation	Result from Staff Interviews
Offer the classes in the Bakersfield area	<p>BOC classes were twice scheduled in the Bakersfield area:</p> <ul style="list-style-type: none"> <li>• The first time, classes were cancelled because the minimum number of participants did not enroll (20 minimum).</li> <li>• The second time, NEEC teamed with Kern High School district, and enough participants were enrolled to be able to offer the program.</li> </ul>
Provide students with reading materials in advance	<p>Except for very rare exceptions, students are not provided reading material in advance.</p> <p>The primary reading material is the handbook for each class. It is copyrighted by NEEC, and is costly to update and print. When given to students in advance, or posted on the web, NEEC loses control of its intellectual property. Further, if students are given the handbook in advance, they often forget to bring the handbook with them to class, so they don't have it available to do the in-class activities.</p>
Initiate a study to estimate energy savings from the program as it operated in California	<p>The BOC Program Director indicated that SCE has not initiated a study to estimate energy savings from the program as it has operated in California. (NEEC would like to see this happen because it likely would be a good selling point for the program.)</p>
Assess the Spanish-speaking market potential	<p>The Spanish-speaking market potential for the BOC program has not been assessed.</p>
Offer BOC classes on-site for employers with large staffs	<p>During the 2006–08 program period, there were several BOC classes offered on-site for employers with large staffs, including:</p> <ul style="list-style-type: none"> <li>• Two “closed” courses on military bases at Port Hueneme and China Lake</li> <li>• An “open” course offered at UC Santa Barbara</li> <li>• An “open” course at the Alhambra Sheriff's facility.</li> </ul> <p>(By “open” course we mean classes that anyone could attend.)</p>
Make classes more accessible to smaller facilities	<p>During the 2006–08 program period, there were no real provisions to help make BOC classes more accessible to smaller facilities</p> <p>(NEEC is open to self-pace attendance in the program, which might help some facilities.)</p>

## Background Characteristics of Students and their Facilities

The students interviewed for this evaluation are quite experienced. Sixty-six percent of them have had more than 10 years of experience in building operations, and 28% of them have over 20 years in the field. Further, 34% of them have done this work at the current facility for more than 10 years. Over half of the students in this sample do not do the hands-on work of building operations, but either supervise only, or serve strictly an administrative function for the company.

**Table xA-7. Participant Professional Characteristics**

Characteristic	PY04-05 Students (N=58)	PY06-08 Students (N=101)
<b>Years of Experience in Building Operations</b>		
Five or Less	15%	14%
Six through Ten	22%	21%
Eleven through Twenty	43%	38%
More than Twenty	20%	28%
<b>Years at this Facility</b>		
Five or Less		32%
Six through Ten		35%
Eleven through Twenty		25%
More than Twenty		9%
<b>Position Relative to Operations</b>		
Does O&M Work--Hands-On		44%
Only Supervises O&M Work		48%
Administrative Only		9%

The facilities represented by the students in this sample tend to be large, with 92% of them having more than one building (Table xA-8), and over 60% having 10 or more. Almost 60% of the facilities operate in facilities greater than 500,000 square feet. Overall, it appears that the students in the PY2006–08 program cycle tend to be from larger facilities than those from 2004-05, with almost twice the number from facilities over 1,000,000 square feet, and many fewer from the category of 100,000 through 500,000.

Table xA-8. Facility Characteristics

Characteristic	PY2004-05 Students (N=58)	PY2006-08 Students (N=101)
<b>Facility has more than one building?</b>		
Yes		92%
No		8%
<b>Number of buildings in facility</b>		
One		8%
Two through nine		30%
Ten through Nineteen		17%
Twenty through ninety-nine		33%
100 or more		11%
<b>Conditioned square footage</b>		
Less than 100,000	24%	23%
100,001 through 500,000	41%	15%
500,001 through 1,000,000	13%	15%
More than 1,000,000	22%	48%

Based on program records, 71% of the interviewed sample had taken only Level I classes, with 29% having been certified at Level I and having taken at least five Level II classes, with one group having taken seven Level II classes (see Table xA-9). Interestingly when asked, 25% of the same sample indicated that they had achieved Level II certification. Given the similarity between the number of self-reported Level II certifications (25%) and the percentage that were on record as having taken at least five Level II classes (29%) it is easy to assume that most of those who were on record as taking Level II classes might well have completed that series by the time they were interviewed.

Since a number of analyses were planned to compare the responses of Level I and Level II students, it became important to decide whether to (1) compare certification based on self-report or based on recorded status, or (2) consider students at Level II if they were fully certified at Level II or if they had only taken several Level II classes. Program personnel were contacted to determine which definition would be more helpful to program planning, and the decision was made to classify students as Level II if they had taken the five (or seven) classes at that level. However, given what is shown in Table 6, the differences would have been subtle at most.

**Table xA-9. Interviewed Sample Program Experience**

<b>Program Experience</b>	<b>2006–08 Students (N=101)</b>
<b>Class Levels Taken per BOC Records</b>	
No Level II Classes	71%
Some Level II Classes*	29%
<b>Self-Reported Certification Level</b>	
Level I or Less	75%
Level II	25%
<b>Met Study Criteria for Dropout</b>	
Yes	35%
No	65%
*In practice, all of this group had taken at least 5 Level II classes	

The job responsibilities of this sample are very similar to those for the 2004-05 sample. The overwhelming majority (82% to 96%) as shown in Table xA-10 are involved in both monitoring and controlling or reducing energy use.

**Table xA-10. Job Responsibilities**

<b>Responsibilities Include:</b>	<b>2004-05 Students (N=34)</b>	<b>Non- Participants (N=58)</b>	<b>2006–08 Students (N=101)</b>	<b>2006–08 Level I Students (N=71)</b>	<b>2006–08 Level II Students (N=29)</b>
Monitoring Energy Use	82%	83%	84%	83%	85%
Controlling or Reducing Energy Use	94%	88%	93%	92%	96%
Paying or Approving Payments of Energy Bills	29%	50%	20%	17%	26%

The businesses at which the interviewed sample work are heavily weighted toward schools, colleges, and universities (Table xA-11), as fully a third of the sample came from that sector. A distant second most frequent organization type (18%) is government or community services, followed by office buildings (13%) and medical buildings (11%). The distribution of business types for this sample does not differ greatly from the PY2004-05 study sample, except for an apparent increase in participants from schools, colleges, and universities.

Table xA-11. Business Activities of Interviewed Sample Employers

<b>Business Activity</b>	<b>PY2004-05 Sample (N=58)</b>	<b>PY2006-08 Sample (N=101)</b>
Government/community services (churches/courthouses/museums)	7%	18%
Hospitality	9%	5%
Medical	2%	11%
Office building (including government offices)	16%	13%
Residential (apts/condos)	0%	1%
Restaurant	0%	1%
Retail	0%	1%
Schools/colleges/universities	20%	33%
Other commercial	2%	8%
Electronics and equipment	9%	1%
Heavy industry/fabrication	5%	6%
High technology (facilities with clean rooms)	8%	1%
Warehouse	0%	1%
Other industrial	13%	5%

## Details for Support of Behavior Change and Adult Learning Yardstick

### Examples of BOC “homework” assignments designed to help transfer to the “real world”

As mentioned in the body of this report, one of the design strengths of the BOC curriculum is that most classes have an end-of-class project (homework assignment) designed to help make the transfer from the classroom to the “real world.”

Although the actual implementation falls short of the design (these homework assignments are not integrated into the training in a meaningful manner), the actual assignments are sensible and likely would facilitate if integrated into the learning experience.

The following is a sample of BOC Level I projects, which appear to be moving students toward taking action that likely would have a beneficial effect (improving operations and maintenance):

- Draw a simple floor plan of the facility. Identify primary heating and cooling plants, distribution lines and control points.
- Draw a simplified power system distribution sketch and list electrical PMs.
- Tabulate a year’s energy consumption data and calculate an Energy Use Index. Profile the occupancy of the facility by week, month and year.
- Review facility heating, cooling and ventilation operations and maintenance measures. Provide a control system overview identifying strategies by system and running time comparisons.
- Perform a simplified lighting survey including Watt densities and lighting levels.

The following are examples of the Level II project assignments, which are clearly focused on identifying opportunities to improve operations:

- Describe a power quality upgrade plan for your facility or part of your facility
- Compare the original designed and installed conditions with current operating conditions and demands. Write a conclusion about the current status of the HVAC system to meet the needs of the facility based on the comparison of the original installation and current conditions.
- Create a complete controls diagram (pneumatic and DDC controls) for the central air system (fan system). (Identify) how to optimize control sequences for a controls review report applicable to your specific job site requirements.
- Create a complete maintenance checklist for (a central air) fan system to optimize control sequences for an (sic) controls review report applicable to your specific job site requirements for the central air system.

Most of these are fairly sophisticated assignments that — if done properly — require synthesis and application of the information addressed during the classes.



## Scoring Details for Support of Behavior Change

The evaluation criteria used to determine how well the design and delivery of classes support behavior change include two major dimensions:

- Encouraging Action addresses the question, “How well does the class’s design and content encourage action — helping participants apply information and concepts addressed in the class to their own environment?”
- Helping Overcome Market Barriers (Other than Language) addresses the question, “How well does the class help overcome common market barriers such as lack of information about application of technologies, financial and non-financial benefits, and risk assessment and mitigation?”

The behaviors we’re concerned with here are those that will have an effect on overall energy efficiency and demand reduction by improving operations and maintenance at the students’ facilities. The content addressed by several of the classes (i.e., Indoor Air Quality, Facility Electrical Systems, and Advanced Electrical Diagnostics) does not have strong direct ties to reducing kWh or kW.

- The evaluation team did not factor in the content focus when scoring the classes on the criteria associated with Encouraging Action.

Rather, we worked on the assumption that classes were part of the whole, which is designed to improve operations and maintenance practices — and improved operations and maintenance will, in turn, improve energy efficiency.

If a class met criteria associated with encouraging any appropriate maintenance and operations behaviors, it was scored positively on those criteria.

- The evaluation team did consider the actual content focus of the classes when scoring them on Helping Overcome Common Market Barriers.

The criteria related to this dimension focus specifically on market barriers to energy efficiency practices and technologies. (For example: “Provides information on the application of energy efficiency measures” and “Describes typical cost savings regarding energy efficiency measures.”)

It is interesting to note a general trend for most criteria across many of the yardstick dimensions:

- The review of materials tends to result in higher scores than the in-person observation of the classes.
- The results of the telephone interviews with instructors results in higher scores than the review of materials.

The difference between scores from reviewing materials and observing the classes is due to the issues discussed under “Concerns” in the discussion of how well course design and delivery support behavior change and adult learning in the body of this report (p. 19).

The difference between the scores from the instructor interviews and from other methods may be due to one or more of several reasons. Perhaps the sample of classes observed in person was anomalous, and instructors usually do have students complete in-class activities and focus more on students’ understanding and ability to apply the class concepts. Or perhaps instructors perceive their classes through “rose colored glasses,” or perhaps instructors gave answers they believed were “correct.”

It also is interesting to note that the scores for Support of Behavior Change are significantly higher for the Level I classes than for the Level II. Relative to the scores for review of materials, this is due to the fact that Level I classes tend to be more oriented toward basic “how to” information, while Level II classes tend to focus on more technically advanced content, rather than more advanced “how to do” guidance. (The Level II project assignments are significantly more advanced than Level I from a performance perspective. However, as discussed in the body of this report (“Concerns” in the discussion of how well course design and delivery support behavior change and adult learning in the body of this report, p. 19) these assignments do not include appropriate guidance and feedback mechanisms, so there is little control or monitoring of how well students are performing.)

## Appendix A-2: Details for BOC Evaluation Results

Table xA-12 and Table xA-13 provide the details on the specific criteria that compose the scores for Encouraging Action and Helping Overcome Market Barriers.

For each criterion, a course could receive a 1 (yes) or 0 (no) or NA (not applicable). (NA items were not factored in the scoring.) Therefore, if all classes got a “perfect score” on one criterion, the value for that criterion in the Tables below would be 1. If half the classes got a “yes,” and half the classes got a “no,” on a criterion, the value for that criterion would be 0.5.

The overall score for a dimension is derived by dividing the actual number of points scored by the total possible number of points that could be scored.

**Table xA-12. Score Details for Encouraging Action**

Encouraging Action	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Includes specific calls to action / specific next steps	0.7	0.5	1.0	0.7
Supports development of individualized action plan	0.6	0.5	0.8	0.6
Includes job aids / worksheets to assist in assessing / analyzing options	0.6	0.5	0.8	0.6
Includes job aids / checklists to assist in taking action	0.6	0.5	0.8	0.6
Includes info on where/how to get assistance in taking action	0.4	0.5	0.8	0.5
<i>Actual Points / Maximum Possible Points</i>	2.9 / 5	2.5 / 5	4 / 5	9.4 / 15
<i>Score</i>	57%	50%	80%	62%
<b>Level II Classes</b>				
Includes specific calls to action / specific next steps	0.6	0.0	0.5	0.5
Supports development of individualized action plan	0.6	0.0	0.5	0.5
Includes job aids / worksheets to assist in assessing / analyzing options	0.3	0.0	0.3	0.3
Includes job aids / checklists to assist in taking action	0.3	0.0	0.3	0.3
Includes info on where/how to get assistance in taking action	0.3	0.0	0.3	0.3
<i>Actual Points / Maximum Possible Points</i>	2 / 5	0 / 5	1.8 / 5	3.8 / 15
<i>Score</i>	40%	0%	35%	25%

Table xA-13. Score Details for Helping Overcome Common Market Barriers (Other than Language)

Helping Overcome Common Market Barriers (Other than Language)	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Provides info on application of EE measures	0.4	0.0	0.8	0.7
Describes typical cost savings re. EE measures	0.4	0.0	0.7	0.6
Quantifies other typical financials (ROI, payback, etc.) typical in segment	0.3	0.0	0.3	0.3
Describes typical non-financial benefits	0.6	0.0	0.7	0.7
Includes info on risk assessment and risk mitigation	0.1	0.0	0.2	0.2
<i>Actual Points / Maximum Possible Points</i>	1.9 / 5	0 / 5	2.7 / 5	4.5 / 15
<i>Score</i>	37%	0%	53%	30%
<b>Level II Classes</b>				
Provides info on application of EE measures	0.1	0.0	0.3	0.3
Describes typical cost savings re. EE measures	0.3	0.0	0.3	0.3
Quantifies other typical financials (ROI, payback, etc.) typical in segment	0.0	0.0	0.0	0.0
Describes typical non-financial benefits	0.1	0.0	0.3	0.3
Includes info on risk assessment and risk mitigation	0.1	0.0	0.0	0.0
<i>Actual Points / Maximum Possible Points</i>	0.7 / 5	0 / 5	0.8 / 5	1.5 / 15
<i>Score</i>	14%	0%	15%	10%

## Scoring Details for Adult Learning Principles

According to program staff interviews, BOC instructors develop their presentations based on a NEEC-provided course outline. The instructors are experts in their fields. They get feedback both from site coordinator observations and from student evaluations. They also receive training in using adult learning principles at annual train-the-trainer events, and at quarterly conference calls that provide training tips and curriculum updates.

- The adult learning portion of the yardstick focuses on issues related to making students active participants in the learning experience and managing the overall experience so they're most likely to succeed in meeting the training objectives.
- Adult Learning Best Practices focuses on issues related to how the training is designed and how the instructor orchestrates the learning environment.

In general scores on the Adult Learning dimensions followed the same pattern identified for Support of Behavior Change:

- Highest scores based on instructor interviews
- Lowest scores based on the in-person audits of classes

The higher scores from instructor interviews may reflect actual differences in teaching styles. (One of the instructors interviewed is known to the evaluation team as having received extensive coaching in applying adult learning principles and another indicated that he had an MS degree in adult education. Neither of these instructors was among the four the evaluation team observed.)

## Appendix A-2: Details for BOC Evaluation Results

The exceptions to this “rule” are in Adult Learning Principles:

- Obtain Learner buy-in — most courses did not have any introductory material focused on “What does this mean to me?” or “How will I benefit from this class?” However, instructors tended to address these issues (albeit lightly) in class.
- A criterion under “Build on What Learners Know” on whether examples and stories are included — in general:
  - The materials did not include actual “real world” examples or stories, especially in the Level II courses. (There were a few exceptions.)
  - Instructors did provide “war stories” related to the topics at hand.

As a result, the score from the in-person observation is higher than the score from the review of materials.

Table xA-14 through Table xA-18 provide the detailed scoring on Adult Learning Principles. Each criterion was scored for each course using a scale of 1 to 5:

- 1 = Not at all or very poor
- 2 = Rarely or poor
- 3 = Occasionally or fair
- 4 = Frequently or good
- 5 = Always or excellent

**Table xA-14. Score Details for Adult Learning Principle: Obtain Learner Buy-in**

Obtain Learner Buy-in	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
There is an initial activity that helps participants see the value of the training.	1.6	2.0	2.8	2.0
The usefulness of the learning in the participants’ lives is emphasized and demonstrated.	2.1	2.5	4.0	2.7
The instructor creates a safe and respectful learning environment. <sup>5</sup>	5.0	4.5	4.5	4.8
<i>Actual Points / Maximum Possible Points</i>	8.7 / 15	9 / 15	11.3 / 15	29 / 45
<i>Score</i>	<b>58%</b>	<b>60%</b>	<b>75%</b>	<b>64%</b>
<b>Level II Classes</b>				
There is an initial activity that helps participants see the value of the training.	1.4	1.5	3.3	2.3
The usefulness of the learning in the participants’ lives is emphasized and demonstrated.	1.9	1.5	3.8	2.6
The instructor creates a safe and respectful learning environment. <sup>5</sup>	5.0	5.0	5.0	5.0
<i>Actual Points / Maximum Possible Points</i>	8.3 / 15	8 / 15	12 / 15	28.3 / 45
<i>Score</i>	55%	53%	80%	63%

<sup>5</sup> We scored this item as 5 (“perfect”) for the review of materials — even though it could not be determined from reviewing the materials. This was to avoid a “false negative” for the overall score. That is, if we had scored this item NA for the review of materials method, the overall “materials” score for this item would have been 20%. This would have given a false impression of how the materials-review scores on other criteria compared to the scores from other methods.

Table xA-15. Score Details for Adult Learning Principle: Build on What Learners Know

<b>Build on What Learners Know</b>	<b>Materials</b>	<b>Observation</b>	<b>Interview</b>	<b>MEAN</b>
<b>Level I Classes</b>				
There are activities that enable the participants to indicate and/or demonstrate their level of experience and expertise.	3.3	1.0	3.0	2.9
Good examples and stories are provided that connect new learning to the participants' prior learning and experience.	1.7	2.5	2.6	2.2
<i>Actual Points / Maximum Possible Points</i>	5 / 10	3.5 / 10	5.6 / 10	14.1 / 30
<i>Score</i>	<b>50%</b>	<b>35%</b>	<b>56%</b>	<b>47%</b>
<b>Level II Classes</b>				
There are activities that enable the participants to indicate and/or demonstrate their level of experience and expertise.	1.6	2.5	3.0	2.3
Good examples and stories are provided that connect new learning to the participants' prior learning and experience.	1.9	3.0	3.3	2.7
<i>Actual Points / Maximum Possible Points</i>	3.4 / 10	5.5 / 10	6.3 / 10	15.2 / 30
<i>Score</i>	<b>34%</b>	<b>55%</b>	<b>63%</b>	<b>51%</b>

Appendix A-2: Details for BOC Evaluation Results

Table xA-16. Score Details for Adult Learning Principle: Engage the Learners

Engage the Learners	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	1.6	1.5	2.5	1.8
There are activities that enable the learners to discover important information on their own.	2.4	1.0	3.3	2.4
There are activities that enable the participants to contribute ideas.	2.4	1.0	3.5	2.4
<i>Actual Points / Maximum Possible Points</i>	6.4 / 15	3.5 / 15	9.3 / 15	19.2 / 45
<i>Score</i>	<b>43%</b>	<b>23%</b>	<b>62%</b>	<b>43%</b>
<b>Level II Classes</b>				
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	1.6	1.0	1.3	1.4
There are activities that enable the learners to discover important information on their own.	2.0	1.0	1.8	1.8
There are activities that enable the participants to contribute ideas.	1.9	1.0	2.0	1.6
<i>Actual Points / Maximum Possible Points</i>	5.4 / 15	3 / 15	5 / 15	13.4 / 45
<i>Score</i>	<b>36%</b>	<b>20%</b>	<b>33%</b>	<b>30%</b>

Table xA-17. Score Details for Adult Learning Principle: Set up Learners for Success

Set Up Learners for Success	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
A maximum of 5 familiar and meaningful concepts and a maximum of 3 unfamiliar concepts are taught at one time.	3.7	2.5	4.0	3.6
Rules are taught first. Exceptions are not introduced until it is clear that the rules are understood.	4.4	3.5	4.8	4.4
Transitional statements are made that show how different sections of the training relate to each other.	3.3	3.0	3.5	3.3
A variety of instructional methods are used to ensure that visual, aural, and kinesthetic learners' needs are addressed.	1.7	2.0	1.0	1.7
<i>Actual Points / Maximum Possible Points</i>	13.1 / 20	11 / 20	13.3 / 20	37.4 / 60
<i>Score</i>	<b>66%</b>	<b>55%</b>	<b>66%</b>	<b>62%</b>
<b>Level II Classes</b>				
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	3.9	2.0	4.0	3.7
There are activities that enable the learners to discover important information on their own.	4.0	2.0	4.5	3.9
There are activities that enable the participants to contribute ideas.	3.4	2.0	4.3	3.7
<i>Actual Points / Maximum Possible Points</i>	1.0	2.0	1.0	1.2
<i>Score</i>	12.3 / 20	8 / 20	13.8 / 20	34 / 60
	<b>61%</b>	<b>40%</b>	<b>69%</b>	<b>57%</b>

## Appendix A-2: Details for BOC Evaluation Results

**Table xA-18. Score Details for Adult Learning Principle: Let Learners Apply What They Have Learned**

Let Learners Apply What They Have Learned	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
There are problem-solving activities that actively engage the learners.	4.4	1.0	4.5	4.0
There are opportunities for participants to immediately apply their new learning in the classroom.	3.4	1.0	3.8	3.1
<i>Actual Points / Maximum Possible Points</i>	7.9 / 10	2 / 10	8.3 / 10	18.1 / 30
<i>Score</i>	<b>79%</b>	<b>20%</b>	<b>83%</b>	<b>60%</b>
<b>Level II Classes</b>				
There are problem-solving activities that actively engage the learners.	3.4	1.0	3.0	2.7
There are opportunities for participants to immediately apply their new learning in the classroom.	3.1	1.0	3.5	3.0
<i>Actual Points / Maximum Possible Points</i>	6.6 / 10	2 / 10	6.5 / 10	15.1 / 30
<i>Score</i>	<b>66%</b>	<b>20%</b>	<b>65%</b>	<b>50%</b>

## Scoring Details for Adult Learning Practices

It's important to note that all courses scored well for learning facilitation; the instructors we observed and those we interviewed were respectful of the students and created a "safe" environment.

Several items are NA for a given method:

- Learning facilitation issues cannot be assessed by a review of materials, and feedback mechanisms were generally not incorporated into the class design, presumably because the instructor was to provide feedback.
- The Lesson Plan dimension, which focuses primarily on issues related to the training objectives, generally has criteria that would be the same regardless of the evaluation method, as they are based on whether or not the materials include appropriate learning objectives. Therefore we scored this as NA relative to the instructor interviews.

We did, however, score the classes we observed on one criterion under Lesson Plan: whether the instructor uses a variety of training methods. (Two of the courses we observed did include some variety of methods; two did not.)

Table xA-19 through Table xA-26 provide the detailed scoring on Adult Learning Principles. As with Adult Learning Principles, each criterion was scored for each course using a scale of 1 to 5:

- 1 = Not at all or very poor
- 2 = Rarely or poor
- 3 = Occasionally or fair
- 4 = Frequently or good
- 5 = Always or excellent



Table xA-19. Score Details for Adult Learning Practice: Lesson Plan

Lesson Plan	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
There are learning objectives	4.3	NA	NA	4.3
The learning objectives are specific, observable and measurable	3.7	NA	NA	3.7
Desired learning levels are identified	3.3	NA	NA	3.3
There is a variety of training methods	1.0	2.0	NA	1.1
<i>Actual Points / Maximum Possible Points</i>	12.3 / 20	2 / 5	NA	14.3 / 25
<i>Score</i>	<b>61%</b>	<b>40%</b>	<b>NA</b>	<b>57%</b>
<b>Level II Classes</b>				
There are learning objectives	4.9	NA	NA	4.9
The learning objectives are specific, observable and measurable	2.1	NA	NA	2.1
Desired learning levels are identified	2.4	NA	NA	2.4
There is a variety of training methods	1.0	2.0	NA	1.1
<i>Actual Points / Maximum Possible Points</i>	10.4 / 20	2 / 5	NA	12.4 / 25
<i>Score</i>	<b>52%</b>	<b>40%</b>	<b>NA</b>	<b>50%</b>

Table xA-20. Score Details for Adult Learning Practice: Content Decisions

Content Decisions	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Clear focus on key content	4.6	3.0	4.7	4.4
There is an organizing principle	4.6	3.5	4.7	4.4
Interesting but unimportant content kept to a minimum	4.0	2.0	4.7	3.9
There is an appropriate amount of content for the time period	3.9	4.5	3.7	3.9
<i>Actual Points / Maximum Possible Points</i>	17 / 20	13 / 20	17.7 / 20	47.7 / 60
<i>Score</i>	<b>85%</b>	<b>65%</b>	<b>88%</b>	<b>79%</b>
<b>Level II Classes</b>				
Clear focus on key content	4.3	3.0	4.5	4.4
There is an organizing principle	4.0	2.5	4.0	4.0
Interesting but unimportant content kept to a minimum	3.6	2.5	4.0	3.9
There is an appropriate amount of content for the time period	4.0	3.0	4.0	4.0
<i>Actual Points / Maximum Possible Points</i>	15.9 / 20	11 / 20	16.5 / 20	43.4 / 60
<i>Score</i>	<b>79%</b>	<b>55%</b>	<b>83%</b>	<b>72%</b>

Appendix A-2: Details for BOC Evaluation Results

Table xA-21. Score Details for Adult Learning Practice: Interactive Activities

Interactive Activities	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Has a participant workbook for hands on activities to check learning and comprehension	3.4	1.0	2.5	2.9
Learners actively engaged in discovering answers	4.0	1.5	2.8	3.4
Checks for comprehension before leaving a key topic area	2.6	1.0	3.8	2.7
Opportunity for learners to practice what they've learned as they learn it	2.7	1.0	3.8	2.9
<i>Actual Points / Maximum Possible Points</i>	12.7 / 20	4.5 / 20	12.8 / 20	30 / 60
<i>Score</i>	<b>64%</b>	<b>23%</b>	<b>64%</b>	<b>50%</b>
<b>Level II Classes</b>				
Has a participant workbook for hands on activities to check learning and comprehension	3.0	1.0	3.3	2.9
Learners actively engaged in discovering answers	3.3	1.5	4.3	3.4
Checks for comprehension before leaving a key topic area	2.6	1.0	4.5	3.3
Opportunity for learners to practice what they've learned as they learn it	2.7	1.0	3.8	3.0
<i>Actual Points / Maximum Possible Points</i>	11.6 / 20	4.5 / 20	15.8 / 20	31.8 / 60
<i>Score</i>	<b>58%</b>	<b>23%</b>	<b>79%</b>	<b>53%</b>

Table xA-22. Score Details for Adult Learning Practice: Learner Centricity

Learner Centricity	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
In-class mini needs assessment conducted	1.7	2.0	2.3	1.8
Focus is on learner rather than presenter	2.0	2.0	2.5	2.1
Builds on learner's prior learning or experience	2.5	3.5	3.3	2.9
Meets needs of different learning styles	1.3	2.0	1.5	1.5
<i>Actual Points / Maximum Possible Points</i>	7.5 / 20	9.5 / 20	9.5 / 20	26.5 / 60
<i>Score</i>	<b>38%</b>	<b>48%</b>	<b>48%</b>	<b>44%</b>
<b>Level II Classes</b>				
In-class mini needs assessment conducted	2.0	1.0	2.5	2.0
Focus is on learner rather than presenter	2.2	2.0	3.0	2.5
Builds on learner's prior learning or experience	2.8	2.0	3.3	2.9
Meets needs of different learning styles	1.0	1.5	1.3	1.2
<i>Actual Points / Maximum Possible Points</i>	8 / 20	6.5 / 20	10 / 20	24.5 / 60
<i>Score</i>	<b>40%</b>	<b>33%</b>	<b>50%</b>	<b>41%</b>

Table xA-23. Score Details for Adult Learning Practice: Learning Facilitation

Learning Facilitation	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Validates learners' involvement and responses	NA	3.5	4.5	4.2
Makes transitional statements between sections	NA	2.5	4.3	3.7
Ensures that all learners can see and hear	NA	5.0	5.0	5.0
Provides breaks every 50 minutes or so	NA	4.0	3.7	3.8
<i>Actual Points / Maximum Possible Points</i>	NA	15 / 20	17.4 / 20	32.4 / 40
<i>Score</i>	NA	<b>75%</b>	<b>87%</b>	<b>81%</b>
<b>Level II Classes</b>				
Validates learners' involvement and responses	NA	2.0	4.3	3.9
Makes transitional statements between sections	NA	2.0	3.3	3.0
Ensures that all learners can see and hear	NA	5.0	5.0	5.0
Provides breaks every 50 minutes or so	NA	4.0	4.3	4.3
<i>Actual Points / Maximum Possible Points</i>	NA	13 / 20	16.8 / 20	29.8 / 40
<i>Score</i>	NA	<b>65%</b>	<b>84%</b>	<b>74%</b>

Table xA-24. Score Details for Adult Learning Practice: Practice Opportunities

Practice Opportunities	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Reflect the learning objectives, including an appropriate mix of terminal performance and enabling objectives	2.8	1.0	2.3	2.4
Are included after each new concept or skill area is addressed	3.2	1.0	3.3	2.8
Are parallel to — but different from — assessment items focusing on the same objectives	1.0	1.0	2.3	1.3
Employ a variety of approaches appropriate to relevant objectives and participants' "real world" requirements	4.0	1.0	3.7	3.3
<i>Actual Points / Maximum Possible Points</i>	11 / 20	4 / 20	11.7 / 20	26.7 / 60
<i>Score</i>	<b>55%</b>	<b>20%</b>	<b>58%</b>	<b>44%</b>
<b>Level II Classes</b>				
Reflect the learning objectives, including an appropriate mix of terminal performance and enabling objectives	2.9	1.0	3.0	2.5
Are included after each new concept or skill area is addressed	2.4	1.0	3.3	2.6
Are parallel to — but different from — assessment items focusing on the same objectives	1.1	1.0	1.3	1.3
Employ a variety of approaches appropriate to relevant objectives and participants' "real world" requirements	1.7	1.0	1.0	1.1
<i>Actual Points / Maximum Possible Points</i>	8.1 / 20	4 / 20	8.5 / 20	20.6 / 60
<i>Score</i>	<b>41%</b>	<b>20%</b>	<b>43%</b>	<b>34%</b>

Appendix A-2: Details for BOC Evaluation Results

Table xA-25. Score Details for Adult Learning Practice: Feedback

Feedback	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Is provided when participants are asked to practice or demonstrate skills and knowledge	NA	1.5	3.3	2.7
Encompasses both positive and corrective feedback as appropriate	NA	2.0	3.5	3.0
Includes corrective guidance as appropriate (e.g., not just “incorrect” or “poor” but why, and where to find the correct information or how to perform better)	NA	1.5	3.5	2.8
<i>Actual Points / Maximum Possible Points</i>	NA	5 / 15	10.3 / 15	15.3 / 30
<i>Score</i>	NA	<b>33%</b>	<b>68%</b>	<b>51%</b>
<b>Level II Classes</b>				
Is provided when participants are asked to practice or demonstrate skills and knowledge	NA	1.0	3.8	3.4
Encompasses both positive and corrective feedback as appropriate	NA	2.0	3.8	3.5
Includes corrective guidance as appropriate (e.g., not just “incorrect” or “poor” but why, and where to find the correct information or how to perform better)	NA	2.0	3.8	3.5
<i>Actual Points / Maximum Possible Points</i>	NA	5 / 15	11.3 / 15	16.3 / 30
<i>Score</i>	NA	<b>33%</b>	<b>75%</b>	<b>54%</b>

Table xA-26. Score Details for Adult Learning Practice: Assessments

Assessments	Materials	Observation	Interview	MEAN
<b>Level I Classes</b>				
Measure successful completion based on “curriculum teaching” rather than “item teaching”	4.9	1.5	3.0	3.9
Include items that sample the full range of learning objectives, including terminal performance and enabling objectives	2.3	1.0	NA	2.1
Reflect the learning level inherent in the objective(s) addressed by the items	2.1	1.0	NA	2.0
Distinguish between those who can meet the course objectives and those who do not	2.4	1.0	NA	2.3
<i>Actual Points / Maximum Possible Points</i>	11.8 / 20	4.5 / 20	3 / 5	19.3 / 45
<i>Score</i>	<b>59%</b>	<b>23%</b>	<b>60%</b>	<b>43%</b>
<b>Level II Classes</b>				
Measure successful completion based on “curriculum teaching” rather than “item teaching”	4.4	2.0	4.0	4.1
Include items that sample the full range of learning objectives, including terminal performance and enabling objectives	1.6	1.0	NA	1.3
Reflect the learning level inherent in the objective(s) addressed by the items	1.4	1.0	NA	1.5
Distinguish between those who can meet the course objectives and those who do not	1.0	1.0	NA	1.0
<i>Actual Points / Maximum Possible Points</i>	8.4 / 20	5 / 20	4 / 5	17.4 / 45
<i>Score</i>	<b>42%</b>	<b>25%</b>	<b>80%</b>	<b>39%</b>

## Details for Influence on Participants' AKA-B

### Effect on Professional Interactions

One of the pathways through which BOC training can work to influence energy efficiency is through the student's interactions with colleagues and management. If the student's knowledge has been increased, his confidence will be increased so that he can contribute to more productive discussions and advocate for energy-efficiency actions. Table xA-27 shows how the interviewees perceive these processes. Overall, the students are quite positive in their assessment of how the BOC training has prepared them to interact confidently about operations issues and increasing the efficiency of the operations. They are particularly strong in their opinions that the likelihood has increased that they will encourage the organization to take energy efficiency actions (81% chose either 4 or 5 on a 5-point scale, where 5 means "Strongly agree"). There is little difference in responses by Level, however.

**Table xA-27. Self-Reported Effects of Training on Professional Interactions**

Influence Type	Percent Choosing 4 or 5 on 5-Point Scale		
	2006–08 Level I Students (N=72)	2006–08 Level II Students (N=29)	2006–08 Students (N=101)
<b>Because of BOC Training....</b>			
The likelihood is increased that you will encourage your organization to take efficiency actions and participate in your utility's energy efficiency programs	79%	86%	81%
You are more confident about what actions your facility might take to reduce load, should the state or your utility call for a demand response	73%	72%	73%
Your interactions with contractors are more productive	62%	59%	61%
Your contribution to O&M discussions at your facility is more helpful	61%	59%	60%

It is interesting to note that the self-reported effects of the training a year or more after completing the training are actually somewhat higher than related scores on the exit surveys completed at the end of each class.

In the exit survey, Level I and Level II participants rated the likelihood of the class affecting their energy efficiency actions at 73% and 72%, respectively; and rated their interest in utility programs in the 60% range. (See Table xA-25.)

**Table xA-28. Related Exit Survey Results on Effects of Training**

Exit Survey topic	BOC Level I N=529	BOC Level II N=212
Likelihood of course affecting energy efficiency practices or equipment purchase decisions	73%	72%
Desire to learn about utility Energy Audit Service	47%	56%
Desire to learn about utility Energy Efficiency Programs	57%	64%

## Influence of Students on Others

During the telephone interviews of students, a similar type of question asked whether the student had shared any of the concepts or methods they learned in the BOC training with coworkers and/or with people outside the firm. Table xA-29 reveals the reports of interviewees on their own efforts to share their knowledge with others. Nearly all of the 2006–08 participants reported having used the concepts and methods they learned at their own facility. The question that followed this in the interview was asked of the 2006–08 participants as it was of the 2004-05 group: Have you shared any of the concepts or methods you learned in the series with any of your coworkers or anyone outside the firm? Oddly, the current group was less likely to report sharing with coworkers than were the earlier group; however, they were more likely to have shared their knowledge outside the firm.

The final question in this series asked whether their sharing had influenced others to initiate energy efficiency projects. Almost half agreed that they had had this influence due to their new knowledge.

**Table xA-29. Influence of Students on Others**

Influence Type	2004-05 Students (N=58)	2006–08 Students (N=101)
<b>Used or applied concepts or methods learned in BOC?</b>		
Yes		91%
No		9%
<b>Shared concepts or methods with others inside or outside your firm?</b>		
Yes, with coworkers	76%	46%
Yes, with people outside the firm	28%	45%
No, neither		10%
<b>Has sharing led colleagues to initiate energy efficiency projects?</b>		
Yes		46%
No		31%
Don't know		23%

## Projects Initiated

As seen in Table xA-30 the percent of students who reported initiating energy efficiency projects is 85% for this program cycle, which is almost identical to the 2004-05 cycle. The projects tended to be dominated by lighting measures, even more than in the previous group (77% overall, compared to 60% for the earlier group). However, the 2006–08 students also report more non-lighting projects than their earlier counterparts.

**Table xA-30. Energy Efficiency Projects Initiated by Participants**

<b>Projects</b>	<b>2004-05 Students (N=58)</b>	<b>2004-05 Non- Participants (N=58)</b>	<b>2006–08 Students (N=101)</b>	<b>2006–08 Level I Students (N=60)</b>	<b>2006–08 Level II Students (N=24)</b>
Facility Began or Completed Projects Aimed at Increasing Energy Efficiency	85%	74%	86%	86%	86%
<b>Project Type</b>					
Lighting	60%	40%	77%	80%	71%
Air Conditioning	33%	14%	33%	32%	38%
Controls	28%	21%	32%	30%	38%
Motors (including fans)	21%	30%	18%	20%	13%
Energy Audit	14%	9%	14%	12%	21%
Chillers/HVAC	7%	5%	18%	20%	13%
Boilers	5%	14%	13%	17%	4%
Benchmarking	2%	7%	6%	5%	8%
Monitoring (including installation of equipment)	3%	14%	21%	17%	33%
Other Equipment, Projects, or Initiatives	19%	14%	65%	63%	71%
Retro-commissioning			1%	2%	0%
VSDs			10%	10%	8%
Practices			4%	5%	0%
<b>Project Development</b>					
Project Complete?	57%	43%	65%	67%	60%
Received Rebate?	46%	40%	41%	45%	33%
BOC Training Had Influence on the Project?*	46%	-	42%	47%	32%
*Total responses exceed 100% because multiple responses were allowed.					
** Responses of 4 or 5 on a 5-point scale					

Follow-ups to the “Other” response to the question were coded into existing categories that the interviewers did not recognize, but also resulted in three new categories: retro-commissioning, VSDs, and practices. Approximately 40% of projects mentioned were reported to be influenced by the BOC training.

## O&M Practices

Table xA-31 shows the distribution of the energy-using systems in use by the facilities of the sampled students, and shows the answers of the PY2004-05 students as a point of comparison. Comparing the current sample with the previous one, the differences that stand out are an increase in the use of economizers and VSDs, and a decrease in compressed air systems.

**Table xA-31. Systems Employed at Facility**

<b>System</b>	<b>2004-05 Students (N=56)</b>	<b>2006-08 Students (N=101)</b>
Motors	69%	56%
Cooling System	66%	62%
Boiler System	61%	54%
Economizers	55%	82%
Compressed Air Systems	52%	47%
Variable Frequency Drives	50%	91%

Respondents were asked about a series of 12 O&M activities and how often they conducted them. The questions were exactly the same as those asked in the PY2004-05 study, enabling comparisons with that time period, including the non-participants interviewed at that time. In addition, it was possible to compare PY2006-08 Level II students with Level I students, testing the possibility that the lessons taught in BOC training are more secure in those exposed to it more often and more deeply. The comparison between the total student sample for the current program and the prior student sample allows us to see if there have been any improvements in instruction between program periods. However, embedded in the program period comparison is a difference in territory included. The prior study included the whole state, while the current evaluation covers only SCE territory.

To make meaningful comparisons of any type, it is essential to understand which answers are “correct,” which are appropriate, or whether there is a pattern such that the more often an activity is done, the better. The latter is not always the case, so where it is not, we must know which answers are good, which are not good, and which are the best answers among those categories provided. The evaluation team employed an engineering firm familiar with these issues to characterize each possible answer as to its appropriateness, and how “good” it is compared to other response categories provided.

For the comparisons of the frequency of O&M activities asked about in the interview (shown in Table xA-32), several rules were applied in deciding which answer category would be counted as the “best” answer. In situations where the more often the activity is performed the better, the top two frequency categories were counted as the “best.” Where one answer is clearly the best, that was the only one counted. The answer characterizations could not be included in this Table due to lack of space. However, they can be seen in Table xA-34 through Table xA-45, which show the responses on which Table xA-32 is based.

The comparison of the PY2006-08 program cycle students with the PY2004-05 group over the 12 activities showed three statistically significant differences, with all differences being in a positive direction, i.e., the current student group more often gave an appropriate response about the frequency of the activity than did the earlier group. The comparison of Level II with Level I over the 12 areas reveals only one significant difference, though it was in a positive direction. The final set of comparisons was between the current sample of students and the non-participants from the earlier study. Comparison to the non-participant group allows us to be assured that BOC students are more knowledgeable than non-participants. This set of 12 comparisons yielded seven significant differences, though two of them were in a negative direction. One of the negatives was checking the boiler combustion system, and the second was inspecting steam traps.

Another analysis that can be revealing is to note the direction of the difference between two groups, ignoring size or statistical significance. In all three group comparison sets, a positive difference is defined as “favorable” for the



program. Comparing the PY2006–08 students with the PY2004-05, seven of 12 were positive. Comparing Level II with Level I, we see a total of 9 positive differences. Similarly, nine of the 12 differences when comparing the PY2006–08 students with the non-participant comparison group from 2004-05 were positive. The overall conclusion of these comparisons is that the program is communicating knowledge to its students, although there is less evidence of improvement over program cycles. There may be some differences between Level II accomplishments and Level I, though they seem small as only one was statistically significant. Over all 36 comparisons represented in the Table, 69% are in a positive direction.

After asking interviewees how often they carried out 12 O&M activities, five areas were followed with another question about exactly what methods they used to do these checks. In this case, as well as in the analysis of the frequency of checks, each answer category provided had to be characterized as to its level of appropriateness. The summary results shown in Table xA-32 include these characterizations. Another difference between this summary and the one for analyzing frequency of activities is that a separate comparison was made across groups for each possible answer category. This was necessary because respondents were allowed to choose multiple answers; thus the answers are not independent so could not be tested in groups. In this analysis, all appropriate (good, better, best) answers were compared by group. Note that even though these questions were asked in the PY2004-05 cycle study, the results were not presented in that report, so they could not be included here for comparison. Thus, the only comparison possible is between Level I and Level II students.

Appendix A-2: Details for BOC Evaluation Results

Table xA-32. Percent Using Each Method for O&M Categories

Activity and Possible Answers	2006–08 Students	2006–08 Level I Students	2006–08 Level II Students	Answer Character- ization	Diff in Level Sig?†
<b>Do repeated benchmarking or indexing?</b>	<b>N=100</b>	<b>N=71</b>	<b>N=29</b>		
Yes	52%	45%	69%	Best	*Pos
No	48%	55%	31%		
<b>Methods used to benchmarking or indexing</b>	<b>N=48</b>	<b>N=29</b>	<b>N=19</b>		
Review utility bills	58%	62%	53%	Good	
Monitor sub-loads	52%	45%	63%	Good	
Record & trend sub-loads	44%	31%	63%	Better	*Pos
Regularly review trended data on EMS	73%	72%	74%	Best	
Other	27%	21%	37%		
<b>Methods used to check &amp; adjust boiler combustion system</b>	<b>N=45</b>	<b>N=28</b>	<b>N=17</b>		
Visually inspect boiler flame & soot accumulation	82%	89%	71%	Good	
Analyze flue gas composition	76%	68%	88%	Good	
Other	18%	14%	24%		
<b>Methods used to check for leaks in supply &amp; return air duct system</b>	<b>N=44</b>	<b>N=28</b>	<b>N=16</b>		
Infrared scans	27%	25%	31%	Best	
"Smoke bomb"	30%	29%	31%	OK	
Other	86%	86%	88%		
<b>Methods used to check chiller controls</b>	<b>N=40</b>	<b>N=25</b>	<b>N=15</b>		
Testing of sensor & valve function	58%	52%	67%	Best	
Comparison of temperature set point against control point	70%	80%	53%	OK	*Mixed
Other	8%	8%	7%		
<b>Methods used for leak detection in compressed air system</b>	<b>N=43</b>	<b>N=27</b>	<b>N=16</b>		
Inspect network and listen	91%	89%	94%	Good	
Monitor flow balances	44%	48%	38%	Good	
Use of portable ultrasonic acoustic detector	21%	26%	13%	Best	
Other	37%	37%	38%		

\*Statistically significant at .10 level

†"Pos" indicates Level II students more frequently provided the better answer

With some exceptions, BOC students, especially Level II students, tend to employ the better methods. One exception is the use of a portable ultrasonic acoustic detector to detect leaks in a compressed air system; this is likely due to the high-tech, and therefore costly, nature of using this technology, and it may not be cost effective in the majority of situations.

Level II students are significantly more likely to conduct benchmarking or indexing activities, by a considerable margin (69% v 45%). Their methods of carrying out this activity are also more likely to include monitoring sub-loads (63% v 45%, not significant), and significantly more likely to record and trend the sub-loads (63% v 31%). The other area where Level II students seem to exceed Level I is in the methods used to check chiller controls. This is a somewhat mixed situation. The clear best method is “Testing of sensor & valve function,” an answer given more frequently by Level II students (67% v 52%, not significant). The statistically significant comparison is seen in the less good answer, “Comparison of temperature set point against control point,” where Level I students choosing that option outnumber the Level II students (80% v 53%, respectively). So, the Level II students were less likely to choose the “OK” answer, and more likely to choose the “Best” answer, though only one of those comparisons was statistically significant. It seems fair to say, though, that the Level II students are more advanced in this area than the other group.

Table xA-33. Percent of each Group Reporting an Appropriate Activity Frequency

O&M Activity	2004-05 Students	2004-05 Non Parts	2006-08 Students	2006-08 Level I Students	2006-08 Level II Students	Current vs 04-05 Cycle Sig?†	Level I v Level II Sig?†	06-08 v 04-05 Non-Part Sig?†	Direction (04-05--06-08)†	Direction (Level I v Level II)†	Direction '06-08 vs 04-05 Non-Parts†
Checking boiler combustion system	82%	86%	70%	67%	76%			* Neg	-	+	-
Inspecting steam traps	12%	69%	29%	29%	31%			* Neg	+	+	-
Testing for proper damper modulation	65%	47%	59%	57%	67%				-	+	+
Checking and recalibrating chilled water loop controls	70%	31%	55%	53%	59%			* Pos	-	+	+
Lubricating motor, fan, and pump bearings	25%	41%	51%	43%	67%	* Pos			+	+	+
Inspect bearings & belt alignments on motors for fans & pumps	83%	1%	79%	74%	90%			* Pos	-	+	+
Inspecting compressed air system for leaks	73%	25%	57%	57%	56%			* Pos	-	-	+
Monitoring compressed air systems for power use, pressure, & temperature	68%	30%	73%	77%	67%			* Pos	+	-	+
Checking refrigerant pressures & temps on package AC Units	21%	22%	26%	29%	14%				+	-	+
Check for leaks in supply & return air ducts	12%	21%	16%	9%	32%		* Pos		+	+	-
Cleaning chiller evaporator & condenser tubes	44%	57%	77%	74%	81%	* Pos		* Pos	+	+	+
Testing & Adjusting VFDs to match loads	15%	19%	14%	6%	26%	* Pos			+	+	+
Percent differences in a positive direction									58%	75%	75%
Total percent difference in positive direction											69%

\*Statistically significant at the .10 level

†Differences between compared groups are considered positive (pos or +) if the current sample more frequently selects appropriate options than the comparison group. For PY2006-08, the comparison is with PY2004-05 students, for the Level II group, it is Level I, and the last comparison is between PY2006-08 students and the PY2004-05 non-participant group.

*Details of O&M Practices***Table xA-34. Checking Boiler combustion System**

Checking Boiler combustion System	2004-05		2006-08 Students (N=53)	2006-08 Level I Students (N=36)	2006-08 Level II Students (N=17)	
	2004-05 Students (N=33)	Nonparticipants (N=39)				
Never	6%	6%	4%	6%	0%	
Every few years	0%	0%	6%	6%	6%	
About once a year	12%	8%	21%	22%	18%	
About twice a year	29%	17%	28%	28%	29%	
Every few months	53%	69%	11%	3%	29%	
Continuous monitoring			30%	36%	18%	Best. The more the better.

**Table xA-35. Inspecting steam traps**

Inspecting steam traps	2004-05		2006-08 Students (N=51)	2006-08 Level I Students (N=35)	2006-08 Level II Students (N=16)	
	2004-05 Students (N=17)	Nonparticipants (N=32)				
Never	6%	6%	37%	40%	31%	Not a good answer.
Every few years	0%	31%	6%	3%	13%	OK
About once a year	12%	38%	24%	26%	19%	Good
About twice a year	29%	6%	20%	17%	25%	Excessive
Every few months	53%	19%	14%	14%	13%	Unrealistic

**Table xA-36. Testing for proper damper modulation**

Testing for proper damper modulation	2004-05		2006-08 Students (N=49)	2006-08 Level I Students (N=37)	2006-08 Level II Students (N=12)	
	2004-05 Students (N=26)	Nonparticipants (N=34)				
Never	8%	6%	6%	8%	0%	
Every few years	0%	29%	6%	5%	8%	
About once a year	27%	18%	29%	30%	25%	
About twice a year	11%	29%	22%	24%	17%	
Every few months	54%	18%	37%	32%	50%	Best. The more the better.

Table xA-37. Checking and recalibrating chilled water loop controls

Checking and recalibrating chilled water loop controls	2004-05 Students (N=23)	Nonparticipants (N=23)	2006-08 Students (N=47)	2006-08 Level I Students (N=25)	2006-08 Level II Students (N=15)	
Never	13%	17%	11%	13%	6%	
Every few years	0%	22%	13%	13%	12%	
About once a year	17%	30%	21%	20%	24%	
About twice a year	17%	9%	4%	3%	6%	
Every few months	53%	22%	51%	50%	53%	Best. The more the better.

Table xA-38. Lubricating motor, fan, and pump bearings

Lubricating motor, fan, and pump bearings	2004-05 Students (N=36)	2004-05 Nonparticipants (N=44)	2006-08 Students (N=55)	2006-08 Level I Students (N=37)	2006-08 Level II Students (N=18)	
Never	6%	5%	2%	0%	6%	Appropriate if bearings permanently sealed.
Every few years	0%	34%	6%	5%	6%	Not enough.
About once a year	8%	23%	20%	16%	28%	Normal if open bearings.
About twice a year	17%	18%	31%	27%	39%	Normal if open bearings.
Every few months	69%	20%	36%	43%	22%	Excessive
Bearings permanently sealed			6%	8%	0%	

Table xA-39. Inspect bearings &amp; belt alignments on motors for fans &amp; pumps

Inspect bearings & belt alignments on motors for fans & pumps	2004-05 Students (N=36)	2004-05 Nonparticipants (N=44)	2006-08 Students (N=57)	2006-08 Level I Students (N=38)	2006-08 Level II Students (N=19)	
Never	3%	9%	2%	0%	5%	
Every few years	0%	36%	2%	3%	0%	
About once a year	14%	23%	18%	24%	5%	
About twice a year	22%	14%	23%	21%	26%	
Every few months	61%	18%	56%	53%	63%	Good. The more the better.

Table xA-40. Inspecting compressed air system for leaks

Inspecting compressed air system for leaks	2004-05		2006-08 Students (N=44)	2006-08 Level I Students (N=28)	2006-08 Level II Students (N=16)	
	2004-05 Students (N=29)	Nonparticipants (N=41)				
Never	14%	15%	9%	14%	0%	
Every few years	3%	38%	7%	4%	13%	
About once a year	10%	22%	27%	25%	31%	
About twice a year	7%	15%	16%	14%	19%	
Every few months	66%	10%	41%	43%	38%	Best. Or ongoing inspecting

Table xA-41. Monitoring compressed air systems for power use, pressure, &amp; temperature

Monitoring compressed air systems for power use, pressure, & temperature	2004-05		2006-08 Students (N=41)	2006-08 Level I Students (N=26)	2006-08 Level II Students (N=15)	
	2004-05 Students (N=28)	Nonparticipants (N=40)				
Never	18%	30%	10%	8%	13%	
Every few years	3%	20%	10%	8%	13%	
About once a year	11%	20%	7%	8%	7%	
About twice a year	0%	8%	15%	12%	20%	
Every few months	68%	22%	59%	65%	47%	The more the better.

Table xA-42. Checking refrigerant pressures &amp; temps on package AC Units

Checking refrigerant pressures & temps on package AC Units	2004-05		2006-08 Students (N=31)	2006-08 Level I Students (N=24)	2006-08 Level II Students (N=7)	
	2004-05 Students (N=24)	Nonparticipants (N=37)				
Never	17%	11%	7%	8%	0%	
Every few years	8%	29%	7%	8%	0%	
About once a year	21%	22%	26%	29%	14%	Good. More is not better.
About twice a year	4%	16%	16%	17%	14%	
Every few months	50%	22%	45%	38%	71%	

Table xA-43. Check for leaks in supply &amp; return air ducts

Check for leaks in supply & return air ducts	2004-05					
	2004-05 Students (N=24)	Nonparticipants (N=37)	2006-08 Students (N=62)	2006-08 Level I Students (N=43)	2006-08 Level II Students (N=19)	
Never	25%	25%	29%	35%	16%	
Every few years	12%	21%	16%	9%	32%	Good answer. More is not better. Continuous process.
About once a year	16%	29%	21%	26%	11%	
About twice a year	41%	10%	11%	12%	11%	
Every few months	6%	15%	23%	19%	32%	

Table xA-44. Cleaning chiller evaporator &amp; condenser tubes

Cleaning chiller evaporator & condenser tubes	2004-05					
	2004-05 Students (N=23)	Nonparticipants (N=23)	2006-08 Students (N=47)	2006-08 Level I Students (N=31)	2006-08 Level II Students (N=16)	
Never	17%	4%	11%	13%	6%	
Every few years	22%	30%	9%	7%	13%	Sufficient. More is not better.
About once a year	44%	57%	77%	74%	81%	
About twice a year	4%	0%	4%	7%	0%	
Every few months	13%	9%	0%	0%	0%	Too much.

Table xA-45. Testing &amp; Adjusting VFDs to match loads\*

Testing & Adjusting VFDs to match loads	2004-05					
	2004-05 Students (N=26)	Nonparticipants (N=36)	2006-08 Students (N=19)	2006-08 Level I Students (N=9)	2006-08 Level II Students (N=10)	
Never	19%	0%	62%	71%	47%	
Only at time of VFD installation	39%	45%	6%	10%	0%	
Every few years	0%	11%	2%	0%	5%	
About once a year	27%	25%	16%	13%	21%	
About twice a year	4%	11%	6%	0%	16%	
Every few months	11%	8%	8%	6%	11%	Best answer for "checking." "Never" correct if nothing was wrong.

\* Asked only if said they did testing & calibration (38% did).



## Details for Support of Programs Yardstick

As noted in the discussion of “Details for Remembering and Taking Advantage of Programs” (p. A-44), during the telephone interviews of students, respondents had a very low rate of unprompted recall of the programs — ranging from 0% for several programs to 21% for the Demand Response program (see Table xA-49). Unsurprisingly, respondents’ recognition of SCE programs was higher when prompted, but remained relatively low for most programs (Table xA-50).

The one outstanding exception is the Retro-Commissioning program, which had a 72% recognition rate among Level II students. (This likely is due to the Level II class, BOC-214: Introduction to Building Commissioning, which focuses on retro-commissioning considerations.)

Exploring how BOC class design and delivery relates to the support of SCE programs can help explain this low recognition rate among students.

According to BOC staff interviews, an SCE customer representative is invited to present information about available IOU programs, including audits and rebates, during one class in each series. This occurs most often when BOC classes are offered at CTAC. In outlying areas, instructors are given current information about IOU program offerings and are told to incorporate the information into their class. Printed materials about the programs are to be distributed to participants.

The BOC courses themselves do not include information specific to SCE programs, and most of the instructors report that they are unfamiliar with most of the program features and benefits. The few instructors we interviewed who did indicate they were familiar with SCE energy efficiency programs said that they rarely mentioned them during class.

As a result, the review of materials, in-person observation, and instructor interviews all indicate that there is little direct support of programs.

### *Tie-in between Courses and Programs*

The evaluation team identified two levels of possible tie-in between the courses and SCE programs:

- High tie-in means that 25% or more of the course content addresses technologies or measures directly related to a given program.
- Low tie-in means that less than 25% (but greater than 0%) of the course content focuses on technologies or measures encompassed by the program.

The evaluation team considered a “short list” of programs, focusing on those that yield the greatest kWh savings and kW reduction. (See “Programs Considered when Assessing Class Support of Programs” in Appendix D-1 (p. D-14) for a discussion of the programs considered.)

This approach for establishing tie-in between courses and programs is the same approach used in the 2006–08 Energy Center Process Evaluation.

Few BOC courses had high tie-in to programs:

- One Level I course had high tie-in to four programs:
  - BOC-104: Efficient Lighting Fundamentals
- Two Level II courses had one high tie-in apiece:
  - BOC-211: Motors in Facilities
  - BOC-214: Introduction to Building Commissioning

More courses had a low tie-in to SCE programs:

- Three Level I courses had low tie-in to programs:
  - BOC-101: Building Systems Overview has low tie-in to seven programs
  - BOC-103: HVAC Systems and Controls has low tie-in to eight programs
  - BOC-104: Efficient Lighting Fundamentals has low tie-in to eight programs
- Three Level II courses had low tie-in to programs:
  - BOC-204: HVAC Controls and Optimization has low tie-in to three programs
  - BOC-211: Motors In Facilities has low tie-in to four programs
  - BOC-216: Enhanced Automation and Demand Reduction has low tie-in to three programs

### *Direct and Indirect Support of Programs*

Direct Support of Programs addresses “How well do the classes directly support the programs — with program-specific information?” The yardstick items in this area focus on whether a course:

- Conveys program purpose, features, and benefits to participants
- Encourages participants to actively pursue the relevant programs

Indirect Support of Programs addresses “How well do the classes indirectly support the programs — with information on technologies or practices related to programs?” The yardstick items in this area focus on whether a course:

- Conveys the benefits of program-related technologies
- Helps participants weigh their options by distinguishing among technology variations that are or are not encompassed by relevant programs
- Helps prepare participants for implementing appropriate technologies by presenting key considerations and offering specific guidance for implementation of relevant technologies and practices

When answering the yardstick items for each class, we considered each program that had a high tie-in to the class.

All courses (both Level I and Level II) scored 0% on the criteria related to direct support of programs; and all scored 100% on the criteria related to indirect support except for the criterion related to distinguishing between variations that are and are not encompassed in a program (Table xA-46 and Table xA-47).

None of the classes we observed had a high tie-in to any of the programs considered, so there is no “Observation” score for direct and indirect support of programs.

All of the courses rated exactly the same in terms of the review of materials and input from instructor interviews, so we do not distinguish between the sources of the scores in the summary tables below.

**Table xA-46. Scores for Direct Support of Programs**

Criteria	Level I	Level II
Describes program goals/objectives (from target customer perspective)	0%	0%
Describes program features	0%	0%
Describes program benefits to participants	0%	0%
Provides information on how to pursue program offerings	0%	0%
Includes recommended next steps to pursue program offerings	0%	0%
Includes contact information (URL, email, phone) for more info or next steps	0%	0%
Distinguishes between technology variations that are and are not included by program	0%	0%
<b>Overall score</b>	<b>0%</b>	<b>0%</b>

**Table xA-47. Scores for Indirect Support of Programs**

Criteria	Level I	Level II
Describes benefits of program-relevant technologies or practices	100%	100%
Includes considerations for implementing relevant technologies or practices	100%	100%
Provides specific guidance for implementing technology or practice	100%	100%
<b>Overall score</b>	<b>100%</b>	<b>100%</b>

The extremely low score for Direct Support of Programs from the “yardstick” method is consistent with the relative lack of interest in the programs shown on the exit surveys completed by students after each class.

**Table xA-48. Related Exit Survey Results on Effects of Training**

Exit Survey topic	BOC Level I N=529	BOC Level II N=212
Desire to learn about utility Energy Audit Service	47%	56%
Desire to learn about utility Energy Efficiency Programs	57%	64%

## Details for Remembering and Taking Advantage of Programs

As indicated in Table xA-30, less than half (41% overall) of the participants whose facilities initiated EE projects after the BOC training reported that they received a rebate on the project. Forty-five percent of Level I students and 33% of Level II students indicated that they received a rebate for the EE projects their facility began or completed after the BOC training.

To determine how well participants remember utility programs after BOC training, interviewees were asked to name as many utility programs as they could recall. The answers were first coded into a pre-determined list of programs by the interviewer; but when the interviewer couldn't code responses, their descriptions were recorded, and subsequently categorized into programs by the evaluation team. As a result of these verbatim responses, two program categories were added to the list. One is "Rebate program" which could have been categorized in one of the specific programs originally listed, but that general description did not allow specific assignment to one of several rebate programs. In addition, "Energy audit" was added.

**Table xA-49. Unprompted Recall of SCE Programs**

Programs Recalled	2006–08 Level I Students (N=72)	2006–08 Level II Students (N=29)	2006–08 Students (N=101)
Express Efficiency	3%	0%	2%
Demand Response	6%	21%	10%
Savings By Design	3%	0%	2%
Retro-Commissioning	1%	7%	3%
Comprehensive HVAC	6%	0%	4%
Additional classes at CTAC	0%	0%	0%
Standard Performance Contract	0%	0%	0%
Rebate program	8%	10%	9%
Energy audit	1%	0%	1%

As seen in Table xA-49, students tended not to be able to recall the names or descriptions of programs. In general, Level II students tend to be better at recall, especially for the demand response program.

Table xA-50 reflects the results of follow-up questions that mentioned a list of specific programs, asking if the student recognized each program. Of course, recognition is more successful than recall, and this is strongly reflected in Table xA-50. Again, in almost all categories, the Level II students were more successful than Level I students. This would seem to indicate that continued exposure (or opportunities for exposure) to this content has a cumulative effect.

Interestingly, the most recognized program is Retro-Commissioning, especially by Level II students, followed by Demand Response. (Level II students' high recognition rate for the Retro-Commissioning program likely is a result of the BOC-214 course, which focuses on retro-commissioning issues and methods.)

By far the least recognized program was Express Efficiency. It may be that the latter program is not a focus of class material as it is more oriented to simple equipment that can be replaced off the shelf, where building operators are often faced with more complex processes. However, even when prompted, most programs are recognized by a minority.

Table xA-50. SCE Programs Recognized when Mentioned

Program	2006–08 Level I Students (N=72)	2006–08 Level II Students (N=29)	2006–08 Students (N=101)
Retro-Commissioning	32%	72%	44%
Demand Response	32%	59%	40%
Standard Performance Contract	31%	34%	32%
Savings By Design	25%	38%	29%
Comprehensive HVAC	22%	45%	29%
Additional classes at CTAC	19%	52%	29%
Express Efficiency	3%	10%	5%

These low rates of recognition for SCE programs is consistent with the results related to scores on the Support of Programs yardstick (see p. A-41), which found that the BOC classes' direct support of programs (that is directly teaching about the programs and the benefits they can provide) is virtually nonexistent — although an SCE representative typically is scheduled to do a brief program-oriented presentation once during each Level I series and Level II series.

## Details for Leveraging Existing Marketing Channels

During the staff interviews, the evaluation team learned that some progress has been made toward leveraging existing channels — specifically NEEC works with SCE customer account reps to build awareness and support for the program so that the reps will promote and support it with their customers.

We also learned that the BOC training has not been incorporated into SCE’s Energy Center calendars, although some BOC classes are held at the Energy Centers. Rather, BOC publishes its own calendar which is available at the ECs and through the customer account reps. (NEEC would like to more thoroughly integrate the two calendars and/or their distribution.)

The primary marketing efforts described in the staff interviews are as follows:

- SCE used direct mail, e-mail blasts, and posting on the SCE website to promote the BOC program, branding the program with the SCE logo to lend credibility to the program.
- In addition to working with SCE customer account reps to help build visibility for the program, NEEC promoted the program through professional associations, using both direct mail and e-mail blasts. They also maintained the website customers use to enroll in the program.
- Past program participants — as well as supervisors of program participants and potential participants, if possible — were notified of upcoming courses.
- Occasionally, if a few more participants were needed to fill a course (making it financially possible to offer the classes), program staff would call selected supervisors to promote participation for their employees.

During the telephone interviews with students, we asked where the participants learned about the BOC program. Table xA-51 reveals the answer to this question.

Of course a participant survey cannot address how frequent and how effective each communication channel was. However, if SCE reps and calendars of events were used more frequently and more effectively than other channels, we would expect to see more participants coming from those sources.

Certainly the most frequent source of program awareness in this group was the calendar of training events sent to the student or his supervisor. This is a positive result, given the strategy of using this channel more than in the past, though the method of using SCE reps appears not to have been the focus, or has been less effective.

Those who chose the “Other” response to the question were asked to specify that answer and their verbatim responses were coded. These are shown at the bottom of Table xA-51. All that most of these participants were able to report is that they learned of the program through word-of-mouth, i.e. through their supervisors or colleagues. How the supervisors and colleagues learned of it is unknown. Interestingly, 9% of the 36% who specified “Other” indicated that they learned of it from their utility. This can be added to the 7% who specified the SCE account rep in the original question to yield a 10% rate of learning of the program from the utility, in this case SCE (9% of 36% = 3% of the total group of respondents; 7% + 3% = 10% who indicated they learned of BOC via SCE reps).

Table xA-51. How Interviewed Participants Learned about BOC Program

Where Participants Learned About BOC Program	Percent Choosing the Option
<b>Original Answer Categories</b>	
Advertisements in Trade Journals	8%
Our SCE account rep	7%
Calendars of training events sent to you or your supervisor	44%
Other	36%
Don't Know	6%
<b>"Other" Specified:</b>	
Management	41%
DOE Mailing	3%
Colleague at work	34%
Utility	9%
Other	13%

## Details for Participant Satisfaction

### Immediately After Class (Exit Survey Results)

Some of the items on the BOC exit survey are rated on a 10-point scale, one is rated on a five-point scale and some are yes/no questions. For ease of reading and comparison to the SCE exit survey data (which is composed of yes/no questions and items on a five-point scale), we have translated the survey results into percentages. With one exception, 100% is a “perfect” score:

- If a five-point scale (5 = best) was used, 100% = 5 points
- If a 10-point scale (10 = best) was used, 100% = 10 points
- If a yes/no answer option was used, 100% = Yes

The exception is the item that asks about appropriateness of the technical level. The way the item is formatted, 55% would be a “perfect” score:

- 10% = Too Basic
- 55% = About Right
- 100% = Too Technical

Since the SCE Energy Center exit surveys address many of the same areas covered by the BOC exit survey, we can compare the results between similar items in the two groups to see whether there are any outstanding differences in the results.

It’s important to note that the relationship between some of the BOC and SCE items is an exact match (identical items on both surveys), while other items are only a rough match. For example, we mapped “Opportunity for questions” to “Appropriate mix between presentation and group involvement,” which is only very roughly equivalent. See Appendix A-5 for details on the mapping of the of BOC and EC exit survey items.

Because the individual exit survey data was unavailable for BOC, we are unable to report what percentage of the students had a favorable response to the various questions on the survey. As mentioned in the Methods section, the BOC site coordinator tallies exit survey results and the summary data is typed into a Microsoft Word® version of the exit survey. Therefore we know the overall score for each exit survey item for each class, but not individual responses for each item. For example, if a class exit survey tally shows “5.5” on an item scored on a 10-point scale, we do not know if half the people answered “1” (very poor) and half the people answered “10” (excellent) or all the people answered “5.5.”

Both Level I and II classes scored well on the majority of the general satisfaction issues addressed in the exit survey, with the Level II class consistently scoring somewhat higher on all items except the one specific to the newness of information presented.

One item where satisfaction level might be considered significantly “below par” is the one addressing the appropriateness of the technical level of the content addressed. As noted, above, for this item, a “perfect” score would be 55%, so the score of 70% for both Level I and Level II respondents indicates that students tended to think the content presented tended toward being “too technical” (see Table xA-52).

From comments on the exit surveys, it appears that people who think the content is too technical may be particularly frustrated by technical terms used in the training. (This is conjecture: because we received only compiled exit survey data, we cannot relate specific comments to the rating an individual gave on a particular item.) Some exit survey comments that indicated participants found the training “too technical” include:

- “A little more layman’s analogy”
- “Define HVAC jargon for non-HVAC mechanics”
- “Change big terms to plain English—too technical”



“Define certain terms or abbreviations for those who may not be familiar with them”

**Table xA-52. Exit Survey Results: General Satisfaction Issues**

BOC item #	EC item #	Topic	BOC Level I N=2284	BOC Level II N=551	SCE EC N=12445
<b>Items for which 100% is a “perfect” score</b>					
1	2	Usefulness / overall quality	85%	86%	94%
2	A	Newness of information	76%	73%	84%
4	NA	Confidence in completing project assignment	84%	88%	NA
5A	5	Organization	84%	87%	87%
5B	3	Clarity	84%	90%	93%
5C	NA	Audio/Visuals	86%	88%	NA
5D	7	Handouts	85%	88%	85%
5E	8	Opportunity for Questions	90%	93%	86%
			<b>N=529</b>	<b>N=212</b>	<b>NA</b>
12A	NA	Perception of value (time and money)	83%	90%	NA
13A	NA	Recommend class to others	84%	90%	NA
<b>Overall average on above</b>			<b>84%</b>	<b>87%</b>	<b>88%</b>
<b>Item for which 55% is a “perfect” score</b>					
3	NA	Appropriateness of technical level	70%	70%	NA

The percentages for items where 100% is “perfect” can be interpreted as follows:

- 0% to 35% Very Poor
- 36% to 55% Poor
- 56% to 70% Fair
- 71% to 85% Good
- 86% to 100% Very Good to Excellent

The percentages for items where 55% is “perfect” can be interpreted as follows:

- less than 50% Not technical enough
- 50% to 60% About right
- greater than 60% Too technical

## After Time Has Elapsed (Telephone Interview Results)

### *General Satisfaction*

The phrase “after time has elapsed” is meant to distinguish the independent evaluation measurement of satisfaction, which takes place one or more years after participation, from the exit survey that is taken immediately following the classes.

One central question was asked to measure student satisfaction with the training received. The results of that question are shown in Table xA-53, and put the program in a positive light. Overall, 94% of the interviewees rated their satisfaction at 4 or 5 on a 5-point scale, and 100% of the Level II students did so.

**Table xA-53. Student Satisfaction with Training**

<b>Overall Satisfaction with Training</b>	<b>2006–08 Level I Students (N=72)</b>	<b>2006–08 Level II Students (N=29)</b>	<b>2006–08 Students (N=101)</b>
1 Very Dissatisfied	0%	0%	0%
2	1%	0%	1%
3	7%	0%	5%
4	44%	38%	43%
5 Very Satisfied	47%	62%	52%

### *Suggestions for Improvement*

As part of determining satisfaction and providing a means to increase satisfaction for the next program cycle, students were also asked if they thought the training could be improved and, if so, how? A little over a quarter of the students thought there could be improvements (Table xA-54). Those interviewees were asked to make specific suggestions and their answers were recorded verbatim and later coded into categories. The suggestions are seen in Table xA-55.

**Table xA-54. Were there Any Courses that Could Be Improved Upon?**

<b>Answer</b>	<b>2006–08 Level I Students (N=72)</b>	<b>2006–08 Level II Students (N=29)</b>	<b>2006–08 Students (N=101)</b>
Yes	26%	28%	27%
No	74%	72%	73%

Twenty-six respondents made specific suggestions. By far the most common suggestion, made by over half of this group, was to include more depth or detail in the instruction. Almost a quarter of the group offering input suggested that better instructional methods be employed in some courses. On the other hand, 12% felt the information was too advanced for them. Several suggestions were made for adding courses or modules to courses such as: green building, safety, indoor air quality, advanced technologies, and offering a third level of study. Suggestions addressing instructional methods included asking for more graphics, more hands-on training, more use of the web, and more accessibility of classes.

Table xA-55. Suggestions for Course Improvement

Suggestions	2006–08 Students (N=26)
More depth or detail	54%
Employ better instructional methods	23%
Green building classes	12%
Info too advanced	12%
More graphics	8%
More hands-on training	8%
More on safety	8%
Make classes more accessible	8%
Use web for presentation	8%
More on indoor air quality	4%
Make use of web as an info resource	4%
Cover advanced technologies	4%
Add Level III	4%

Below are some examples of what students said that were categorized into the two top categories.

First, requests for more depth or detail:

“Be more in depth. (p) Pretty much generally don't go into depth nor detail. They just skimmed across the surface. They don't go in depth like a trade school. (p) Instructors are well informed, but they only lightly skim over surface. (p) That is pretty much it.”

“I believe the HVAC system could been more detailed. The bulk of the course information was kind of short. (p) More emphasis on safety with the electrical.”

“Those are tough questions to answer. The reason why, the whole thing, the way, a little too general in terms of the information presented. (p) More hands on training, meaning like, similar, like, just more visual with the training films. (p) Why no, that's it.

The next most common suggestion category was the request for better instructional methods. Here are some examples of those comments:

“...the lighting class. The instructor was very vague. It seemed like the class dragged. There probably could have been more information. Maybe there could have been more about it. (p) That was probably it.”

“I think the instructor for lamping was pretty tedious. It is like he took a five hour course and made it eight hours. (p) Nothing more really.”

“Just the lighting course. It seems like the instructor had four hours of information that he was trying to stretch into six or seven hours. A lot of stuff we deal with here are stage productions. So we are always on the cutting edge in regards to lighting including with energy efficiency. So we are already on top of what the instructor taught. We are already there where other people maybe new to it. (p) That's it.”

These comments from the telephone interviews of students are consistent with results from other methods used in this evaluation.

- Requests related to more depth, which imply or directly state the need for **more focus on practical application** (e.g., “They don’t go into depth **like a trade school**,” “**More hands-on** training...”), are consistent with the results from the yardstick and the exit surveys (“Details for Support of Behavior Change and Adult Learning Yardstick”, p. A-16).

It seems unlikely that the requests for more depth or detail should be interpreted as requests for greater technical depth or detail since:

- Exit survey findings that indicated most of the students found the information somewhat too technical
  - 12% of the interview respondents who suggested improvements indicated that the information presented in the classes was too advanced.
- Requests related to better instructional methods also are consistent with results from the yardstick used to evaluate the courses (“Details for Support of Behavior Change and Adult Learning Yardstick”, p. A-16).

### *Dropouts*

As was mentioned earlier in the report, 35 participants in the sample were identified as possibly having dropped out of the program based on their registration patterns. However, only 10 of those actually intended to drop out. Those 10 participants were asked for the reasons they had for this decision. The most common reason was simply that they did not have enough time (Table xA-56). This may speak to the need to make the classes more accessible by offering them in formats and at times more feasible for those who are not able to leave work for the classes. A second most common specific reason (not “other”) for dropping out is that they already knew all or most of the material presented, which corresponds to the suggestion seen in Table xA-55 that more depth or detail be covered in class. Only 10% (one person) left because the material was too technical or because they don’t work in the field any more.

**Table xA-56. Reasons for Dropping Out of the Program**

<b>Reasons</b>	<b>2006–08 Students (N=10)</b>
Didn't have the time	60%
Already knew all or most of material	20%
Material was too technical	10%
Don't work in the field any more	10%
Other	30%

# Appendix A-3: BOC Seminar Participants Interview Protocol

## Building Operators Certification Study CSRS #91824 10/14/09

May I please speak with (INSERT NAME FROM SAMPLE)?

Hello, this is \_\_\_\_\_, calling about your participation in the Building Operator's Certification program. Southern California Edison Company is conducting an evaluation of that program to get information on how to improve it, and to see how well it is meeting your needs.

P0. Our records indicate that you were enrolled in one or more classes in the BOC program, is that correct?

- 1 YES
- 2 NO → THANK AND TERMINATE, RECORD AS NQP0
- 8 DON'T KNOW → THANK AND TERMINATE, RECORD AS DKP0
- 9 REFUSED → THANK AND TERMINATE, RECORD AS RFP0

Are you willing to answer some questions about your experience with the program and your work?

- 1 YES → CONTINUE
- 2 NO → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL
- 8 DON'T KNOW → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL
- 9 REFUSED → THANK AND TERMINATE, RECORD AS INTIAL REFUSAL

### Characteristics of participants

P1. Do you conduct, direct, oversee, or administer operations and maintenance activities at your facility?

- 1 YES
- 2 NO → THANK AND TERMINATE, RECORD AS NQP1
- 8 DON'T KNOW → THANK AND TERMINATE, RECORD AS DKP1
- 9 REFUSED → THANK AND TERMINATE, RECORD AS RFP1

P1a. Which of the following best describes your position:

- 1 I perform the operation and maintenance work
- 2 I supervise the operation and maintenance work
- 3 I have strictly an administrative role in the company
- 4 Other (SPECIFY): \_\_\_\_\_
- 8 DON'T KNOW
- 9 REFUSED

P2. How many years have you been in building operations?

- \_\_\_\_\_ MONTHS
- \_\_\_\_\_ YEARS
- 8888=DON'T KNOW
- 9999=REFUSED

P2a. How many years have you been in building operations at the current location?

\_\_\_\_\_ MONTHS

\_\_\_\_\_ YEARS

8888=DON'T KNOW

9999=REFUSED

P3. Does your facility have more than one building?

1 YES

2 NO → SKIP TO P5

8 DON'T KNOW → SKIP TO P5

9 REFUSED → SKIP TO P5

P4. How many buildings are there?

\_\_\_\_\_ number of buildings 888=DON'T KNOW 999=REFUSED

P4a. Does your facility have more than one service address?

1 YES

2 NO

8 DON'T KNOW

9 REFUSED

P5. What is the approximate square footage of the total conditioned space of the buildings for which you have responsibilities?

\_\_\_\_\_ square footage 8888=DON'T KNOW 9999=REFUSED

P6. Do you have or share responsibility for... (READ; CHECK ALL THAT APPLY)

1 monitoring energy use at your facility

2 controlling or reducing energy use at your facility

3 paying or approving payments of energy bills?

8 DON'T KNOW

9 REFUSED

P7. How would you characterize the principal business or activity performed at the buildings for which you have responsibility? (DON'T READ; PROBE TO CODE)

01 GROCERY STORE

02 GOVERNMENT/COMMUNITY SERVICES (CHURCHES/COURTHOUSES/MUSEUMS)

03 HOSPITALITY

04 MEDICAL

05 OFFICE BUILDING (INCLUDING GOVERNMENT OFFICES)

06 RESIDENTIAL (APTS/CONDOS)

07 RESTAURANT

08 RETAIL

09 SCHOOLS/COLLEGES/UNIVERSITIES

10 OTHER COMMERCIAL

11 CHEMICALS/PETROLEUM/PLASTICS/RUBBER

12 ELECTRONICS AND EQUIPMENT

13 FOOD PROCESSING

14 HEAVY INDUSTRY/FABRICATION

15 HIGH TECHNOLOGY (FACILITIES WITH CLEAN ROOMS)

16 WAREHOUSE

17 OTHER INDUSTRIAL

- 88 DON'T KNOW
- 99 REFUSED

**IF P7=10 (OTHER COMMERCIAL) OR P7=11 (OTHER INDUSTRIAL) CONTINUE OTHERWISE SKIP TO S1**

P7\_verbatim Other principal business or activity:

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P8. Which of the following organizations, if any, does your employer belong to:

- 1 IFMA
- 2 BOMA
- 3 CSHE
- 4 PC-APPA
- 5 CASBO
- 6 CASH
- 7 Other (SPECIFY) \_\_\_\_\_
- 8 DON'T KNOW
- 9 REUFSED

**Satisfaction with classes/course of study**

S1. On a scale of 1-5, where 1 is not at all satisfied and 5 is very satisfied, how satisfied are you overall with the training you received?

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

S2. Were there any courses that you think could be improved upon?

- 1 YES → CONTINUE
- 2 NO → SKIP TO INSTRUCTION ABOVE S3
- 8 DON'T KNOW → SKIP TO INSTRUCTION ABOVE S3
- 9 REFUSED → SKIP TO INSTRUCTION ABOVE S3

S2a. How could we provide a more meaningful course to you?

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**IF DROPOUT=1 OR 2 CONTINUE OTHERWISE SKIP TO INTRO ABOVE AK1**

S3. Have you decided not to continue with the certification program?

- 1 YES → CONTINUE
- 2 NO → SKIP TO INTRO ABOVE AK1
- 8 DON'T KNOW → SKIP TO INTRO ABOVE AK1
- 9 REFUSED → SKIP TO INTRO ABOVE AK1

S4. Why have you decided to leave the program? Is it because...

		YES	NO	DON'T KNOW	REFUSED
a.	You already knew all or most of the material	1	2	8	9
b.	The material was too technical	1	2	8	9
c.	You didn't have the time	1	2	8	9
d.	You don't work in this field anymore	1	2	8	9
e.	Other (IF YES: SPECIFY) _____	1	2	8	9

### Influence of classes on AKA

For the next four questions, please use a scale of 1-5, where 1 is strongly disagree and 5 is strongly agree. [IF DROPOUT=1 OR 2 INSERT, Please answer based on the courses you have actually taken.]

AK1. Your contribution to O&M discussions at your facility is more helpful than before the BOC training.  
 \_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

AK2. Your interactions with contractors are more productive now because of your BOC training.  
 \_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

AK3. The BOC training has increased the likelihood that you will encourage your organization to take efficiency actions and participate in your utility's energy efficiency programs.  
 \_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

AK4. The BOC training has made you more confident about what actions your facility might take to reduce load, should the state or your utility call for a "demand response."  
 \_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

### Influence of classes on behavior

B1. Aside from any activities you did as part of the coursework, have you used or applied at your facility any of the concepts or methods taught in the series?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

B2. Have you shared any of the concepts or methods you learned in the series with any of your coworkers or anyone outside your firm?

- 1 YES COWORKERS → CONTINUE
- 2 YES PEOPLE OUTSIDE FIRM → CONTINUE
- 3 YES BOTH → CONTINUE
- 4 NO NEITHER → SKIP TO B4
- 8 DON'T KNOW → SKIP TO B4
- 9 REFUSED → SKIP TO B4



B3. As far as you know, have any of those efforts led to your colleagues initiating energy efficiency projects at their own facilities?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

B4. Since your training, has your facility begun or completed any projects or initiatives aimed at increasing energy efficiency, such as installing energy efficient equipment, performing energy audits, or installing monitoring equipment?

- 1 YES → CONTINUE
- 2 NO → SKIP TO B10
- 8 DON'T KNOW → SKIP TO B10
- 9 REFUSED → SKIP TO B10

B5. What equipment, projects, or initiatives has your facility begun or completed?

(DON'T READ; CHECK ALL THAT APPLY)

- 01 LIGHTING
- 02 AIR CONDITIONING
- 03 MOTORS (INCLUDING FANS)
- 04 CONTROLS
- 05 CHILLERS
- 06 BOILERS
- 07 ENERGY AUDIT
- 08 BENCHMARKING
- 09 MONITORING (INCLUDING INSTALLATION OF MONITORING EQUIPMENT)
- 10 OTHER
- 88 DON'T KNOW
- 99 REFUSED

**IF B5=10 (OTHER) CONTINUE, OTHERWISE SKIP TO B7**

B6. What other equipment, projects or initiatives has your facility begun or completed?

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B7. Is the equipment, project, or initiative complete?

- 1 YES → CONTINUE
- 2 NO → SKIP TO B9
- 8 DON'T KNOW → SKIP TO B9
- 9 REFUSED → SKIP TO B9

B8a. Did you apply for a rebate from your utility for this?

- 1 YES → CONTINUE
- 2 NO → SKIP TO B9
- 8 DON'T KNOW → SKIP TO B9
- 9 REFUSED → SKIP TO B9

B8b. Did you get the rebate?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

B9. Please use a scale from 1 to 5, where 1 is no influence at all and 5 is very influential. How much influence did your BOC training had on the project? [IF NEEDED: Such as the decision to go ahead with the project at this time, the type of efficiency of equipment for the project.]

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

B10. Since your training, have you advocated for any energy efficiency equipment or projects that have not been initiated?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM1
- 8 DON'T KNOW → SKIP TO OM1
- 9 REFUSED → SKIP TO OM1

B11. What energy efficiency equipment or projects did you advocate for?

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B12. Do you think it might happen in the future?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

### O&M Practices

OM1. Do you carry out any type of ongoing or repeated look at building energy use, such as benchmarking or indexing?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM4
- 8 DON'T KNOW → CONTINUE
- 9 REFUSED → SKIP TO OM4

OM2. Do you... (READ; CHECK ALL THAT APPLY)

		YES	NO	DON'T KNOW	REFUSED
a.	review utility bills	1	2	8	9
b.	monitor sub-loads	1	2	8	9
c.	record and trend sub-loads	1	2	8	9
d.	regularly review trended data on Energy Management System	1	2	8	9
e.	Other (NOT SPECIFYING)	1	2	8	9

OM3. Deliberately skipped

OM4. Do your responsibilities include the operation of a boiler system?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM8
- 8 DON'T KNOW → SKIP TO OM8
- 9 REFUSED → SKIP TO OM8

OM5. How often do you check the boiler combustion system? Would you say...

- 1 Every few years → CONTINUE
- 2 About once a year → CONTINUE
- 3 About twice a year → CONTINUE
- 4 Every few months → CONTINUE
- 5 Continuous monitoring → CONTINUE
- 6 Never → SKIP TO OM7
- 8 DON'T KNOW → SKIP TO OM7
- 9 REFUSED → SKIP TO OM7

OM6. What methods do you use to check and adjust the boiler combustion system? Do you...

		YES	NO	DON'T KNOW	REFUSED
a.	visually inspect boiler flame and soot accumulation	1	2	8	9
b.	analyze flue gas composition	1	2	8	9
c.	other (NOT SPECIFYING)	1	2	8	9

OM7. How often do you inspect the steam traps for need of repair or replacement? Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

OM8. Are you responsible for the operation of the cooling system?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM20
- 8 DON'T KNOW → SKIP TO OM20
- 9 REFUSED → SKIP TO OM20

OM9. How often do you check for leaks in the supply and return air duct system? Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

**Appendix A-3: BOC Seminar Participants Interview Protocol**

OM10. What methods do you use to check for leaks in the supply and return air duct system?  
Do you use...

		YES	NO	DON'T KNOW	REFUSED
a.	infrared scans	1	2	8	9
b.	"smoke bomb"	1	2	8	9
c.	other (NOT SPECIFYING)	1	2	8	9

OM11. Does your system have economizers?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM13
- 8 DON'T KNOW → SKIP TO OM13
- 9 REFUSED → SKIP TO OM13

OM12. How often do you test for proper damper modulation in the outdoor air dampers?

Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

OM13. Are your building's cooling needs primarily met by a central chilled water plant or packaged AC system?

- 1 Chilled water plant → CONTINUE
- 2 Packaged system → SKIP TO INSTRUCTION ABOVE OM18
- 8 DON'T KNOW → SKIP TO INSTRUCTION ABOVE OM18
- 9 REFUSED → SKIP TO INSTRUCTION ABOVE OM18

OM14. How often do you check and recalibrate chilled water loop controls? Would you say...

- Every few years → CONTINUE
- About once a year → CONTINUE
- About twice a year → CONTINUE
- Every few months → CONTINUE
- Never → SKIP TO OM16
- DON'T KNOW → CONTINUE
- REFUSED → CONTINUE

OM15. Which of the following does your check of chiller controls include? Does it include...

- 1 testing of sensor & valve function
- 2 comparison of temperature set point against control points
- 3 other activities
- 8 DON'T KNOW
- 9 REFUSED

**IF OM15=3 (OTHER ACTIVITIES) CONTINUE, OTHERWISE SKIP TO OM17**

OM16. Other chiller control checks:

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OM17. How often do you clean chiller evaporator or condenser tubes? Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

**IF OM13=2 (PACKAGED SYSTEM) CONTINUE, OTHERWISE SKIP TO OM19**

OM18. How often do you check refrigerant pressures and temperatures on your package units?

Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

IFOM13=1 (CHILLED WATER PLANT) CONTINUE, OTHERWISE SKIP TO OM19b (NOTE – IF BOTH CHILLER AND PACKAGED, GET TONNAGES FOR EACH)

OM19a. What are the tonnages of the cooling units for which you are responsible?

\_\_\_\_\_ number of tonnages 888=DON'T KNOW 999=REFUSED

**IFOM13=2 (PACKAGED SYSTEM) CONTINUE, OTHERWISE SKIP TO OM20**

OM19b. What are the tonnages of the cooling units for which you are responsible?

\_\_\_\_\_ number of tonnages 888=DON'T KNOW 999=REFUSED

OM20. Are you responsible for the operation of any motors, including any applications such as compressed air?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM26
- 8 DON'T KNOW → SKIP TO OM26
- 9 REFUSED → SKIP TO OM26

OM21. How often do you inspect bearings and belt alignments on motors for fans and pumps? Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 8 DON'T KNOW
- 9 REFUSED

OM22. How often do you lubricate motor, fan, and pump bearings? Would you say...

- 1 Every few years
- 2 About once a year
- 3 About twice a year
- 4 Every few months
- 5 Never
- 6 Bearings permanently sealed
- 8 DON'T KNOW
- 9 REFUSED

OM23. Do you utilize variable frequency drives on any of your manufacturing equipment or HVAC system components?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM26
- 8 DON'T KNOW → SKIP TO OM26
- 9 REFUSED → SKIP TO OM26

OM24. Do you do calibration and testing on it?

- 1 YES → CONTINUE
- 2 NO → SKIP TO OM26
- 8 DON'T KNOW → SKIP TO OM26
- 9 REFUSED → SKIP TO OM26

OM25. How often do you do this testing and adjusting process? Would you say...

- 1 Only at time of VFD installation
- 2 Every few years
- 3 About once a year
- 4 About twice a year
- 5 Every few months
- 6 Never
- 8 DON'T KNOW
- 9 REFUSED

OM26. Are you responsible for the operation of compressed air systems?

- 1 YES → CONTINUE
- 2 NO → SKIP TO PP1
- 8 DON'T KNOW → SKIP TO PP1
- 9 REFUSED → SKIP TO PP1

OM27. How often do you inspect the compressed air system for leaks? Would you say...

- 1 Every few years → CONTINUE
- 2 About once a year → CONTINUE
- 3 About twice a year → CONTINUE
- 4 Every few months → CONTINUE
- 5 Never → SKIP TO PP1
- 8 DON'T KNOW → CONTINUE
- 9 REFUSED → SKIP TO PP1

OM28. What methods do you utilize for leak detection? Do you...

		YES	NO	DON'T KNOW	REFUSED
a.	inspect network and listen	1	2	8	9
b.	monitor flow balances	1	2	8	9
c.	use of portable ultrasonic acoustic detector	1	2	8	9
d.	other (NOT SPECIFYING)	1	2	8	9

**IF OM26=1 (YES) CONTINUE, OTHERWISE SKIP TO PP1**

OM30. How often do you monitor for system power use, pressure, and temperatures? Would you say...

- 1 Every few years → CONTINUE
- 2 About once a year → CONTINUE
- 3 About twice a year → CONTINUE
- 4 Every few months → CONTINUE
- 5 Never → SKIP TO PP1
- 8 DON'T KNOW → SKIP TO PP1
- 9 REFUSED → CONTINUE

OM31. Do you record values and conduct baseline monitoring of these compressed air operating parameters as a part of O & M practices?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

OM32. Please rate how helpful you think the BOC classes have been in helping you implement energy efficiency decision-making? Please use a 1 to 5 scale, with 1 being not at all helpful, and 5 being very helpful.

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

**Process Questions**

PP1. Did you receive advance or pre-class materials for any of the classes you have attended?

- 1 YES → CONTINUE
- 2 NO → SKIP TO PP4
- 8 DON'T KNOW → SKIP TO PP4
- 9 REFUSED → SKIP TO PP4

PP2. Which ones?

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PP3. Was it helpful to receive the pre-class materials?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

PP4. Did the BOC program staff remind your supervisor of any of your classes in advance?

- 1 YES → CONTINUE
- 2 NO → SKIP TO PP7a
- 8 DON'T KNOW → SKIP TO PP7a
- 9 REFUSED → SKIP TO PP7a

PP5. Which ones?

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PP6. Was it helpful that your supervisor was reminded?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

PP7a. Have you been certified for Level I?

- 1 YES → CONTINUE
- 2 NO → SKIP TO PP9
- 8 DON'T KNOW → SKIP TO PP9
- 9 REFUSED → SKIP TO PP9

PP7b. Have you been certified for Level II?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF PP7a=1 (YES) OR PP7b=1 (YES) CONTINUE, OTHERWISE SKIP TO PP9**

PP8. Was your supervisor notified of the certification?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

PP10. Please use a 1 to 5 scale, with 1 meaning not at all important and 5 meaning very important. How important is the certification to you beyond the actual training?

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

PP11. Using the same 1 to 5 scale, with 1 being not at all important and 5 being very important, based on your impressions, how important do you think the certification is to your employer?

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED



PP12. Using a 1 to 5 scale, with 1 being not at all serious and 5 being very serious, how seriously does your employer take the training you have completed?  
\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

PP13. How did you learn about the BOC program?

- 1 Advertisements in Trade Journals → SKIP TO PP15
- 2 Our SCE account rep → SKIP TO PP15
- 3 Calendars of training events sent to you or your supervisor → SKIP TO PP15
- 4 Other → CONTINUE
- 8 DON'T KNOW → SKIP TO PP15
- 9 REFUSED → SKIP TO PP15

PP14. Where did you learn about it?

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PP15. Would you be interested in a refresher course about advances in energy-efficiency that would be offered every other year?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

PP16. Would you be interested in taking classes in a web format (Webinar)?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

PP17. Would you like a 1-2 hour module to be added to a class where SCE account managers come to discuss SCE energy-efficiency programs, and available rebates, incentives and services?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

## Energy Efficiency Programs

EP1. What utility programs for energy efficiency are you aware of? [DON'T READ]

- 01 EXPRESS EFFICIENCY
- 02 STANDARD PERFORMANCE CONTRACT
- 03 DEMAND RESPONSE
- 04 ADDITIONAL CLASSES AT CTAC
- 05 SAVINGS BY DESIGN
- 06 RETRO-COMMISSIONING
- 07 COMPREHENSIVE HVAC
- 08 OTHER (SPECIFY) \_\_\_\_\_
- 88 DON'T KNOW
- 99 REFUSED

**IF EP1=03 CONTINUE, OTHERWISE SKIP TO EP5**

EP2. Does your utility have a demand response program?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=03 (DEMAND RESPONSE) OR EP2=1 (YES) CONTINUE, OTHERWISE SKIP TO EP5**

EP3. Are you participating in the DR program?

- 1 YES → CONTINUE
- 2 NO → SKIP TO EP5
- 8 DON'T KNOW → SKIP TO EP5
- 9 REFUSED → SKIP TO EP5

EP4. Were you introduced to this by BOC?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

EP5. Which utility serves the buildings of the company where you are employed?

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**IF EP1=01 (EXPRESS EFFICIENCY) SKIP TO INSTRUCTION ABOVE EP6b, OTHERWISE CONTINUE**

EP6a. Are you familiar with express efficiency?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=02 (STANDARD PERFORMANCE CONTRACT) SKIP TO INSTRUCTION ABOVE EP6c, OTHERWISE CONTINUE**

EP6b. Are you familiar with standard performance contract?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=04 (ADDITIONAL CLASSES AT CTAC) SKIP TO INSTRUCTION ABOVE EP6d, OTHERWISE CONTINUE**

EP6c. Are you familiar with additional classes at CTAC?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=05 (SAVINGS BY DESIGN) SKIP TO INSTRUCTION ABOVE EP6e, OTHERWISE CONTINUE**

EP6d. Are you familiar with savings by design?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=06 (RETRO-COMMISSIONING) SKIP TO INSTRUCTION ABOVE EP6f, OTHERWISE CONTINUE**

EP6e. Are you familiar with retro-commissioning?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=07 (COMPREHENSIVE HVAC) SKIP TO INSTRUCTION ABOVE EP6g, OTHERWISE CONTINUE**

EP6f. Are you familiar with the comprehensive HVAC program?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

**IF EP1=03 (DEMAND RESPONSE) SKIP TO EP9, OTHERWISE CONTINUE**

EP6g. Are you familiar with demand response?

- 1 YES → CONTINUE
- 2 NO → SKIP TO EP9
- 8 DON'T KNOW → SKIP TO EP9
- 9 REFUSED → SKIP TO EP9

EP7. Are you participating in the DR program?

- 1 YES → CONTINUE
- 2 NO → SKIP TO EP9
- 8 DON'T KNOW → SKIP TO EP9
- 9 REFUSED → SKIP TO EP9

EP8. Were you introduced to this by BOC?

- 1 YES
- 2 NO
- 8 DON'T KNOW
- 9 REFUSED

EP9. Has your company participated in any energy efficiency programs sponsored by your utility company?

- 1 YES → CONTINUE
- 2 NO → SKIP TO ENDING
- 8 DON'T KNOW → SKIP TO ENDING
- 9 REFUSED → SKIP TO ENDING

EP10. What programs did you participate in, and when? (IF NEEDED: Please use date project committed, not finished.)

Program Year    Month

- 1.
- 2.
- 3.

**IF EP10 HAS AT LEAST 1 PROGRAM CONTINUE, OTHERWISE SKIP TO ENDING**

EP10a. Using a 1 to 5 scale, where 1 means very unsatisfied and 5 means very satisfied. How satisfied were you with the [INSERT PROGRAM 1]?

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

**IF EP10 HAS AT LEAST 2 PROGRAMS CONTINUE, OTHERWISE SKIP TO ENDING**

EP10b. Using the same 5 point scale, where 1 means very unsatisfied and 5 means very satisfied, how satisfied were you with the [INSERT PROGRAM 2]?

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

**IF EP10 HAS AT LEAST 3 PROGRAMS CONTINUE, OTHERWISE SKIP TO ENDING**

EP10c. Using that same 5 point scale, how satisfied were you with the [INSERT PROGRAM 3]? [IF NEEDED: 1 means very unsatisfied and 5 means very satisfied.]

\_\_\_\_\_ 8=DON'T KNOW 9=REFUSED

Ending: That concludes the interview. Thank you very much for your help!

# Appendix A-4:

## BOC Instructor Interview Guide

### Interview Guide for BOC Instructors (PY 2006-2008)

Interviewee: \_\_\_\_\_

1. During 2006 to 2008, which of the BOC classes did you teach? (confirm our records are correct)  
See last page for table of classes.
2. What kind of training or guidance — specific to teaching the BOC class(es) — have you received?
  - 2.1. What training or guidance did you receive when you first started teaching BOC classes?
  - 2.2. Have you received training or guidance since then? If so, what?
  - 2.3. Have you been trained specifically in applying adult learning principles or practices (either through the BOC program or other avenues)?
    - 2.3.1. If so, where/how did you receive this training/coaching?
    - 2.3.2. How do you incorporate the principles you learned into the BOC classes you deliver?
3. For \_\_\_\_\_ (class name), what percentage of the total time of the class time do you spend on each of the following delivery methods?  
Is this true of the other classes you teach? If not, how is it different?
 

<b>Method</b>	<b>%</b>
a. Lecture/Presentation (including PowerPoint or other slideshow)	
b. Video/Movie presentation	
c. Group Discussion	
d. Instructor demonstration	
e. Attendee Presentations	
f. Hands-on exercises	
g. Other (specify)	
4. What role do the participants' home work assignments play in the training?
  - 4.1. Do you review their homework from a preceding class before teaching your class?
  - 4.2. Do you review their homework assignment from the class that you have taught?
5. How closely do you follow the outline and agenda for the class?
  - a. Completely — “what’s there and only what’s there”
  - b. Closely — “what’s there, but with my own additions”
  - c. Fairly closely — “mostly what’s there, with my own additions”
  - d. Moderately — “use the course materials as a general guideline”
  - e. Loosely — “use the course materials as a general guideline”
6. [Skip if 5 = a] Do you add “stories and examples” that are not included in the standard material?

7. What do these stories and examples focus on?
  - 7.1. Do you talk about...
    - a. General considerations for applying what the class addresses in the type of organization the participants work in
    - b. Detailed considerations specific to applying what the class addresses in the type of organization the participants work in
    - c. "Success stories" and "ware stories" from other similar organizations?
8. Do you use any materials in addition to the standard BOC materials when you teach this class?
  - a. Yes
  - b. NoIf yes...
  - 8.2. What kind of additional materials do you use?
    - a-1. New or customized slides
    - a-2. Handouts summarizing course content
    - a-3. Handouts with specific "how-to" instructions/guides
    - a-4. List of resources
    - a-5. Tools (ex. Flicker-Checker)
    - a-6. Software
    - a-7. Reference materials (ex. Title 24 codes)
    - a-8. DVD or CD
    - a-9. Other, specify
  - 8.3. What kind of kinds of information do these materials address?
9. How do you kick off the class? How do you involve the participants at startup?
  - 9.1. Do you ever adjust the training based on what you learn about the participants' experience, needs, and interests?
    - a-1. Yes
    - a-2. NoIf yes...
  - 9.1.2. How do you learn about participants experience, needs, and interests?
  - 9.1.3. Can you describe an example of when how you've done this?
10. What approaches do you use to encourage people to contribute their own ideas and share their own experiences?
  - 10.1. Roughly what percentage of class time typically is spent with participants sharing their ideas and experiences?
11. What kinds of techniques do you use to help people "see where we are" and "relate the parts to the whole"?
12. Do you ever ask participants to complete the in-class activities that are included in the standard BOC materials?
  - a. Yes
  - b. NoIf yes...
  - 12.2. For roughly what percentage of the classes do you do this?  
If not 100%...
    - 12.2.1. How do you decide whether to include the activities or not?
  - 12.3. (When you include the activities) Approximately what percentage of class time is spent on having the participants do the activities?

- 12.4. (When you include the activities) How do you debrief the activities? (What kind of feedback to participants receive?)
- 12.5. (When you include the activities) Approximately what percentage of the class time is spent on “debriefing” the activities?
13. Do you ever incorporate participant activities that are not part of the standard BOC materials?
- Yes
  - No
- If yes...
- 13.2. What kind of activities?
- 13.3. For roughly what percentage of the classes do you do this?
- If not 100%...
- 13.3.1. How do you decide whether to include the “extra” activities or not?
- 13.4. (When you include “extra” activities) Approximately what percentage of class time is spent on having the participants do the “extra” activities?
- 13.5. (When you include “extra” activities) How do you debrief the activities? (What kind of feedback to participants receive?)
- 13.6. (When you include the “extra” activities) Approximately what percentage of the class time is spent on “debriefing” the “extra” activities?
14. How do you help participants be successful on the final exam? (all that apply)
- Address the content and concepts that are in the class materials
  - Present examples of questions or problems that are:
    - Generally like those on the exam
    - Very similar to those on the exam
    - Exactly like those on the exam
  - Have the participants answer questions or work through problems that are:
    - Generally like those on the exam
    - Very similar to those on the exam
    - Exactly like those on the exam
  - Specifically cover exam questions, noting they are on the exam

## Target Audience / Customer Segments

15. What level of expertise is expected of the audience at the beginning of the \_\_\_\_\_ (course)?
- None/Novice — no experience needed to understand the course
  - Basic/Appreciation — basic skills or knowledge in this topic
  - Operational — can apply the skills and concepts addressed in the class to different situations; can analyze situations relative to the concepts addressed in the class
  - Expert — can apply skills and concept addressed in the class to complex situations; can interpret and weigh complex alternatives using the skills and concepts addressed in the class
  - Mixed (mix of skill levels)
16. What is their expected skill level at the end of the course?
- None/Novice — no experience needed to understand the course
  - Basic/Appreciation — basic skills or knowledge in this topic
  - Operational — can apply the skills and concepts addressed in the class to different situations; can analyze situations relative to the concepts addressed in the class
  - Expert — can apply skills and concept addressed in the class to complex situations; can interpret and weigh complex alternatives using the skills and concepts addressed in the class
  - Mixed (mix of skill levels)

17. Do participants typically meet the expected entry-level of expertise?
  - a. Yes
  - b. No
18. Do participants typically meet the expected skill level at the end of the class?
  - a. Yes
  - b. No

## EE/Demand Reduction Measures and Programs

19. To what degree is the implementation of EE (energy efficiency) practices or behaviors by participants is the focus of the course?
  - a. Very high — 90 to 100% of the course focuses on implementation of EE practices/behaviors
  - b. High — 70 to 89%
  - c. Moderate — 40 to 69%
  - d. Low — 20 to 39%
  - e. Very low — less than 20%
  - 19.2. Can you give us some examples of specific and actionable guidance you give students on how to implement EE practices and behaviors?
20. To what degree is the implementation of Demand Reduction practices or behaviors by participants is the focus of the course?
  - a. Very high — 90 to 100% of the course focuses on implementation of demand reduction practices/behaviors
  - b. High — 70 to 89%
  - c. Moderate — 40 to 69%
  - d. Low — 20 to 39%
  - e. Very low — less than 20%
  - 20.2. Can you give us some examples of specific and actionable guidance you give students on how to implement Demand Reduction practices and behaviors?
21. How familiar would you say you are with SCE's incentive and rebate programs that are relevant to your class participants and class topics?
  - a. Very knowledgeable
  - b. Moderately knowledgeable
  - c. Little knowledge
  - d. No or virtually no knowledge
22. In a typical class taught in SCE territory, do you — as the instructor — address SCE incentive or rebate programs in any way?
  - a. Yes
  - b. No

If yes..

  - 22.2. Which of the following describes how you address the programs?
    - a-1. Note which measures or technologies you're covering in the class are addressed by an SCE program
    - a-2. Describe relevant programs and what their goals/objectives are
    - a-3. Describe the benefits of relevant programs
    - a-4. Tell people how they can get more information on the program
    - a-5. Suggest ways people can get started with the program
    - a-6. Distribute literature related to the program



- a-7. Other (specify) \_\_\_\_\_
- 22.3. For (roughly) what percentage of the BOC classes you teach do you address programs in this way?
- 22.4. When you do address SCE programs in a BOC class, about what percentage of the class time is focused on program-specific topics?
- 23. Do SCE program manger or account reps (or other SCE personnel) ever visit your BOC classes to share information with participants on relevant SCE programs?  
If so...
  - 23.1. For (roughly) what percentage of the BOC classes you teach do SCE representatives visit in this way?
  - 23.2. Typically, about how much time is allotted for the SCE representative's presentation?
  - 23.3. How many programs do they typically address in their presentation?
    - a-1. Information about only one program
    - a-2. Overviews of multiple programs
    - a-3. Relatively detailed information about one program, with overviews of other programs
    - a-4. Relatively detailed information about multiple programs
  - 23.4. What type of information do they share about the programs?
    - a-1. Note which measures or technologies you're covering in the class are addressed by an SCE program
    - a-2. Describe relevant programs and what their goals/objectives are
    - a-3. Describe the benefits of relevant programs
    - a-4. Tell people how they can get more information on the program
    - a-5. Suggest ways people can get started with the program
    - a-6. Distribute literature related to the program
    - a-7. Other (specify) \_\_\_\_\_
- 24. In what ways do you encourage — as the instructor — participants to act on energy efficiency and demand-reduction measures and practices?
  - a. Include specific calls to action and recommend next steps
  - b. Ask them to develop (in class) an individual "action plan" or "to do" list
  - c. Provide them with worksheets or quick references that help them assess their options
  - d. Point them in the right direction to get more information or assistance
- 25. What roadblocks do you think participants are likely to encounter if they try to apply the skills and knowledge addressed in the class?
  - 25.1. What things can help them overcome these obstacles?
- 26. Assuming one of the goals of the BOC curriculum is to encourage and support participants taking action to improve energy efficiency (and reduce demand), what suggestions do you have for helping achieve this goal through the training?

## BOC Instructor Course Map

	Rick Casault	Roger Ebbage	Dale Garcia	Gregory Hansen	Richard Jackson-Gistelli	Greg Jourdan	Duane Lewellen	Tony Lipka	Bud Offerman	Rich Prill	Bob Rogers	Bill Weber	David Wylie	Alan Suleiman
101 Building Systems Overview											YES		YES	
102 Energy Conservation Techniques		YES			YES						YES		YES	
103 HVAC Systems and Controls					YES	YES					YES		YES	
104 Efficient Lighting Fundamentals				YES										YES
105 Op. and Maint. Practices for Sustainable Buildings														
106 Indoor Air Quality									YES	YES				
107 Facility Electrical Systems								YES				YES		
201 Preventive Maintenance and Troubleshooting Principles						YES					YES			
202 Advanced Electrical Diagnostics			YES											
203 HVAC Troubleshooting and Maintenance							YES				YES		YES	
204 HVAC Controls and Optimization					YES	YES					YES		YES	
211 Motors In Facilities											YES		YES	
214 Introduction to Building Commissioning	YES										YES			
216 Enhanced Automation and Demand Reduction											YES		YES	

# **Appendix A-5: BOC and SCE EC Exit Surveys**

## Mapping BOC and SCE Exit Surveys

BOC		SCE	
Item #	BOC Item	Item #	SCE Item
1	In general, today's BOC class was... ( <i>Not Useful to Very Useful</i> )	2.	The overall quality of this seminar was excellent. ( <i>Strongly Disagree to Strongly Agree</i> )
2	How much of the information presented was new? ( <i>None to All</i> )	A.	Please rate your knowledge level on the subject matter... ( <i>Not at all knowledgeable to Very knowledgeable</i> ) Before attending the class After attending the class [Delta in Knowledge: 4 point = "All"; 0 point = "None"]
3	The content of the presentation was... ( <i>Too Basic to Too Technical</i> )	NA	NA
4	Do you feel that you can complete the on-site project based on today's presentation ( <i>No/Yes</i> )	NA	NA
5A	Please rate the following part of the class... Organization ( <i>Needs Improvement to Excellent</i> )	5.	The course material covered was well organized and easy to understand. ( <i>Strongly Disagree to Strongly Agree</i> )
5B	Please rate the following part of the class... Clarity ( <i>Needs Improvement to Excellent</i> )	3	The instructor was an effective communicator ( <i>Strongly Disagree to Strongly Agree</i> )
5C	Please rate the following part of the class... Audio/Visuals ( <i>Needs Improvement to Excellent</i> )	NA	NA
5D	Please rate the following part of the class... Handouts ( <i>Needs Improvement to Excellent</i> )	7.	The handouts will be helpful to me as reference material. ( <i>Strongly Disagree to Strongly Agree</i> )
5E	Please rate the following part of the class... Opportunity for Questions ( <i>Needs Improvement to Excellent</i> )	8.	There was an appropriate mix between presentation and group involvement. ( <i>Strongly Disagree to Strongly Agree</i> )
7	To what extent do you think this course information will increase the likelihood that you/your company will purchase energy efficient equipment or energy efficiency practices in the future? ( <i>Very Unlikely to Very Likely</i> )	B.	To what extent do you think this course information will increase the likelihood that you/your company will purchase energy efficient equipment or energy efficiency practices in the future? ( <i>Very Unlikely to Very Likely</i> )
10	Would you like your electric and gas utility to tell you more about their Energy Audit Service? ( <i>Yes/No</i> )	E.	Would you like Southern California Edison to tell you more about our Energy Audit Service? ( <i>Yes/No</i> )

BOC		SCE	
Item #	BOC Item	Item #	SCE Item
11	Would you like electric and gas utility to tell you more about their Energy Efficiency Programs? <i>(Yes/No)</i>	F.	Would you like Southern California Edison to tell you more about our Energy Efficiency Programs? <i>(Yes/No)</i>
12	Do you feel you got a good value for your time and money spent on this class? <i>(Yes/No/Don't Know)</i>		
13	Would you recommend this class to others? <i>(Yes/No/Don't Know)</i>	NA	NA



## BOC Exit Survey

We would like your feedback on the class today. Your comments will help us make improvements to BOC and plan future courses of value to you.

DATE: \_\_\_\_\_ CLASS TOPIC: \_\_\_\_\_

LOCATION: \_\_\_\_\_ INSTRUCTOR: \_\_\_\_\_

YOUR JOB TITLE: \_\_\_\_\_

For the following questions, please circle a number for each question:

1. In general, today's BOC class was:

Not Useful					Somewhat Useful					Useful			Very Useful
1	2	3	4	5	6	7	8	9	10				

2. How much of the information presented was new?

None				Little				Some				Most	All
1	2	3	4	5	6	7	8	9	10				

3. The content of presentation was:

Too Basic							About Right					Too Technical
1	2	3	4	5	6	7	8	9	10			

4. Did you feel that you can complete the on-site project based on today's presentation?

No					Need More Info					Maybe			Yes
1	2	3	4	5	6	7	8	9	10				

5. Please rate the following parts of the class:

	Needs	Improvement			Satisfactory				Very Good		Excellent
Organization	1	2	3	4	5	6	7	8	9	10	
Clarity	1	2	3	4	5	6	7	8	9	10	
Audio/Visuals	1	2	3	4	5	6	7	8	9	10	
Handouts	1	2	3	4	5	6	7	8	9	10	
Opportunity for Questions	1	2	3	4	5	6	7	8	9	10	

**OVER**

6. Suggestions for the instructor to improve:

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7. To what extent do you think this course information will increase the likelihood that you/your company will purchase energy efficient equipment or energy efficiency practices in the future? (On a scale of 1 to 5, 1=Very Unlikely, 5=Very Likely)

1       2       3       4       5

8. Will you/your company be making equipment purchase decisions for your facility in the near future? (Check one)

Next 6-months \_\_\_ 6-12 Months \_\_\_ 1-2 Years \_\_\_ Beyond 2 Years \_\_\_ Other (specify) \_\_\_ No \_\_\_

9. Is your company planning to upgrade or add any of the following? (Check as many as appropriate)

Lighting \_\_\_ HVAC \_\_\_ Industrial Processing \_\_\_ Pumping \_\_\_ Other \_\_\_\_\_ None \_\_\_

10. Would you like your electric and gas utility to tell you more about their Energy Audit Service?

Yes       No

11. Would you like electric and gas utility to tell you more about their Energy Efficiency Programs?

Yes       No

12. Do you feel you got a good value for your time and money spent on this class?

Yes       No       Don't know

13. Would you recommend this class to others?

Yes       No       Don't know

14. If you would not recommend this class to others, please tell us why.

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# SCE Exit Survey

Event #: \_\_\_\_\_

Date: \_\_\_\_\_

**SEMINAR:** \_\_\_\_\_

Please check the appropriate response. Your feedback is important and will be used to evaluate our instructors, design future courses and improve current seminars.

**Please rate the extent to which you disagree or agree with the following statements:**

	Strongly Disagree				Strongly Agree
	(1)	(2)	(3)	(4)	(5)
• The registration process was user friendly.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The overall quality of this seminar was excellent.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The instructor was an effective communicator.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The instructor was knowledgeable on this subject.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The course material covered was well organized and easy to understand.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The material covered in the seminar was relevant to my job.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The handouts will be helpful to me as reference material.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• There was an appropriate mix between presentation and group involvement.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• The classroom supported a comfortable learning experience.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• If used, the center's exhibits or displays complemented the course material and enhanced the seminar/class. (Skip, if not applicable)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
• I am completely satisfied with my total experience at the Energy Center.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A. Please rate your knowledge level on the subject matter (On a scale of 1 to 5, 1=not at all knowledgeable, 5=very knowledgeable)					
Before attending the class?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
After attending the class?	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
B. To what extent do you think this course information will increase the likelihood that you/your company will purchase energy efficient equipment or energy efficiency practices in the future? (On a scale of 1 to 5, 1=Very Unlikely, 5=Very Likely)					
	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>
C. Will you/your company be making equipment purchase decisions for your business facility in the near future? (Check one)					
Next 6-months _____, 6-12 Months _____, 1-2 Years _____, Beyond 2 Years _____, Other (specify) _____, No _____					
D. Are you/your company planning to upgrade or add any of the following? (Check as many as appropriate)					
Lighting _____, HVAC _____, Industrial Processing _____, Pumping _____, Other _____, None _____					
E. Would you like Southern California Edison to tell you more about our Energy Audit Service? <input type="checkbox"/> Yes <input type="checkbox"/> No					
F. Would you like Southern California Edison to tell you more about our Energy Efficiency Programs? <input type="checkbox"/> Yes <input type="checkbox"/> No					
G. If you requested additional information, please provide your contact information: (Name, Phone# & email address)					
_____					
H. What other services or seminars should the Energy Centers provide? _____					
_____					
I. How did you hear about this seminar?					
<input type="checkbox"/> Mailed Flier <input type="checkbox"/> Calendar <input type="checkbox"/> Email <input type="checkbox"/> Website <input type="checkbox"/> Radio <input type="checkbox"/> Billboard <input type="checkbox"/> My Supervisor, <input type="checkbox"/> My Edison Representative, Other (specify) _____					
J. Do you have any other comments?					

**ENERGY CENTER USE ONLY**

Contacted By: \_\_\_\_\_

Comments: \_\_\_\_\_



# Appendix A-6: BOC Program Stakeholder Interview Summary and Interview Guide

## Building Operator Certification Program Evaluation for PY 2006 - 2008

Summary of Interviews with the Program Director( Cynthia Putnam, NEEC) and Site Manager(Greg Funke, ASW Eng.)

Both Cynthia and Greg described program operations in the same way the program is described in the PIP. Both are familiar with the PIP.

### Program Marketing

NEEC identifies markets for the BOC program, divides them geographically, and coordinates with the IOUs and SMUD to schedule BOC courses in each geographic area. The IOUs and SMUD brand the program with their logo, which adds credibility to the program. SCE used direct mail, e-mail blasts, and posting on the SCE website to promote the program. NEEC promotes the program through professional associations, using both direct mail and e-mail blasts. NEEC maintains the website customers use to enroll in the program. NEEC works with SCE customer reps to build awareness and support for the program so that the reps will promote and support it with their customers.

Past program participants were made aware of upcoming courses, both so they could promote it to others and because they are required to continue to take classes to maintain their certification. Graduates of level one certification are the primary source of participants in level two certification courses. Supervisors of program participants and potential participants, if possible, are notified of upcoming courses, and if the program is looking for a few more participants to fill a course (making it financially possible to offer the classes), supervisors may receive personal phone calls promoting participation for their employees.

The BOC classes are held at the IOUs' energy centers. The centers maintain separate calendars and do not show the BOC classes on the calendar. BOC publishes its own calendar which is available at the ECs and through the customer reps. NEEC would like to more thoroughly integrate the two.

### Incorporating IOU Programs Into BOC Classes

An IOU customer representative is invited to present information about available IOU programs, including audits and rebates during one class in each series. This is most successful at CTAC. In outlying areas, instructors are given current information about IOU program offerings and are told to incorporate the information into their class. Printed materials about the programs are distributed to participants.

### BOC Classes

Supervisors are reminded of student participation in BOC when they receive the confirmation of enrollment. They are not reminded before each class.

BOC instructors develop their presentations based on a NEEC-provided course outline. The instructors are experts in their fields. They get feedback both from site coordinator observations and from student evaluations.

Instructors receive training in using adult learning principles at annual train-the-trainer events, and at quarterly conference calls that provide training tips and curriculum updates. NEEC is interested in improving testing procedures in the classes, because instructors provide varying levels of support and coaching during testing, and some instructors go too far in helping students.

The site coordinator is responsible for reviewing and approving students' homework assignment. The site coordinator is given a checklist for what should be included in the assignment, but he does not evaluate the "correctness" of the homework. The checklist is in the project workbook which has been provided to the program evaluation team. If a student does not satisfactorily complete the homework assignment on the first try, he is given another chance to successfully complete the assignment.

At the end of each class, students take a final exam. The exam is open book, and is graded by the site coordinator. Students are given a numeric score for the exam at the next class meeting, and if they do not pass the exam, they can take it again. A passing score is 70%.

### Prior Recommendations

1. Offer the classes in the Bakersfield area: The classes were scheduled twice, but the first time, classes were cancelled because the minimum number of participants did not enroll (20 minimum). The second time, NEEC teams with Kern High School district, and enough participants were enrolled to be able to offer the program.
2. Provide students with reading materials in advance: This was not done. The primary reading material is the handbook for each class. It is copyrighted by NEEC, and is costly to update and print. When given to students in advance, or posted on the web, NEEC loses control of its intellectual property. Further, if students are given the handbook in advance, they often forget to bring the handbook with them to class, so they don't have it available to do the in-class activities.
3. Initiate a study to estimate energy savings from the program as it operated in California: Not done. This would be an IOU responsibility, and NEEC would like to see it happen because it would be such a good sales tool for the program.
4. Assess the Spanish-speaking market potential: No
5. Offer BOC classes on-site for employers with large staffs: Yes. There were two "closed" courses on military bases at Port Hueneme and China Lake. There were courses offered at UC Santa Barbara and at the Alhambra Sheriff's facility. These two courses were open to anyone.
6. Make classes more accessible to smaller facilities: No real provisions were made during the program period. NEEC is open to self-pace attendance in the program, which might help some facilities.

## Interview Guide for Building Operator Certification Program (PY 2006 – 2008)

Interviewee: \_\_\_\_\_

1. What is your position relative to the BOC program? What are your responsibilities for the program? – How long have you worked with the program? Thinking about the implementation of the program, will you please describe for me how the program actually operated? Is your description consistent with the PIP for this program or were there variations from the PIP? What caused those variations?
2. Did SCE aid in marketing the program to customers?
  - 2.1. How did SCE implement its marketing effort?
  - 2.2. What did NEEC do to market the program to SCE customers?
  - 2.3. How were marketing efforts coordinated between NEEC and SCE?
3. Were past course participants informed about the availability and schedule of advanced classes?
4. Were the courses marketed to supervisors of likely participants? If so, please describe when and how this was done.
5. How did the energy centers keep the BOC classes discrete from the other classes offered at the centers?
  - 5.1. Was there overlap between the two sets of classes?
  - 5.2. Did customers have any trouble making the distinction?
6. How was information about relevant SCE programs (e.g. audits and rebates) incorporated into BOC course offerings?
  - 6.1. Were instructors provided information about the relevant programs to incorporate into their presentations?
  - 6.2. Were instructors provided promotional materials for the programs or other relevant materials that they distributed to class participants?
  - 6.3. How frequently did SCE representatives (e.g., program managers) attend BOC classes to present relevant programs?
7. The evaluation from the 04-05 program recommended offering BOC in Bakersfield. Was that done?
8. That same evaluation recommended that students be provided with course-related reading materials in advance of classes.
  - 8.1. Was that done?
  - 8.2. If so, how was the material provided (online, in electronic file via download or email, mailing hardcopy, etc.)?
9. At the conclusion of most of the BOC classes, participants are given a homework assignment that they turn in at the next class in the series...
  - 9.1. Who is responsible for reviewing and approving the homework assignment?
  - 9.2. What kind of feedback or coaching do participants receive on their responses to the homework assignment?
  - 9.3. Are there specific guidelines for what is required to successfully complete a homework assignment?

## Appendix A-6: BOC Program Stakeholder Interview Summary and Interview Guide

- 9.3.1. If so, may we see copies of these guidelines for all relevant BOC courses?
- 9.3.2. If not, how does the reviewer determine whether a student has met the homework requirements?
- 9.4. What happens if a student does not successfully meet the homework requirements? (For example, does a student have a chance to resubmit the homework? Is the requirement waived?)
10. At the conclusion of the BOC classes, participants are given a given a final exam...
  - 10.1. What kind of guidance are instructors given regarding what is and is not appropriate coaching for the exam ("teaching to the test")?
  - 10.2. Who is responsible for grading these exams?
  - 10.3. What kind of feedback do participants receive on their responses on the exams?
  - 10.4. What is the minimum passing score for an exam?
  - 10.5. What happens if a student does not pass an exam?
11. Were program participants' supervisors reminded of class schedules? If so, please describe when and how this was done.
12. What efforts were made to make classes more accessible to smaller facilities that could not suffer the absence of an employee to take the BOC classes? (offer evening classes? On-site classes? Break each class into a few shorter sessions? Making classes available on-line?)
13. Was BOC offered on-site for employers with large staffs of building operators and maintenance personnel? Which employers participated?
14. Do BOC instructors receive training or instruction in using adult learning principles when teaching a class?
15. Do instructors tailor presentations based on their own subject matter expertise or their understanding of participants' needs and interests? Is there any follow up or quality assurance relative to the way instructors may tailor/modify the presentations?
16. The 04-05 evaluation recommended that a study be initiated to estimate energy savings from the program as it operated in California. What is the status of that effort?
17. Has the Spanish-speaking market potential been assessed?
18. What problems did you encounter in the program during these program years (2006 – 2008)?
19. Do you have any thoughts about how BOC could be improved?
20. Should the program be expanded? Why or why not? How could that be done?
21. Is there anything else I should know about BOC?

# **Appendix B: Supporting Information for CLEO Process Evaluation**

# Appendix B-1: Details for CLEO Goals and Evaluation Methods

## CLEO Program Goals and Strategies

A program theory specifies goals, both overarching and detailed. They are grouped here in a way that facilitates the organized presentation of results from this study.

### Goal 1: Increase awareness and knowledge of energy efficiency and CLEO seminars

The overarching strategy for the CLEO program is to offer information in native languages in local communities with high concentrations of target customers in order to increase awareness, attitudes and behavior toward increasing energy-efficient behaviors. The approach is based on the belief that:

- Lack of in-language information about the benefits of energy efficiency is a barrier that prevents people whose native language is not English from taking energy efficiency actions.
- If the information were available in residents' native language, participation in energy efficiency through program participation and purchase of energy-efficient equipment would increase.

Thus, the program's activities are focused on reducing the language barrier through:

- In-language radio and TV advertising
- In-language print media advertising
- Booths with in-language displays and literature at local community events
- In-language seminars held in local communities

### Goal 2: Increase awareness of energy efficiency programs offered by SCE and participation in energy efficiency programs

The strategies supporting Program Goal 2 are the same as those supporting Program Goal 1. The assumption behind this goal is that increased awareness of energy efficiency programs will lead to increased participation in programs and increases in energy efficiency behaviors. As described under Goal 1, this should be facilitated by presentation of information about energy efficiency programs in residents' native language.

### Goal 3: Increase energy efficiency behaviors in target communities

The program strategies supporting Program Goal 3 ALSO are the same as those supporting Program Goal 1. The assumption behind this goal is that increased understanding of energy efficiency measures and practices will lead to increases in energy efficiency behaviors. As described under Goal 1, this should be facilitated by presentation of energy efficiency information in residents' native language.

### Goal 4: Generate satisfied participants

An underlying principle of the program strategy is that by providing energy efficiency information in residents' native language through in-language seminars, not only will the barriers to energy-efficient behavior be lowered, but participant satisfaction will be maximized.

## Goal 5: Expand the program to other hard-to-reach groups, starting with African Americans

In this program cycle, program managers have been interested in determining the feasibility of introducing a CLEO-type program to African Americans. The strategy for this goal is to conduct a survey to determine the needs and interests of the African-American community.

## Telephone Interviews with CLEO Participants

### Sampling

The records received by the evaluation team contained 2080 participant entries. Of these, 1198 were Chinese language, 514 were Vietnamese language participants, and 369 Korean language participants. However, these were not all available for sampling as 38 (3%) of Chinese entries, 48 (9%) of Vietnamese entries, and 129 (35%) Korean entries had no phone numbers. This left 1865 entries, although another 148 were lost to duplicate phone numbers, largely due to multiple members of the same family attending. The final sample frame summed to 1717, including 1039 Chinese, 450 Vietnamese, and 228 Korean language participants with unique telephone numbers.

A power analysis revealed that the industry standard of 90% confidence with 10% relative precision could be met for mean estimates with samples of 61 from each language group, totaling to 183. The actual sample achieved was 334, with 94 from the Chinese language community, 188 from the Vietnamese community, and 52 from the Korean. The small number of Korean-language interviews was the result of losing so many to a lack of telephone numbers provided. The large number of Vietnamese-speaking interviewees was a result of interviewers not getting the message to stop when intended. Table xB-1 shows the disposition of the sample attempted.

**Table xB-1. CLEO Process Evaluation Sample Disposition**

<b>Disposition</b>	<b>Chinese</b>	<b>Korean</b>	<b>Vietnamese</b>
Completed	94	52	188
Refusal	49	24	11
Terminated	60	25	10
Busy/Fax	4	5	15
Wrong number/Disconnected	197	47	91
Dead number	165	30	0
Call back	8	0	53
No answer	3	0	126
Language barrier	288	0	0
Deceased	3	0	0
In hospital	0	0	1
<b>Total</b>	<b>871</b>	<b>183</b>	<b>495</b>

### Interviews

The interview protocol was developed by the evaluation team, and was reviewed by program staff. It was then translated into the three languages, and administered in language. Interviewers who spoke both Mandarin and Cantonese<sup>6</sup> were employed to match the needs of the Chinese-speaking participants. See Appendix B-3 (p. B-32) for a copy of the interview protocol in English.

The interview was composed of five sections, covering how participants learned about the seminars, questions about awareness of energy efficiency, awareness of energy efficiency programs, self-reported effects of the seminar on energy-efficient behavior, and a section on satisfaction. Though it was not part of the original goals of the program or evaluation, satisfaction questions from the 2006–08 Home Energy Efficiency Survey (HEES) evaluation interview were added so that CLEO participants' satisfaction with the HEES program with the intention of comparing to that from the English-speaking participants in that program. This section was included in the current study where we were talking to the CLEO participants already in their native language and was therefore was more convenient than starting a stand-alone study.

### Structure, Use, and Scoring for Yardsticks

The evaluation team used two “yardsticks” to determine how well the CLEO seminar design and delivery support:

- Change in participant behavior through adult learning principles and practices as well as several dimensions focused specifically on encouraging action and overcoming market barriers  
(See in “Criteria for Support of Behavior Change” and “Criteria for Adult Learning” in Appendix D-1, pp. D-2 and p. D-4, for a copy of the yardstick used to evaluate support of adult learning and behavior change.)
- Increased awareness of and participation in energy efficiency programs  
(See “Support of Programs” in Appendix D-1, p. D-9, for a copy of the yardstick used to evaluate support of programs.)

These “yardsticks” were based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes during the 2006–08 Energy Center Process Evaluation. The evaluation team updated these criteria to reflect the specific requirements of the 2006–08 ETO Process Evaluation, and the updated yardsticks were reviewed by program staff.

Related to both yardsticks is background information collected about seminars and classes to help put the criteria in context. For example:

- The CLEO seminar’s design and delivery support of programs was assessed only in the context of those programs the seminar is intended to support.
- The CLEO seminars’ design and delivery adherence to adult learning principles and practices was assessed only in terms of the intent of the seminar — that is information transfer (“Foundation” Performance Level) rather than acquisition of new skills or knowledge (“Operation” or “Realization” Performance Level).

We documented this background information based on a review of the program documentation, interviews with program stakeholders, and a review of the seminar materials. (See “Background Information” in Appendix D-1, p. D-11, for a copy of the background information collected.)

<sup>6</sup> The written Chinese-speaking language does not differ between Mandarin and Cantonese so only one Chinese translation was required, but two seminars were required.



## Structure and Use of the Adult Learning and Support of Behavior Change Yardstick

The yardstick used to evaluate adherence to adult learning principles and practices and support of behavior change is found in Appendix D-1. This yardstick is based on evaluation criteria established in the 2006–08 SCE Energy Center Process Evaluation.

Because the CLEO seminar is a “Foundation” level offering, intended to disseminate relatively simple information, the evaluation team excluded several criteria that are on the standard adult learning yardstick. For example, we considered criteria related to practice and application activities and assessment of participants’ meeting learning objectives to be “NA” (not applicable) to the CLEO seminar, so they are not included in the scoring.

- Criteria specific to adult learning principles that we considered in the CLEO seminar evaluation are:
  - Obtain learner buy-in
  - Engage the learners
  - Set up learners for success (a subset of criteria from the full yardstick)
- Criteria specific to best practices in adult learning that we considered in the CLEO seminar evaluation are:
  - Lesson plan (subset; only criterion re. learning objectives)
  - Content decisions
  - Learning Facilitation (subset)
- Criteria related to support of behavior change are the same as those used in the Energy Center Process Evaluation
  - Encouraging action
  - Helping overcoming market barriers
  - Support of specific customer segments

Criteria specific to adult learning are rated the same way as in the Energy Center Process Evaluation: using a scale of one to five (1 = Not at all or very poor; 5 = Always or excellent).

Criteria related to support of behavior change are essentially yes/no questions (“yes” scoring 1 point; “no” scoring 0 points).

Criteria that are not applicable to a given situation are not considered in the scoring.

## Structure and Use of the Support of Programs Yardstick

The Support of Programs Yardstick is found in Appendix D-1. It has the same criteria used to evaluate SCE Energy Center classes’ support of programs in the 2006–08 SCE Energy Center Process Evaluation, and includes two dimensions:

- Direct support of programs with information specifically focused on SCE incentive and rebate programs
- Indirect support of programs with information on technologies or measures associated with SCE incentive and rebate programs

Specific criteria under each dimension are essentially yes/no questions (“yes” scoring 1 point; “no” scoring 0 points). If a criterion is not applicable to the given situation, that criterion is not considered in the scoring.

We considered one criterion under direct support of programs to be “NA” (not applicable) to the CLEO seminar: Has scheduled presentation by program manager or account executive on program(s). Because the purpose of the CLEO seminar is to offer in-language information, and few program managers or account executives are likely to

## Appendix B-1: Details for CLEO Goals and Evaluation Methods

speak the languages in which CLEO seminars are offered, we did not “score” this criterion relevant to direct support of programs.

To maintain a reasonable project scope, we focused primarily on 16 high-impact programs that account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW reductions. (See “Programs Considered when Assessing Class Support of Programs” in Appendix D-1, p. D-14, for a list of the programs considered.)

Tie-in between a seminar or class and a program is based on whether the seminar or class addresses technologies, measures, or practices that are encompassed by a program.

- If 25% or more of the content covered in a seminar or class addresses technologies or measures encompassed by a program, we consider that class to have a high tie-in to the program.

Also if a seminar or class has a specific goal of promoting or encouraging a program, we consider that seminar or class to have a “high tie-in” to that program.

- If a seminar or class addresses technologies or measures encompassed by a program, but that content represents less than 25% of the session, we consider that seminar or class to have a “medium to low tie-in” to the program.

## Contexts in which the Yardsticks Were Applied

### *Seminar Materials*

The CLEO seminar is approximately one-hour in duration that is supported by a PowerPoint file composed of 37 slides for the body of the presentation and an additional 10 slides in an appendix. (The appendix provides supporting information about income-qualifying programs: CARE, FERA, EMA, DAP, and LIHEAP, and the Medical Baseline Program.)

Participant materials for the seminar are handouts composed of pages with reduced copies (two-up) of the presentation slides. The content in the handouts is identical to the content of the slides.

The PowerPoint materials were originally developed in English, and reviewed and approved by program stakeholders before being translated into the languages supported by the CLEO program (Chinese, Vietnamese, and Korean).

The evaluation team reviewed the English version of the PowerPoint presentation materials and determined the rating (yes/no for binary criteria; one to five for scale-based criteria) based specifically on what was evident in the materials.

Some criteria on the Adult Learning Yardstick are “NA” (not applicable) specifically in the context of the review of seminar materials. For example, the criterion specific to creating a safe and respectful environment can be evaluated during an in-person audit, but cannot be determined based on a review of materials.

### *Auditing the Seminar in Person*

Because there may be a significant difference between what seminar or class materials indicate is intended to happen during a session, and what actually happens in the “real world,” the evaluation team audited one of the CLEO seminars to observe how a session actually unfolds.

We originally planned to attend a seminar in English (targeted to the Indian community), but learned that these seminars are no longer offered through the CLEO program. (In fact, we signed up for an Indian seminar online at the CLEO website before we learned that the function for signing up to seminars is not necessarily closely linked to the actual seminars available — and that CLEO efforts targeted to the Indian community are confined to booths at selected events.) Therefore, we audited a CLEO seminar offered in San Gabriel for the Chinese community.

Two sessions ran concurrently: one in Mandarin and one in Cantonese. We audited the Mandarin version, which was attended by roughly half of the total of approximately 160 people who registered for the event.

During the session, we referred to our in-English handouts, which directly mapped to the in-language slides used during the presentation. Therefore we were able to note the amount of time spent on each topic and to gauge the level and type of interaction among the participants and between participants and the instructor — and roughly address most of the criteria on the evaluation “yardsticks.”

### *Instructor Interviews*

As noted above, there may be significant differences between how a session runs “in theory” (as indicated by the session materials) and how it unfolds in the “real world.” There also may be significant differences between the way individual sessions are run — based on instructor styles and experience as well as the needs or interests of a particular group of session participants.

The evaluation team interviewed the third-party provider who is responsible for training and managing the instructors, and interviewed one of the three seminar instructors. (One instructor cancelled several interview appointments and another initially agreed to an interview, but then declined because of family issues.)

The interview guide included questions designed to address the relevant yardstick items. (See Appendix B-5 for details.)

# Appendix B-2: Details for CLEO Evaluation Results

## Responding to Prior Evaluation Recommendations

The previous process evaluation for the CLEO program did not provide any specific recommendations for the improving the program.

## Background Characteristics

The characteristics of a household are pertinent to energy use and to the potential to increase efficiency. The evaluation team considered it important to understand what the household characteristics were, and how they compared across the ethnic groups. Table xB-2 shows that there was a large difference among groups in home ownership, with Chinese-language participants being by far the most likely to own (68%), compared to only 14% of Korean participants, and 35% of Vietnamese.

**Table xB-2. Percent of CLEO Participants who Own vs. Rent**

Response	Chinese (N=77)	Korean (N=52)	Vietnamese (N=188)	Total (N=317)
Own	68%	14%	35%	39%
Rent	33%	87%	65%	61%

$\chi^2=42.1, 2, p<.05$

Table xB-3 reveals that the Chinese-speaking group was also most likely to pay their own electricity bills (99%, followed by the Korean group (75%) and the Vietnamese (32%). It is not clear why the Korean participants so often pay their own electricity bills, while at the same time being the most likely (overwhelmingly) to rent.

**Table xB-3. Percent of CLEO Participants who Pay Own Electricity Bill**

Response	Chinese (N=76)	Korean (N=48)	Vietnamese (N=184)	Total (N=308)
Pay Own Bill	99%	75%	32%	55%
Included in Mortgage or Rent	1%	25%	69%	45%

$\chi^2=102.3, 2, p<.05$

The Korean-speaking participants were comprised mainly of one- and two-person households (Table xB-4) and the other two groups were more likely to have four or five.

**Table xB-4. Number of Residents in CLEO Participants' Households**

# Residents in Household	Chinese (N=77)	Korean (N=52)	Vietnamese (N=188)	Total (N=317)
One	10%	35%	11%	15%
Two	23%	33%	28%	28%
Three	22%	12%	18%	18%

## Appendix B-2: Details for CLEO Evaluation Results

# Residents in Household	Chinese (N=77)	Korean (N=52)	Vietnamese (N=188)	Total (N=317)
Four	30%	6%	16%	18%
Five Plus	17%	15%	27%	22%

$\chi^2=41.6, 18, p<.05$

The percent of all members of interviewed households that fall into each age category is shown in Table xB-5. The highest concentration of over 60 members is in the Korean-speaking group. The largest percent of 18-59 year olds is in the Chinese-speaking group, and the under 18 group is quite low in all ethnic groups.

**Table xB-5. Percent of Each Age Category in CLEO Participants' Households by Ethnicity**

Age Category	Chinese-speaking	Korean-speaking	Vietnamese-speaking	Total
Under 18	17%	11%	14%	15%
18-59	59%	34%	47%	48%
60+	24%	54%	39%	37%

There were also ethnic differences in education level. The Vietnamese-speaking group were the most educated (Table xB-6), having the largest percentage with at least some college, and the least likely not to have started high school. The Chinese and Korean-speaking groups were similar in educational patterns.

**Table xB-6. CLEO Participants' Level of Education**

Education Level	Chinese (N=77)	Korean (N=43)	Vietnamese (N=187)	Total (N=307)
Less than HS	26%	28%	3%	12%
Some HS	8%	0%	20%	14%
HS Graduate	22%	33%	18%	21%
Trade/Tech School	1%	2%	4%	3%
Some College	12%	2%	24%	18%
College Graduate	25%	33%	27%	27%
Some Graduate School	0%	2%	5%	3%
Graduate Degree	7%	0%	0%	2%

$\chi^2=84.2, 14, p<.05$

## Details for Learning about CLEO and EE Awareness

### How Participants Learned of the CLEO

As explained in the program description, participants can be informed about the CLEO seminars through multiple channels. Participants were asked to name the channels through which they learned of the seminar they attended. Their multiple responses were combined into the results shown in Table xB-7. There are clear differences in how the ethnic groups learned about the program. For instance, 71% of Chinese speakers said they learned of it from an advertisement or article, while almost none of the other groups said this. The Korean group was most likely to say they learned of it from a community center, while the Vietnamese cited festivals and events. These differences seem to reflect the differences in sites on which the seminars were offered, and how recruitment was different across program ethnic groups. (As noted earlier, Koreans were often recruited from adult daycare centers and churches, Vietnamese sometimes were at festivals and some at a Vietnamese newspaper, and Chinese most often met in hotels.)

**Table xB-7. Sources of Information about CLEO Program**

Response	Chinese (N=91)	Korean (N=52)	Vietnamese (N=174)	Total
Bill insert	3%	0%	0%	1%
Utility direct mail	0%	0%	1%	1%
Friends-neighbors	13%	8%	15%	13%
TV	15%	0%	11%	10%
SCE program	1%	0%	0%	0%
Ad or article	71%	0%	7%	25%
SCE web site	0%	0%	0%	0%
Radio	29%	0%	51%	36%
Email	1%	0%	0%	0%
Booth at event	3%	0%	2%	2%
Community Center	9%	85%	0%	16%
Church	0%	8%	0%	1%
Festival or event	0%	0%	66%	36%
Advertisement (medium not specified)	1%	0%	1%	1%
Personal contact with Edison Representative	2%	0%	5%	3%
Thao	0%	0%	1%	0%

Exit survey data seems consistent with the findings from the participant telephone interviews (Table xB-35).

**Table xB-8. Exit Survey Responses re. Learning about CLEO**

Survey Questions	Responses				
	Radio	TV	Newspaper	Other	
How did you hear about CLEO?	29%	5%	63%	3%	
	Excellent	Very Good	Good	Fair	Poor
How effective were the media ads?	26%	56%	16%	2%	0%

## Participants' EE Awareness Compared to Other Groups

For the telephone survey, five questions that test a respondent's knowledge of some basic energy efficiency issues were taken from the PY2006–08 Home Energy Efficiency Rebate Program evaluation study.

This allowed for a comparison of the CLEO participants with the rebate program participants on general knowledge. The questions and the summary of participant knowledge from both studies can be seen in Table xB-9.

**Table xB-9. Awareness and Knowledge of Energy Efficiency by Ethnic Group and Program**

Statement	Correct Answer	Percent Answering Correctly				Comparisons	
		2006–08 HEER Prog Partic (N=658)	2006–08 CLEO Participants			Chi-Square Probabilities	
			Chinese (N=94)	Korean (N=52)	Vietnamese (N=186)	Within CLEO	CLEO v HEER
Replacing an old refrigerator with a new Energy Star refrigerator will save the typical household more than \$150 a year.	True	89%	94%	88%	99%	p=.002	p=.0004
Edison will haul away your old refrigerator or freezer at no cost to you.	True	81%	98%	68%	85%	p=.0001	p=.048
Standard incandescent light bulbs generate more heat than light.	True	71%	87%	94%	85%	p=.277	p<.0001
All air conditioners that are Energy Star certified are equally efficient.	False	60%	4%	41%	3%	p<.0001	p<.0001
Homes emit insignificant amounts of greenhouse gasses compared with cars.	False	38%	39%	25%	1%	p<.0001	p<.0001

The first three questions are answered correctly by a very large majority of participants in both programs, and across ethnic groups in CLEO. These are questions that are addressed by topics covered in the CLEO in the seminar materials, while the last two are not. Overall, more CLEO participants answered the first three questions correctly than HEER participants. The same is not true of the last two where the HEER participants did better. This pattern gives the impression that the seminars communicated energy efficiency information to participants, and that the starting background energy efficiency knowledge is lower among CLEO participants.

There were also differences across ethnic groups in the ability to answer the questions correctly. On the first two questions the Chinese-speaking and Vietnamese-speaking groups did better than the Korean group. On the third question, concerning incandescents generating more heat than light, all three groups did well, and there were no significant differences across ethnic groups.

## Details for Program Awareness

### Program Awareness Post-Seminar (Participant Interviews)

#### *Recall of Programs*

The interviewees were asked what programs they had heard of. The interviewer had a list of possible programs that they checked if the participant mentioned it or something like it, but interviewees were not prompted. If the participant gave a response that did not fit anything on the list, it was written verbatim, and later coded. Many of those answers could be coded into the pre-coded list by a person more knowledgeable about the programs than the interviewers could be. Table xB-10 shows the results of both the pre-coded and post-coded responses.

**Table xB-10. SCE Programs Recalled by Participants**

Response	Chinese (N=63)	Korean (N=51)	Vietnamese (N=176)	Total
Rebate Program (HEER)	8%	2%	77%	49%
Low-Income Home Energy Assistance Program (LIHEAP)	11%	41%	59%	45%
Energy Management Assistance (EMA)	2%	4%	16%	11%
CARE Rate	3%	0%	18%	11%
Direct Assistance Program (DAP)	38%	14%	0%	11%
Interrupting or cycling A/C (Summer discount)	13%	8%	0%	4%
Home Energy Audits (HEES)	6%	10%	1%	3%
Recycling used appliances (RARP)	14%	2%	0%	3%
Family Electric Rate Assistance Program (FERA)	2%	16%	0%	3%
Medical Baseline Program	0%	2%	1%	1%
Other	75%	18%	10%	25%
None	0%	53%	16%	19%

Overall, the most familiar program to these participants is the HEER Program at 49%; close to this is the Low-Income Home Energy Assistance Program at 45%. The level of familiarity of the other programs ranges between 3 and 11%. There are clear differences across ethnic group, however. The Vietnamese-speaking group is the most likely, by far, to have heard of the HEER rebate program (77%). Among the other groups, less than 10% are aware of this program. The Vietnamese-speaking group is also most likely (59%) to be familiar with the Low-Income Home Energy Assistance Program, followed by the Korean-speaking group (41%). The Chinese-speaking group is more likely to be familiar with the Direct Assistance Program (38%) than any other. A large majority (75%) of the Chinese ethnic group provided responses that could not be classified into the pre-coded list. The question arises as to whether the seminars differ in their program emphasis. The ethnic differences in familiarity are striking, so there should be a clear explanation for them.

It's interesting to note that the amount of time spent on topics only roughly correlates to participants' recall of the programs (Table xB-11). (For program-specific seminar times, see Table xB-15)

- Far more participants recall the income qualifying programs than would be anticipated based strictly on time spent on this topic during the seminar.
- Far fewer participants recall HEES than would be anticipated based strictly on time spent on this topic during the seminar.



**Table xB-11. Relating Time Spent in Class to Programs Recalled by Participants**

Topic	% of Program-Specific Seminar Time	% of Recalled by Participants
Rebates (HEER, part of Residential Non-lighting)	42%	49%
<b>Home Energy Efficiency Survey (HEES)</b>	<b>39%</b>	<b>3%</b>
Summer Discount Program	7%	4%
<b>Income-qualifying programs</b>	<b>7%</b>	<b>45%</b>
Residential Lighting (upstream incentive)	4%	NA
Appliance Recycling	2%	3%

One possible reason for the low recall score for HEES, compared the relatively high class time is that HEES is the last topic of the seminar. During the session we observed:

- Participants were preparing to leave during this portion of the presentation.
- The time when participants were to be completing the short version of the HEES form, seminar staff were in the room distributing gift bags to the participants.

One possible reason for the high recall score for income-qualifying programs compared to the relatively low class time is that the topic of assistance on electric bills may be of special interest to the seminar participants: people tend to remember best what's most important to them. (In the seminar we observed, many of the participants had brought their electric bills with them and apparently wanted to review the bills during class time.)

### *Participation in Programs*

Interviewed CLEO participants were asked what programs they had participated in, and the list of potential programs was read to them. An extremely small percentage of interviewees reported reporting in any program; the numbers for individual programs was too small to warrant showing the entire list and associated percentages. Before being asked to respond to the list of programs, interviewees were asked if they had participated in any SCE program since participating in the CLEO seminar. Table xB-12 shows the percentage of CLEO participants in each ethnic group who reported participating in ANY SCE program. The numbers are very low to zero in any ethnic group, with no statistically significant differences seen.

**Table xB-12. Percent of CLEO Participants who Have Participated in Any SCE Program**

Response	Chinese 2006–08 (N=94)	Korean 2006–08 (N=52)	Vietnamese 2006–08 (N=186)	Total (N=332)
Yes	7%	0%	5%	5%
No	93%	100%	95%	95%

$\chi^2=3.309, 2, p>.05$

Perhaps one of the more memorable programs that residential customers may have participated in is the HEER or rebate program. For this reason, and because analogous figures are available for comparison with the PY2004-05 CLEO participants, the rates for this program are shown in Table xB-13.

The difference between the participation level of the 2004-05 participants and the 2006–08 participants is dramatic.

- Approximately 42% of the 2004-05 participants reported participating in HEES.
- Virtually none of the 2006–08 participants reported participating in the HEES program.

## Appendix B-2: Details for CLEO Evaluation Results

This type of difference suggests something very systematic happening either at the program level or in the way interview questions are asked.

- In the current study, a list of programs were read in descriptive terms (not just the name of the program) and the interviewee was asked whether they had participated in each, and they answered with a yes or a no.
- In the 2004-05 study, participants were asked if they had “contacted the utility rebate program” and if the answer was yes, they were asked if they had received rebates from “any utility rebate programs.”

It is possible that the questions asked in the prior program cycle were interpreted broadly to include other utility programs in addition to the SCE rebate program. In the current study, the participation question was preceded by the general question about whether they had participated in any SCE program. This would have had the effect of narrowing the range of consideration to SCE programs only.

However, the possibility that there was a systematic difference in focus between the two program cycles should also be considered.

**Table xB-13. Percent of CLEO Participants who Participated in SCE Rebate Program: Comparing 2004-2005 Responses to 2006–08 Responses**

Participated in Rebate Program?	Chinese 2004-05 (N=34)	Chinese 2006–08 (N=94)	Korean 2006–08 (N=52)	Vietnamese 2006–08 (N=186)	Total CLEO 2006–08 (N=332)
Yes	43%	2%	0%	0%	1%
No	57%	98%	100%	100%	99%

$\chi^2=5.09, 2, p>.05$

One focus of the CLEO seminars is to encourage participation in the HEES program. In fact, a short version of the HEES Survey is completed by participants during class. Because of this, it may seem surprising that almost no CLEO participants reported participating in the SCE HEES program (Table xB-14). However, it is important to note that in the current study the question specified reports of participation after the CLEO seminar. Thus, what was done during the seminar was specifically excluded. Under this definition, almost no one participated in the HEES program. With such a small number participating, statistically significant differences across ethnic groups would be nearly impossible, and that is reflected in the test reported at the bottom of the Table . It should be noted that the impact study of education, training and outreach programs, completed by Opinion Dynamics Corporation, showed a 58% participation in HEES among CLEO participants. However, this was based on the short-form HEES that is administered during the seminar. Therefore, this number does not compare to the results we obtained, based on asking what participants did AFTER the seminar. The hope of the program is that participants will go to the next step after the seminar, but our results show that they seem to leave it at the short version done during the seminar.

**Table xB-14. Percent of CLEO Participants who Reported Participating in the SCE HEES Program After Being Asked About that Program Specifically**

Participated in HEES Program?	Chinese 2006–08 (N=94)	Korean 2006–08 (N=52)	Vietnamese 2006–08 (N=186)	Total CLEO 2006–08 (N=332)
Yes	1%	0%	1%	1%
No	99%	100%	99%	99%

$\chi^2=3.259, 1, p>.05$

## Seminar Support of Programs (Yardstick)

Approximately half of the hour-long CLEO seminar is focused specifically on energy efficiency programs. Most of this time is spent on rebate information for a variety of products (pool pump and motor, whole-house fan, water heater, attic and wall insulation, clothes washers, and dish washers). Table xB-15 summarizes the approximate time spent on topics directly related to energy efficiency incentive and rebate programs.

**Table xB-15. Approximate Seminar Time Spent on Program-specific Topics**

Topic	Approximate Time
Rebates (HEER, part of Residential Non-lighting)	11.5 minutes
Home Energy Efficiency Survey (HEES)	11 minutes
Summer Discount Program	2 minutes
Income-qualifying programs (LIHEAP, CARE, FERA, EMA, DAP)	2 minutes
Residential Lighting (upstream incentive)	1 minute
Appliance Recycling	.5 minute
<b>Total time on program-specific</b>	<b>28 minutes</b>

### *Scores for Direct Support*

The CLEO seminar does an excellent job of direct program support, scoring 100% for all criteria, using all different approaches to scoring (review of materials, observation, and instructor interview). As mentioned above, a significant portion of the seminar time is used to present “how much and how to” information for rebate-related programs, and to encourage participants to complete short versions of the HEES form in the seminar.

Specifically the seminar addresses the following information for a wide variety of rebate scenarios, etc.:

- The amount of rebate available
- Qualifying considerations (qualifying products and other consideration, if relevant; e.g., requirements for existing insulation in order to qualify for insulation rebates)
- How to apply for the rebate
- Sources of additional information

**Table xB-16. Scores for Direct Support of Programs**

Criteria for Direct Support of Programs	Materials	Observation	Interview	MEAN
<b>Describes program goals/objectives (from target customer perspective)</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%
<b>Describes program features</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%
<b>Describes program benefits to participants</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%
<b>Provides information on how to pursue program offerings</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%

**Appendix B-2: Details for CLEO Evaluation Results**

<b>Criteria for Direct Support of Programs</b>	<b>Materials</b>	<b>Observation</b>	<b>Interview</b>	<b>MEAN</b>
<b>Includes recommended next steps to pursue program offerings</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%
<b>Includes contact information (URL, email, phone) for more info or next steps</b>				
<i>Actual Points / Maximum Possible Points</i>	2 / 2	2 / 2	2 / 2	6 / 6
<i>Score</i>	100.00%	100.00%	100.00%	100.00%
<b>Distinguishes between technology variations that are and are not included by program</b>				
<i>Actual Points / Maximum Possible Points</i>	1 / 1	1 / 1	1 / 1	3 / 3
<i>Score</i>	100.0%	100.0%	100.0%	100.0%
<b>Overall Score for Direct Support of Programs</b>				
<i>Actual Points / Maximum Possible Points</i>	13 / 13	13 / 13	13 / 13	39 / 39
<i>Score</i>	100.0%	100.0%	100.0%	100.0%

*Scores for Indirect Support*

The seminar does very poorly in indirect support of programs. Essentially, this means that the seminar rarely touches on “why bother” and “what this means to me” topics. For example, the only areas that include a specific discussion of benefits (other than the amount of a rebate) are:

- One slide on estimated annual savings from replacing 100W bulbs with 25W bulbs
- One line on a (very busy) slide on estimated annual savings by retiring an inefficient refrigerator or freezer

Neither of programs associated with these topics (Residential Lighting, and Appliance Recycling) are reflected in the scores below because so little time was spent on them that they did not qualify as high tie-in programs.

**Table xB-17. Scores for Indirect Support of Programs**

<b>Criteria for Indirect Support of Programs</b>	<b>Materials</b>	<b>Observation</b>	<b>Interview</b>	<b>MEAN</b>
<b>Includes considerations for implementing technologies or measures</b>				
<i>Actual Points / Maximum Possible Points</i>	0 / 1	NA	0 / 1	0 / 2
<i>Score</i>	0.0%	NA	0.0%	0.0%
<b>Describes benefits of program-relevant technologies or measures</b>				
<i>Actual Points / Maximum Possible Points</i>	0 / 1	NA	0 / 1	0 / 2
<i>Score</i>	0.0%	NA	0.0%	0.0%
<b>Includes considerations for implementing technologies or measures</b>				
<i>Actual Points / Maximum Possible Points</i>	0 / 1	NA	0 / 1	0 / 2
<i>Score</i>	0.0%	NA	0.0%	0.0%
<b>Provides specific guidance for implementing technology or measure</b>				
<i>Actual Points / Maximum Possible Points</i>	0 / 1	NA	0 / 1	0 / 2
<i>Score</i>	0.0%	NA	0.0%	0.0%
<b>Overall Score for Indirect Support of Programs</b>				
<i>Actual Points / Maximum Possible Points</i>	0 / 4	NA	0 / 4	0 / 8
<i>Score</i>	0.0%	NA	0.0%	0.0%

### *About the Scoring*

The CLEO Seminar has high tie-in to two SCE energy efficiency programs that we considered during this process evaluation; that is 25% or more of the session addressed information related to:

- HEER (Home Energy Efficiency Rebate: part of Residential Non-lighting )
- HEES (Home Energy Efficiency Survey)

The following Programs were considered to have medium to low tie-in to the CLEO Seminar; that is, less than 25% of the seminar addressed information related to:

- Residential Lighting
- Summer Discount Plan
- Appliance Recycling
- CARE/FERA
- EMA

(Several of the programs with low tie-in to the CLEO Seminar are “other” programs, not included on our “short list” of 16 programs, but were clearly and directly addressed by the CLEO seminar, so we added them to the list of programs to be considered.)

Each criterion on the Support of Programs Yardstick has three possible values:

Yes = 1 point; No = 0 points; NA = Not applicable and not considered in the scoring.

The seminar’s score on a criterion is the sum of points scored divided by the maximum possible number of points that could be scored.

Since the seminar has a high tie-in with two programs considered in this evaluation, the maximum possible score for a single criterion is 2 points (scoring one point on that criterion for each program).

For some criteria under indirect support of programs, the maximum possible score for a single criterion is less than 2 points because that criterion was considered NA for some programs. Indirect support criteria focus on information associated with technologies or measures encompassed by a program, and one of the high tie-in programs (HEES) was not considered “technology driven.”

For example, consider the criterion: “Distinguishes between technology variations that are and are not included by program.”

- This is a relevant to HEER because some products are included in the program and some are not.
- This is irrelevant to HEES because it is not “technology driven” and there are no technology-related distinctions to make.

In addition, some criteria were considered NA specifically for the in-person audit scoring. If we believed that the instructor may have addressed a topic during the session, even though the information was not in the presentation materials, we decided not “score down” the item, since we attended an in-language presentation and could not determine whether or not the topic was actually addressed. (For example, the instructor might mention annual savings typically associated with energy efficient appliances.)

## Details for Behavior Change

### Behavior Change Post-Seminar (Participant Interviews)

During the 2004-05 cycle, most participants (87%, see Table xB-18) reported installing something after the seminar; during this cycle, of the comparable group in the 2006–08 cycle, (Chinese-speaking participants) 77% reported installing some energy-efficient equipment. The Vietnamese-speaking group showed an even higher rate of installation (93%), but the Korean-speaking participants had a much lower installation rate at 42%. The cross-cycle difference is noticeable, but not large. The within-cycle ethnic differences are quite large. The Korean-speaking group has a low installation rate, but this might be explained by the fact that so many (87%) are renters. It is interesting that the Vietnamese-speaking group has the highest installation rate even though 65% of them are renters.

Not shown in Table xB-18 is a result from an impact study of CLEO completed by Opinion Dynamics Corporation<sup>7</sup> covering the same program period. Those results, based on a sample of 100, indicated a post-seminar installation rate of 79%, which compares closely to the 80% overall rate shown in the current process evaluation.

**Table xB-18. Percent Who Installed Some Energy-Efficient Equipment after the Seminar**

Installed Energy Efficient Equipment?	Chinese 2004-05 (N=34)	Chinese 2006-08 (N=94)	Korean 2006-08 (N=52)	Vietnamese 2006-08 (N=186)	Total (N=332)
Yes	87%	77%	42%	93%	80%
No	13%	23%	58%	7%	20%

$\chi^2=65.232,2, p<.0001$

Addressing what was actually installed, the interviewers asked the question in an open-ended format, and the responses were coded later. Comparing the Chinese-speaking group from 2004-05 to the analogous group during the 2006–08 cycle shows a marked drop in the percent of the sample that installed lighting measures only Table xB-19, though there is a slightly larger number (7 percentage points more than in the last period) who installed lighting plus something else, and another 6% installed non-lighting only measures. While the overall installation rate is a bit lower for this program cycle in this group, there is more diversity in what was installed.

**Table xB-19. What Participants Installed**

What was Installed	Chinese 2004-05 (N=30)	Chinese 2006-08 (N=94)	Korean 2006-08 (N=52)	Vietnamese 2006-08 (N=186)
Installed lighting only	57%	33%	33%	59%
Installed Lighting plus Non-Lighting	30%	37%	10%	32%
Installed Non-Lighting Only	-	6%	0%	1%

$\chi^2=35.73,2, p<.0001$  (Ethnic comparison)

Note: Percentages do not add to 100 because non-installers are not included.

The Vietnamese-speaking group is striking for its focus on lighting, though again, this can be attributable to the high rate of rentership in this group. The Korean-speaking participants have the lowest overall installation rate, and the highest ratio of lighting to other measures. Interestingly, they were also the most likely to report that the installations were completed by other parties, usually SCE (8%, not shown in a Table).

<sup>7</sup> Opinion Dynamics Corp, "PY2006-2008 Indirect Impact Evaluation of the Statewide Education & Information Programs, Vol II." For the California Public Utilities Commission Energy Division. February 2010.

A critical aspect of this analysis of the effectiveness of the program is to establish the extent to which changes in behavior, such as installations of energy-efficient equipment is attributable to the program. This evaluation measures attribution through self-report. After asking whether anything was installed and what was installed, participants were asked whether the installations were influenced by the program. Table xB-20 shows the results of that question. The Vietnamese-speaking group was most definite about their answers: 97% said, unequivocally that their actions were influenced by the seminar. The Korean-speaking participants showed a 20 percentage point difference, and the Chinese-speaking group went down to 64% claiming program influence. However, almost 20% of both of the latter two groups said they were partially influenced by the seminar. The differences across groups are statistically significant.

**Table xB-20. Did the CLEO Seminar Influence Decision to Install?**

Response	Chinese 2006–08 (N=72)	Korean 2006–08 (N=22)	Vietnamese 2006–08 (N=170)	Total (N=264)
Yes	64%	77%	97%	86%
Partially	19%	18%	3%	9%
No	17%	5%	0%	5%

$\chi^2=53.494, 4, p<.0001$

The bottom line of this analysis is the percentage of each group that has made installations because of the influence of the program. This result has to take into account both the rate of installation as well as the rate at which program influence is claimed. Table xB-21 shows these results. Ninety percent of the Vietnamese-speaking participants report installing energy-efficient equipment after the seminar that they definitely attribute to the program. Only 49% of the Chinese-speaking group falls into that category, and 32% of Korean-speaking participants.

**Table xB-21. Percent of Participants Who Installed and Were Influenced by CLEO**

CLEO Influenced Decision?	Chinese 2006–08 (N=72)	Korean 2006–08 (N=22)	Vietnamese 2006–08 (N=170)
Yes	49%	32%	90%
Partially	15%	8%	3%

Another focus of the seminars is energy practices that can be changed to reduce energy consumption. Interview questions and analyses similar to those done for equipment installations were carried out for practices. The results in this arena mirror those from the equipment installation analysis; the Vietnamese-speaking participants show the highest rate of changing practices with 95% claiming to have done so (Table xB-22). The Chinese-speaking group has a substantially lower rate at 68%, followed by the Korean-speaking participants at 44%. These figures are very similar to the equipment installation rates. There is an analogous figure for this program, in this same time period, produced by the Opinion Dynamics study mentioned above. Their overall estimate of practice changes after the seminar was 90% compared to the overall rate found in the current study of 79%.

**Table xB-22. Did Energy Practices Change After CLEO Seminar?**

Response	Chinese 2006–08	Korean 2006–08	Vietnamese 2006–08	Total CLEO 2006–08
Yes	68%	44%	95%	79%
Somewhat	14%	12%	1%	6%
No	18%	44%	4%	15%

$\chi^2=79.584, 4, p<.0001$  for CLEO Comparison

$\chi^2=1.196, 1, p=.274$  for ODC Comparison

## Appendix B-2: Details for CLEO Evaluation Results

As before, we are concerned with the extent to which these changes were influenced by the program. This matter is addressed by Table xB-23. As before, the Vietnamese-speaking participants who made changes in energy practices overwhelmingly reported being influenced by the seminar at 98%. This rate of attribution was followed by that for the Korean-speaking group of 76%, and by the Chinese-speaking group at 53%. There is about a 20 percentage point difference between the contiguous groups (in the Table), and over a 40 percentage point difference between the Chinese-speaking and Vietnamese-speaking groups. These differences are statistically significant.

**Table xB-23. Did the CLEO Seminar Influence Changes in Energy Practices?**

Response	Chinese 2006–08 (N=76)	Korean 2006–08 (N=29)	Vietnamese 2006–08 (N=177)	Total 2006–08 (N=282)
Yes	53%	76%	98%	83%
Partially	37%	24%	2%	14%
No	11%	0%	1%	3%

$\chi^2=82.233, 4, p<.0001$

When combining the change rate with the rate of claiming program influence (Table xB-24) the Vietnamese-speaking participants are again far ahead of the other two groups with 93% claiming to have changed their energy practices due to the influence of the CLEO seminar. The Korean-speaking and Chinese-speaking participants are very similar in their level of program-influenced change at 33%. Ethnic differences this dramatic suggest the need to investigate further to understand the reasons for the differences. Are these cultural differences? Economic status differences? Or differences in the seminars?

**Table xB-24. Percent Whose Practices Changed and Were Influenced By CLEO**

Response	Chinese 2006–08 (N=76)	Korean 2006–08 (N=29)	Vietnamese 2006–08 (N=177)
Yes	36%	33%	93%
Partially	5%	3%	0%

The available exit survey results for the CLEO seminar also indicate a strong tendency to change energy efficiency practices. (As noted in the Methods section of this report, the individual results of the Exit Surveys administered during the 2006–08 CLEO seminars were unavailable. The only Exit Survey data that the program staff was able to provide was the consolidated results reported in the CLEO 2008 Annual Report, submitted by Global Energy Services in February 2009.)

Because exit survey data is unavailable by event — we are unable to determine if there are any patterns by ethnic group or other variables (such as event location).

There were a total of 568 respondents to the exit survey. Table xB-25 summarizes the figures cited in the annual report relative to participant intentions, immediately after the seminar, for energy efficiency behavior.



Table xB-25. Exit Survey Responses re. Intentions for Energy Efficiency Behavior

Survey Questions	Responses								
	Lamps	Refrigerator	Clothes Washer	Water Heater	Dish-washer	Insulation	Furnace		
Are you planning to save energy by changing or buying the following?	36%	21%	13%	12%	4%	6%	8%		
	<b>Yes</b>	<b>No</b>							
Have you received utility rebates for purchasing Energy Efficient products?	16%	84%							
	Lighting	Refrigerator	Clothes Washer	Water Heater	Dish-washer	Insulation	Furnace	Air Condit.	Other
If YES, which rebates have you received?	23%	29%	12%	11%	4%	2%	2%	15%	2%
	<b>Yes</b>	<b>No</b>							
After attending a CLEO seminar, will you take advantage of utility rebate programs?	95%	5%							
	<b>Yes</b>	<b>No</b>							
After attending a CLEO seminar, will you make your house energy efficient?	99%	1%							

### Seminar Support for Behavior Change (Yardstick)

The CLEO seminar is approximately one hour in duration. There is no published agenda for the seminar, but interviews indicate that the agenda we observed during the in-person audit is generally consistent across various deliveries of the seminar.

Table xB-26. Overall Timing for CLEO Seminar

Topic	Time
Introduction	8 min
Tips for Energy Saving	28 min
SCE Rebates and Savings	28 min

The “Tips for Energy Saving” topic includes simple “directives” such as:

- Replace incandescent bulbs with fluorescent bulbs
- Use a high-efficiency natural gas furnace
- Install insulation

The “SCE Rebates and Savings” topic addresses energy efficiency rebate and incentive programs, and is discussed under Evaluation Goal 2-2 above.

The CLEO seminar scored very well in terms Support of Behavior Change and Adult Learning Principles and Practices.

## Appendix B-2: Details for CLEO Evaluation Results

### *Support of Behavior Change*

The evaluation criteria used to determine how well the design and delivery of seminars and classes support behavior change include two major dimensions. Because of the special focus and format of the CLEO seminar, some of the criteria on the standard yardstick were considered NA. (See Table xB-28 and Table xB-29.)

- Encouraging Action addresses the question, “How well does the session’s design and content encourage action — helping participants apply information and concepts addressed in the class to their own environment?”
- Helping Overcome Market Barriers (Other than Language) addresses the question, “How well do the classes help overcome common market barriers, such as lack of information about application of technologies, financial and non-financial benefits, and risk assessment and mitigation?”

Overall, the CLEO seminar scored extremely well in Encouraging Action and poorly in Helping Overcome Common Market Barriers (Other than Language) as indicated Table xB-27.

It’s also interesting to note the complete consistency between scores obtained through review of the materials, observation of the seminar, and interviews with instructors. (The three methods gave very different results in the parallel BOC process evaluation effort.)

**Table xB-27. Overall Score for Support of Behavior Change**

Major Dimensions of Supporting Behavior Change	Materials	Observation	Interview	MEAN
Encouraging Action	100%	100%	100%	100%
Helping Overcome Common Market Barriers (Other than Language)	20%	50%	20%	25%

**Table xB-28. Score Details for Encouraging Action**

Encouraging Action	Materials	Observation	Interview	MEAN
Includes specific calls to action / specific next steps	1	1	1	1
Supports development of individualized action plan	NA	NA	NA	NA
Includes job aids / worksheets to assist in assessing / analyzing options	NA	NA	NA	NA
Includes job aids / checklists to assist in taking action	NA	NA	NA	NA
Includes info on where/how to get assistance in taking action	1	1	1	1
<i>Actual Points / Maximum Possible Points</i>	<b>2/2</b>	<b>2/2</b>	<b>2/2</b>	<b>6/6</b>
<i>Score</i>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>	<b>100.00%</b>

**Table xB-29. Score Details for Helping Overcome Common Market Barriers  
(Other than Language)**

<b>Helping Overcome Common Market Barriers (Other than Language)</b>	<b>Materials</b>	<b>Observation</b>	<b>Interview</b>	<b>MEAN</b>
Provides info on application of EE measures	1	1	1	1
Describes typical cost savings re. EE measures	0	0	0	0
Quantifies other typical financials (ROI, payback, etc.) typical in segment	0	NA	0	NA
Describes typical non-financial benefits	0	NA	0	NA
Includes info on risk assessment and risk mitigation	0	NA	0	NA
<i>Actual Points / Maximum Possible Points</i>	<b>1/5</b>	<b>1/2</b>	<b>1/5</b>	<b>3/12</b>
<i>Score</i>	<b>20%</b>	<b>50%</b>	<b>20%</b>	<b>25%</b>

The evaluation team finds this consistent with results from the telephone interviews:

- Participants reported a high level of energy efficiency behavior after the seminar, which is consistent with the fact that the seminar includes a lot of “to dos” relative to increasing energy efficiency.
- Participant interviews gave comparatively lower scores specific to understanding “what to do next” (see Table xB-37), which likely is due to the same issues that resulted in the low scores for overcoming market barriers other than language. That is, little or no information was provided relative to:
  - The process — or difficulty and expense — associated with various recommended actions
  - The likely benefits (financial and other) associated with the recommended actions

For example, recommendations such as “replace incandescent bulbs with fluorescent bulbs” appears to be given the same weight an attention as suggestions to install various lighting controls — with no guidance about what it takes to install controls or what benefit you’re likely to gain as a result.

### *Adult Learning Principles and Practices*

Because of the special nature of the CLEO seminar, many of the criteria typically considered when assessing adherence to Adult Learning Principles and Practices were considered NA.

In addition several criteria were considered NA for a given evaluation method. For example, a review of materials cannot provide useful and reliable information about how the instructor interacts with the participants. As another example, criteria related to the types of statements an instructor might make during the session were NA because we were observing an in-language session and could not determine the finer points of some of the instructor’s presentation. (See Table xB-31 through Table xB-33 for details on which items were considered NA for a given method.)

Overall, the CLEO seminar scored well in the relevant aspects of Adult Learning Principles and Practices, as seen in Table xB-30.

It is interesting to note the differences in some scores resulting from the different methods of obtaining the data. For example:

- A review of the materials did not indicate that there were significant efforts to obtain learner buy-in, but observing the live interactions made it apparent that this was an important element — and this was supported by information obtained in the instructor interviews. (The instructor opened the session with an open question to the participants, who engaged in a lively discussion with the instructor for the first 8 minutes of the session.)

## Appendix B-2: Details for CLEO Evaluation Results

- Both a review of materials and observation resulted in low scores for engaging learners and setting them up for success — largely because the presentation did not seem to be “tailorable” based on input from participants and the relationships between the various topics was not evident.

However, instructor interviews indicated that both of these elements are addressed in the way they handle the seminars.

**Table xB-30. Overall Score for Adult Learning Principles and Practices**

Dimension	Materials	Observation	Interview	MEAN
Obtain Learner Buy-in	30%	90%	100%	73 %
Engage the Learners and Set Them Up for Success	20%	20%	80%	44%
Learning Facilitation	NA	100%	93%	97%
Content Decisions	75%	80%	100%	85%

**Table xB-31. Score Details for Obtaining Learner Buy-in**

Obtain Learner Buy-in	Materials	Observation	Interview	MEAN
There is an initial activity that helps participants see the value of the training.	1	4	5	3.3
The usefulness of the learning in the participants' lives is emphasized and demonstrated.	2	NA	5	3.5
The instructor creates a safe and respectful learning environment.	NA	5	5	5.0
<i>Actual Points / Maximum Possible Points</i>	<b>3 / 10</b>	<b>9 / 10</b>	<b>15 / 15</b>	<b>27 / 35</b>
<i>Score</i>	<b>30%</b>	<b>90 %</b>	<b>100%</b>	<b>73 %</b>

**Table xB-32. Score Details for Engaging Learners and Setting Them Up for Success**

Engage the Learners and Set Them Up for Success	Materials	Observation	Interview	MEAN
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	1	1	3	1.7
Transitional statements are made that show how different sections of the training relate to each other.	1	NA	5	3
<i>Actual Points / Maximum Possible Points</i>	<b>2 / 10</b>	<b>1 / 5</b>	<b>8 / 10</b>	<b>11 / 25</b>
<i>Score</i>	<b>20%</b>	<b>20%</b>	<b>80%</b>	<b>44%</b>

**Table xB-33. Score Details for Learning Facilitation**

Learning Facilitation	Materials	Observation	Interview	MEAN
Validates learners' involvement and responses	NA	5	5	5
Makes transitional statements between sections	NA	5	5	4.5
Ensures that all learners can see and hear	NA	5	5	5
<i>Actual Points / Maximum Possible Points</i>	<b>NA</b>	<b>15 / 15</b>	<b>15 / 15</b>	<b>29 / 30</b>
<i>Score</i>	<b>NA</b>	<b>100%</b>	<b>93%</b>	<b>97%</b>

Table xB-34. Score Details for Content Decisions

Content Decisions	Materials	Observation	Interview	MEAN
Clear focus on key content	5	5	5	5
There is an organizing principle	5	5	5	5
Interesting but unimportant content kept to a minimum	3	NA	5	4
There is an appropriate amount of content for the time period	2	2	5	3
<i>Actual Points / Maximum Possible Points</i>	<b>15 / 20</b>	<b>12 / 15</b>	<b>20 / 20</b>	<b>51 / 60</b>
<i>Score</i>	<b>75%</b>	<b>80%</b>	<b>100%</b>	<b>85%</b>

### *About the Scoring*

Two different scoring techniques were used in evaluating the results noted for Support of Behavior Change and Adult Learning Principles and Practices.

Support of Behavior Change was scored in the same manner as the Support of Programs: a series of “yes/no” criteria, with each criterion receiving a 1 (yes) or 0 (no) or NA (not applicable).

Adherence to Adult Learning Principles and Practices was scored on a scale, with each criterion scoring between 1 and 5 (or NA for not applicable items).

For each criterion, a course may score from one to five:

- 1 = Not at all or very poor (10%)
- 2 = Rarely or poor (40%)
- 3 = Occasionally or fair (60%)
- 4 = Frequently or good (80%)
- 5 = Always or excellent (100%)

In both cases, the score for a particular dimension was the total points scored for criteria under that dimension divided by the maximum total number of points possible.

## Details for Participant Satisfaction

### Exit Survey Results re. Satisfaction

As noted in the Methods section of this report, the individual results of the Exit Surveys administered during the 2006–08 CLEO seminars were unavailable. The only Exit Survey data that the program staff was able to provide was the consolidated results reported in the CLEO 2008 Annual Report, submitted by Global Energy Services in February 2009.

Because exit survey data is unavailable by event — we are unable to determine if there are any patterns by ethnic group or other variables (such as event location).

It also struck the evaluation team that the scale that is used on the CLEO exit survey is somewhat unusual. It is a 5-point scale, with the high end as “Excellent” and the low end as “Poor.” (Usually the low end of such a scale would be “Very Poor.”) The way the scale is currently set on the survey, the respondent has three positive choices, one neutral, and one negative. (Typically there are two positive, one neutral, and two negative.)

There were a total of 568 respondents to the exit survey. Table xB-35 summarizes the figures cited in the annual report relative to participant satisfaction results on the exit survey.

Looking at the mean score, we see that the seminar scored between 4.1 and 4.2 on a scale of 1 to 5, which is quite a bit lower than average satisfaction score for courses offered at the SCE energy centers, which have an average score of 4.4 to 4.5 on similar items (Table xB-36).

**Table xB-35. Exit Survey Responses re. General Satisfaction with the Seminar**

Exit Survey Items	Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)	Average Score
How do you rate the CLEO seminar facility?	32%	48%	17%	3%	0%	4.1
How do you rate the CLEO seminar instruction?	33%	53%	13%	1%	0%	4.2
How do you rate the CLEO seminar material?	35%	49%	14%	2%	0%	4.2
	<b>Yes</b>	<b>No</b>				
After attending a CLEO seminar, will you recommend CLEO to your friends?	99%	1%				

**Table xB-36. Comparing CLEO Satisfaction Scores to SCE Energy Center Scores**

Satisfaction Area	Average Scores		
	CLEO	TTC Courses at EC	EC Courses Excluding TTC
Facility	4.1	4.4	4.1
Instruction	4.2	4.7	4.7
Materials	4.2	4.5	4.3
Average	4.1	4.5	4.4

(See Table xC-26 in Appendix C-2 for details on exit survey satisfaction scores for TTC and EC classes.)

## Participant Interview Results re. Satisfaction

Participants were asked about their satisfaction with the CLEO seminars on six dimensions: relevance of the information, examples used in class, clarity of information, the way the leader conducted the seminar, overall satisfaction, and whether the customer knew what to do next. Table xB-37 displays the means of the answers to these questions that were based on a 1 to 5 scale, with 1 meaning not at all satisfied and 5 meaning very satisfied. Means for all dimensions are above 4.0 with the exception of one, indicating a high level of satisfaction overall and across ethnic groups. Another obvious pattern is that the Korean-speaking participants had the highest level of satisfaction of the three groups.

The one area where some means fell below 4.0 was the participants' understanding of what their next step should be. The Chinese-speaking and Vietnamese-speaking group means were 3.77 and 3.96 respectively. So, if there is any weakness in the content of the seminars it may be in making it clear what the next step should be for the participants.

There were statistically significant differences among ethnic groups in four of the six dimensions of satisfaction. The two aspects of the seminars that did not show significance were clarity of information and how the leader conducted the seminar. For all other aspects, the Korean-speaking groups showed more satisfaction than the others.

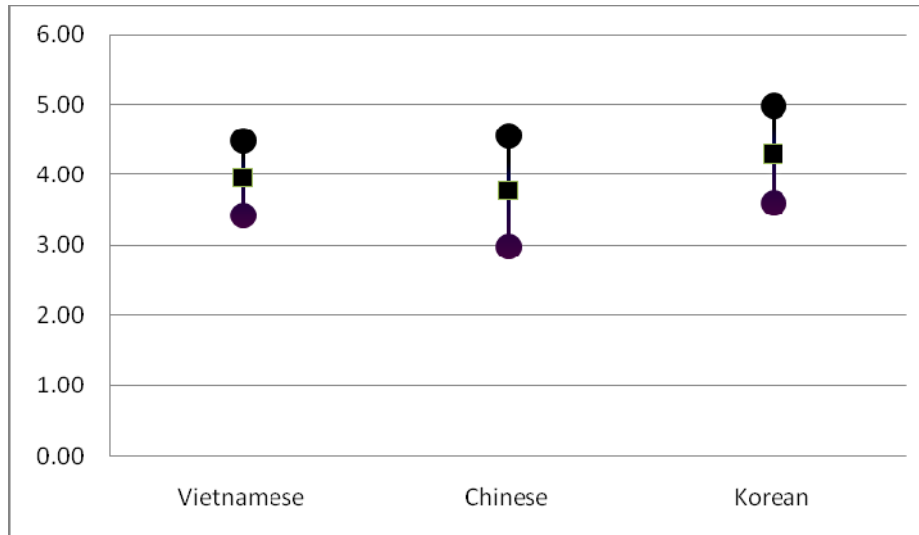
**Table xB-37. Mean Satisfaction on Six Aspects of CLEO Seminars**

	Vietnamese	Chinese	Korean
Understand what to do next?	3.96	3.77	4.30
Satisfaction with seminar	4.25	4.26	4.51
Satisfaction with how leader conducted it	4.28	4.26	4.42
Satisfaction with clarity of information	4.23	4.30	4.45
Satisfaction with examples used	4.27	4.14	4.49
Satisfaction with relevance of information	4.26	4.22	4.62

Another way to analyze the satisfaction scores is to consider how consistent the answers were within each ethnic group. In other words, how much variation is there in the individual answers versus how close together are they? A statistical measure of variation is the standard deviation; the larger the standard deviation, the more variation there is within the group. More variation indicates more disagreement; the level of disagreement about the various aspects of the seminar might indicate some variation in the quality of the seminars. Some aspects of the seminars produced more disagreement among the participants than others. For example, Figure xB-2 portrays visually how spread out or close together each ethnic group's answers were about how well they understood what to do next; the longer the vertical line, the more disagreement within the group on this topic. The point marked by the square is the mean response, and the points demarcated with circles show the point that is one standard deviation above and below the mean. Clearly, the Chinese-speaking group showed the most variation while the Vietnamese-speaking group showed the least variation, or, in other words, the most agreement.

## Appendix B-2: Details for CLEO Evaluation Results

**Figure xB-2. Variation in Answers: Understanding What to Do Next**



Another area where the ethnic groups were different is in their level of within-group agreement on overall satisfaction with the seminar. Figure xB-3 demonstrates the same pattern that we saw in Figure xB-2: more agreement among the Vietnamese-speaking participants, and less for the Chinese-speaking group.

Figure xB-4 shows the same pattern but even more strongly. The topic is the relevance of information. There is a lot of variation in satisfaction on this topic among the Chinese-speaking participants, and much less among the Vietnamese-speaking participants, with the Korean-speaking group falling between the two.

**Figure xB-3. Variation in Answers: Overall Satisfaction with Seminar**

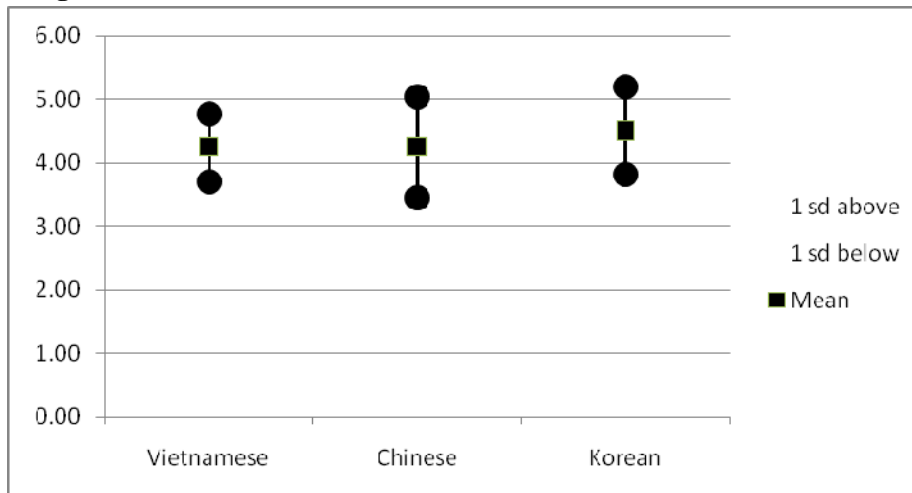
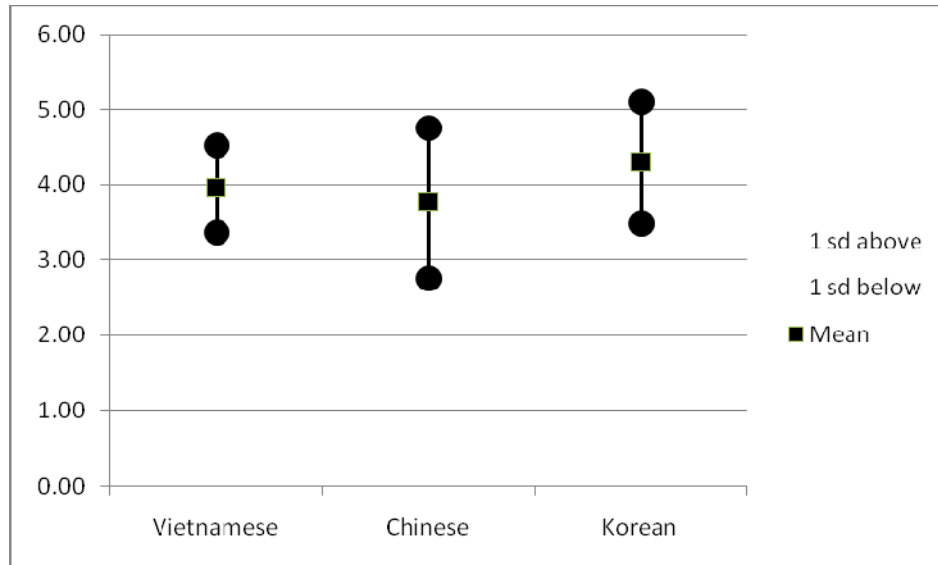




Figure xB-4. Variation in Answers: Satisfaction with Relevance of Information



Another way to measure satisfaction is to ask participants what they liked and disliked about the program, and what suggestions they have for improving it. These questions were all asked of the CLEO seminar participants in an open-ended format. The interviewers wrote down what each person said, and these responses were coded. Table xB-38 reveals the types of comments participants made about what they liked about the program. The most frequent comment (52% to 66%) was that participants liked learning about how to save energy, not surprisingly, since that was the focus of the program and was advertised as such before customers decided to attend. The differences across ethnic groups were not large, though the Chinese-speaking group mentioned this the most frequently.

The second most frequently-mentioned feature of the seminars was the free things that were provided. This was especially appreciated by the Vietnamese-speaking participants at 41% mentioning it compared to 10% of the other groups. In keeping with the patterns we have observed before, the Vietnamese-speaking group mentioned quite a few more areas as things they liked than the other groups. Eight areas drew favorable comment from at least 10% of the Vietnamese-speaking group, compared to only two areas for the Korean-speaking participants, and five areas for the Chinese-speaking. The areas that the Chinese-speaking ethnic group found most worthy of comment were learning about saving energy, clarity of information, learning about saving money by saving energy, the lottery, and the free gifts. The list of favorable features cited by the Korean-speaking group were learning about saving energy, learning about energy-efficient light bulbs, and the free gifts. They notably did not mention clarity as a feature they liked, although the other groups did.

**Appendix B-2: Details for CLEO Evaluation Results**

**Table xB-38. What Participants Liked about the CLEO Seminar**

<b>Response</b>	<b>Chinese (N=77)</b>	<b>Korean (N=29)</b>	<b>Vietnamese (N=160)</b>	<b>Total</b>
Learning about saving energy	66%	52%	58%	59%
Free stuff	10%	10%	41%	29%
Clarity of information (answering many question, language, detail)	16%	3%	24%	19%
Learning about saving money by saving energy	16%	3%	23%	18%
Useful, helpful	1%	0%	19%	12%
Fun (meet people, community)	0%	0%	18%	11%
Learning to save the planet by saving energy	4%	0%	13%	9%
The presenter/host	1%	3%	10%	7%
The lottery	10%	3%	4%	6%
Learning about energy-efficient lighting/light bulbs	6%	14%	3%	5%
General liking	1%	17%	3%	4%
Learning about SCE programs	4%	0%	0%	1%

On the other side of the satisfaction continuum, Table xB-39 lists the areas the participants thought to mention as things they did not like. The most notable aspect of this Table is how few people were able to name things they did not like. Only 26 people produced these comments, and most of them are from the Chinese-speaking group. This may be related to the variation in opinion revealed above for this group. More specifically, 14% of the 21 who mentioned any dislikes mentioned a chaotic setting, a lack of knowledge or enthusiasm from the instructor, and lack of clarity. Ten percent mentioned the content being too broad and general, too many people in the room, nothing new to them was presented, and the seminar was presented in the wrong language (Mandarin versus Cantonese). Across ethnic groups, one of the more common complaints was that the material was too broad or general.

**Table xB-39. What Participants Mentioned They Disliked About the Seminar**

<b>Response</b>	<b>Chinese (N=21)</b>	<b>Korean (N=2)</b>	<b>Vietnamese (N=3)</b>	<b>Total</b>
Too broad/general	10%	50%	33%	15%
Chaotic setting	14%	0%	33%	15%
Presenter not knowledgeable or enthusiastic	14%	0%	0%	12%
Not clear	14%	0%	0%	12%
Boring	5%	50%	0%	8%
Too many people for good Q&A	10%	0%	0%	8%
Nothing new presented	10%	0%	0%	8%
Wrong language	10%	0%	0%	8%
Wanted more on wind/solar energy	5%	0%	0%	4%
Wanted more on AC	5%	0%	0%	4%
Solutions/suggestions too expensive	5%	0%	0%	4%
Too small a setting	5%	0%	0%	4%
Couldn't find location	0%	0%	33%	4%

A final approach to assessing satisfaction is to ask what suggestions the participant has for program improvement. This question, too, was asked in open-ended format. The responses were coded into categories and are shown in Table xB-40. Only a minority of participants made suggestions: 40% for Chinese-speaking participants, 27% for Korean-speaking and only 9% for Vietnamese-speaking.

**Table xB-40. Participant Suggestions for Program Improvement**

Response	Chinese (N=38)	Korean (N=14)	Vietnamese (N=17)	Total
Offer more seminars/more locations/more target audiences	16%	57%	82%	41%
Advertise more for seminars and energy-efficiency	24%	0%	18%	17%
Provide more/better examples	11%	21%	0%	10%
Provide more detail	13%	7%	0%	9%
Give more light bulbs and incentives	5%	7%	6%	6%
Orient more to low-income people	11%	0%	0%	6%
Make experience more fun	3%	7%	0%	3%
Connect people to programs more directly	5%	0%	0%	3%
Provide more light bulb recycling opportunities/general concern about pollution	5%	0%	0%	3%
Promote solar energy more and explain how to do it	5%	0%	0%	3%
Answer more questions	3%	0%	0%	1%
Provide more incentives to attend	3%	0%	0%	1%
Host should be more enthusiastic	3%	0%	0%	1%
Just send a brochure home	3%	0%	0%	1%
Cover more than just light bulbs	3%	0%	0%	1%
Just advertise energy efficiency at community events- -not seminars	3%	0%	0%	1%
Use slides for presentation	3%	0%	0%	1%

The most frequent comment was the suggestion to expand the availability of the seminars. Some suggestions related to location, other to more seminars, and reaching more target audiences. This category of suggestion came mainly from Korean-speaking and Vietnamese-speaking participants. It is the type of suggestion that reflects well on the program as opposed to complaints about format or content. The Chinese-speaking group did make this suggestion (16%) but more often (24%) addressed the possibility of doing more advertising. This category included advertising the seminars and advertising energy efficiency.

The Chinese-speaking participants provided more suggestions and a broader variety of them. The other two ethnic groups concentrated their thoughts on just a few categories, especially the positive ones of broadening the scope of the program. Another common suggestion among the Chinese-speaking group was asking for more detail in the seminars (13%). The suggestion of providing more and better examples came from 11% of Chinese-speaking and 21% of Korean-speaking participants. One final suggestion made only by Chinese-speaking was to orient the program more to low-income customers (11%).

# Appendix B-3: Details for CLEO Exploratory Investigation Results

## Method of CLEO Exploratory Investigation

There is one source of information for this exploratory investigation: telephone interviews. An interview protocol was developed to address the four research goals as follows.

To address Research Question 5-1: *What is the current position of African Americans on energy efficiency?*, the interview protocol included:

- A battery of questions about general attitudes toward energy efficiency that has been administered to many populations.
- A battery of questions testing general knowledge about energy efficiency that was administered to the existing CLEO program interview sample.
- A question exploring what SCE programs the customer recognizes on a list.
- A set of questions that measures how committed the customer is to saving energy over five end use areas.

Slightly different questions were asked of renters and homeowners.

- Homeowners were asked how much effort they had put into saving energy on energy practices, plug load, lighting, building envelope, and heating and cooling equipment. They were also asked about their efforts in conserving water.
- Renters were asked about practices, plug load, lighting, water, and gas.

The actual phrasing of these questions can be seen in the interview in Appendix B-8.

To address Research Question 5-2: *What do members of the community want to learn about energy efficiency?*, the interview protocol included a set of questions (immediately following the questions asking about level of effort) that asked how interested the customer was in learning about that end use area.

Of course the same separation of questions was maintained for owners versus renters.

To address Research Question 5-3: *What learning formats do these customers prefer?*, we asked a set of questions asking whether or not each of six possible formats for learning would be of interest.

To address Research Question 5-4: *How does this group's characteristics compare to existing CLEO customers?*, we compared the results for the African-American group to a set of questions asked of the present CLEO participants to characterize the household.

A set of additional questions to characterize the community that were not asked of the current program participants.

The target customer for this interview was African-American. However, it is not feasible to screen potential respondents to assure only African-American interviewees. The approach we took was to sample from SCE ZIP codes that have at least 50% African-American residents, and complete interviews with any willing participant who lives in those ZIP codes. In practice, one ZIP code, representing Compton, that was slightly under 50% African-American was included as well. The demographic information about the ZIP codes was obtained from the US Census Bureau website.

### Appendix B-3: Details for CLEO Exploratory Investigation Results

A power analysis revealed that a sample of 66 would meet the confidence and precision criteria of 90/10. However, because we wanted to be sure to reach enough African-Americans in the completed sample, a target of 100 was set. The sample frame was defined by a random sample of 1500 SCE customers residing in the identified ZIP codes. Of the 1500, six had insufficient information to call. Table xB-41 shows the number of calls attempted, and the disposition of each.

**Table xB-41. Exploratory Study Sample Disposition**

<b>Response Category</b>	<b>N</b>
Completed Interviews	100
Terminated Interviews	11
Not Qualified Interviews	1
Refused to participate	73
Disconnected number	165
Wrong number	51
Modem	10
Hard of hearing	1
Deceased	9
Duplicate number	1
<b>Total Resolved Sample</b>	<b>422</b>

## Context for the Results

### General Characteristics

The aim was to maximize the number of African-American customers surveyed, and to get at least 66 in that category. Table xB-42 shows that this goal was achieved with 77 of the 100 interviewees being African American. In the report that follows, sometimes results will be broken down by ethnic group: African American versus non-African American. The purpose for this is to allow program planners to focus their attention on that ethnic group if desired. In some tables, the groups are combined, and that reflects a lack of difference between the groups in that analysis. Also, the small number of non-African-American interviewees in this sample doesn't allow some analyses to be conducted with the groups separated.

Another basic fact about this sample is the very high rate of home ownership as shown in Table xB-42. Only six interviewees were renters. This means that very few analyses can be focused on renters. (See "A Closer Look at the Homeownership Rate" on p. B-35 for a discussion of the unusually high homeownership rate in the interview sample.)

**Table xB-42. Interviewee Characteristics**

<b>Ethnicity</b>	<b>Percent (N=100)</b>
Hispanic/Latino/Latina	1%
African-American	77%
Caucasian	9%
Asian-American	1%
Native American	1%
Multi-Racial	6%
Other	3%
Refused	2%
<b>Tenancy</b>	<b>Percent (N=99)</b>
Own	94%
Rent	6%
<b>Age Category</b>	
Under 18	18%
18-59	43%
60+	39%

Table xB-43 shows that over half of the exploratory sample resides in homes built between 1950 and 1970. Very few were built more recently than that.

Table xB-43 also shows the characteristics of the homes that the sample interviewees occupy. We see that single-family homes are very much the norm in this sample.

The majority of homes (61%) are air conditioned and these homes usually have central air conditioning.

Table xB-43. Home Characteristics

Type of Home	Percent (N=100)
Single Family	86%
Condominium	3%
Apartment	2%
Mobile Home	6%
Other	3%
Year House Built	Percent (N=100)
2000-2009	1%
1990-1999	2%
1980-1989	8%
1970-1979	12%
1960-1969	30%
1950-1959	22%
1940-1949	16%
Before 1940	8%
Air Conditioning?	Percent (N=100)
Yes	61%
No	39%
Type of Air Conditioning	Percent (N=61)
Room Air	3%
Central Air	97%

In summary, the sample of customers in this study is overwhelmingly African American, and they own their own single-family homes. Most have central air conditioning in homes that are relatively old, the majority of which were built during the two decades between 1950 and 1970.

## A Closer Look at the Homeownership Rate

The home-ownership rate of 94% for this sample seemed quite high, so it was investigated further.

As mentioned in the Methods discussion, this sample was drawn from nine ZIP codes that were identified from the US Census as being 50% or more African-American. The first step in assessing how well the home ownership rate in the sample represents the population rate in those ZIPs was to calculate the overall home ownership rate for the group of ZIP codes directly from the Census. The mean rate for these areas was weighted by the population in each. That weighted rate of home ownership is 56%, clearly very different from the rate found in the interviewed sample.

To investigate what the source of this difference is, the outgoing sample of 1,500 and the interviewed sample of 100 were evaluated in the same way. In other words, for each source, the rate of home ownership in each ZIP code was weighted by the sample size in that area, and summed to reveal the overall ownership rate for all predominantly African-American ZIP codes. Table xB-44 shows the results for all analyses.

## Appendix B-3: Details for CLEO Exploratory Investigation Results

**Table xB-44. Homeownership Rates for Nine Predominantly African-American ZIP Codes**

Source	Average Home-Ownership Rate
Census: Weighted by population in each ZIP code	56
Outgoing sample: Census rate weighted by sample N in each ZIP code	65
Interviewed sample: Census rate weighted by sample N in each ZIP code	63
Interviewed sample: Self-reported rate	94

The outgoing sample of 1,500 was selected randomly from SCE customers residing in the specified ZIP Codes that consisted predominantly of African-American residents. This should produce a home ownership rate similar to the Census rates in the same ZIP Codes. However, as seen in Table xB-44, that rate is 65% compared to 56% from the actual Census reports. Similarly, the Census-reported rate for the interviewed sample is 63%.

These figures reveal that the sampling processes probably biased the results only slightly.

However, it is when we ask the interviewed sample whether they own or rent their homes that we see a dramatic jump in the ownership rate. Here we have 94% compared to the Census-based ownership rate of 63% for the same sample. In other words, if we assign each of 100 interviewed customers to the appropriate ZIP code, and assign the Census-based ownership rate to that ZIP code, and weight by the number of sampled households in that area, the rate is 63%, but when we ask the same sampled customers whether they own or rent, 94% say they own.

- This difference is very large, and it is unlikely to be the result of interviewee lying to the interviewer.
- What is more likely is that the 28% of the outgoing sample of 1,500 that couldn't be reached by the phone number provided were dominated by renters due to the higher mobility experienced by that group.

Had those customers been reachable, the rental rate would probably have increased substantially, and the ownership rate would have fallen.

In any case, we should consider the ownership rate for the African-American population living in ZIP codes dominated by that group to have an ownership rate closer to 56%. The sampled ZIP codes range between 28% and 88% home ownership in the Census reports.

An analysis of the Census figures for the sampled ZIP codes gives us some information about the income of this population and of our sample. It should be noted that the median income figures we are working with here come from the 2000 Census, so may be somewhat out of date. However, they do serve to indicate that a sample from these areas is likely to be a sample of moderate income families, putting them in the hard-to-reach status. The Census reports that these predominantly African-American ZIP codes have an average median income of \$38,140.

The outgoing interview sample of 1,500 yields a Census-based estimate of \$50,390, and the interviewed sample of 100 produces an estimate of \$47,877. Of course, we do not know the actual (self-reported) income of the sample, so the same biases that applied to the ownership rate could apply here too.



## Current Position on Energy Efficiency

Attitudes are important in predicting behavior, and changing attitudes about the importance of energy efficiency can increase customers' energy-efficient behavior, and understanding customers' attitudes can help focus education campaigns. There are many ways of measuring relevant attitudes in this field, and we have employed some of them. One battery of attitude questions has been in use for a decade, and using the same ones for the current study and for different populations can give us a better understanding of the position of the target population than would be possible with a unique set of questions. We considered it valuable to present the responses of the CLEO exploratory study interviewees in the context of other contemporaneous studies as well as baseline values taken in 1999. Table xB-45 shows those figures.

The strongest pattern in the Table, considering the focus of this study, is that the African-American community in the sampled ZIP codes is very much in the mainstream both in terms of comparisons with other current programs and in terms of improvements over the decade. Both segments rated very highly the statement that, "It is worth it to me for my household to use less energy in order to help preserve the environment." The average response, on a scale of 1 to 10 was about 8.3, the strongest endorsement of energy efficiency among all items. This is consistent with other study groups over the last few years, and is a slight improvement over the baseline measures. In this, and most other interview items, the only group that has higher ratings than the African-American group in the current study, is the participants in the Comprehensive Mobile Home Program. The latter group consistently shows more orientation to energy efficiency and the environment than other groups, starting with the first item that states, "My life is too busy to worry about making energy related improvement to my home." The disagreement of the CMH population is likely due to the larger percentage (73%) of CMH participants who are over 60 and therefore more likely to be retired. The same explanation may pertain to the other questions as well. Retirees may feel more available to focus on energy efficiency.

Overall, this community should be characterized as quite typical of other groups of SCE customers. SCE customers, including this sample, appear to have made some gains in energy efficiency attitudes compared to the general population of the US and California in 1999, and are likely to be amenable to the messages of the CLEO program.

Table xB-46 shows the results of a 5-item energy efficiency knowledge quiz comparing the current study sample results to the 2006–08 HEER participants and the 2006–08 CLEO seminar participants. The percentages indicate how many correct answers were provided by the interviewees. On the first two questions, both groups of the current sample did extremely well (94.7% and 95.9% correct for the African-Americans and 100% and 90.5% for the non-African Americans), in fact as well or sometimes better than other program participants, especially compared to the Korean-speaking sample (88% and 68%) of CLEO. They are most comparable to the Chinese-speaking CLEO participants (94% and 98%). On the third question, comparing CFLs to incandescents, the African-American group didn't do as well (65.7%) as the CLEO participants (85% to 94%). Interestingly, they did much better than participants in both programs on the last two questions covering the meaning Energy Star and how homes compare with cars on greenhouse gasses. These are questions based on information not covered by CLEO seminars so they tap into background knowledge even for the CLEO participants. We would expect CLEO participants to do better than the current study participants on the first three questions since the former had been deliberately exposed to relevant material while the latter had not. For the last two questions all groups might be expected to be on an equal footing since they didn't tap in to CLEO material. Based on that, it would seem that the current study sample is better informed, in general, than the CLEO group or the HEER participant group. In fact, the background energy efficiency knowledge of the current interviewees is likely better than other ethnic groups since the latter groups had just been taught the information in a way that the current interviewees had not.

Appendix B-3: Details for CLEO Exploratory Investigation Results

Table xB-45. Energy Efficiency Attitudes of Exploratory Interviewees and Other Comparison Groups (1-10 Scale)

Question	Statistic	2009 Exploratory Study Results			Comparison Groups & Study Results			
		African-American (n=77)	Non-African-American (n=23)	SCE CMH 2009 (n=100)	SCE In-Home Res Audit 2002 (n=127) <sup>1</sup>	SCE In-Home Res Audit 2001 (n=270) <sup>2</sup>	CA Residents 1999 (n=1,170) <sup>3</sup>	US Residents 1999 (n=651) <sup>3</sup>
My life is too busy to worry about making energy related improvements to my home	Mean	3.7	2.3	4.2	3.3	8.0	3.7	3.4
	S.D.	3.20	2.8	3.60	2.94	3.94	†	†
Scarce energy supplies will be a major problem in the future	Mean	7.8	7.7	9.0	7.9	6.7	6.9	7.1
	S.D.	2.65	3.2	2.02	2.69	4.43	†	†
Instead of building new power plants, customers should use less electricity	Mean	6.3	5.4	7.4	6.6	5.8	6.2	6.3
	S.D.	3.17	3.1	3.02	3.07	3.94	†	†
It is possible to save energy without sacrificing comfort by being energy efficient	Mean	7.7	7.7	8.8	8.0	8.0	7.7	7.9
	S.D.	2.41	2.9	2.09	2.26	3.44	†	†
It is worth it to me for my household to use less energy in order to help preserve the environment	Mean	8.3	8.4	9.1	8.1	8.3	7.7	7.7
	S.D.	2.39	2.6	1.78	2.11	3.12	†	†
Using energy in ways that preserve the environment is not worth it if it requires major lifestyle changes	Mean	4.2	3.7	4.9	†	†	†	†
	S.D.	3.18	3.4	3.69	†	†	†	†
My energy use is too small to worry about in the grand scheme of things*	Mean	3.9	4.6	4.7	†	†	3.4	3.3
	S.D.	3.14	3.7	3.54	†	†	†	†
I feel guilty if I use too much electricity	Mean	6.1	6.4	†	†	†	†	†
	S.D.	3.29	3.1	†	†	†	†	†

Note: The years shown in the columns are the years of the survey, not the program year of the study  
† Not available from the original published study  
\* The wording on this item is not exactly the same in the CBEE study  
<sup>1</sup>KVD Research Consulting, "Final Report for the Measurement and Evaluation Study of Southern California Edison Company's PY2002 Local In-Home Audit Program," April 26, 2004.  
<sup>2</sup>Ridge & Associates, "Evaluation of Southern California Edison's Residential Audit Programs: Final Report," Sept 6, 2002  
<sup>3</sup>Hagler Bailly, "CBEE Baseline Study On Public Awareness And Attitudes Toward Energy Efficiency: Final Report," June 18, 1999.

Table xB-46. Exploratory Sample Interviewees' Answers to Energy Efficiency Knowledge Questions

Statement	Correct Answer	Percent Answering Correctly					
		Exploratory Study		HEER Program	2006–08 CLEO Participants		
		African-American (N=75)	Non-African-American (N=23)	2006–08 HEER Prog Partic (N=658)	Chinese (N=94)	Korean (N=52)	Vietnamese (N=186)
Replacing an old refrigerator with a new Energy Star refrigerator will save the typical household more than \$150 a year.	True	95%	100%	89%	94%	88%	99%
Edison will haul away your old refrigerator or freezer at no cost to you.	True	96%	91%	81%	98%	68%	85%
Standard incandescent light bulbs generate more heat than light.	True	66%	71%	71%	87%	94%	85%
All air conditioners that are Energy Star certified are equally efficient.	False	48%	62%	60%	39%	25%	1%
Homes emit insignificant amounts of greenhouse gasses compared with cars.	False	53%	65%	38%	4%	41%	3%

## Familiarity with SCE Programs

The evaluation team was also interested in knowing how familiar the exploratory sample was with SCE programs. To determine that, they were asked to indicate which of a list of programs read to them they recognized. These results are shown in Table xB-9. It should be noted that these results cannot be compared to results of a similar question asked of CLEO participants since the latter did not have the benefit of hearing the list of programs.

The program most recognized by the current sample, both African-American and non-African-American groups is the Appliance Recycling program (87%), followed by the HEER (Rebate) program (70%). A significant drop in recognition can be observed in programs after those two. For the next five programs, the recognition rate is 50% or a little more. These programs include the solar incentives, renewable energy/green power, HEES (audits), the Summer Discount Program, and Energy Management Assistance (the lowest rate in this group). The programs this group is least likely to recognize tend to be the low-income programs. Of the remaining programs, only the financing program is not related to low-income.

More than 50% of customers in the current study have heard of the yellow Energy Guide stickers that appear on appliances (57% of African Americans and 65% of non-African-American customers). (See Table xB-48). On the other hand, customers are much more likely to be familiar with the Energy Star label, although there is a significant difference between the African-American customers and the non-African-American (68% versus 87%). Interestingly, in both cases, the African-American group has lower familiarity than the non-African-American customers in the same ZIP codes.

Another way of describing customers' current position on energy efficiency is their commitment to conserving energy in their own homes. One way to tap into that is to ask them how much effort they have put into the various areas where conservation is possible. Customers who own their own homes were asked about that effort in areas pertinent to homeownership, while renters were asked similar questions about areas relevant to renters. Of course 94% of the sample of 100 customers was homeowners (meaning that there are only 6 renters in the sample), so the results for renters should be viewed with caution. The questions about areas of potential conservation were guided by the various end uses involved in customers' homes: practices, lighting, plug load, envelope, and heating and air conditioning. In addition, we asked about conserving water since the HEES survey addresses that as well as electricity. The end uses relevant to renters were: practices, lighting, plug load, and heating/air conditioning (because it is possible for them to purchase area heaters and room air conditioners), as well as conserving gas, as a point of comparison.

Table xB-47 summarizes the results of asking those questions by showing the percent of the sample that chose the values of 4 or 5 on a 5-point scale, values over the midpoint of the scale. Among the items that tap in to conserving electricity, practices is the area where interviewees reported putting the most effort (83%). After that are lighting (70%), plug load (68%) and then envelope (64%). Renters showed a similar level of effort in the domains relevant to them.

Table xB-47. SCE Programs Recognized by Sample Customers

Response	African-American (n=75)	Non-African-American (n=23)	Total
Recycling used refrigerators or freezers	87%	86%	87%
Rebates on energy-efficient purchases	70%	73%	70%
Incentives for solar power (California Solar Initiative)	59%	55%	58%
Renewable energy/green power	53%	64%	55%
Home energy audits/energy survey	51%	64%	54%
Interrupting or cycling the central air conditioner (Summer Discount Plan)	53%	55%	53%
Paying for energy efficient appliances for low income customers (Energy Management Assistance)	47%	59%	50%
CARE Rate	33%	32%	33%
FERA (Family Electric Rate Assistance Program)	25%	32%	27%
LIHEAP (Low-Income Home Energy Assistance Program)	22%	41%	27%
Financing or approved contractor lists for central air-conditioning	24%	27%	24%
Medical Baseline Program	21%	18%	20%
DAP (Direct Assistance Program)	20%	18%	19%
Other	8%	9%	8%

Table xB-48. Energy-Related Labels Recognized by Sample Customers

Seen or heard of...	African-American (n=77) % Yes	Non-African-American (n=23) % Yes
... yellow stickers called Energy Guide labels that appear on new appliances?	57%	65%
... the Energy Star label*	68%	87%
* $\chi^2=3.31, 1, p=.069$		

Appendix B-3: Details for CLEO Exploratory Investigation Results

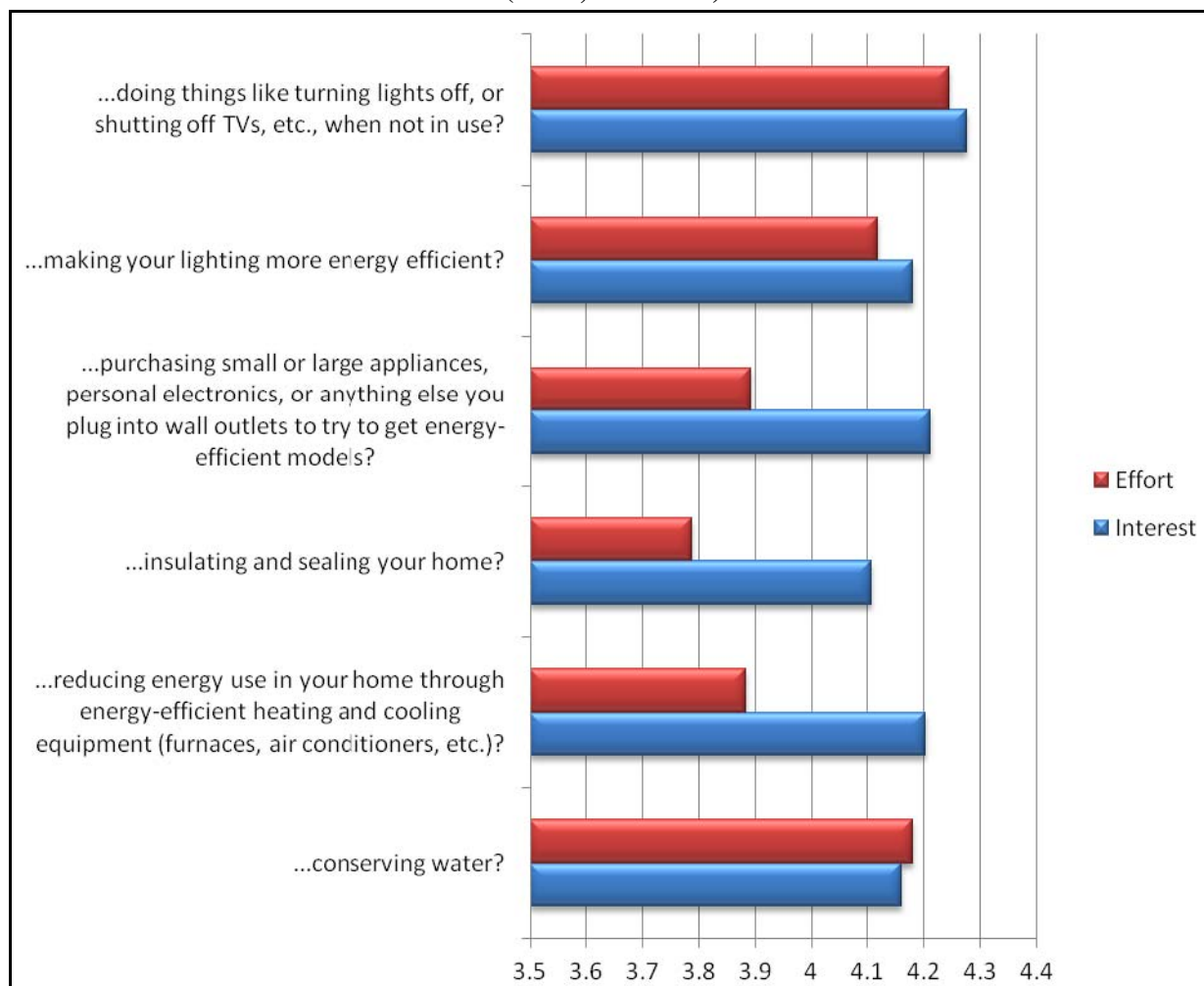
Table xB-49. Commitment to Energy Efficiency in the Home

How much effort have you put into....	% Saying 4 or 5 on 5-Point Scale
<b>Owners</b>	
...doing things like turning lights off, or shutting off TVs, etc., when not in use?	83%
...making your lighting more energy efficient?	72%
...purchasing small or large appliances, personal electronics, or anything else you plug into wall outlets to try to get energy-efficient models?	68%
...insulating and sealing your home?	64%
...reducing energy use in your home through energy-efficient heating and cooling equipment (furnaces, air conditioners, etc.)?	70%
...conserving water?	82%
<b>Renters</b>	
...doing things like turning lights off, or shutting off TVs, etc., when not in use?	83%
...making your lighting more energy efficient?	83%
...purchasing small or large appliances, personal electronics, or anything else you plug into wall outlets to try to get energy-efficient models?	67%
...reducing energy use in your home through energy-efficient heating and cooling equipment (furnaces, air conditioners, etc.)?	67%
...conserving gas?	50%

## Interest in Learning about Energy Efficiency

The approach we took to assessing the interviewees' interest in learning about energy efficiency is to ask directly about their interest in each of the areas where we had asked about their commitment. In fact, each interest question was asked directly after its corresponding commitment question. Probably the most revealing way to portray the level of interesting in learning is to present it immediately adjacent to the average level of commitment. For this analysis, average ratings were used rather than percentages because the averages represent the full range of responses, and the comparison of averages better represents the differences between effort and interest. Figure xB-5 reveals these comparisons.

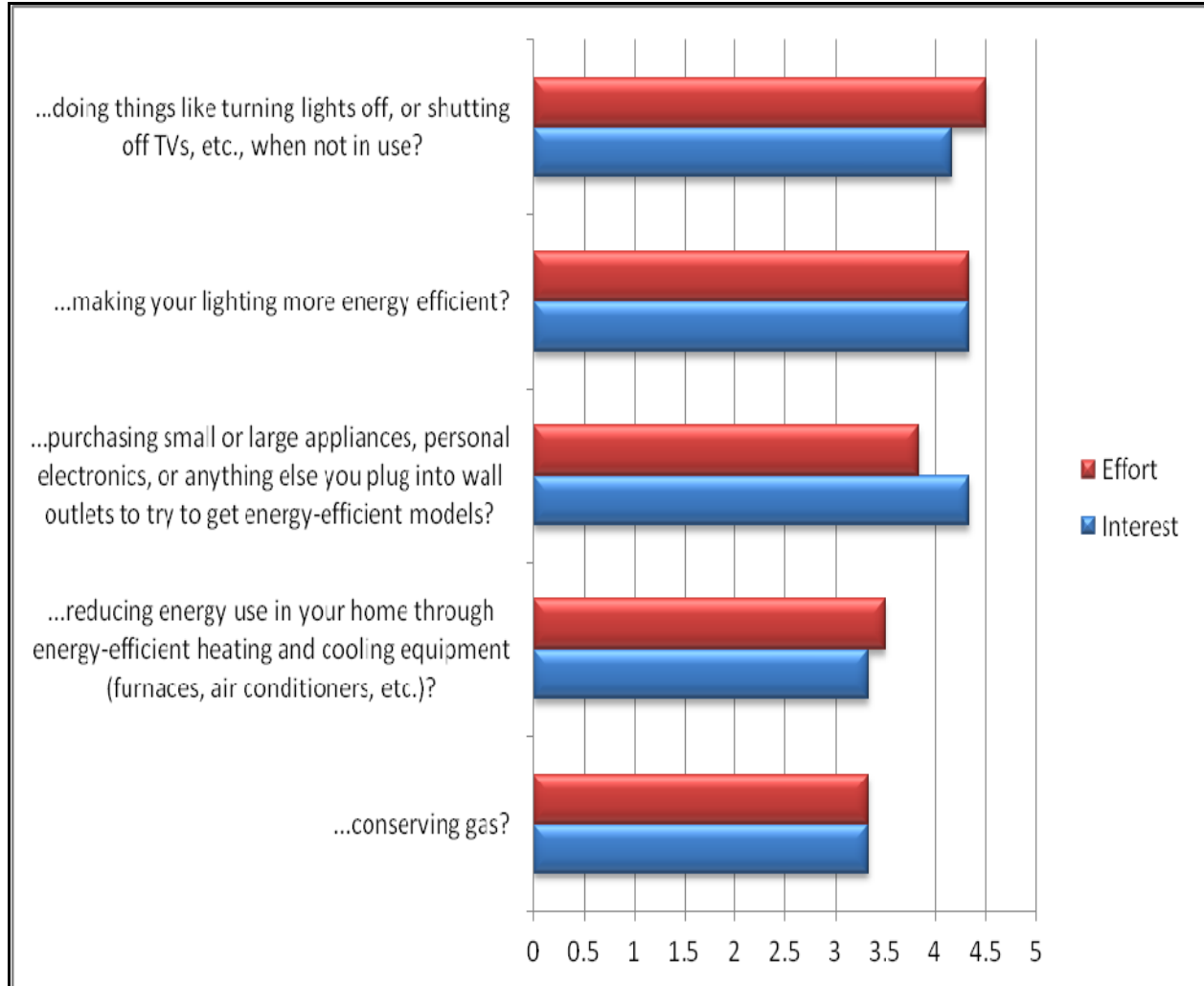
**Figure xB-5. Average Level of Interest Compared to Level of Effort: Homeowners (N=94, Scale=1-5)**



The area of strongest effort (practices) is also the area of greatest interest in learning. However, the areas of least effort (envelope, plug load, and heating/air conditioning) also show high levels of interest in learning more. These may be the areas of greatest potential for presenting information that promotes change.

Results for the renters are shown in Figure xB-6 but it should be repeated that these are based on only six interviewees. For these six people, the level of interest in learning more parallels more closely the level of effort reported for each end use area.

Figure xB-6. Average Level of Interest Compared to Level of Effort: Renters  
(N=6, Scale=1-5)





## Preferences for Learning Formats

The interviewees in this sample reveal a heartening level of interest in learning more about energy efficiency. The question that follows that, logically, is how would they like to learn? In what format? Table xB-50 reveals what the most and least favorite formats were for this group.

**Table xB-50. Preferred Formats for Learning More About Energy Efficiency**

Format	Percent Selecting*
TV announcements	82%
Literature sent by direct mail	80%
Literature sent as an insert to your electricity bill	75%
A web site presentation	62%
Radio announcements	55%
A presentation to a small group in a church or community center	47%
Other	13%
*Respondents could select multiple format options	

The most selected methods of learning were TV announcements (82%) and direct mail literature (80%), followed closely by literature inserted into electricity bills (75%). The option least selected was the format typical of the CLEO program, the seminar (47%). At face value, this would imply that the CLEO-type seminar is not the best option. However, we should take into account what has already been done. Energy Efficiency information has been disseminated by TV, direct mail, and bill inserts. It may be that these methods have had whatever impact they are going to have. So, while the group presentation may not be the most popular option, the 47% figure reflects a reasonable portion of this group; i.e., this method could reach a substantial portion of the African-American customers and take them beyond where they are at this time.

Another analysis further supports the idea of offering seminars for this group. Table xB-51 shows the average level of interest in learning about energy efficiency and level of effort to save energy over all end uses, broken down by whether the interviewee selected each type of information format. This analysis allows us to see if those who chose a particular format have a higher level of interest than those who didn't choose it.

**Table xB-51. Average Interest and Effort by Formats Chosen (Scale=1-5)**

Format	Chosen?	Interest		Effort		Statistically Sig?	
		Mean	S.D.	Mean	S.D.	Interest	Effort
Small group presentation (seminar)	Yes	4.6	.84	4.2	.76	Yes	No
	No	3.9	1.14	3.9	.83		
Website presentation	Yes	4.2	1.07	4.1	.83	No	No
	No	4.2	1.07	4.0	.78		
Direct mail	Yes	4.3	.99	4.1	.81	Yes	No
	No	3.7	1.21	3.9	.78		
Bill insert	Yes	4.3	1.05	4.1	.85	No	No
	No	4.0	1.09	3.8	.66		
TV Announcements	Yes	4.2	1.06	4.1	.79	No	No
	No	4.1	1.11	3.8	.86		
Radio Announcements	Yes	4.2	1.11	4.0	.81	No	No
	No	4.1	1.03	4.0	.81		

## Appendix B-3: Details for CLEO Exploratory Investigation Results

Those who said “yes” to the small group presentation format showed a statistically significantly higher interest in learning than those who said “no” to that format. This is further support for the idea that the seminar format would draw those most interested in learning about energy efficiency. The other format that distinguished those more and less interested interviewees is direct mail. No format choice distinguished high versus low levels of prior effort. Only level of interest in learning was related to format choice.

## Comparison to Other CLEO Participants

This section is focused on analyzing how similar or different the exploratory sample is from CLEO participants as these similarities and differences could help program planners design the most appropriate education tools for the target audience.

What is appropriate for a given customer is quite different depending on whether they own or rent. The exploratory sample consists almost entirely of home owners (94%, Table xB-52). As discussed under “B-35A Closer Look at the Homeownership Rate

As discussed under “A Closer Look at the Homeownership Rate” (p. B-35), the number of homeowners among interviewees in the exploratory investigation is unusually high — likely due to the inability to reach individuals who were renters and relocated after the source data for interview contacts was collected. The analyses we conducted to determine the more likely homeownership rate indicates that the rate likely is similar to that of the Chinese CLEO group, and higher than the other current CLEO groups.

**Table xB-52. Tenancy by Ethnic Group**

Tenancy	Chinese (N=77)	Korean (N=52)	Vietnamese (N=188)	CLEO Total (N=317)	CLEO Exploratory (N=99)	Census Rate for Study ZIP Codes
Own	68%	14%	35%	39%	94%	56%
Rent	33%	87%	65%	61%	6%	44%

Responsibility for paying electric bills is related to owning versus renting. Therefore, it is not surprising that the groups with the highest rate of home ownership also have the highest rate of being responsible for paying the electric bill (See Table xB-53): the exploratory sample and the Chinese-speaking CLEO participants. However, the Korean-speaking group has a disproportionate likelihood of paying the bill compared to its rate of renting.

**Table xB-53. Who Pays the Electric Bill by Ethnic Group**

Who Pays Electric Bill	Chinese (N=76)	Korean (N=48)	Vietnamese (N=184)	CLEO Total (N=308)	CLEO Exploratory (N=99)
Pay Own	99%	75%	32%	55%	100%
Included in Mortgage or Rent	1%	25%	69%	45%	0%

The number of people in the household has an impact on any energy efficiency efforts. Table xB-54 reveals that the CLEO exploratory group, made up primarily of African Americans does not differ substantially from the existing group of CLEO participants. Individual cells in the Table show differences, but overall, the distributions are similar, particularly in comparing the exploratory group with the total CLEO group distribution.

**Table xB-54. Number of Residents in Household by Ethnic Group**

# Residents	Chinese (N=77)	Korean (N=52)	Vietnamese (N=188)	CLEO Total (N=317)	CLEO Exploratory (N=99)
One	10%	35%	11%	15%	5%
Two	23%	33%	28%	28%	40%
Three	22%	12%	18%	18%	22%
Four	30%	6%	16%	18%	15%
Five Plus	17%	15%	27%	22%	17%

The age composition of a household can also have an impact on efforts to conserve energy. Table xB-55 shows the comparison of age distribution. This Table shows the percentage of all participating households that fall into each age category; i.e., it does not reflect only the interview respondents, but everyone in their households. Here again, the exploratory group does not differ significantly from the existing CLEO participants.

**Table xB-55. Percent in Each Age Group in Households by Ethnic Group**

Age Category	Korean-speaking	Chinese-speaking	Vietnamese-speaking	CLEO Total	CLEO Exploratory
Under 18	11%	17%	14%	15%	18%
18-59	34%	59%	47%	48%	43%
60+	54%	24%	39%	37%	39%

Education is also relevant to pursuit of energy efficiency and to the best approach to education. The comparison of the exploratory sample to the CLEO participants is seen in Table xB-56.

**Table xB-56. Highest Education Attained by Ethnic Group**

Education Level	Chinese (N=77)	Korean (N=43)	Vietnamese (N=187)	CLEO Total (N=307)	CLEO Exploratory (N=99)
Less than HS	26%	28%	3%	12%	5%
Some HS	8%	0%	20%	14%	3%
HS Graduate	22%	33%	18%	21%	10%
Trade/Tech School	1%	2%	4%	3%	0%
Some College	12%	2%	24%	18%	23%
College Graduate	25%	33%	27%	27%	29%
Some Graduate School	0%	2%	5%	3%	2%
Graduate Degree	7%	0%	0%	2%	27%

Here is where the two samples do seem to differ. There is a very noticeable trend toward higher education among the exploratory sample interviewees compared to the traditional CLEO participant sample.

# Appendix B-4: CLEO Seminar Participants Interview Protocol

## CLEO Participant Interview (PY2006–08)

Name \_\_\_\_\_

Phone No \_\_\_\_\_

Participant ID No. \_\_\_\_\_

Household Address \_\_\_\_\_

Start Time \_\_\_\_\_ End Time \_\_\_\_\_

### Find correct person

Hello, I'm \_\_\_\_\_ calling on behalf of Southern California Edison Company to talk to you about your participation in CLEO (Custom Language Efficiency Outreach-[DO NOT READ UNLESS ASKED]). [IF NEEDED]: You attended a seminar at the [NAME EVENT] to help you learn about energy use in your home. Do you recall this? [IF YES, CONTINUE. IF NO, THANK AND TERMINATE (BUT KEEP TRACK OF THE NUMBER WHO CAN'T BE SUCCESSFULLY REMINDED)].

### How participants learned about program

- L1. From where did you hear about the CLEO Program? Anywhere else? [ALLOW MULTIPLE RESPONSES]
1. Utility bill insert/ stuffer
  2. Other utility direct mail piece
  3. Word-of-mouth (friend/neighbor/landlord)
  4. TV
  5. A retailer/installation contractor
  6. Participation in Edison program
  7. Newspaper article/ ad
  8. Edison Web site
  9. Radio
  10. Home/trade show
  11. Email
  12. Booth at a community event
  13. Other (RECORD)\_\_\_\_\_
  97. Don't know/Not sure/Can't remember
  98. Refused

### Awareness of Energy Efficiency

**AKA1:** Now I'm going to read you a series of statements about energy efficiency and ask you if each one is true or false. The purpose of these questions is to help Edison better understand what residential customers do and don't know about this topic.

**T/F STATEMENTS**

**AKA1A.** Replacing an old refrigerator with a new Energy Star refrigerator will save the typical household more than \$150 a year.

**AKA1B.** Edison will haul away your old refrigerator or freezer at no cost to you.

**AKA1C.** Standard incandescent light bulbs generate more heat than light.

**AKA1D.** Homes emit insignificant amounts of greenhouses gasses compared with cars.

**AKA1E.** All air conditioners that are Energy Star certified are equally efficient.

**[FOR AKA1A TO AKA1E, RANDOMIZE ORDER OF PRESENTATION AND RECORD ONE OF THE FOLLOWING FOR EACH STATEMENT:]**

1. True
2. False
97. Don't know/Not sure/Can't remember
98. Refused

**AKA2.** Have you seen or heard of yellow stickers called Energy Guide labels that appear on new appliances?

1. True
2. False
97. Don't know/Not sure/Can't remember
98. Refused

**AKA3.** Have you seen or heard of any other labels or logos about energy on appliances or on other products for your home?

1. Yes
2. No [SKIP TO AKA5]
97. Don't know/Not sure/Can't remember [SKIP TO AKA5]
98. Refused [SKIP TO AKA5]

**AKA4.** What other labels or logos about energy have you seen or heard? Any others? [ALLOW MULTIPLE RESPONSES]

1. Energy Star label [SKIP TO AKA6]
2. Labels, stickers, magnets, or signs from Edison
3. Other (record)\_\_\_\_\_
97. Don't know/Not sure/Can't remember
98. Refused

**AKA5.** Have you seen or heard of the Energy Star label, which is on some new appliances, electronic equipment, lighting, and home products?

1. Yes
2. No
97. Don't know/ Not sure/ Can't remember
98. Refused

**AKA6.** In the past 12 months do you recall seeing or hearing any messages from Southern California Edison concerning how to manage home energy use, the energy efficiency of specific products, or Edison programs that help customers save energy?

1. Yes
2. No [SKIP TO AKA9]
97. Don't know/ Not sure/ Can't remember [SKIP TO AKA9]
98. Refused [SKIP TO AKA9]

## Appendix B-4: CLEO Seminar Participants Interview Protocol

**AKA7.** What messages do you recall? [ALLOW MULTIPLE RESPONSES]

**[RECORD RESPONSE]**

- 97. Don't know/Not sure/Can't remember
- 98. Refused

**AKA8.** Where did you see or hear these messages from Edison? [DON'T PROMPT. ACCEPT MULTIPLE RESPONSES]

- 1. Label on appliances or electronic equipment
- 2. Display in stores
- 3. Salesperson
- 4. TV
- 5. Radio
- 6. Edison bill insert/ stuffer
- 7. Other mailing from Edison
- 8. Internet
- 9. Friend, neighbor, relative, or co-worker
- 10. Newspaper/ magazine ad
- 11. Newspaper/ magazine article
- 12. Other (RECORD) \_\_\_\_\_
- 97. Don't know/Not sure/Can't remember
- 98. Refused

### Awareness of EE programs

**AKA9.** What, if any, Southern California Edison programs or services to help customers save energy in their homes have you heard of? Any others? [ALLOW MULTIPLE RESPONSES]

- 1. Rebate program
- 2. Home energy audits/energy survey
- 3. Recycling used refrigerators or freezers
- 4. Interrupting or cycling the central air conditioner (Summer Discount Plan)
- 5. Paying for energy efficient appliances for low income customers (Energy Management Assistance)
- 6. CARE Rate
- 7. FERA (Family Electric Rate Assistance Program)
- 8. DAP (Direct Assistance Program)
- 9. LIHEAP (Low-Income Home Energy Assistance Program)
- 10. Medical Baseline Program
- 11. Other (RECORD) \_\_\_\_\_
- 12. None \_\_\_\_\_
- 97. Don't know/Not sure/Can't remember/not aware
- 98. Refused

### Behavior

**B1.** Have you installed any energy efficiency equipment since attending the CLEO seminar?

- 1 YES
- 2 NO → SKIP TO B4
- 8 DON'T KNOW → SKIP TO B4
- 9 REFUSED → SKIP TO B4

**B2.** *[IF B1 =1]* What have you installed?

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**B3.** *[IF B1 =1]* Did the program influence your decision to do this?

- 1 YES
- 2 PARTIALLY
- 3 NO
- 8 DON'T KNOW
- 9 REFUSED

**B4.** Have you changed your energy use practices since participating in this program?

- 1 YES
- 2 SOMEWHAT
- 3 NO → SKIP TO B7
- 8 DON'T KNOW → SKIP TO B7
- 9 REFUSED → SKIP TO B7

**B5.** *[IF B4 =1]* How have you changed your practices?

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**B6.** *[IF B4 =1]* Did the program influence your decision to change your practices?

- 1 YES
- 2 PARTIALLY
- 3 NO
- 8 DON'T KNOW
- 9 REFUSED

**B7.** Have you participated in any other SCE programs since participating in the CLEO Program?

- 1 YES
- 2 NO → SKIP TO S1
- 8 DON'T KNOW → SKIP TO S1
- 9 REFUSED → SKIP TO S1

**B8.** What program(s) have you participated in? Read List

- Rebate program, Specify appliance \_\_\_\_\_
- Home energy audit/energy survey
- Recycling used refrigerators or freezers
- Interrupting or cycling the central air conditioner (Summer Discount Plan)
- EMA (Energy Management Assistance)
- CARE Rate
- FERA (Family Electric Rate Assistance Program)
- DAP (Direct Assistance Program)
- LIHEAP (Low-Income Home Energy Assistance Program)
- Medical Baseline Program
- Other (RECORD) \_\_\_\_\_

**Appendix B-4: CLEO Seminar Participants Interview Protocol**

None \_\_\_\_\_

97. Don't know/Not sure/Can't remember/not aware

98. Refused

**B9.** Did the CLEO program influence your decision to participate in other programs?

1 YES

2 PARTIALLY

3 NO

8 DON'T KNOW

9 REFUSED

**B10.** *[If B8 NOT=2]* After attending the CLEO seminar, did you participate in the Home Energy and Water Efficiency Survey program (an SCE home energy audit)?

1 YES → SKIP TO S1

2 NO

8 DON'T KNOW

9 REFUSED

**B11.** *[If B10 NOT=1]* Why did you choose not to participate in the Home Energy and Water Efficiency Survey?

1. I plan to but I just haven't gotten around to it

2. I already knew what to do to save energy

3. I don't have time

4. It was too much trouble

5. I wasn't sure how to do it

6. Other, \_\_\_\_\_

**B12.** After you participated in the CLEO seminar, have you logged onto the SCE.com website?

1 YES

2 NO

8 DON'T KNOW

9 REFUSED

**Satisfaction with CLEO Seminar**

**S1.** On a scale from 1 to 5, with 1 being not at all satisfied and 5 being very satisfied, How satisfied were you with:

\_\_\_ S1A. the seminar you attended

\_\_\_ S1B. the way the seminar leader conducted the seminar

\_\_\_ S1C. the clarity of the information

\_\_\_ S1D. the examples the leader used

\_\_\_ S1E. the relevance of the information

\_\_\_ **S2.** On a scale from 1 to 5, with 1 being I didn't understand at all and 5 being I understood very well, how well did you understand what to do next to save energy?

**S3.** What did you most like about the seminar? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**S4.** What did you not like about the seminar? \_\_\_\_\_

\_\_\_\_\_



S5. What suggestions do you have about how to improve the program? \_\_\_\_\_

---

## Participation in HEES and satisfaction

[Ask the following if B10=1, Else, skip to D1].

HS1. This item number purposely not used.

HS2. There are several modes for participating in the Home Energy and Water Efficiency Survey program. Which did you choose (Read List):

1. Mail, "on paper and mailed it in"
2. Web, "on-line through the SCE website"
3. Onsite, "through an in-home visit"
4. Telephone, "over-the-phone"

HS3. How satisfied were you with your survey mode, that is, taking the survey [INSERT MODE]?

Were you ...

1. Very satisfied
2. Moderately satisfied
3. Slightly satisfied
4. Neutral
5. Slightly dissatisfied
6. Moderately dissatisfied
7. Very dissatisfied
97. Don't know
98. Refused

**IF HS3=1, 88 or 99 SKIP TO HS5**

HS4. In what ways were you not completely satisfied with your survey mode? [DO NOT READ] *Multiple choice*

1. Website survey portal had errors
2. Website survey portal was slow
3. Website survey portal was hard to use
4. Was annoying/difficult to enter in my account number(s)
5. Too much work to handwrite all the answers in
6. Font size of survey was too small
7. Took too long to receive survey report
8. Never received my report
9. Questions did not have enough answer choices
10. Too impersonal
11. Took too long to complete survey
12. Was too complicated
13. Questions were too technical
14. Not comprehensive enough
15. Did not have questions that applied to my household
16. Auditor gave bad advice
17. Auditor was late
18. Auditor was rude/unprofessional
19. Auditor was too slow

## Appendix B-4: CLEO Seminar Participants Interview Protocol

- 20. Other
- 97. Don't know
- 98. Refused

### [Ask if Survey Mode = onsite, Else, skip to HS6]

**HS5.** When the in-home consultant came to your home, he/she offered to install up to 6 CFLs. In addition, you received a free Energy Efficiency Starter kit that included another CFL, a Low-Flow Showerhead, a Kitchen Sink Aerator, and 2 bathroom sink aerators. On request, the consultant may have installed the showerhead and aerators in your home. Which items did the in-home consultant install in your home?

- 1. CFL(s)
- 2. Low-Flow Showerhead
- 3. Kitchen Sink Aerator
- 4. One of the Bathroom Sink Aerators or
- 5. Both of the Bathroom Sink Aerators
- 6. Did not install ANY of them
- 7. Was not offered ANYTHING
- 8. Did not know consultant would install
- 97. Don't know
- 98. Refused

### [Ask if Survey Type NOT onsite, Else, skip to HS8]

**HS6.** Did you receive an Energy Efficiency Starter Kit (including 1 CFL, 1 Low-Flow Showerhead, 1 Kitchen Sink Aerator, and 2 Bathroom Sink Aerators) as a free gift for taking the Survey?

- 1. Yes
- 2. No [SKIP TO HS8]
- 97. Don't Know [SKIP TO HS8]
- 98. Refused [SKIP TO HS8]

**HS7.** Which of the items do you find the most valuable? *Single choice*

- 1. CFL(s)
- 2. Low-Flow Showerhead
- 3. Kitchen Sink Aerator
- 4. Bathroom Aerators
- 5. None of them is valuable
- 97. Don't know
- 98. Refused

**HS8.** The Home Energy and Water Efficiency Survey results synced up with your bill history to provide charts of how your home uses energy and water. This estimated the share of your energy and water bills that each of your big appliances uses and also how your energy and water use (consumption and bill amount) fluctuated each month. How USEFUL was this information about your energy and water usage?

- 1. Very Useful
- 2. Somewhat Useful
- 3. Not Very Useful
- 4. Not At All Useful
- 5. Did not look at the charts at all
- 97. Don't know
- 98. Refused

**HS9.** The Home Energy and Water Efficiency Survey report also COMPARED your annual energy and water consumption with the REGIONAL AVERAGE. How USEFUL was this comparison?

1. Very Useful
2. Somewhat Useful
3. Not Very Useful
4. Not At All Useful
5. Did not read the comparisons
97. Don't know
98. Refused

This part of the survey asks about your satisfaction with the Home Energy and Water Efficiency Survey.

**HS10.** How easy was it to complete the Home Energy and Water Efficiency Survey? Was it ...

1. Very Easy
2. Somewhat Easy
3. Somewhat Difficult
4. Very Difficult
97. Don't know
98. Refused

**HS11.** How satisfied were you with the AMOUNT OF TIME it took to complete the survey?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

**[IF HS11=1, 88 or 99 SKIP TO HS13]**

**HS12.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Took too long
2. Was too short, not detailed enough
3. Other
97. Don't know
98. Refused

**HS13.** How satisfied were you with the CLARITY of the recommendations provided by the survey?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

## Appendix B-4: CLEO Seminar Participants Interview Protocol

**[IF HS13=1, 88 or 99 SKIP TO HS15]**

**HS14.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Did not understand SOME of the recommendations
2. Did not understand ANY of the recommendations
3. Recommendations were too vague/Wanted more specific information
4. Was not sure how to access rebates mentioned
5. Could not find information about the rebates/programs on the websites listed
6. Was not sure how to join energy efficiency programs mentioned
7. Other (S7oth) \_\_\_\_\_
97. Don't know
98. Refused

**HS15.** How satisfied were you with the USEFULNESS of the recommendations provided?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

**[IF HS15=1, 88 or 99 SKIP TO HS17]**

**HS16.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Already did most of them
2. Too basic – already knew about these things
3. Did not seem customized for my household
4. They were too much of a hassle
5. Wanted information on solar energy
6. Other, \_\_\_\_\_
97. Don't know
98. Refused

**HS17.** How satisfied were you with the INFORMATION provided on other energy efficiency programs?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

**[IF HS17=1, 88 or 99 SKIP TO HS19]**

**HS18.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Did not receive info about other energy efficiency programs
2. Information was not complete/specific enough
3. Already have done all these programs
4. Already knew about all these programs
5. Wanted info on renewable energies programs (sun, wind, etc)
6. Wanted info on solar energy equipment for my home
7. Wanted info on demand response programs for my home
8. Wanted info on other programs \_\_\_\_\_
9. Other \_\_\_\_\_
97. Don't know
98. Refused

**HS19.** How satisfied were you with how CUSTOMIZED the survey results were to your household?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

**[IF HS19=1, 88 or 99 SKIP TO HS21]**

**HS20.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Seemed like everyone received the same recommendations
2. I already was doing all or most of the recommendations
3. Most or all of the recommendations did not apply to my household
4. The recommendations were too generic/not specific enough
5. The usage charts did not match my household very well
6. Other \_\_\_\_\_
97. Don't know
98. Refused

**[ASK IF Survey Mode = Onsite, else SKIP TO HS23]**

**HS21.** How satisfied were you with the knowledge, professionalism, and enthusiasm of your in-home consultant?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

## Appendix B-4: CLEO Seminar Participants Interview Protocol

**[IF HS21=1, 88 or 99 SKIP TO HS23]**

**HS22.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Consultant was late
2. Consultant was rude/unprofessional
3. Consultant was not very knowledgeable
4. Consultant installed the free equipment poorly (CFLs, aerators, showerhead)
5. Consultant was not very enthusiastic about the recommendations
6. Other (HS22oth)\_\_\_\_\_
97. Don't know
98. Refused

**HS23.** OVERALL, how satisfied were you with the Home Energy and Water Efficiency Survey?

1. Very Satisfied
2. Moderately Satisfied
3. Slightly Satisfied
4. Neutral
5. Slightly Dissatisfied
6. Moderately Dissatisfied
7. Very Dissatisfied
97. Don't know
98. Refused

**[IF HS23=1, 88 or 99 SKIP TO HS25]**

**HS24.** In what ways were you not completely satisfied? [DO NOT READ] *Multiple choice*

1. Survey took too long
2. Did not like having to enter in my gas and water account numbers
3. Survey instrument was not in-depth enough/too short/not detailed enough
4. Did not know how to answer some of the survey questions/too technical
5. The internet site was slow/had delays
6. Survey was not appropriate for people who live in apartments/multifamily complexes (Follow-up: How so?)
7. Inaccurate charts about my appliances
8. Inaccurate charts about my energy and water bills
9. Inaccurate comparison of my house with other similar households
10. Recommendations were too basic/Just seemed like common sense
11. Already did most/all of the recommendations
12. Recommendations were too vague
13. Did not understand how to implement the recommendation(s)
14. Recommendations were not customized to my household/Felt like everyone got the same thing
15. Recommendations did not apply to my household
16. Recommendations were too much of a hassle to implement
17. Recommendations were too expensive to implement
18. Did the recommendations but not seeing desired energy savings
19. Wanted a more direct link to energy efficiency and other rebate programs from the Survey Report
20. Wanted information on solar equipment/financial incentives for solar equipment
21. Wanted more detailed information on rebates (Follow-up: For what equipment?)
22. Wanted information on renewable power options (Follow-up: What type of renewable energy (wind, solar, wave, water, etc))

## Appendix B-4: CLEO Seminar Participants Interview Protocol

- 23. Wanted more information about demand response programs
- 24. Does not link to my gas utility's account history (Follow-up: What is your gas utility?)
- 25. Does not link to my water utility's account history (Follow-up: What is your water utility?)
- 26. Was not in my primary language (Follow-up: What is your primary language?)
- 97. Don't know
- 98. Refused

**HS25.** What was the most helpful part of the Home Energy and Water Efficiency Survey? **[DO NOT READ]** *Single choice*

- 1. Charts of energy and water use
- 2. Regional comparison of energy and water costs
- 3. Information about rebates
- 4. Information about energy efficiency programs
- 5. Insulation recommendations
- 6. Air conditioning recommendations
- 7. Furnace and space heating recommendations
- 8. Air distribution (duct) recommendations
- 9. Water heater recommendations
- 10. Pool/spa recommendations
- 11. Dishwasher recommendations
- 12. Clothes washer recommendations
- 13. Lighting recommendations
- 14. Extra information from the in-home consultant
- 15. Other \_\_\_\_\_
- 16. None
- 17. The Free EE Starter Kit
- 97. Don't know
- 98. Refused

**HS26.** Have you recommended the Home Energy and Water Efficiency Survey to others?

- 1. Yes
- 2. No
- 97. Don't know
- 98. Refused

**Demographics**

- D1. Do you own or rent the home you live in?  
 Own .....1  
 Rent .....2  
 Don't Know .....-97  
 Refused .....-98
- D2. Do you pay your own electric bill or is it included in your mortgage or rental payment each month?  
 Pay Own Electric Bill .....1  
 Included in Mortgage and Rental Payment.....2  
 Don't Know .....-97  
 Refused .....-98
- D3. How many people live at this residence?  
 \_\_\_\_\_ NUMBER OF PEOPLE  
 -97DON'T KNOW [SKIP TO F3]  
 -98REFUSED [SKIP TO F3]
- D4. What are the ages of the residents of your household? [INSERT NUMBER OF PEOPLE IN HOUSEHOLD], [READ]  
 a. How many are 17 years or younger? \_\_\_\_\_  
 b. How many are between 18 and 59? \_\_\_\_\_  
 c. How many are 60 or over? \_\_\_\_\_  
 -97 = Don't Know  
 -98= Refused
- D5. What is the highest level of education you have completed? **READ IF NECESSARY**  
 Less than High School .....1  
 Some High School .....2  
 High School Graduate .....3  
 Trade or Technical School .....4  
 Some College .....5  
 College Graduate .....6  
 Some Graduate School .....7  
 Graduate Degree .....8  
 DON'T KNOW .....-97  
 REFUSED .....-98

END. Those are all the questions I have. Thank you very much for helping us!



# Appendix B-5:

## CLEO Instructor Interview Guide

### Interview Guide for CLEO Instructors (PY 2006–08)

Interviewee: \_\_\_\_\_

1. What kind of training or guidance — specific to teaching the CLEO seminar — have you received?
  - 1.1. What training or guidance did you receive when you first started delivering the CLEO seminar?
  - 1.2. Have you received training or guidance since then? If so, what?
2. How closely do you follow the outline and agenda for the seminar?
  - 2.1. Completely — “what’s there and only what’s there”
  - 2.2. Closely — “what’s there, but with my own additions”
  - 2.3. Moderately — “use the course materials as a general guideline”
  - 2.4. Loosely — “just cover what I think is important”
3. [Skip if 2 = a] Do you add “stories and examples” that are not included in the standard material?
  - 3.1. What do these stories and examples focus on?
 

Do you talk about...

    - a. General considerations for energy efficiency practices and measures
    - b. Examples of benefits that people can expect from energy efficiency practices and measures
    - c. Specific “success stories” about how people have implemented energy efficiency in their homes?
  - 3.2. Do you use any materials in addition to the standard CLEO materials when you teach this class?
    - a. Yes
    - b. No

If yes...
  - 3.3. What kind of additional materials do you use?
    - a. New or customized slides
    - b. Handouts with specific “how-to” instructions/guides
    - c. List of resources
    - d. Other, specify
  - 3.4. What kind of kinds of information do these materials address?
4. How do you kick off the seminar? How do you involve the participants at startup?
  - 4.1. Do you ever adjust the seminar based on what you learn about the participants’ experience, needs, and interests?
    - a. Yes
    - b. No

If yes...
  - 4.2. How do you learn about participants experience, needs, and interests?
  - 4.3. Can you describe an example of when how you’ve done this?

## Appendix B-5: CLEO Instructor Interview Guide

5. What approaches do you use to encourage people to contribute their own ideas and share their own experiences throughout the seminar?
  - 5.1. Roughly what percentage of session time typically is spent with participants sharing their ideas and experiences?

### Target Audience

6. How would you describe the typical participants' knowledge about energy efficiency practices and measures when they come to the seminar?
  - a. None — no familiarity with EE practices or products
  - b. Basic/Appreciation — general knowledge and interest (e.g., familiar with “ENERGY STAR”)
  - c. Operational — know how to implement effective EE practices and products; know how to take advantage of some EE incentive/rebate programs
  - d. Expert — understand considerations specific to alternative EE practices and products; know the details of various EE incentive/rebate programs
  - e. Mixed (mix of skill levels)
7. What is their expected level at the end of the course?
  - a. None — no familiarity with EE practices or products
  - b. Basic/Appreciation — general knowledge and interest (e.g., familiar with “ENERGY STAR”)
  - c. Operational — know how to implement effective EE practices and products; know how to take advantage of some EE incentive/rebate programs
  - d. Expert — understand considerations specific to alternative EE practices and products; know the details of various EE incentive/rebate programs
  - e. Mixed (mix of skill levels)
8. Do participants typically meet the expected entry-level of expertise?
  - a. Yes
  - b. No
9. Do participants typically meet the expected skill level at the end of the class?
  - a. Yes
  - b. No
10. What would you say are the biggest roadblocks (obstacles) that prevent the people who come to the CLEO seminars from implementing EE practices and measures?
11. What would you say are the biggest roadblocks (obstacles) that prevent the people who come to the CLEO seminars from taking advantage of SCE's incentive and rebate programs?
12. In addition to presenting the information that's in the CLEO Seminar PowerPoint presentation, do you do anything in a seminar that you think will help overcome these obstacles? If so, what?
13. In what ways do you encourage — as the instructor — participants to act on energy efficiency and demand-reduction measures and practices?
  - a. Include specific calls to action and recommend next steps
  - b. Ask them to develop (in class) an individual “action plan” or “to do” list
  - c. Provide them with worksheets or quick references that help them assess their options
  - d. Point them in the right direction to get more information or assistance

### Suggestions

14. Do you have any suggestions for making the CLEO seminar better (more effective, more engaging) for the participants? If so, what?
15. Do you have any ideas on what might make things better for you as a CLEO seminar instructor? If so, what?

# Appendix B-6: CLEO Exit Survey

## CLEO Exit Survey

NOTE: The following questions were excerpted from the CLEO PY 2008 Annual Report

Question 1 – How did you hear about CLEO?

Radio/TV/Newspaper/Other

Question 2 – How effective were the media ads?

Excellent/Very Good/Good/Fair/Poor

Question 3A – How do you rate the CLEO seminar facility?

Excellent/Very Good/Good/Fair/Poor

Question 3B – How do you rate the CLEO seminar instruction?

Excellent/Very Good/Good/Fair/Poor

Question 3C – How do you rate the CLEO seminar material?

Excellent/Very Good/Good/Fair/Poor

Question 4 – Are you planning to save energy by changing or buying:

Lamps/Refrigerator/Clothes Washer/Water Heater/Dishwasher/Insulation/Furnace?

Question 5A – Have you received utility rebates for purchasing Energy Efficient products?

Yes/No

Question 5B – If YES, which rebates have you received?

Lighting/Air-Conditioning/Refrigerator/Clothes Washer/Water  
Heater/Furnace/Dishwasher/Insulation/Other

Question 6A – After attending a CLEO seminar, will you take advantage of utility rebate programs?

Yes/No

Question 6B – After attending a CLEO seminar, will you make your house energy efficient?

Yes/No

Question 6C – After attending a CLEO seminar, will you recommend CLEO to your friends?

Yes/No

# Appendix B-7: CLEO Program Stakeholder Interview Guide

## Interview Guide for Community Language Energy Outreach Program (PY 2006-2008)

Interviewee: \_\_\_\_\_

1. What is your position in the CLEO program?
2. How long have you been in this position?
3. What are your responsibilities for the CLEO program?
4. Did CLEO operate in the way described in the PIP? (Getting referrals and requests from other departments within the IOU?? Attend community events? How were these events identified?)
5. What was the strategy for CLEO?
6. In which languages did CLEO operate during these program years?
7. In which languages were HEES surveys available to customers during these program years?
8. How did CLEO staff coordinate with the HEES staff to ensure that in-language surveys were kept current with regard to measures and recommendations? Beyond advertising in-language, how did CLEO target the low and middle income customers it specified in the PIP? Were the messages different than they would have been in English? What was the goal once CLEO had these customers' attention?
9. How did CLEO market itself to small businesses as specified in the PIP? What was the goal of marketing to these customers?
10. How did program activities target small businesses? How well do you think outreach to these businesses worked? Do you think CLEO produced energy savings among these customers?
11. How did CLEO market itself within faith-based communities? How were these communities identified? What was the goal of marketing to these customers?
12. How was CLEO coordinated across IOUs?
13. How were program energy savings verified?
14. How do you think the use of Green Ambassadors worked out? Did success of this strategy vary among the various target audiences for CLEO?
15. Do you think the school-based programs were effective in producing energy savings?
16. What problems did you encounter in the program during these program years?
17. Do you have any thoughts about how CLEO could be improved?
18. Should CLEO be expanded? Why or why not? How could that be done?
19. Is there anything else I should know about CLEO?

# Appendix B-8: CLEO African American Audience Interview Protocol

## CLEO Exploratory

**CSRS #91832 12/7/09**

May I please speak to \_\_\_\_\_?

Hello, this is [INSERT INTERVIEWER NAME] calling from CSRS on behalf of Southern California Edison. Southern California Edison wants to learn something about what people in your neighborhood think about energy use and saving energy so that they can plan programs that would help you save. Even if you are not interested in this, it will help us to hear your thoughts through this survey. Would you be willing to answer a few questions to help us in this planning?

1 YES

2 NO → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL

Q1. Do you own or rent the home at [INSERT ADDRESS]?

1 OWN

2 RENT

3 NEITHER OWN OR RENT

8 DON'T KNOW → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL

9 REFUSED → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL

Q2. Do you live at [INSERT ADDRESS]?

1 YES → SKIP TO INSTRUCTION ABOVE O1A

2 NO

8 DON'T KNOW

9 REFUSED

Q3. Do you live in the [INSERT ZIP CODE] zip code?

1 YES

2 NO → THANK AND TERMINATE, RECORD AS NQ3

8 DON'T KNOW → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL

9 REFUSED → THANK AND TERMINATE, RECORD AS INITIAL REFUSAL

**IF Q1=1 → SKIP TO INTRODUCTION ABOVE O1A**

**IF Q1=2 → SKIP TO INTRODUCTION ABOVE R1A**

**IF Q1=3 → SKIP TO INTRODUCTION ABOVE R1A**

### Questions for Homeowners

I'm going to ask you a few questions about what you have and haven't done in your home to reduce energy use. There are no right or wrong answers, and your answers will help us develop programs that meet your needs.

For the following questions, please indicate how much effort and interest you have in each area.

O1A. How much effort have you put into doing things like turning lights off, or shutting off TVs, etc., when not in use? Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O1B. How much interest do you have in learning more about how you can save energy in this way? Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O2A. How much effort have you put into making your lighting more energy efficient? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O2B. How much interest do you have in learning more about energy-efficient lighting? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O3A. How much effort have you put into purchasing small or large appliances, personal electronics, or anything else you plug into wall outlets to try to get energy-efficient models? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O3B. How much interest do you have in learning more about energy-efficient appliances and equipment? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O4A. How much effort have you put into insulating and sealing your home? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O4B. How much interest do you have in learning more about this way of saving energy? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O5A. How much effort have you put into reducing energy use in your home through energy-efficient heating and cooling equipment (furnaces, air conditioners, etc.)? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O5B. How much interest do you have in learning more about this way of saving energy? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O6A. How much effort have you put into conserving water? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

O6B. How much interest do you have in learning more about conserving water? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

**SKIP TO INTRODUCTION ABOVE P1**

**Questions for Renters**

I'm going to ask you a few questions about what you have and haven't done in your home to reduce energy use. There are no right or wrong answers, and your answers will help us develop programs that meet your needs.

For the following questions, please indicate how much effort and interest you have in each area.

R1A. How much effort have you put into changing your energy-use habits like turning lights off, or shutting off TVs, etc., when not in use? Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R1B. How much interest do you have in learning more about how you can save energy in this way? Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R2A. How much effort have you put into making your lighting more energy efficient? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R2B. How much interest do you have in learning more about energy-efficient lighting? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R3A. How much effort have you put into purchasing small or large appliances, personal electronics, or anything else you plug into wall outlets to try to get energy-efficient models? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R3B. How much interest do you have in learning more about energy-efficient appliances and equipment? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R4A. How much effort have you put into reducing water usage? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

**Appendix B-8: CLEO African American Audience Interview Protocol**

R4B. How much interest do you have in learning more about reducing water usage? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R5A. How much effort have you put into reducing gas usage? IF NECESSARY: Where 1 means a little effort and 5 means a lot of effort and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

R5B. How much interest do you have in learning more about reducing gas usage? IF NECESSARY: Where 1 means not at all interested and 5 means very interested and of course you may use any number between 1 and 5.

\_\_\_\_\_ 8=DK 9=RF

Now I would like to ask you a few questions about energy-efficiency programs.

P1. What, if any, Southern California Edison programs or services to help customers save energy in their homes have you heard of? READ LIST AND WAIT FOR YES/NO [ALLOW MULTIPLE RESPONSES]

Rebates on energy-efficient purchases .....	01
Home energy audits/energy survey .....	02
Paying for energy efficient appliances for low income customers (Energy Management Assistance) .....	03
CARE Rate.....	04
FERA (Family Electric Rate Assistance Program).....	05
DAP (Direct Assistance Program).....	06
LIHEAP (Low-Income Home Energy Assistance Program).....	07
Medical Baseline Program .....	08
Financing or approved contractor lists for central air-conditioning (A/C Quality).....	09
Recycling used refrigerators or freezers .....	10
Interrupting or cycling the central air conditioner (Summer Discount Plan).....	11
Incentives for solar power (California Solar Initiative).....	12
Renewable energy/green power .....	13
Other (RECORD) _____ .....	14
None _____ .....	77
DON'T KNOW/NOT SURE/CAN'T REMEMBER/NOT AWARE .....	88
REFUSED .....	99

P2. Have you seen or heard of the ENERGY STAR label, which is on some new appliances, electronic equipment, lighting, and home products?

- 1 YES
- 2 NO
- 8 DON'T KNOW/NOT SURE/CAN'T REMEMBER
- 9 REFUSED

P3. Have you seen or heard of yellow stickers called Energy Guide labels that appear on new appliances?

- 1 YES
- 2 NO
- 8 DON'T KNOW/NOT SURE/CAN'T REMEMBER
- 9 REFUSED



- P4. Have you seen or heard of any other labels or logos about energy on appliances or on other products for your home?
- 1 YES
  - 2 NO → SKIP TO P6
  - 8 DON'T KNOW/NOT SURE/CAN'T REMEMBER → SKIP TO P6
  - 9 REFUSED → SKIP TO P6
- P5. What other labels or logos about energy have you seen or heard? Any others? [ALLOW MULTIPLE RESPONSES]
- Energy Star label.....1
  - Labels, stickers, magnets, or signs from Edison.....2
  - Other (record).....3
  - DON'T KNOW/NOT SURE/CAN'T REMEMBER.....8
  - REFUSED.....9
- P6. If you were interested in learning more about how you can save energy and money, what would be your preferred formats? READ LIST AND WAIT FOR YES/NO
- A presentation to a small group in a church or community center.....1
  - A web site presentation.....2
  - Literature sent by direct mail.....3
  - Literature sent as an insert to your electricity bill.....4
  - TV announcements.....5
  - Radio announcements.....6
  - Other, specify.....7
  - DON'T KNOW.....8
  - REFUSED.....9

**Attitudes**

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

- AA1. My life is too busy to worry about making energy-related improvements to my home.  
 \_\_\_\_\_ 88=DK 99=RF
- AA2. Scarce energy supplies will be a major problem in the future.  
 \_\_\_\_\_ 88=DK 99=RF
- AA3. Instead of building new power plants, customers should use less electricity.  
 \_\_\_\_\_ 88=DK 99=RF
- AA4. It is possible to save energy without sacrificing comfort by being energy efficient.  
 \_\_\_\_\_ 88=DK 99=RF
- AA5. It is worth it to me for my household to use less energy in order to help preserve the environment.  
 \_\_\_\_\_ 88=DK 99=RF
- AA6. Using energy in ways that preserve the environment is not worth it if it requires major lifestyle changes.  
 \_\_\_\_\_ 88=DK 99=RF
- AA7. My energy use is too small to worry about in the grand scheme of things.  
 \_\_\_\_\_ 88=DK 99=RF

## Appendix B-8: CLEO African American Audience Interview Protocol

AA8. I feel guilty if I use too much electricity.

\_\_\_\_\_ 88=DK 99=RF

AKA1. Now I'm going to read you a series of statements about energy efficiency and ask you if each one is true or false. The purpose of these questions is to help Edison better understand what residential customers do and don't know about this topic.

AKA1A. Replacing an old refrigerator with a new Energy Star refrigerator will save the typical household more than \$150 a year. Would you say true or false?

- 1 True
- 2 False
- 8 DON'T KNOW
- 9 REFUSED

AKA1B. Edison will haul away your old refrigerator or freezer at no cost to you. IF NECESSARY: Would you say true or false?

- 1 True
- 2 False
- 8 DON'T KNOW
- 9 REFUSED

AKA1C. Standard incandescent light bulbs generate more heat than light. IF NECESSARY: Would you say true or false?

- 1 True
- 2 False
- 8 DON'T KNOW
- 9 REFUSED

AKA1D. Homes emit insignificant amounts of greenhouse gasses compared with cars. IF NECESSARY: Would you say true or false?

- 1 True
- 2 False
- 8 DON'T KNOW
- 9 REFUSED

AKA1E. All air conditioners that are Energy Star certified are equally efficient. IF NECESSARY: Would you say true or false?

- 1 True
- 2 False
- 8 DON'T KNOW
- 9 REFUSED

## Housing Information

H1. When did you move to this address? [IF NECESSARY RECORD BOTH MONTH AND YEAR]

\_\_\_\_\_ month or  
\_\_\_\_\_ year

8888=DON'T KNOW 9999=REFUSED

### IF Q1=1 CONTINUE, OTHERWISE SKIP TO H3

H2. In what year was your home built?

\_\_\_\_\_ year → SKIP TO H3

8888=DON'T KNOW → CONTINUE

9999=REFUSED → CONTINUE

H2A. Was it built...?

- 01 Within the last 9 years (since 2000)
- 02 Between 1990 and 1999
- 03 Between 1980 and 1989
- 04 Between 1970 and 1979
- 05 Between 1960 and 1969
- 06 Between 1950 and 1959
- 07 Between 1940 and 1949
- 08 Before 1940
- 88 DON'T KNOW
- 99 REFUSED

H3. Do you pay your own electric bill or is it included in your mortgage or rental payment each month?

- 1 Pay own electric bill
- 2 Included in mortgage or rental payment
- 8 DON'T KNOW
- 9 REFUSED

H4. How many square feet of living space do you now have?

\_\_\_\_\_ square feet → SKIP TO H5

8888=DON'T KNOW → CONTINUE

9999=REFUSED → CONTINUE

H4A. Is it...

- 01 Less than 800
- 02 800 to less than 1,000
- 03 1,000 to less than 1,250
- 04 1,250 to less than 1,500
- 05 1,500 to less than 1,750
- 06 1,750 to less than 2,000
- 07 2,000 to less than 2,250
- 08 2,250 to less than 2,750
- 09 2,750 to less than 3,000
- 10 3,000 to less than 3,500
- 11 3,500 to less than 4,000
- 12 Or over 4,000
- 88 DON'T KNOW
- 99 REFUSED

H5. Does your home have air conditioning?

- 1 YES
- 2 NO → SKIP TO H6
- 8 DON'T KNOW → SKIP TO H6
- 9 REFUSED → SKIP TO H6

H5a. Is it room air conditioner(s) or central air conditioning?

- 1 ROOM AIR CONDITIONER(S)
- 2 CENTRAL AIR CONDITIONING
- 8 DON'T KNOW
- 9 REFUSED

**Appendix B-8: CLEO African American Audience Interview Protocol**

- H6. What type of home do you live in? [READ LIST]
- 1 Single family home
  - 2 Condominium
  - 3 Apartment
  - 4 Mobile home
  - 5 Other, specify \_\_\_\_\_
  - 8 DON'T KNOW
  - 9 REFUSED

**Demographics**

- D1. Including yourself, how many people live at this residence?  
\_\_\_\_\_ number of people  
88=DON'T KNOW → SKIP TO D3      99=REFUSED → SKIP TO D3

- D2. What are the ages of the residents in your household?

- D2A. How many are 17 years or younger?      \_\_\_\_\_      88=DON'T KNOW      99=REFUSED
- D2B. How many are between 18 and 59?      \_\_\_\_\_      88=DON'T KNOW      99=REFUSED
- D2C. How many are 60 or over?      \_\_\_\_\_      88=DON'T KNOW      99=REFUSED

**D2A-D2C NEEDS TO EQUAL THE VALUE IN D1**

- D3. What is the highest level of education you have completed? READ LIST IF NECESSARY
- 01 LESS THAN HIGH SCHOOL
  - 02 SOME HIGH SCHOOL
  - 03 HIGH SCHOOL GRADUATE
  - 04 TRADE OR TECHNICAL SCHOOL
  - 05 SOME COLLEGE
  - 06 COLLEGE GRADUATE
  - 07 SOME GRADUATE SCHOOL
  - 08 GRADUATE DEGREE
  - 88 DON'T KNOW
  - 99 REFUSED
- D4. Which of the following **best** describes your racial or ethnic background? ACCEPT ONLY ONE ANSWER
- 1 Hispanic/Latino/Latina
  - 2 African American
  - 3 Caucasian
  - 4 Asian American
  - 5 Native American
  - 6 Multi-racial
  - 7 OTHER (SPECIFY \_\_\_\_\_)
  - 8 DON'T KNOW
  - 9 REFUSED

Thank you very much for your help.

# **Appendix C: Supporting Information for TTC Process Evaluation**

# Appendix C-1: Details for TTC Goals and Evaluation Methods

## TTC Program Goals and Strategies

The focus of PY 2006–08 TTC evaluation effort is confined specifically to the issues related to how TTC communicates the results of their work and promotes new technologies through classes offered through the Energy Centers.

A program theory specifies goals, both overarching and detailed. The TTC goals that are relevant to the focus of this evaluation effort are grouped here in a way that facilitates the organized presentation of results from this study.

### Goal 1: Increase customer AKA-B (Awareness, Knowledge, Attitude and Behavior) [inferred]

Increasing customer awareness, knowledge, attitudes, and behavior (AKA-B) can be inferred as a program goal associated with TTC's training efforts. Essentially it is the underlying reason for conducting the training, and it directly relates to overcoming the performance uncertainties are often the key barriers for decision makers to try new energy efficiency strategies. The program goal of aligning TTC goals and procedures with other ETO programs was stated in TTC program documentation, further supporting increasing customer AKA-B as a logical TTC program goal.

In addition, two program strategies related to adult learning principles were identified for TTC that strengthen the implication that this is a program goal.

- Incorporate adult learning principles into training

Success criterion noted in program theory:

*100% of all teaching instruction and material updated to meet requirements for adult learning principle*

- Train TTC instructors in adult learning principles

Success criterion noted in program theory:

*100% of all instructors must complete adult learning principle training*

A third strategy that can be inferred from this goal is:

- Encourage energy efficiency behavior in training participants

Although the strategy of encouraging energy efficiency behavior in training participants is not overtly stated in the TTC program theory, it can be inferred as a key element is increasing AKA-B. Since it is not a formally stated program strategy, the program theory does not identify specific success criteria for this goal.

### Goal 2: Align TTC goals and procedures with other ETO programs

The TTC program theory indicates that the classes taught at the Energy Centers by TTC staff should conform to Energy Center requirements.

The program strategy pertaining to adult learning principles noted under Program Goal 1: Increase customer AKA-B (Awareness, Knowledge, Attitude and Behavior) above also directly relates to Program Goal 3.

Another program strategy can be inferred from Program Goal 2 is:

- Guide participants into utility energy efficiency programs [inferred strategy]

While this is not a formally stated strategy for TTC, it is supported by the expected outcomes on the TTC program logic diagram (Figure TTC-1, p. 68 in the body of this report) and is consistent with the training goals of the Energy Centers, which TTC is to align with.

### Goal 3: Engender participant satisfaction [inferred]

While there is no formally stated goal or strategy for promoting customer satisfaction, this goal can be inferred from the fact that it is an element of influencing AKA-B and it is a perennial goal of the Energy Centers training efforts, which TTC classes are intended to conform to.

For the purposes of this evaluation project, we have compared the results of TTC-specific exit survey data pertaining to participant satisfaction and other related issues to the exit survey results for EC-specific courses.

For each program goal described above, including the strategies to achieve the goal, evaluation goals were developed. These are all summarized in Table TTC-3 (p. 67 in the body of this report), together with the basic research method employed to address the corresponding evaluation goal. These basic research approaches will then be described in more detail in the Method section.

These “yardsticks” were based on the evaluation criteria used to establish baseline metrics for SCE Energy Center classes during the 2006–08 Energy Center Process Evaluation. The evaluation team updated these criteria to reflect the specific requirements of the 2006–08 ETO Process Evaluation, and the updated yardsticks were reviewed by program staff.

Related to both yardsticks is background information collected about classes to help put the criteria in context. For example:

- A course’s support of SCE energy efficiency programs is evaluated only in terms of those programs to which it is logically tied.

A course doesn’t get “scored down” for not mentioning a program’s benefits, etc., if that program isn’t related to the topics the class addresses.

- A course’s support of customer segments (one of the dimensions in Support of Behavior Change) is evaluated in only terms of those customer segments that are an appropriate target audience for that class.

For example, a course doesn’t get “scored down” for not including information relevant to agricultural applications if the class is geared to commercial and industrial customers.

We documented this background information based on a review of the program documentation, interviews with subject matter experts, and a review of the course materials.

See Appendix D-1 for details on the yardsticks.

## Yardsticks for Class Design and Delivery

### Support of Behavior Change and Adult Learning Yardstick

Support of Behavior Change and Adult Learning yardstick is based on the one that was used to evaluate CTAC and AgTAC course offerings during the 2006–08 Energy Center Process Evaluation. The only difference in the criteria is that the yardstick used for this ETO Process Evaluation has some new (additional) criteria related to best practices in adult learning. One of these new criteria were considered in the TTC course evaluation.

- Criteria related to support of behavior change are grouped into three dimensions:
  - Encouraging action
  - Helping overcoming market barriers
  - Support of specific customer segments

All the criteria in this section of the yardstick are the same as those used in the 2006–2008 Energy Center Process Evaluation.

- Criteria specific to adult learning principles are grouped into five dimensions:
  - Obtaining learner buy-in
  - Building on what learners know
  - Engaging the learners
  - Setting up learners for success

All the criteria in this section of the yardstick are the same as those used in the 2006–08 Energy Center Process Evaluation.

- Criteria specific to best practices in adult learning that we considered when evaluating the TTC courses are grouped into five dimensions:
  - Lesson plan
  - Content decisions
  - Interactive Activities
  - Learner Centricity
  - Practice Opportunities

All but the last dimension were considered in the 2006–2008 Energy Center Process Evaluation. The Practice Opportunities dimension was added to the Adult Learning Practices section of the yardstick based on lessons learned in that Energy Center Process Evaluation and the specific requirements of the ETO Process Evaluation.

The dimensions used to evaluate the TTC courses represent a subset of the dimensions considered in the BOC course evaluation for this project.

- Since we were reviewing TTC course materials only (not interviewing instructors and not auditing classes in person), the learning facilitation and feedback dimensions were considered not applicable.
- The TTC courses do not include formal assessments (post-tests or final exams), so the Assessments dimension also is not applicable.

Scoring for the criteria on the Support of Adult Learning and Behavior Change yardstick is the same as it was for the 2006–2008 Energy Center Process Evaluation:

- Criteria related to support of behavior change are essentially yes/no questions.  
(Yes = 1; No = 0)
- Criteria specific to adult learning are rated on a scale of one to five.  
(1 = Not at all or very poor; 5 = Always or excellent)



- Criteria that are not applicable are marked NA and are not considered in the scoring. (For example, criteria related to how an instructor interacts with participants are marked NA when evaluating a class based on a review of the materials.)

It is important to note that the scores based on observation (one TTC class and three EC classes) were based on a “composite” view of the class that included both a review of the training materials and an in-person audit of the class.

### Support of Programs Yardstick

The Support of Programs Yardstick has the same criteria used to evaluate SCE Energy Center classes’ support of programs in the 2006–08 SCE Energy Center Process Evaluation, and includes two dimensions:

- Direct support of programs, which includes criteria related to how a class addresses information about SCE energy efficiency programs themselves
- Indirect support of programs, which includes criteria on technologies or measures associated with SCE energy efficiency programs

Specific criteria under each dimension are essentially yes/no questions (Yes = 1; No = 0). If a criterion is not applicable to the given situation, that criterion marked NA and is not considered in the scoring.

To maintain a reasonable project scope, we focused on primarily on 16 high-impact programs that account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW reductions. Other programs also may be considered if a seminar or class clearly and directly addresses that program.

Tie-in between a course and a program is based on whether the class addresses technologies, measures, or practices that are encompassed by a program.

- If 25% or more of the content covered in a class addresses technologies or measures encompassed by a program, we consider that class to have a high tie-in to the program.  
Also if a class has a specific goal of promoting or encouraging a given program, we consider that seminar or class to have a “high tie-in” to that program.
- If a class addresses technologies or measures encompassed by a program, but that content represents less than 25% of the class, we consider that class to have a “medium to low tie-in” to the program.
- If the class addresses only topics outside the scope of a given incentive or rebate program, we said there is no tie-in between the class and that program.

A class’s support of a program was scored only if the evaluation team identified a tie-in between the class and that program.

### Courses to which the Yardsticks Were Applied

At the beginning of the process evaluation project, we conducted a preliminary review of TTC course materials initially made available to us:

- *Overview of the RTTC & Simple Refrigeration Measures* — delivered at the South Commercial Group’s Staff Meeting
- *Energy Efficiency Strategies and Audit Techniques: Customized Refrigeration Training Program, Part I* — delivered to Business Solutions Group
- *Energy Efficiency Strategies and Audit Techniques: Customized Refrigeration Training Program, Part II* — delivered to Business Solutions Group
- *Instrumentation Lending Program* — delivered to Customer Service Business Unit
- *Energy Efficient Opportunities for Rooftop Package Units*

## Appendix C-1: Details for TTC Goals and Evaluation Methods

- *Basic Refrigeration* — delivered to Customer Service Business Unit

However, we determined that these courses were an inappropriate focus for this evaluation effort for several reasons:

- They were designed for and delivered to internal SCE staff.

Although informing SCE program staff about new technology and measures is an important part of TTC staff's efforts, it is not directly related to the program goals and strategies this evaluation focuses on. Rather, courses that are delivered as under the umbrella of the Energy Center customer training are more pertinent to our evaluation focus.

In addition, since these classes were delivered to SCE staff, the strategy of guiding class participants into utility energy efficiency programs was irrelevant and could not be sensibly evaluated in this context.

- Exit surveys were not used after the classes.

Because the classes were offered to internal staff, SCE's database of exit surveys did not include these courses. Therefore, if we were to focus on these courses, we would be unable to address the evaluation goal of determining participant satisfaction after the classes.

- All of them were developed and delivered in 2006.

Considering courses that were delivered throughout the program cycle would be more appropriate to this process evaluation.

After determining our original "short list of courses" was inappropriate to this evaluation effort, we turned to our database of classes offered at Energy Centers.

Our original database was developed in support of the 2006-08 Energy Center process evaluation, and included only classes delivered in 2006 and 2007, as the 2008 data was unavailable at during that project. As part of the ETO process evaluation we incorporated the (newly available) 2008 course data. (We also updated our results for the Energy Center exit survey analysis that was included in the 2006-08 Energy Center process evaluation. Those updated results are available in Appendix F.)

We created a worksheet listing all the classes in our Energy Center course database and enlisted Energy Center staff's help to identify which of the various classes were taught by various group's staff (CTAC/AgTAC employees or others under contract with CTAC or AgTAC, TTC staff, BOC staff, Codes and Standards staff, Emerging Technology staff, and others.)

We combined the Energy Center Staff's input on this worksheet to a list of known TTC instructors to identify the following courses that were taught by TTC staff as part of the Energy Center's training effort:

- *Basics of LED Technology*
- *Cool Coatings for Exterior HVAC Systems*
- *Energy Efficiency Strategies in Cold Storage*
- *Inland Empire IES —ED50 and ED100*
- *Lighting Fixture Maintenance Workshop / Lighting Fixture Maintenance*
- *Lighting Retrofit Strategies and Project Management Techniques*
- *Vons EE Refrigeration*

We sent this list of classes taught by TTC staff at the Energy Centers to the TTC program manager with a request for the course materials. The courses for which materials were available (all but Cool Coatings for Exterior HVAC Systems and ED100) formed the list of courses we considered during this process evaluation.

## Appendix C-1: Details for TTC Goals and Evaluation Methods

BOC program staff provided the evaluation team with electronic files of all the class material for the relevant courses. The evaluation team reviewed (and applied the yardsticks) all available materials for each of these courses (Table xC-1).

**Table xC-1. Summary of TTC Courses Reviewed (and Audited)**

<b>Course Materials Reviewed</b>	<b>Instructor / Developer</b>	
Basics of LED Technology	Vireak Ly, Doug Avery	
Energy Efficiency Strategies in Cold Storage	Ramin Faramarzi	
Inland Empire IES —ED50	Vireak Ly	
Lighting Fixture Maintenance	Doug Avery	
Vons EE Refrigeration	Ramin Faramarzi	
<b>Class Audited during Energy Center Process Evaluation</b>		<b>Location, Date</b>
Lighting Fixture Maintenance	Doug Avery	AgTAC, March 11, 2008

The course material available for review consisted solely of an Adobe Acrobat® file representing the slides used to support the instructor’s presentation.

# Appendix C-2: Details for TTC Evaluation Results

## Support of Behavior Change

The evaluation criteria used to determine how well the design and delivery of classes support behavior change include two major dimensions:

- Encouraging Action addresses the question, “How well does the class’s design and content encourage action — helping participants apply information and concepts addressed in the class to their own environment?”
- Helping Overcome Market Barriers (Other than Language) addresses the question, “How well does the class help overcome common market barriers such as lack of information about application of technologies, financial and non-financial benefits, and risk assessment and mitigation?”

The yardstick dimensions relating to Support of Behavior Change were not considered during the in-person audits conducted during the EC evaluation.

However, the criteria under these dimensions were considered in the review of EC course materials during the EC evaluation. Likewise, we considered these criteria when reviewing course materials during this TTC process evaluation effort.

Therefore, there are no “Observation” scores for either the TTC courses or the EC courses. In the tables that follow:

- The “TTC Materials” column reflects the scores obtained by reviewing course materials during this TTC process evaluation.
- The “EC Materials” column reflects the scores obtained by reviewing course materials during the 2006–08 EC process evaluation conducted in 2008–09.

Table xC-2 shows the overall scores relative to the support of behavior change.

- Encouraging Action addresses issues such as specific calls to action or next steps and guidance on getting support when taking action.
- Helping Overcome Market Barriers addresses issues such as information on the practical application energy efficiency measures, typical cost savings and other financial benefits, and risk assessment and mitigation.
- Support of Customer Segments addresses issues such as considerations typical benefits of energy efficiency measures that have been realized in particular customer segments, success stories of actual customers in a given segment who have implemented the relevant measures, and detailed case studies about implementations in a particular customer segment.

The TTC courses scored significantly better in Encouraging Action and Support of Customer Segments than did EC courses.

It’s important to note that several of the TTC classes scored exceptionally high across all three dimensions (in the 80% to 100% range). However other classes, more focused on general technology information than how the technologies can be implemented, brought the overall average down.

**Table xC-2. TTC and EC Courses' Overall Score for Support of Behavior Change**

Major Dimensions of Supporting Behavior Change	TTC Materials	EC Materials
Encouraging Action	53%	29%
Helping Overcome Market Barriers	43%	42%
Support of Customer Segments	54%	22%

## Scoring Details for Support of Behavior Change

Table xC-3 through Table xC-5 provide the details on the specific criteria that compose the scores for Encouraging Action and Helping Overcome Market Barriers.

For each criterion, a course could receive a 1 (yes) or 0 (no) or NA (not applicable). (NA items were not factored in the scoring.) Therefore, if all classes got a “perfect score” on one criterion, the value for that criterion in the Tables below would be 1. If half the classes got a “yes,” and half the classes got a “no,” on a criterion, the value for that criterion would be 0.5.

The overall score for a dimension is derived by dividing the actual number of points scored by the total possible number of points that could be scored.

**Table xC-3. Score Details for Encouraging Action**

Encouraging Action	TTC Materials	EC Materials
Includes specific calls to action / specific next steps	37%	27%
Supports development of individualized action plan	33%	22%
Includes job aids / worksheets to assist in assessing / analyzing options	67%	22%
Includes job aids / checklists to assist in taking action	67%	20%
Includes info on where/how to get assistance in taking action	33%	36%
<i>Actual Points / Maximum Possible Points</i>	<b>2.7 / 5</b>	<b>1.4 / 5</b>
<i>Score</i>	<b>53%</b>	<b>29%</b>

**Table xC-4. Score Details for Helping Overcome Common Market Barriers (Other than Language)**

Helping Overcome Common Market Barriers (Other than Language)	TTC Materials	EC Materials
Provides info on application of EE measures	83%	84%
Describes typical cost savings re. EE measures	33%	40%
Quantifies other typical financials (ROI, payback, etc.) typical in segment	33%	22%
Describes typical non-financial benefits	50%	36%
Includes info on risk assessment and risk mitigation	17%	0%
<i>Actual Points / Maximum Possible Points</i>	<b>2.2 / 5</b>	<b>2.1 / 5</b>
<i>Score</i>	<b>43%</b>	<b>42%</b>

**Table xC-5. Score Details for Support of Customer Segments**

Criteria	TTC Materials	EC Materials
Describes considerations for specific “sub-segments”	67%	53%
Includes example of “typical” benefits realized through energy efficiency measures (EEM) in this segment	50%	26%
Includes EEM success stories of actual customers in this segment	50%	5%
Includes detailed case study of actual implementations in this segment	50%	5%
<i>Actual Points / Maximum Possible Points</i>	<b>2.2 / 4</b>	<b>0.9 / 4</b>
<i>Score</i>	<b>54%</b>	<b>22%</b>

### Exit Survey Results Related to Support of Behavior Change

Items A through D on the Energy Center exit survey address issues related to likely behavior change, asking students about the change in the knowledge level as a result of the class, the likely effect of the class on the purchase of energy efficient equipment, when such purchase decisions are likely to be made, and what equipment they are planning to upgrade or add.

#### *Impact on Subject Matter Knowledge*

Exit survey question A asks students to rate their knowledge level on the subject matter before attending the class and after attending the class.

An Energy Center success criterion related to this item is that 50% of class participants will show an increase in knowledge of one or more points.

As shown in Table xC-6, both the TTC courses and the EC course far exceeded this goal, with the TTC courses having a higher percentage of participants indicating a relative high impact. (48% of TTC respondents and 37% of EC respondents indicated a 2-point or greater change in knowledge.)

**Table xC-6. TTC and EC Participants’ Responses to Impact on Knowledge Item in Exit Survey**

unchanged		one or more points		1 point		2 points		3 points		4 points	
TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC
12%	16%	87%	84%	40%	46%	37%	30%	9%	6%	2%	1%

#### *Impact on Likelihood of EE Purchases or Practices*

Exit survey question A asks students to rate the effect of the course increasing the likelihood that they or their company will employ energy efficient practices or purchase energy efficient equipment in the future. (See Table xC-7.)

An Energy Center success criterion related to this item is that 50% of class participants will agree that the information provided will increase the likelihood of taking EE actions in the future.

Once again, both the TTC courses and the EC courses significantly exceeded the goal, with TTC courses averaging somewhat higher than EC courses. (The average score for TTC respondents is 4.0; the average score for EC respondents is 3.9.)

**Table xC-7. TTC and EC Participants' Responses to Likelihood of EE Purchases or Practices in Exit Survey**

5 (Very Likely)		4		3		2		1 (very unlikely)	
TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC
42%	36%	32%	32%	19%	21%	4%	5%	3%	4%

74% of TTC and 68% of EC students say the class likely will have a positive effect on their future action

7% of TTC and 9% of EC students say the class will have a little or no effect on their future action

### *Purchase Decision Time Frame and Types of Equipment Considered*

Items C and D in the exit survey ask participants when they anticipate making an equipment purchase and the type of equipment they're considering. (There were no EC success criteria associated with either of these exit survey items.)

The purchase decision timeframe was remarkably similar for TTC and EC courses: 49% TTC and 47% EC students indicating a purchase decision within the next 12 months (Table xC-7).

The primary differences between responses regarding the types of equipment considered are:

- More EC class students selected multiple technologies than did TTC students
- More TTC students indicated that lighting equipment was under consideration, which is probably due to the fact that the TTC courses considered in this evaluation had a higher percentage of lighting courses than the EC course sample. (Unsurprisingly, there is a correlation between the technology focus of a course and the type of equipment considered for purchase.)

**Table xC-8. TTC and EC Participants' Responses to Purchase Decision Timeframe in Exit Survey**

Next 6 Months		6-12 Months		1-2 Years		Beyond 2 Years		No		Other	
TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC
31%	30%	18%	18%	14%	13%	8%	7%	22%	27%	5%	4%

**Table xC-9. TTC and EC Participants' Responses to Types of Equipment Considered for Addition or Upgrade in Exit Survey**

Lighting		HVAC		Industrial Processing		Pumping		Other		None	
TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC	TTC	EC
49%	32%	28%	32%	5%	8%	8%	14%	19%	17%	5%	9%

## Adherence to Adult Learning Principles and Practices

The in-person audits conducted during the EC process evaluation were scored using a “composite view,” reflecting both a review of the materials and observation of the live session. This means that their scores may vary significantly from the scores achieved just by a review of the materials simply because of the different methods used to determine the scores. (See “Comparing Apples to Apples” on p. C-18 below.)

- All of the TTC classes have scores based on a review of the materials alone.
  - In the Tables that follow, those scores are in the “TTC Materials” column.
  - Scores in the “TTC Materials” column are the average of the scores for each of the classes considered.
- One of the TTC courses (*Lighting Fixture Maintenance*) also has a score from the in-person audits conducted during the EC process evaluation.
  - In the Tables that follow, those scores are in the “TTC Observation” column.
  - Scores in the “TTC Class Observation” column are the scores obtained during the EC process evaluation and reflect a composite view of the training — including both the materials and events and interactions during the live event.
- Three EC classes also were included in the in-person audits conducted during the EC process evaluation.
  - In the Tables that follow, those scores are in the “EC Observation” column.
  - As with the TTC class that was observed, scores in the “EC Observation” column reflect a composite view of the training — including both materials and the dynamics of the live events.
- None of the EC classes were scored on adult learning principles and practices based on a review of the materials alone.

The evaluation team cautions the reader from drawing firm conclusions by comparing the scores across the three columns, unless the two columns were scored using the same method. For example:

- It’s appropriate to say, “*Lighting Fixture Maintenance* scored 100% for Obtain Learner Buy-in in the TTC Observation column, and the average score for EC classes in the EC Observation column is 73%. Therefore *Lighting Fixture Maintenance* rated better than the EC average on this dimension.”

In that case you are comparing “apples to apples” — both scores are composite views based on a combination of a review of the materials and observation of how the classes actually unfolded.
- It is **inappropriate** to say “*Lighting Fixture Maintenance* scored 100% for Obtain Learner Buy-in in the TTC Observation column, and the average score for TTC courses in the TTC Materials column is 23%. Therefore *Lighting Fixture Maintenance* far outperforms other TTC classes in this dimension.”

In that case you are comparing “apples to aardvarks” — one score is based on a composite view, reflecting what actually happened in the classroom; the other score is based on a review of materials only.

In fact, what this difference in scores means is that the instructor did things in the classroom that generated learner buy-in, but these activities are not incorporated in the course materials. (Although *Lighting Fixture Maintenance* scored 100% for Obtain Learner Buy-in during the in-person audit, it scored 20% on the Obtain Learner Buy-dimension based solely on a review of the course materials. This score is wholly consistent with the average score for TTC classes on this dimension.)



## Adult Learning Principles

Table xC-10 shows the overall scores for adult learning principles.

The most striking result from the analysis relative to adult learning principles is that scores resulting from in-person audits is significantly higher than the scores from a review of materials alone. This means that although the class materials do not include things like an initial activity to show value or examples and stories to connect new information to prior knowledge, instructors “fill the gap” when they are teach the class.

It’s also interesting to note that in the in-person audit scoring, the TTC class did significantly better on two dimensions than the EC classes, and essentially the same on three dimensions.

- The dimensions where the TTC class excelled are related to demonstrating the value of the information provided, allowing participants to demonstrate their knowledge, and providing stories and examples to “bring home” the learning.
- The dimensions where the TTC classes did essentially the same as the EC classes are related to tailoring the event to meet the specific needs of the audience, engaging the students in discovery and problem-solving activities, and using a “building block” approach to addressing new content and concepts.

The scoring details, showing the scores on the individual criteria for each of the dimensions is in Appendix C-1.

**Table xC-10. TTC and EC Courses’ Overall Score for Adult Learning Principles**

Major Dimensions of Adult Learning Principles	TTC Materials	TTC Observation	EC Observation
Obtain Learner Buy-in	49% <sup>8</sup>	100%	74%
Build on What Learners Know	20%	100%	85%
Engage the Learners	20%	58%	59%
Set Up Learners for Success	37%	56%	56%
Let Learners Apply What They Have Learned	37%	50%	50%

### *Scoring Details for Adult Learning Principles*

Table xC-11 through Table xC-15 provide the detailed scoring on Adult Learning Principles. Each criterion was scored for each course using a scale of 1 to 5.

- 1 = Not at all or very poor
- 2 = Rarely or poor
- 3 = Occasionally or fair
- 4 = Frequently or good
- 5 = Always or excellent

<sup>8</sup> For one criterion relating to the instructor creating a safe and respectful environment, we used a “default” value of 5, even though it logically is NA in terms of a review of the materials. We didn’t want to create a “false negative” by scoring this item low for the review of materials, while instructors consistently scored high for the in-person audit.

Appendix C-2: Details for TTC Evaluation Results

**Table xC-11. Score Details for Adult Learning Principle: Obtain Learner Buy-in**

<b>Obtain Learner Buy-in</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
There is an initial activity that helps participants see the value of the training.	23%	100%	65%
The usefulness of the learning in the participants' lives is emphasized and demonstrated.	23%	100%	85%
The instructor creates a safe and respectful learning environment. <sup>9</sup>	100%	100%	70%
<i>Actual Points / Maximum Possible Points</i>	<b>7.3 / 15</b>	<b>15 / 15</b>	<b>44 / 60</b>
<i>Score</i>	<b>49%</b>	<b>100%</b>	<b>73%</b>

**Table xC-12. Score Details for Adult Learning Principle: Build on What Learners Know**

<b>Build on What Learners Know</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
There are activities that enable the participants to indicate and/or demonstrate their level of experience and expertise.	20%	100%	70%
Good examples and stories are provided that connect new learning to the participants' prior learning and experience.	20%	100%	100%
<i>Actual Points / Maximum Possible Points</i>	<b>2 / 10</b>	<b>5 / 5</b>	<b>34 / 40</b>
<i>Score</i>	<b>20%</b>	<b>100%</b>	<b>85%</b>

**Table xC-13. Score Details for Adult Learning Principle: Engage the Learners**

<b>Engage the Learners</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	20%	100%	55%
There are activities that enable the learners to discover important information on their own.	20%	80%	65%
There are activities that enable the participants to contribute ideas.	20%	100%	55%
<i>Actual Points / Maximum Possible Points</i>	<b>3 / 15</b>	<b>14 / 15</b>	<b>35 / 60</b>
<i>Score</i>	<b>20%</b>	<b>93%</b>	<b>58%</b>

<sup>9</sup> We scored this item as 5 (“perfect”) for the review of materials — even though it could not be determined from reviewing the materials. This was to avoid a “false negative” for the overall score. That is, if we had scored this item NA for the review of materials method, the overall “materials” score for this item would have been 20%. This would have given a false impression of how the materials-review scores on other criteria compared to the scores from other methods.

**Table xC-14. Score Details for Adult Learning Principle: Set up Learners for Success**

<b>Set Up Learners for Success</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
A maximum of 5 familiar and meaningful concepts and a maximum of 3 unfamiliar concepts are taught at one time.	50%	100%	50%
Rules are taught first. Exceptions are not introduced until it is clear that the rules are understood.	37%	80%	70%
Transitional statements are made that show how different sections of the training relate to each other.	40%	60%	55%
A variety of instructional methods are used to ensure that visual, aural, and kinesthetic learners' needs are addressed.	20%	60%	50%
<i>Actual Points / Maximum Possible Points</i>	<b>7.3 / 20</b>	<b>10 / 15</b>	<b>45 / 80</b>
<i>Score</i>	<b>37%</b>	<b>75%</b>	<b>56%</b>

**Table xC-15. Score Details for Adult Learning Principle: Let Learners Apply What They Have Learned**

<b>Let Learners Apply What They Have Learned</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
There are problem-solving activities that actively engage the learners.	40%	80%	50%
There are opportunities for participants to immediately apply their new learning in the classroom.	33%	60%	50%
<i>Actual Points / Maximum Possible Points</i>	<b>3.7 / 10</b>	<b>7 / 10</b>	<b>20 / 40</b>
<i>Score</i>	<b>37%</b>	<b>70%</b>	<b>70%</b>

## Adult Learning Practices

Table xC-16 shows the overall scores for Adult Learning Practices. Here the distinction between the difference in “materials-only” scoring and “composite” scoring from the in-person audits is not a clear-cut as it is for Adult Learning Principles. For example:

- Both the materials review of TTC course materials and the in-person audit resulted in very low scores for the Lesson plan dimension.  
That dimension focuses on training objectives and identifying the anticipated learning levels. (See Appendix D-2 for a brief discussion of objectives and learning levels.)
- The review of TTC course materials resulted in a higher score for Content Decisions than the in-person audit.  
This likely is because the individual who evaluation team member who the in-person audit felt that the TTC instructor addressed “nice to know” information more often than desirable during delivery, and the materials did not include as much inessential information.

Another conclusion that can be drawn from the information in Table xC-16 is that the TTC course that was audited in person scored higher on all but one dimension than the average EC class observed. (The exception is the Lesson Plan dimension, which, as mentioned above, focuses on training objectives and learning levels.)

Appendix C-2: Details for TTC Evaluation Results

Table xC-16. TTC and EC Courses' Overall Score for Adult Learning Best Practices

Major Dimensions of Adult Learning Best Practices	TTC Materials	TTC Observation	EC Observation
Lesson Plan	20%	30%	48%
Content Decisions	78%	65%	58%
Interactive Activities	22%	70%	59%
Learner Centricity	33%	85% <sup>10</sup>	46%
Learning Facilitation	NA <sup>11</sup>	80%	61%
Practice Opportunities	20%	NA <sup>12</sup>	NA <sup>12</sup>

*Scoring Details for Adult Learning Practices*

Table xC-17 through Table xC-22 provide the detailed scoring on Adult Learning Principles. As with Adult Learning Principles, each criterion was scored for each course using a scale of 1 to 5:

- 1 = Not at all or very poor
- 2 = Rarely or poor
- 3 = Occasionally or fair
- 4 = Frequently or good
- 5 = Always or excellent

Table xC-17. Score Details for Adult Learning Practice: Lesson Plan

Lesson Plan	TTC Materials	TTC Observation	EC Observation
There are learning objectives	20%	20%	60%
The learning objectives are specific, observable and measurable	20%	20%	40%
Desired learning levels are identified	20%	20%	40%
There is a variety of training methods	20%	60%	50%
<i>Actual Points / Maximum Possible Points</i>	<b>4 / 20</b>	<b>6 / 20</b>	<b>38 / 80</b>
<i>Score</i>	<b>20%</b>	<b>30%</b>	<b>48%</b>

<sup>10</sup> There was a typographical error in the 2006–08 Energy Center Process Evaluation report, showing the *Lighting Fixture Maintenance* class score for Learner Centricity at 80%. The correct score, 85%, is used here.

<sup>11</sup> “Learning Facilitation” is considered NA for the review of course materials because there were no indicators of how the instructor would manage the learning environment or student interactions.

<sup>12</sup> “Practice Opportunities” is considered NA for the audits conducted during the EC evaluation because this dimension was added to the yardstick after those audits were completed.

Table xC-18. Score Details for Adult Learning Practice: Content Decisions

Content Decisions	TTC Materials	TTC Observation	EC Observation
Clear focus on key content	70%	100%	65%
There is an organizing principle	80%	40%	55%
Interesting but unimportant content kept to a minimum	80%	80%	70%
There is an appropriate amount of content for the time period	80%	40%	40%
<i>Actual Points / Maximum Possible Points</i>	<b>15.5 / 20</b>	<b>13 / 20</b>	<b>46 / 80</b>
<i>Score</i>	<b>78%</b>	<b>65%</b>	<b>58%</b>

Table xC-19. Score Details for Adult Learning Practice: Interactive Activities

Interactive Activities	TTC Materials	TTC Observation	EC Observation
Has a participant workbook for hands on activities to check learning and comprehension	23%	20%	25%
Learners actively engaged in discovering answers	23%	100%	60%
Checks for comprehension before leaving a key topic area	20%	80%	40%
Opportunity for learners to practice what they've learned as they learn it	20%	60%	60%
<i>Actual Points / Maximum Possible Points</i>	<b>4.3 / 20</b>	<b>14 / 20</b>	<b>37 / 80</b>
<i>Score</i>	<b>22%</b>	<b>70%</b>	<b>46%</b>

Table xC-20. Score Details for Adult Learning Practice: Learner Centricity

Learner Centricity	TTC Materials	TTC Observation	EC Observation
In-class mini needs assessment conducted	20%	100%	60%
Focus is on learner rather than presenter	43%	80%	55%
Builds on learner's prior learning or experience	43%	100%	70%
Meets needs of different learning styles	23%	60%	50%
Actual Points / Maximum Possible Points	<b>6.5 / 20</b>	<b>17 / 20</b>	<b>47 / 80</b>
Score	<b>33%</b>	<b>85%</b>	<b>59%</b>

## Appendix C-2: Details for TTC Evaluation Results

**Table xC-21. Score Details for Adult Learning Practice: Learning Facilitation**

<b>Learning Facilitation</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
Validates learners' involvement and responses	NA13	100%	80%
Makes transitional statements between sections	NA	40%	50%
Ensures that all learners can see and hear	NA	80%	50%
Provides breaks every 50 minutes or so	NA	100%	65%
<i>Actual Points / Maximum Possible Points</i>	<b>NA</b>	<b>16 / 20</b>	<b>49 / 80</b>
<i>Score</i>	<b>NA</b>	<b>80%</b>	<b>61%</b>

**Table xC-22. Score Details for Adult Learning Practice: Practice Opportunities**

<b>Practice Opportunities</b>	<b>TTC Materials</b>	<b>TTC Observation</b>	<b>EC Observation</b>
Reflect the learning objectives, including an appropriate mix of terminal performance and enabling objectives	20%	NA14	NA
Are included after each new concept or skill area is addressed	20%	NA	NA
Are parallel to — but different from — assessment items focusing on the same objectives	20%	NA	NA
Employ a variety of approaches appropriate to relevant objectives and participants' "real world" requirements	20%	NA	NA
<i>Actual Points / Maximum Possible Points</i>	<b>4 / 20</b>	<b>NA</b>	<b>NA</b>
<i>Score</i>	<b>20%</b>	<b>NA</b>	<b>NA</b>

## Comparing Apples to Apples

It is important to note that a review of materials can result in very different scores for the evaluation dimensions associated with support of behavior change and adherence to adult learning principles and practices. For example:

- If course materials include “check your understanding” opportunities, Table group activities, and other interactive elements designed to engage the learners — as well as checklists and job aids designed to help the student bridge between the classroom and the “real world” — a review of the materials likely will result in a relatively high score for support of behavior change and adherence to adult learning principles and practices.

However, if an instructor chooses not include the activities during the class — and ignores or “belittles” the checklists and job aids — the scores from observing the class will be significantly lower than from the review of material.

- On the other hand, the actual class materials may be very “bare bones” presentation support (“just” slides with key content), but the instructor adds informal “check your understanding” and practice opportunities — and provides job-aid-like guidance on a flipchart or whiteboard.

In that case, a review of the materials likely will result in a relatively low score for support of behavior change and adherence to adult learning principles and practices, but the scores from observing the class will be significantly higher.

<sup>13</sup> Issues associated with facilitation generally cannot be evaluated by a review of course materials.

<sup>14</sup> The Practice Opportunities dimension was added to the yardstick after the TTC and EC classes were audited for the 2006–08 Energy Center Process Evaluation project. Therefore there is no score for these criteria.

The BOC and CLEO sections of this report provide some concrete examples of this concept. (The review of BOC course materials tended to have significantly higher scores than resulted from the observation of BOC classes. The review of CLEO seminar materials resulted significantly lower scores on several key than resulted from observing the CLEO seminar.)

The evaluation team's interview with the TTC program manager indicated that TTC staff have not participated in training specific to adult learning principles or practices.

## Support of Programs

### Tie-in between Courses and Programs

The evaluation team identified two levels of possible tie-in between the courses and SCE programs:

- High tie-in means that 25% or more of the course content addresses technologies or measures directly related to a given program.
- Low tie-in means that less than 25% (but greater than 0%) of the course content focuses on technologies or measures encompassed by the program.

As discussed under Methods, the evaluation team considered a “short list” of programs, focusing on those that yield the greatest kWh savings and kW reduction.

This approach for establishing tie-in between courses and programs is the same approach used in the 2006–08 Energy Center Process Evaluation.

- 100% the TTC courses had high tie-in to programs
  - Three of the courses have high tie-in to four programs
  - Four of the courses have high tie-in to three programs
- 90% of the classes considered during the 2006–08 Energy Center Process Evaluation had high tie-in to programs

### Direct and Indirect Support of Programs

Direct Support of Programs addresses “How well do the classes directly support the programs — with program-specific information?” The yardstick items in this area focus on whether a course:

- Conveys program purpose, features, and benefits to participants
- Encourages participants to actively pursue the relevant programs

Indirect Support of Programs addresses “How well do the classes indirectly support the programs — with information on technologies or practices related to programs?” The yardstick items in this area focus on whether a course:

- Conveys the benefits of program-related technologies
- Helps participants weigh their options by distinguishing among technology variations that are or are not encompassed by relevant programs
- Helps prepare participants for implementing appropriate technologies by presenting key considerations and offering specific guidance for implementation of relevant technologies and practices

When answering the yardstick items for each class, we considered each program that had a high tie-in to the class.

## Appendix C-2: Details for TTC Evaluation Results

Table xC-23 shows that both TTC and EC courses do poorly in direct support of programs, though the TTC courses do better overall than the EC courses. (Since the evaluation was confined to a review of course materials, the criterion related to a schedule presentation by a program manager was considered NA.)

Table xC-24 shows that TTC courses do exceptionally well in indirect support of programs, with the exception of the criterion about distinguishing between technology variations that do and do not qualify for rebates through the program. (Again, we caution the reader to remember that these scores reflect only what can be directly observed in a review of the course materials; it is very possible that instructors address this issue during a live event.)

**Table xC-23. TTC and EC Courses' Direct Support of Programs**

Criteria	TTC Materials	EC Materials
Distinguishes between technology variations that are and are not included by program	0%	1%
Describes program goals/objectives (from target customer perspective)	5%	7%
Describes program features	10%	7%
Describes program benefits to participants	10%	7%
Provides information on how to pursue program offerings	20%	7%
Includes recommended next steps to pursue program offerings	5%	7%
Includes contact information (URL, email, phone) for more info or next steps	15%	7%
<b>Overall score</b>	<b>9%</b>	<b>6%</b>

**Table xC-24. TTC and EC Courses' Indirect Support of Programs**

Criteria	TTC Materials	EC Materials
Describes benefits of program-relevant technologies or practices	100%	84%
Includes considerations for implementing relevant technologies or practices	100%	65%
Provides specific guidance for implementing technology or practice	95%	36%
<b>Overall score</b>	<b>74%</b>	<b>57%</b>

### *Exit Survey Data Related to Student Interest in Programs*

Table xC-25 shows the results of the exit survey analysis on the two questions specific to students' interest programs immediately following a class. These responses can be looked at in light of the Energy Center goal of 10% of class participants will request referral to audit or rebate programs. In this context, both the TTC classes and the EC classes exceeded the goal, with the TTC classes scoring somewhat higher overall.

Note that we distinguish between two types of positive responses to questions regarding students' interest in more information about the Energy Audit Service and SCE energy efficiency programs:

- “Partial request” for more information — If a participant:
  - Responded “Yes” (tell me more about the Energy Audit Service or EE programs)
  - Did not provide contact information; that is, all “yes” answers are counted
- “Full request” for more information — If a participant:
  - Responded “Yes” (tell me more about the Energy Audit Service or EE programs)
  - Provided contact information (phone number or email address or both)



Table xC-25. TTC and EC Courses' Exit Survey Results on Effects of Training

Exit Survey topic	TTC Yes, "Partial"	TTC Yes, "Full"	EC Yes, "Partial"	EC Yes, "Full"
Desire to learn about utility Energy Audit Service (exit survey item E)	27%	11%	22%	12%
Desire to learn about utility Energy Efficiency Programs (exit survey item F)	33%	15%	29%	15%

***The "Lows"***

- Considering all positive responses ("partial" and "full"), one TTC class (13%) fell below the goal of 10%:
  - *Inland Empire IES —ED100* (9%)
- Considering only "full requests" (contact information included), two TTC classes (25%) fell below the goal of 10%.
  - *Inland Empire IES – ED100* (5%)
  - *Vons EE Refrigeration* (68%)

***The "Highs"***

- Considering all positive responses, four of the classes (50%) scored 50% or higher:
  - *Cool Coatings for Exterior HVAC Systems* (54%)
  - *Energy Efficiency Strategies in Cold Storage* (100%)
  - *Lighting Fixture Maintenance* (56%)
  - *Vons EE Refrigeration* (68%)

## Participant Satisfaction

The first 11 items on the Energy Center exit survey provide insight into participant satisfaction with a class immediately following that class. All of these items are rated on a scale of 1 (strongly disagree) to 5 (strongly agree).

We have expressed the results both as the average “raw” score and as a percentage. (The percentage is useful when comparing these results to those from other exit surveys, such as the BOC exit survey, which have similar questions, but a different scale.)

There are 620 TTC exit surveys and 12,445 EC exit surveys from 2007 and 2008 reflected in these scores. As is shown in Table xC-26:

- The TTC and EC courses scored roughly the same on questions related to general satisfaction and instructor skills (questions 1–4 and 11)
- TTC courses scored higher than EC courses on questions pertaining to organization, relevance, comfort with the learning environment, and use of exhibits and displays (questions 5–10).

The average score for TTC courses on these items is 4.4 or 89%, while the average for EC courses is 4.0 or 82%.

**Table xC-26. TTC and EC Courses’ Exit Survey Results Relevant to Participant Satisfaction**

Exit Survey Item Pertaining to Satisfaction	TTC		EC	
	TTC raw	TTC %	EC raw	EC %
1. The registration process was user friendly.	4.7	94%	4.7	94%
2. The overall quality of this seminar was excellent.	4.7	94%	4.6	92%
3. The instructor was an effective communicator.	4.7	93%	4.7	93%
4. The instructor was knowledgeable on this subject.	4.7	94%	4.7	94%
5. The course material covered was well organized and easy to understand.	4.6	91%	4.4	87%
6. The material covered in the seminar was relevant to my job.	4.5	91%	4.3	86%
7. The handouts will be helpful to me as reference material.	4.5	89%	4.3	85%
8. There was an appropriate mix between presentation and group involvement.	4.5	91%	4.3	86%
9. The classroom supported a comfortable learning experience.	4.4	89%	4.1	83%
10. If used, the center’s exhibits or displays complemented the course material and enhanced the seminar/class. (Skip, if not applicable)	4.1	82%	3.1	62%
11. I am completely satisfied with my total experience at the Energy Center.	4.6	91%	4.5	91%
<b>Overall average</b>	<b>4.5</b>	<b>91%</b>	<b>4.3</b>	<b>87%</b>

# Appendix C-3: TTC Staff Interview Summary

## Technology Test Centers Process Evaluation PY 2006 -2008

### Interview with Scott Mitchell, SCE Program Manager

Scott has been involved with TTC since 2003, working mainly on the refrigeration and thermal side. There is also a lighting lab, for which he is responsible, but not as familiar. Scott is responsible for some technology testing, managing technical projects for ET and codes and standards, and he supervises lab operations.

Funding for TTC is provided by more than one program. O&M and training are paid by ETO; ET pays for specific projects. Technologies tested during the program period include A/C for hot & dry climates, advanced rooftop a/c, vending machines, ice machines, refrigerated display cases, air curtains, lighting for freezers with doors, and anti-sweat technologies. The purpose for testing these technologies was two-fold: proof of concept, and to inform rebate programs. Technologies which were “proved” by TTC include ice machines and some lighting technologies. Some lighting technologies, and the hot & dry climate A/C were disproved.

Results of TTC tests were shared with other IOUs in California through the ET programs or codes and standards, were posted on the TTC website, and through networking and informal contacts. EE program staff were informed about TTC findings through technical reports posted on the TTC website, through classes taught by the TTC staff and incorporated into ASHRAE technical handbooks. TTC information has been used to update two chapters in ASHRAE handbooks twice. TTC also develops technology fact sheets for CTAC.

TTC teaches classes at the Energy Centers. The classes are attended by O&M contractors, SCE customer reps, and EE staff. Instructors do not receive much training in preparation for this assignment.

Important market barriers for technologies evaluated by TTC include rapid technological change, especially in lighting, and the lack of understanding by decision makers about lighting.

Internal accounting for costs of TTC between ETO and other programs is an ongoing issue.

There are many potential areas of expansion for TTC, especially in all types of controls, and in plug loads.

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# **Appendix D: Supporting Information Applying to BOC, CLEO, and TTC Process Evaluations**

# Appendix D-1: Yardsticks and Related Information

## About the Yardsticks

We will apply two “yardsticks” when assessing courses for the 2006-2008 ETO Process evaluation:

- Support of Behavior Change and Adult Learning

The description of evaluation criteria for support of behavior change and adult learning begins on p. D-2.

- Support of Programs

The description of evaluation criteria for support of programs begins on p. D-9.

In addition, we document background information about the courses including:

- General information — whether it’s classroom or online training, what materials we reviewed, who taught the class, etc.
- Content-related information — subject areas addressed, whether the content addressed is basic, intermediate, or advanced, etc.
- Performance expectations-related information — the type of behavior is expected to result from the class and whether the class is part of a certification or licensing program
- Audience-related information — market segments that the class targets, communities the class targets, and market barriers typical within the target audience(s)

The background information collected for courses begins on p. D-11.

## Yardstick: Support of Behavior Change and Adult Learning

### Criteria for Support of Behavior Change

Within each of the three dimensions related to support of behavior change, there are four or five criteria. For each criterion, a course may score 1 (“yes”), 0 (“no”), or NA (“not applicable”). If a criterion is not applicable to a given course, that criterion is not considered in the scoring.

A course’s overall score in a dimension is determined by actual score divided by the total possible score. For example, let’s consider the “Encouraging Action” dimension:

There are five criteria, as shown in below.

- The course gets a “yes” on four of these criteria
- It gets a “no” on one criterion

That means the course scores 4 (four yes answers) out of 5 total possible points.

Table xD-1. Example Scoring for Support of Behavior Change

Criteria for Encouraging Action	Score
Includes specific calls to action / specific next steps	YES
Supports development of individualized action plan	YES
Includes job aids / worksheets to assist in assessing / analyzing options	YES
Includes job aids / checklists to assist in taking action	NO
Includes info on where/how to get assistance in taking action	YES
<b>Total Points Scored / Total Possible Points</b>	<b>4/5</b>
<b>Score</b>	<b>80%</b>

This (80%) is a “good” score, as this yardstick uses the same definitions (from “very poor” to “excellent to very good”) as the Adult Learning yardstick:

0%	to	35%	Very Poor
36%	to	55%	Poor
56%	to	70%	Fair
71%	to	85%	Good
86%	to	100%	Excellent to Very Good

### *Encouraging Action*

- Includes specific calls to action / specific next steps
- Supports development of individualized action plan
- Includes job aids / worksheets to assist in assessing / analyzing options
- Includes job aids / checklists to assist in taking action
- Includes info on where/how to get assistance in taking action

### *Helping Overcome Market Barriers*

- Provides info on application of EE measures
- Describes typical cost savings re. EE measures
- Quantifies other typical financials (ROI, payback, etc.) typical in segment
- Describes typical non-financial benefits
- Includes info on risk assessment and risk mitigation

### *Support of Customer Segments*

#### *Segment-Specific*

- Describes considerations for specific “sub-segments”
- Includes example of “typical” benefits realized through EEM in segment
- Includes EEM success stories of actual customers in this segment
- Includes detailed case study of actual implementations in this segment

### *Second-language Support*

- Spanish

## Appendix D-1: Yardsticks and Related Information

- Korean
- Mandarin
- Cantonese
- Vietnamese
- TBD A
- TBD B
- Other

### Criteria for Adult Learning

The following summarizes the criteria used to evaluate training offerings in terms of their adherence to adult learning principles and practices. There are several dimensions under “Principles” and several dimensions under “Practices,” with specific criteria under each dimension.

With the exception of the criteria under dimensions 2.6, 2.7, and 2.8 (practice opportunities, feedback, and assessment) all of the criteria are the same as those that were used in the Energy Center 2006-2008 Process Evaluation.

Under each dimension are two to four specific criteria used to determine how well a course meets that principle or practice.

For each criterion, a course may score from one to five:

- 1 = Not at all or very poor
- 2 = Rarely or poor
- 3 = Occasionally or fair
- 4 = Frequently or good
- 5 = Always or excellent

A course’s overall score for a given principle or practice is based on the course’s score on each of the criteria for that principle or practice. If a criterion is not applicable to a course, the criterion is marked “NA” and is not calculated in the scoring.

0%	to	35%	Very Poor
36%	to	55%	Poor
56%	to	70%	Fair
71%	to	85%	Good
86%	to	100%	Excellent to Very Good

For example, let’s say we’re considering the “Obtain Learner Buy-in” principle for several instructor-led courses. The courses’ scores for this principle’s criteria are shown in the table below.



Table xD-2. Scoring for Adult Learning, Example One

Criteria for Obtain Learner Buy-in	Course 1	Course 2	Course 3
There is an initial activity that helps participants see the value of the training.	2	5	5
The usefulness of the learning in the participants' lives is emphasized and demonstrated.	3	4	5
The instructor creates a safe and respectful learning environment.	5	3	5
<b>Total Points Scored / Total Possible Points</b>	<b>10/15</b>	<b>12/15</b>	<b>15/15</b>
<b>Score</b>	<b>67%</b>	<b>80%</b>	<b>100%</b>

In the example above, Course 1 received a “Fair” rating, Course 2 received a “Good” rating, and Course 3 received an “Excellent” rating.

As another example, let's say the courses above were offered as self-study online training. In that case, the third criterion, which relates instructor behavior, would be not applicable. In that case, the scoring for the course would be as follows:

Table xD-3. Scoring for Adult Learning, Example Two

Criteria for Obtain Learner Buy-in	Course 1	Course 2	Course 3
There is an initial activity that helps participants see the value of the training.	2	5	5
The usefulness of the learning in the participants' lives is emphasized and demonstrated.	3	4	5
The instructor creates a safe and respectful learning environment.	NA	NA	NA
<b>Total Points Scored / Total Possible Points</b>	<b>5/10</b>	<b>9/10</b>	<b>10/10</b>
<b>Score</b>	<b>50%</b>	<b>90%</b>	<b>100%</b>

### *Adult Learning Principles*

#### *Obtain Learner Buy-in*

- There is an initial activity that helps participants see the value of the training.
- The usefulness of the learning in the participants' lives is emphasized and demonstrated.
- The instructor creates a safe and respectful learning environment.

#### *Build on What Learners Know*

- There are activities that enable the participants to indicate and/or demonstrate their level of experience and expertise.
- Good examples and stories are provided that connect new learning to the participants' prior learning and experience.

#### *Engage the Learners*

- There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.
- There are activities that enable the learners to discover important information on their own.
- There are activities that enable the participants to contribute ideas.

## **Appendix D-1: Yardsticks and Related Information**

### ***Set Up Learners for Success***

- A maximum of 5 familiar and meaningful concepts and a maximum of 3 unfamiliar concepts are taught at one time.
- Rules are taught first. Exceptions are not introduced until it is clear that the rules are understood.
- Transitional statements are made that show how different sections of the training relate to each other.
- A variety of instructional methods are used to ensure that visual, aural, and kinesthetic learners' needs are addressed.

### ***Let Learners Apply What They Have Learned***

- There are problem-solving activities that actively engage the learners.
- There are opportunities for participants to immediately apply their new learning in the classroom.

### ***Adult Learning Best Practices***

#### ***Lesson Plan***

- There are learning objectives
- The learning objectives are specific, observable and measurable
- Desired learning levels are identified
- There is a variety of training methods

#### ***Content Decisions***

- Clear focus on key content
- There is an organizing principle
- Interesting but unimportant content kept to a minimum
- There is an appropriate amount of content for the time period

#### ***Interactive Activities***

- Has a participant workbook for hands on activities to check learning and comprehension
- Learners actively engaged in discovering answers
- Checks for comprehension before leaving a key topic area
- Opportunity for learners to practice what they've learned as they learn it

#### ***Learner Centricity***

- In-class mini needs assessment conducted
- Focus is on learner rather than presenter
- Builds on learner's prior learning or experience
- Meets needs of different learning styles

#### ***Learning Facilitation***

- Validates learners' involvement and responses
- Makes transitional statements between sections
- Ensures that all learners can see and hear
- Provides breaks every 50 minutes or so

NOTE: The following items (Practice Opportunities, Feedback, and Assessment) are new elements in the Adult Learning Yardstick. That is, they were not included in the Adult Learning Yardstick used in the 2006–08 Process Evaluation for Energy Centers (CTAC and AgTAC).

***Practice Opportunities***

- Reflect the learning objectives, including an appropriate mix of terminal performance and enabling objectives
- Are included after each new concept or skill area is addressed
- Are parallel to — but different from — assessment items focusing on the same objectives
- Employ a variety of approaches appropriate to relevant objectives and participants’ “real world” requirements

***Feedback***

- Is provided when participants are asked to practice or demonstrate skills and knowledge
- Encompasses both positive and corrective feedback as appropriate
- Includes corrective guidance as appropriate (e.g., not just “incorrect” or “poor” but why, and where to find the correct information or how to perform better)

***Assessments***

- Measure successful completion based on “curriculum teaching” rather than “item teaching”
- Include items that sample the full range of learning objectives, including terminal performance and enabling objectives
- Reflect the learning level inherent in the objective(s) addressed by the items
- Distinguish between those who can meet the course objectives and those who do not

## Appendix D-1: Yardsticks and Related Information

### *Rationale behind Adult Learning Criteria*

<b>Criteria for Obtain Learner Buy-in</b>	<b>Tenets Underlying the Criteria</b>
There is an initial activity that helps participants see the value of the training.	Adults learn because they see the value of the training content to their lives.
The usefulness of the learning in the participants' lives is emphasized and demonstrated.	Adults learn best when practical application is encouraged.
The instructor creates a safe and respectful learning environment.	Adults learn best in an informal atmosphere.
<b>Criteria for Build on What Learners Know</b>	<b>Tenets Underlying the Criteria</b>
There are activities that enable the participants to indicate and/or demonstrate their level of experience and expertise.	Adults bring a wealth of experience that must be acknowledged and respected in the training setting.
Good examples and stories are provided that connect new learning to the participants' prior learning and experience.	Adults learn and retain information more easily if they can relate it to their reservoir of past experiences.
<b>Criteria for Engage the Learners</b>	<b>Tenets Underlying the Criteria</b>
There is an activity that enables participants to indicate their learning goals, and/or participants are given choices to select activities or content that is relevant to their interests and needs.	Adults have a need to be self-directing and take a leadership role in their learning.
There are activities that enable the learners to discover important information on their own.	Adults are more likely to believe something if they arrive at the idea themselves.
There are activities that enable the participants to contribute ideas.	Adults have ideas to contribute.
<b>Criteria for Set Up Learners for Success</b>	<b>Tenets Underlying the Criteria</b>
A maximum of 5 familiar and meaningful concepts and a maximum of 3 unfamiliar concepts are taught at one time.	Adults can learn only a specific amount of information at one time.
Rules are taught first. Exceptions are not introduced until it is clear that the rules are understood.	Adults need to learn rules before they learn exceptions to the rules.
Transitional statements are made that show how different sections of the training relate to each other.	Adults need to know how one part of the training relates to other parts.
A variety of instructional methods are used to ensure that visual, aural, and kinesthetic learners' needs are addressed.	Adults have different learning styles that are responsive to different instructional methods.
<b>Criteria for Let Learners Apply What They Have Learned</b>	<b>Tenets Underlying the Criteria</b>
There are problem-solving activities that actively engage the learners.	Adults use a hands-on, problem-solving approach to learning.
There are opportunities for participants to immediately apply their new learning in the classroom.	Adults want to apply new knowledge and skills immediately.

## Yardstick: Support of Programs

The following summarizes the criteria used to evaluate training offerings in terms of their support of:

- Energy efficiency incentive and rebate programs
- Behavior change on the part of the class participants
- “Special” customer segments (e.g., customers from a specific subsegment, such as food service, or who speak a language other than English)

Within each of the three areas, there two dimensions with specific criteria under each dimension. For each criterion, a course may score 1 (“yes”), 0 (“no”), or NA (“not applicable”). If a criterion is not applicable to a given course, that criterion is not considered in the scoring.

**All of the criteria under support of programs are the same as those that were used in the Energy Center 2006-2008 Process Evaluation.**

A course’s overall score in an area is determined by actual score divided by the total possible score. For example, let’s consider the “Direct Support of Programs” dimension under “Support of Programs.”

There are seven criteria, as shown in below.

- The course gets a “yes” on five of these criteria
- It gets a “no” on one criterion
- It gets a “NA” on another criterion.

That means the course scores 5 (five yes answers) out of 6 total possible points. (One of the seven criteria was not applicable, so not considered as part of the total possible points.)

**Table xD-4. Example Scoring for Support of Programs**

<b>Direct Support of Programs Criteria</b>	<b>Score</b>
Describes program goals/objectives (from target customer perspective)	YES
Describes program features	YES
Describes program benefits to participants	YES
Provides information on how to pursue program offerings	YES
Includes recommended next steps to pursue program offerings	YES
Includes contact information (URL, email, phone) for more info or next steps	NO
Has scheduled presentation by program mgr or account exec on program(s)	NA
<b>Total Points Scored / Total Possible Points</b>	<b>5/6</b>
<b>Score</b>	<b>83%</b>

This (83%) is a “good” score, as this yardstick uses the same definitions (from “very poor” to “excellent to very good”) as the Adult Learning yardstick:

0%	to	35%	Very Poor
36%	to	55%	Poor
56%	to	70%	Fair
71%	to	85%	Good
86%	to	100%	Excellent to Very Good

### Support of Programs

To maintain a reasonable project scope, we focused on 16 high-impact programs that account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW savings. (See p. D-14 for a list of the programs to be considered.)

Tie-in between a class and a program was based on whether a class addressed technologies, measures, or practices that are encompassed by a program. If 25% or more of the content covered in a class addresses technologies or measures encompassed by a program, that class will be considered to be “closely tied” to the program.

When assessing how well a course supports a given program, we will consider only those programs which are considered to be closely tied to the course.

The following notes the two major dimensions and the specific criteria under both dimensions related to a course’s support of programs.

#### *Direct Support of Programs (Program-Specific Information)*

- Describes program goals/objectives (from target customer perspective)
- Describes program features
- Describes program benefits to participants
- Provides information on how to pursue program offerings
- Includes recommended next steps to pursue program offerings
- Includes contact information (URL, email, phone) for more info or next steps
- Has scheduled presentation by program mgr or account exec on program(s)

#### *Indirect Support of Programs*

- Includes content on program-relevant technologies or measures
- Describes benefits of program-relevant technologies or measures
- Includes considerations for implementing relevant technologies or measures
- Provides specific guidance for implementing technology or measure
- Distinguished between technology variations that are and are not included by program

## Background Information

General
<b>Ownership</b>
1. EC
2. TTC
3. BOC
4. CLEO
5. MEU
6. CS
7. ET
8. SCLTC
9. RTTC-TTC
<b>Delivery Channel</b>
1. Web Cast
2. Podcast
3. Classroom
4. Conference/Special Event
5. Webinar
6. On-Line
<b>Class Materials</b>
1. (na deleted)
2. Workbook
3. Handouts
4. Lesson Plan
5. Welcome Package
6. Presentation Material
7. Instructor Guide
8. Objectives
9. Agenda
10. Syllabus

Performance Expectations Related
<b>Performance Level</b>
1. Foundation
2. Appreciation
3. Operation
4. Realization
<b>Certification / Licensing</b>
1. NATE
2. BOC
3. LEED
4. CHPS
5. ACCA
6. APEP
7. LEED-NC
8. HERS

Audience Related
<b>Target Audience</b>
1. Agriculture
1.1. General
1.2. Small
1.3. Farm
1.4. Dairy
2. Commercial
1.1. General
1.2. Small
1.3. Cleaners
1.4. Golf Course, Landscape
1.5. Grocery
1.6. Hotel, Motel, Spa, Resort
1.7. Food Service
3. Industrial
1.1. General
1.2. Small
1.3. Manufacturing
1.4. Processing
1.5. Water, Wastewater
4. Residential
1.1. General
1.2. Multi-Family
1.3. Single Family
5. Institution
1.1. General
1.2. Healthcare
1.3. School
1.4. Correctional
6. New Construction
7. Market Actors
1.1. Energy Efficiency Consultant
1.2. Architect or Designer
1.3. Commercial Property Developer
1.4. Government
1.5. Equipment Designer and Manufacturer
<b>Target Community</b>
1. African-American
2. Spanish
3. Korean
4. Mandarin
5. Cantonese
6. Vietnamese
7. Asian Indian
<b>Market Barriers</b>
1. Lack of knowledge about application of the technology
2. Lack of clarity on economic benefits
3. Lack of clarity on the other benefits
4. Perception of high risk

## Appendix D-1: Yardsticks and Related Information

Content Related	Content Related (cont.)
<p><b>Class Focus</b></p> <ol style="list-style-type: none"> <li>1. Software</li> <li>2. Operations and Maintenance</li> <li>3. Selection and Analysis</li> <li>4. Management</li> <li>5. General</li> </ol> <p><b>Incentive / Rebate</b></p> <ol style="list-style-type: none"> <li>1. Express Efficiency</li> <li>2. Standard Performance Contract</li> <li>3. Non Residential Audit</li> <li>4. Direct Install</li> <li>5. Package AC Systems</li> <li>6. Savings by Design</li> <li>7. Industrial EE</li> <li>8. Agricultural EE</li> <li>9. Retro Commissioning</li> <li>10. CA Community College</li> <li>11. CA New Home</li> <li>12. Multi Family EE Rebate</li> <li>13. Residential Lighting</li> <li>14. Residential Non-lighting</li> <li>15. Appliance Recycle</li> <li>16. Home EE Survey</li> <li>17. Other-CA Solar Initiative</li> <li>18. Other</li> </ol> <p><b>Content Level</b></p> <ol style="list-style-type: none"> <li>1. Basic</li> <li>2. Intermediate</li> <li>3. Advanced</li> <li>4. N/A</li> </ol>	<p><b>Subject Area</b></p> <ol style="list-style-type: none"> <li>1. Agricultural Process</li> <li>2. Building Envelope</li> <li>3. Code             <ol style="list-style-type: none"> <li>3.1. Title 24</li> </ol> </li> <li>4. Compressed Air</li> <li>5. Demand Response</li> <li>6. EE Audits and Assessments</li> <li>7. SCE Programs             <ol style="list-style-type: none"> <li>7.1. Incentives</li> <li>7.2. Rebates</li> </ol> </li> <li>8. Electricity</li> <li>9. Electronic Controls             <ol style="list-style-type: none"> <li>9.1. EMS</li> <li>9.2. SCADA</li> </ol> </li> <li>10. Emerging Technology</li> <li>11. Financial and Risk Analysis</li> <li>12. Food Service</li> <li>13. Hot Water, Boilers and Process Heat</li> <li>14. HVAC</li> <li>15. Commercial and/or Industrial Process</li> <li>16. Lighting</li> <li>17. Motors and Drives</li> <li>18. Overview of Multiple Technologies</li> <li>19. Pumps</li> <li>20. Refrigeration</li> <li>21. Self-Gen             <ol style="list-style-type: none"> <li>21.1. Solar</li> <li>21.2. Photovoltaic</li> <li>21.3. Geothermal</li> <li>21.4. Wind</li> <li>21.5. Hydroelectric</li> </ol> </li> <li>22. Water and Wastewater</li> <li>23. Green Building and Landscaping             <ol style="list-style-type: none"> <li>23.1. LEED</li> <li>23.2. Green Building</li> <li>23.3. Green Landscaping</li> </ol> </li> </ol>



## Courses Considered in the 2006–08 Energy Center Process Evaluation

Table xD-5 lists the courses that were assessed with the “yardsticks” during the 2006–08 Energy Center Process Evaluation. It is included in this report because we have made comparisons between yardstick scores for courses from other programs (BOC and TTC) to the yardstick scores obtained during the EC evaluation.

**Table xD-5. Courses Considered in the 2006–08 Energy Center Process Evaluation**

- |   |  |
|---|--|
| 1. Adjustable Speed Drives  | 37. Motors Starters  |
| 2. Advanced EnergyPro   | 38. On-Farm SCADA  |
| 3. Advanced Lighting Technologies   | 39. Overcoming Objections to Energy Efficiency Investments                         |
| 4. Basic Heating, Ventilation & Air Conditioning (HVAC)   | 40. Package Unit Heating, Ventilation & Air Conditioning (HVAC)                    |
| 5. Chilled Water System Efficiency  | 41. Principles of Lighting   |
| 6. Compressed Air System Efficiency   | 42. Programmable Logic Controllers – Energy-Efficient Applications                 |
| 7. Daylighting for Buildings  | 43. Putting the “V” in Residential HVAC  |
| 8. Demand Response Programs: What They Are and How Participants Can’t Lose                          | 44. Save Energy, Save Money  |
| 9. DOE (CEC) Fan System Assessment Training   | 45. Schools – Pass the Test on Energy Efficient & Effective Lighting               |
| 10. DOE Motor Systems Management  | 46. Selling Energy Efficiency and / or Green Building to Building Owners           |
| 11. DOE Pumping System Assessment Training (PSAT)   | 47. Specifying Foodservice Lighting for Energy Efficiency                          |
| 12. Efficiency Technologies for Commercial Refrigeration  | 48. Technology Update  |
| 13. Energy Efficiency Treatment of Dairy Lagoons and Wastewater Management                          | 49. Title 24 - Acceptance Training for Designers and Contractors                   |
| 14. Energy-Efficient Refrigeration Equipment & Ice Makers   | 50. Title 24 (2005) Energy Standards for Nonresidential Buildings                  |
| 15. EnergyPro Nonresidential Software for Beginners   | 51. Title 24 Duct Leakage Testing  |
| 16. Foodservice Equipment Performance – Measuring, Optimizing and Specifying                        | 52. Title 24 Energy Efficiency Standards: A Seminar for Plan Checkers & Inspectors |
| 17. Fundamentals of Electricity and Energy Efficiency   | 53. Title 24 Nonresidential Energy Efficiency Standards – Envelope & Mechanical    |
| 18. Generating Electrical Energy from Dairy Cow Waste   | 54. Title 24 Nonresidential Energy Efficiency Standards – Lighting                 |
| 19. Groundwater Wells and Pumps   | 55. Tool Lending Library   |
| 20. HID Outdoor and Indoor Lighting Applications  | 56. Wet Cleaning Demonstration   |
| 21. Hot Rebates & Cool Savings for Foodservice  |  |
| 22. HVAC Direct Digital Control (DDC) -- The Emergence of Open Systems                              |  |
| 23. HVAC Quality Installation   |  |
| 24. HVAC System Air Flow and Static Pressure Diagnostics  |  |
| 25. Improving Energy Efficiency in Drip irrigation  |  |
| 26. Improving Pump Plant Efficiency to Lower Energy Cost  |  |
| 27. Industrial Refrigeration  |  |
| 28. Insulate Right!   |  |
| 29. Introduction to Life-Cycle Costing  |  |
| 30. Introduction to the California Solar Initiative   |  |
| 31. Introductory eQUEST: "Schematic Design"   |  |
| 32. Keys to Home Comfort and Performance  |  |
| 33. Lighting Fixture Maintenance Workshop   |  |
| 34. Lighting for Architecture and Interiors   |  |
| 35. Maximizing Energy Efficiency for LEED Certification—Leadership in Energy & Environmental Design |  |
| 36. Metal Halide VS Fluorescent – 10 Rounds in the Hibay Arena                                      |  |

## Programs Considered when Assessing Class Support of Programs

The 16 programs listed below account for 93% of all impact program budget and over 73% of kWh savings and 63% of kW savings. (See the following page for details on figures and calculation used to identify the “short list” of programs.)

1. Express Efficiency
2. Standard Performance Contract
3. Nonresidential Audit
4. Direct Install
5. Package AC Systems
6. Savings by Design
7. Industrial EE
8. Agricultural EE
9. Retro Commissioning
10. CA Community College
11. CA New Home
12. Multifamily EE
13. Residential Lighting
14. Residential Non Lighting
15. Appliance Recycling
16. Home EE Survey

## Calculation Used to Identify Program “Short List”

Table xD-6. Data Behind Selection of Programs Considered for “Short List”

Program	Segment	Classification	Budget	MWh	MW	TRC	PC
1. Business Incentive & Services (Express, SPC, Non-res Audit)	Non-residential	Statewide	\$113,999,715	1,156,755	387.44	3.91	5.84
2. Residential Energy Efficiency Incentive Program (Lighting & Non-Lighting)	Residential	Statewide	\$66,886,222	805,072	113.71	4.38	6.75
3. Non-Residential Direct Install Program	Non-residential	Local	\$49,642,987	303,970	55.11	3.47	3.38
4. Appliances Recycling Program	Residential / Non-residential	Statewide	\$39,893,411	177,323	30.82	6.07	2.52
5. Comprehensive Packaged Air Conditioning System	Residential / Non-residential	Local	\$59,149,186	161,885	89.10	1.04	2.46
6. Industrial Energy Efficiency Program	Non-residential	Local	\$37,360,338	159,333	30.04	2.34	3.39
7. Agriculture Energy Efficiency Program	Agriculture	Statewide	\$37,292,557	129,368	36.10	1.49	2.95
8. Savings by Design	Non-residential New Construction	Statewide	\$28,458,461	128,617	26.32	2.81	3.95
9. Multi-family Energy Efficiency Rebate Program	Residential	Statewide	\$53,023,116	125,741	14.54	2.27	1.39
10. Retro-Commissioning Program	Non-residential	Local	\$11,626,203	39,040	9.60	1.47	2.11
11. California Community College	School / Colleges	Statewide	\$8,985,167	24,426	5.15	2.39	2.32
12. Home Energy Efficiency Survey	Residential	Statewide / Local	\$6,112,567	18,011	6.52	0.73	0.75
13. CA New Home Program	Residential New Construction	Local	\$18,294,211	12,766	8.72	0.42	0.80
14. Local Government Energy Action Resource	Crosscutting	Local	\$5,420,032	8,385	1.77	0.58	0.81
15. County of Los Angeles Partnership	Non-residential	Local	\$4,743,598	1,156,755	387.44	3.91	5.84
16. Sustainable Community	Crosscutting	Local	\$4,284,084	8,212	21.10	3.85	4.49
17. California Department of Correction & Rehabilitation	Prison and Rehabilitation Facilities	Statewide	\$2,898,675	6,912	1.46	1.98	2.01
18. Community Energy Partnership	Crosscutting	SCE Territory	\$2,316,943	6,605	0.70	1.60	1.60
19. Ventura County Partnership	Crosscutting	Local	\$2,201,099	5,700	1.24	2.43	1.56
20. Bakesfield and Kern County Energy Watch	Residential, Small Commercial, Government Facilities	Local	\$1,737,709	3,508	0.46	1.37	1.24
21. Integrated School-Based Program	Residential / Non-residential	Local	\$5,003,583	3,093	0.99	0.30	0.31
22. San Gabriel Valley Energy Efficiency Partnership	Residential / Non-residential	Local	\$1,737,709	2,701	0.84	1.35	1.23
23. County of Riverside Partnership	Non-residential	Local	\$995,550	2,596	0.55	2.18	2.22
24. UC/CSU/IOU Energy Efficiency Partnership	Schools and Colleges	Statewide	\$6,830,972	2,596	0.55	2.18	2.22
Sum of rows 1 through 24			\$568,894,095	\$4,449,370	\$1,230		
<b>Sum of rows 1 through 13</b>			<b>\$530,724,141</b>	<b>\$3,242,307</b>	<b>\$813</b>		
			<b>93%</b>	<b>73%</b>	<b>66%</b>		

Rows 1 through 13 represent the 16 programs considered for evaluating class support of programs

We considered Row 1 as representing three incentive programs: Express Efficiency, Standard Performance Contract, and Non-residential Audit.

We considered Row 2 as representing two incentive programs: Residential Lighting and Residential Non-lighting.

## Appendix D-2:

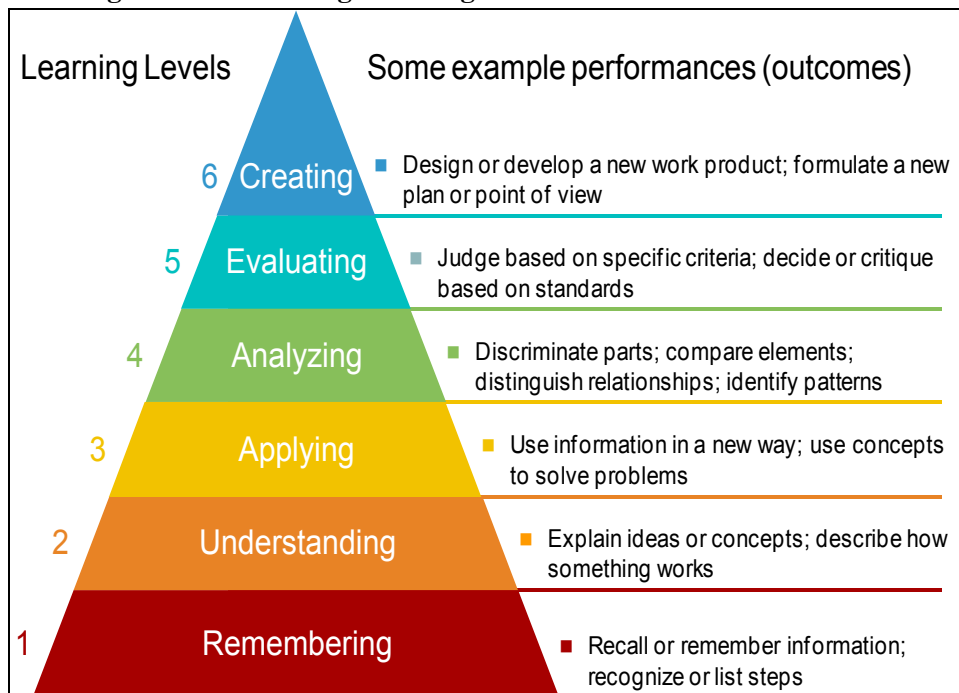
# Learning Levels and Objectives

## Learning Levels and Training Objectives

Decisions regarding the design of the training should be informed by the desired outcomes of the training. That is, the first questions a course developer needs to ask are, “What are we trying to accomplish?” and “What is the desired end result of the training experience?”

Learning outcomes often are categorized into six levels — referred to as Bloom’s taxonomy — from the most “basic” to the most “advanced.”<sup>15</sup> An updated version of these levels are depicted in Figure xD-1.

**Figure xD-1. Relating Learning Levels to Performance Outcomes**



Which learning outcomes are most appropriate depend upon the overarching goal of the training. For example:

- The Remembering level is appropriate if the end goal is to raise participants’ awareness — or to establish the “background knowledge” necessary to achieve the higher levels of outcomes.
- The Understanding level is appropriate if the end goal is to change participants’ attitudes.
- The Applying level is appropriate if the end goal is to change participants’ behavior in relatively discrete and structured ways.
- The Analyzing, Evaluating, and Creating levels are appropriate if the end goal is to help participants make relatively complex decisions or enhance their behavior.

<sup>15</sup> The original taxonomy, established by Bloom in 1956, defined the levels as Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. This was refined in the 1990s to reflect the levels shown <sup>above</sup>. [Source: [http://www.odu.edu/educ/roverbau/Bloom/blooms\\_taxonomy.htm](http://www.odu.edu/educ/roverbau/Bloom/blooms_taxonomy.htm)]

Another way of looking at the relationship between these levels and learning outcomes is in terms of the degree of “sophistication” of the classes. Typically:

- Fundamentals courses most appropriately target the Remembering and Understanding levels.
- Intermediate courses typically target the Applying level.
- Advanced courses typically target the Analyzing, Evaluating, and Creating levels.

### Objectives

Once you have identified the desired learning outcomes for a course, you can develop the specific training objectives that serve as the touchstone for the presentations and activities that compose the course — as well as form the basis for evaluating the success of the training and participants’ performance relative to the training.

Training objectives are typically stated in terms of a hierarchy:

- Terminal performance objectives (TPOs) are the “main things” you want participants to do as a result of the training.

The TPOs of a course should directly reflect the desired outcomes. They tell you what “putting it together” activities should address, and they define the parameters for what would be in a “final exam.”

If participants meet the TPOs (and the TPOs are appropriate to your overarching goals for the training), you will have accomplished what you set out to accomplish.

- Enabling objectives (EOs) are the subsidiary things that participants must know or do in order to accomplish the TPOs. They are the building blocks of the TPOs.

The EOs set the parameters for teaching points and interim practice opportunities.

Both kinds of objectives should be written in terms of measurable, observable behaviors. For example, instead of saying the participant will “appreciate” something, it is more useful to say the participant will “describe the benefits” of something or “select the option that reflects the value” of something,

- You can’t directly tell by listening or watching whether someone appreciates — and two different observers may interpret the same behavior as appreciating or not.
- You can, however, tell whether someone describes the benefits of something or selects the alternative that reflects the characteristics of what you want them to appreciate.

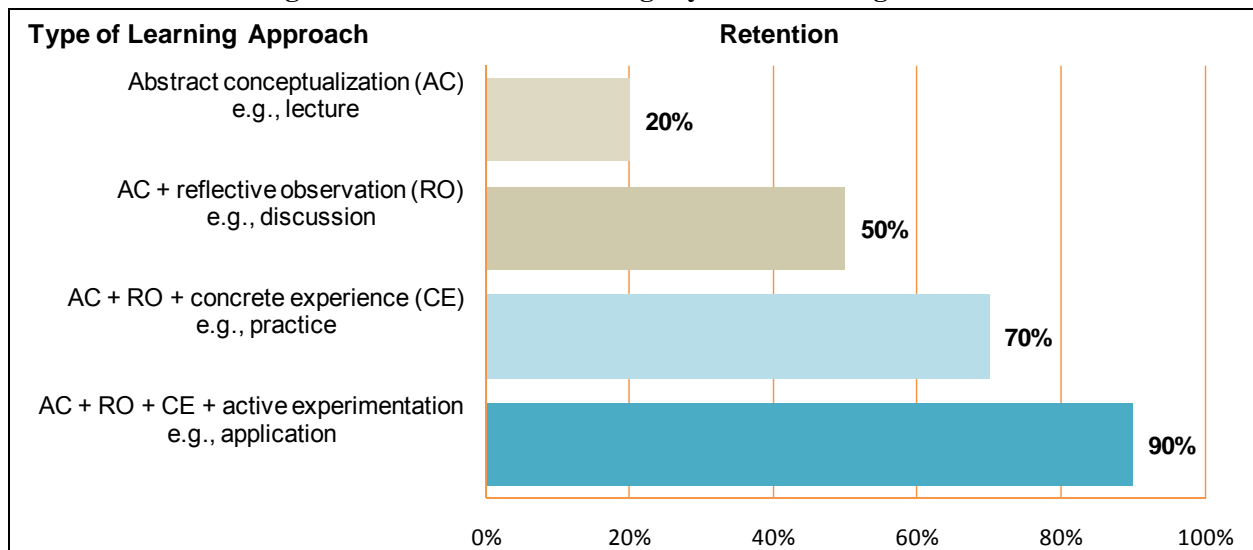
A practical way to tackle objectives is to ask yourself, “What will success look like? How will I know if participants meet my expectations? What will they be able to do at the end of the class to prove they’ve learned ‘the right stuff?’” The answers to these questions form the TPOs for the class. Once you’ve established the TPOs, ask yourself, “What goes into doing what the TPO describes? How will I know if someone knows that or can do that?” The answers to these questions form the EOs for the class.

# Appendix D-3: Why Lecture Alone Is Inadequate to Change Behavior

## Why Practice and Application Are Crucial to Training Effectiveness

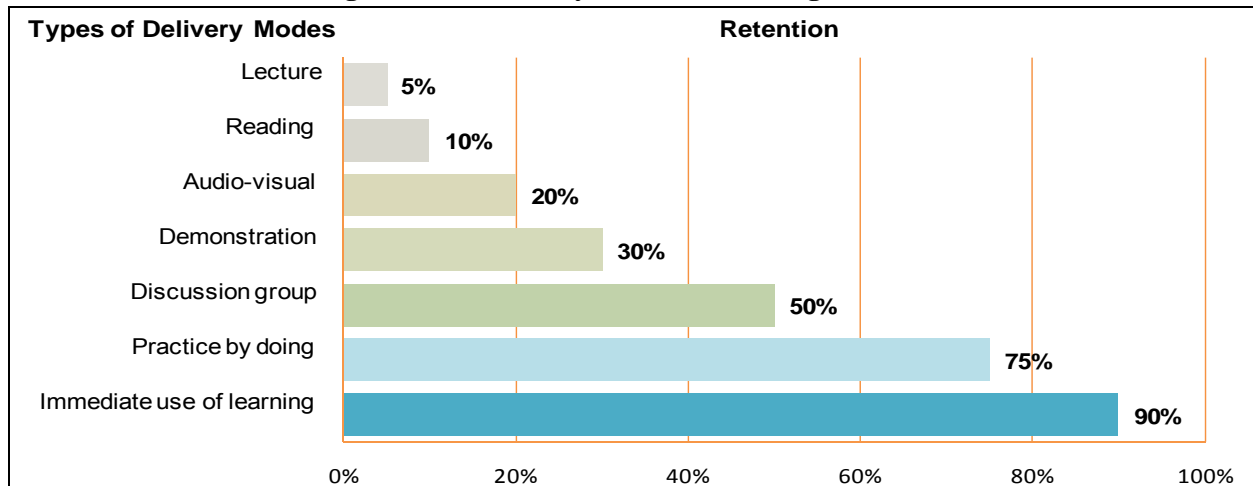
Numerous studies indicate that people learn best — and are more likely to retain and apply their learning — when the learning experience includes a variety of teaching styles and methods. Figure xD-2 and Figure xD-3 clearly show the positive impact that actively involving participants has on the long-term effect of the training.

**Figure xD-2. Effect of Teaching Styles and Average Retention Rates**



Source: [ftp://ftp-fc.sc.egov.usda.gov/NEDC/isd/choosing\\_instructional\\_strategies.pdf](ftp://ftp-fc.sc.egov.usda.gov/NEDC/isd/choosing_instructional_strategies.pdf)

**Figure xD-3. Delivery Mode and Average Retention Rates**



Source: [ftp://ftp-fc.sc.egov.usda.gov/NEDC/isd/methods\\_media.pdf](ftp://ftp-fc.sc.egov.usda.gov/NEDC/isd/methods_media.pdf)

# **Appendix E: Supporting Information for MEU Process Evaluation**

# Appendix E-1: Details for MEU Evaluation Results

## Summary of Programs on the Lead Cards

Table xE-1 summarizes the utility programs as they are listed on the MEU lead card and as they are abbreviated in this report (and represented in the data collection tool).

**Table xE-1. MEU Lead Card Program-related Data**

On the MEU Lead Card	In the Database
Home Energy Efficiency Survey	HEES
In Home	in home
Online	online
Mail in	mail in
Comprehensive Home Performance	CHP
Lighting Education	Lighting
ENERGY STAR <sup>®</sup> Qualified Home Appliances & Rebates	HEER
Appliance Recycling & Rebates	ARP
California Alternate Rate for Energy (CARE) & Family Electric Rate Assistance (FERA)	CARE/FERA
Energy Management Assistance (EMA)	EMA
Energy Management Solutions for Business	Business
Training (Energy Centers)	Energy Centers
School Programs / Outreach Efforts	EARTH
Solar Energy - California Solar Initiative	CSI
	SDP16
Gas Company Programs	Gas Check
Your gas provider: (fill-in)	Gas Agency
Water Agency Programs	Water Check
Your water provider: (fill-in)	Water Agency
Other (fill-in)	Other

## Filtering for Valid Lead Cards

Before analyzing the lead card data, the evaluation team filtered the 2009 MEU Lead Card data last submitted to the evaluation team:

- For 248 of the lead cards recorded, the MEU staff were unable to locate the customer in their customer databases.
- An additional 44 lead cards represented closed accounts



We considered lead cards with accounts that could not be verified or were closed to be invalid leads and excluded them from the analysis.

Of the remaining 1,850 lead cards:

- For 13 of them, the MEU staff were unable to find service account numbers, but did find customer numbers.
- For another 24 lead cards, the MEU staff determined the account was on a master meter.
- For two of the lead cards, the customer contact was a business rather than residence.

We considered these cards to represent valid leads since they were confirmed SCE customers. **The filtered database represents 1,850 lead cards for confirmed SCE customers.**

## Identifying Events that Generated Lead Cards

The MEU Event Log for 2009 lists 142 events.

- Events 1 through 7 occurred before the MEU lead cards were fielded
- Events 8 through 142 occurred from March 25, 2009 through December 6, 2009, during the period when lead cards were fielded.
- The lead card data base does not contain data for 27 Event IDs in the series of Event IDs during the period when lead cards were fielded (Table xE-2).
- This means there was a total of 109 Event IDs (representing unique events) associated with lead card data.

**Table xE-2. Event IDs “Missing” from the Lead Card Database**

Event IDs Not Found in Lead Card Database		
1 – 8 (before lead cards)		
16	34	53
18	36	54
22	38	58
23	39	63
24	38	91
26	48	106
28	49	109
29	51	119
30	52	131

## Comparing Number of Leads to Event Attendees and MEU Contacts

Working with the set of events that generated valid lead cards, the evaluation team used the unique Event ID to map lead card data to data in the MEU log, which includes information about:

- The estimated number of event attendees
- The number of people contacted by the MEU

## Appendix E-1: Details for MEU Evaluation Results

This let us compare the number of lead cards generated to the number of estimated event attendees and the number of MEU contacts.

An initial review of this data led us to believe that the estimated number of attendees was not a useful number to use in the analysis.

- For four events, the number of MEU contacts was greater than the estimated number of attendees, and the ratio of contacts to attendees varied wildly — from 167% to 0.6%.
- This assumption regarding the estimate of event attendees was confirmed in a conversation with the program manager who indicated that the estimated number of attendees was provided by the event sponsor prior to the event, and often bore little relationship to the number of people who actually attended the event.

The number of MEU contacts is assumed to be a valid number, since it is logged by third-party staff, working for MEU, at the event.

## Identifying Leads

- “Program Leads” refers to a customer requesting information on a program.

If the customer checked multiple program-specific boxes on the lead card (which most of them did; see Table xE-4), each of those checkmarks was counted as a program lead.<sup>17</sup>

- “Gas or Water Leads” refers to a check mark next to “Gas Company Programs” or “Water Agency Programs” on the lead card.
- “Special Requests/Comments” refers to a customer writing in a comment on the lead card.

Most of these comments imply a request for more information or assistance with an energy-efficiency related topic. 39% of these are coded as “AC tune-up” and 25% are coded as “EAF.” The remaining special requests or comments reflect a range of topics such as wind turbines, requests for employment, and complaints.

Table xE-3 shows the number of lead cards generated and the number and type of leads on those cards. The percentages are the ratio of lead cards or leads to the number of MEU contacts.

**Table xE-3. Leads Captured by MEU Lead Cards**

	Number	% Contacts	% Lead Cards
<b>MEU Contacts</b>	33,705		
<b>Lead Cards Generated</b>	1,850	6%	
<b>SCE Program Leads</b>	4,032	12%	218%
<b>Gas or Water Leads</b>	388	1%	21%
<b>Special Requests / comments</b>	400	1%	22%

There are a total of twelve possible SCE programs on the lead card that a customer might have requested information about. (That is the eleven programs that are listed on the current lead card, plus the Summer Discount Program, which used to be listed on the card.) Most (55%) customers checked more than one program, with several checking all programs. (See Table xE-4.)

<sup>17</sup> The exception to this rule is HEES as there are four check boxes associated with that program, letting the customers choose the type of survey they preferred (in-home, online, or mail-in), or just select HEES in general. For HEES one or more checks for any of the HEES options counts as one HEES lead.

Table xE-4. Number of Programs Marked per Lead Card

Lead Cards	Number of Programs Marked									
	0		1		2		3		4 or more	
	Number	% cards	Number	% cards	Number	% cards	Number	% cards	Number	% cards
1,876	168	9%	670	36%	446	24%	279	15%	311	17%

Most of the cards that did not have any programs checked did have “Gas Agency” or “Water Agency” marked, or had a comment written in. A few (2%) lead cards were completely blank—except for the customer name and contact information—according to the MEU lead card data.

## Identifying Program-specific Leads

The lead card has one check box next to the main HEES entry, and subordinate checkboxes for the various “flavors” of surveys (in-home, online, and mail in). Some customers checked only the main checkbox, while others checked two or more of the subordinate checkboxes (with or without the main checkbox being marked). For the purpose of determining which programs generated the most interest, we counted one or more entry under HEES on a single lead card as one request for information about HEES.

Table xE-5 shows the number of leads identified for each program on the lead card. The percentage is the ratio of requests for a program to the total number of program leads across all cards—that is, 4,056 check marks next to a program on a lead card.

Table xE-5. Number of Leads by Program

Program	Number of Requests	% of Total Requests	Program	Number of Requests	% of Total Requests
HEES	809	20%	EMA	301	7%
CARE/FERA	492	12%	SDP	235	6%
HEER	490	12%	CHP	208	5%
ARP	435	11%	EARTH	128	3%
Lighting	453	11%	Energy Centers	102	3%
CSI	351	9%	Business	52	1%

## Lead Follow-up Data

Table xE-6 shows the information on lead follow-up provided by MEU program staff.

- For most programs, the lead follow-up data shows a higher number of leads that the evaluation team has cited in this report (Table xE-7).

This appears to be due to the filtering of “invalid” leads that the evaluation team conducted.

(We excluded lead cards where the account was closed or no SCE customer service number or account number could be located. Therefore, we’re showing fewer leads per program.)

- In the case of HEES, the filtered lead card database shows a higher number of leads than the lead follow-up data.

We expect that this is due to summing error in the lead follow-up data.

## Appendix E-1: Details for MEU Evaluation Results

There are four different fields in which HEES requests may be entered (“generic,” in-home, online, and mail-in). It appears that the total HEES leads listed in the lead follow-up data accidentally excluded the “generic” HEES field.

(We counted a maximum of one HEES lead per lead card. If any one of the four HEES fields were checked, we counted it as one HEES lead; if more than one HEES field was checked on a card, we counted it as one HEES lead.)

**Table xE-6. Summary of Follow-up on Leads**

<b>Program</b>	<b>Leads by12/31/09</b>	<b>Processed</b>	<b>% Processed</b>	<b>Completed</b>	<b>% Completed</b>	<b>Not Approved</b>	<b>% Not Approved</b>	<b>No Response</b>	<b>% No Response</b>
HEES	765	98	13%	11	1%	87	11%	667	87%
CHP	237	Not implemented	na		na		na		na
Lighting	539	na	na		na		na		na
HEER	564	Marketing Only	na		na		na		na
ARP	493	23	5%	18	4%	5	1%	470	95%
Business	562	Marketing Only	na		na		na		na
CARE/FERA	316	82	26%	64	20%	18	6%	234	74%
EMA	82	82	100%	67	82%	17	21%	0	0%
EC	128	Marketing Only	na		na		na		na
EARTH	158	Marketing Only	na		na		na		na
CSI	403	Marketing Only	na		na		na		na
SDP	272	Discontinued	na		na		na		na
Gas	374	na	na		na		na		na
Water	273	na	na		na		na		na
<b>Totals</b>	<b>5166</b>	<b>285</b>	<b>6%</b>	<b>160</b>	<b>3%</b>	<b>125</b>	<b>2%</b>	<b>1371</b>	<b>27%</b>

**Table xE-7. Comparing Leads per Program from Lead Follow-up Data and Filtered Lead Card Database**

<b>Program</b>	<b>Leads by12/31/09</b>	<b>Leads by12/31/09</b>
HEES	765	822
CHP	237	203
Lighting	539	447
HEER	564	484
ARP	493	429
Business	562	51
CARE/FERA	316	485
EMA	82	296
EC	128	103
EARTH	158	128
CSI	403	351
SDP	272	233
Gas Company	374	339
Water Agency	273	252
Comments/Special Requests	365	
Total lead generated in 2009 (SCE, Gas, and Water)	5166	4623
Total lead cards filled out in 20098	2169	1850

# Appendix E-2: MEU Lead Card

## Welcome to the Mobile Energy Unit (MEU)

Southern California Edison has designed a full range of programs to help our customers to reduce energy consumption and reduce environmental impact, would you like to learn more about them?

Full Name: \_\_\_\_\_ Phone: \_\_\_\_\_  
\_\_\_\_\_

Address: \_\_\_\_\_ City: \_\_\_\_\_  
\_\_\_\_\_

State: \_\_\_\_\_ Zip Code: \_\_\_\_\_ E-mail: \_\_\_\_\_  
\_\_\_\_\_

Are you a customer of Southern California Edison?  Yes  No

I am interested in the following programs and services:

- |   |   |
|---|---|
| <input type="checkbox"/> Home Energy Efficiency Survey                    | <input type="checkbox"/> Training (Energy Centers)                    |
| <input type="checkbox"/> Lighting   | <input type="checkbox"/> School Programs / Outreach Efforts           |
| <input type="checkbox"/> Energy Star® qualified Home Appliances & Rebates | <input type="checkbox"/> Photovoltaic and California Solar Initiative |
| <input type="checkbox"/> Appliance Recycling & Rebate                     | <input type="checkbox"/> Summer Discount Rate Plan                    |
| <input type="checkbox"/> Comprehensive Home Performance                   | <input type="checkbox"/> Gas Company's Programs                       |
| <input type="checkbox"/> Business Programs                                | Providers Name? _____   |
| <input type="checkbox"/> Income Qualified Programs (CARE/FERA/EMA)        | <input type="checkbox"/> Water Agency's Programs                      |
|   | Providers Name? _____   |
| <input type="checkbox"/> Other _____                                      |   |



Date: _____ Event: _____
-----------------------------

**MOBILE ENERGY UNIT**  
 Save **Energy, Money**  
 and the **Environment**

Southern California Edison thanks you for attending this session and for providing us with such valuable feedback.

# **Appendix F: Updated Exit Survey Results for CTAC and AgTAC**

# Appendix F-1: Updated EC Exit Survey Items A through G

The following information is directly parallel to that which was included in the 2006–08 Energy Center Process Evaluation, except the following has been updated to include classes held in 2008. (2008 exit survey data was unavailable at the time the previous report was published.)

## Impact on Subject Matter Knowledge

The Exit Survey item that addresses Impact on Subject Matter Knowledge is:

**Survey Question A:** *Please rate your knowledge level on the subject matter (On a scale of 1 to 5, 1=not at all knowledgeable, 5=very knowledgeable)*

- *Before attending the class?*
- *After attending the class?*

*EC goal: After attending workshops and seminars, 50% of participants show an increase in knowledge by one point*

**SCE has exceeded this goal, with 83% of the class participants indicating they experienced an increase in subject matter knowledge by one point or more.**

**Table xF-1. EC Participants’ responses to Impact on Knowledge item in Exit Survey**

Participants’ Responses to Impact on Knowledge Item in Exit Survey				
unchanged	1 point	2 points	3 points	4 points
15.9%	46.3%	30.1%	6.0%	1.2%

### *How This Item Was Scored*

Scoring for Impact on Subject Matter Knowledge is based on the number of participants that show an increase in knowledge as a result of a class.

- For example, for a class in which 70% of the students said they knew more after the class than before, the class would score 70%.
- As another example, for an instructor for whom 70% of the instructor’s students said they knew more after a class taught by the instructor than before, the instructor would score 70%.

It is important to note that some participants responded with a negative answer (showed one or more points **decrease** in knowledge as a result of the class). Because the question is essentially a two-part item administered only at the end of a class, the lower score associated with “after attending the class” likely is not a reflection of “before the class, they didn’t realize how much they didn’t know, but as a result of the class they understand how much they have to learn.”

- 55 respondents (0.5%) gave a lower number for “after attending the class” than they gave for “before attending the class.”



- These 55 responses to Question A were considered erroneous responses, and not considered in the scoring for this item.

The total number of responses considered in scoring for this item is 11,855 (11,908 responses out of 12,973 participants, but 55 of the responses were considered erroneous).

### *Score Ranges by Class (Question A)*

There were a total of 175 classes.

- Two of the classes fell below the goal of 50%.  
*Community-Scale Site Planning for Sustainability* (49%)  
*Industrial Customer Forum* (33%)
- 10 classes scored 100%:  
*3R's - Lighting Workshop Retrofit, Relight, Redesign/Lighting Workshop*  
*Energy Savings 101*  
*EnergyPro 4.0 Lighting*  
*eQuest Employee Training*  
*Foodservice Facility Design: Advanced Level*  
*Hands-On Programmable Logic Controllers (PLC) ControlLogix 5000*  
*Lighting Hype and Best Practices*  
*Metal Halide, Fluorescent and LEDs-Free for All in the Hi-bay Arena*  
*Not Your Plain Vanilla Lighting Retrofit Class*  
*Title 24 Energy Efficiency Standards - Lighting*
- The range of scores by class is:
 

Scoring 75 – 100%	134 classes	(77%)
Scoring 50 – 74%	39 classes	(22%)
Scoring 1 – 49%	2 classes	(1%)
Scoring 0%	0 classes	(0%)

### *Score Ranges by Instructor (Question A)*

There were a total of 62 instructors represented in the Exit Survey results.

- One of instructors fell below the goal of 50%.
- 2 instructors scored 100%.
- The range of scores by instructor is:
 

Scoring 75 – 100%	50 instructors	(81%)
Scoring 50 – 74%	11 instructors	(18%)
Scoring 1 – 49%	1 instructors	(2%)
Scoring 0%	0 instructors	(0%)

### *Score Ranges by Location (Question A)*

There were a total of 14 different locations.

- None of the locations fell below the goal of 50%.
- No locations scored 100%:
- Scores by various location:
  - AgTAC 84%
  - CTAC 84%
  - Others 85%

## Appendix F-1: Updated EC Exit Survey Items A through G

- The range of scores by location is:
 

Scoring 75 – 100%	14 locations	(100%)
Scoring 50 – 74%	0 locations	(0%)
Scoring 1 – 49%	0 locations	(0%)
Scoring 0%	0 locations	(0%)

### Score Ranges by Technology (Question A)

- None of technology areas fell below the goal of 50%.
- The range of scores by technology area is:
 

Scoring 75 – 100%	0 tech areas	(0%)
Scoring 50 – 74%	0 tech area	(0%)
Scoring 1 – 49%	0 tech areas	(0%)
Scoring 0%	0 tech areas	(0%)

## Impact on Likelihood of EE Purchases or Practices

The Exit Survey item that addresses Impact on Likelihood of EE Purchases or Practices is:



**Survey question B:** *Did attending the course increase the likelihood that you/your company will purchase energy efficient equipment or energy efficiency practices in the future?*

*(On a scale of 1 to 5, 1=Very Unlikely, 5=Very Likely)*

*EC goal: 50% of participants will agree that the information provided will increase the likelihood of taking EE actions in the future*

**SCE has exceeded this goal, with 70% of the class participants responding 4 or 5 (5 being “very likely”).**

**Table xF-2. Participants’ responses to Likelihood of EE Purchases or Practices item in Exit Survey**

Participants’ Responses to Impact on Likelihood of EE Purchases or Practices				
Five	Four	Three	Two	One
37%	33%	21%	5%	4%
 <p>Assumed to mean moderate to high (positive) impact on likelihood</p>			 <p>Assumed to mean little or no impact on likelihood</p>	

### How This Item Was Scored

Note that the form of the question and answer options may make this item somewhat ambiguous.

- The question asks about the impact of the course, but the answer options seem to refer only to likelihood of taking action, rather than the impact that the course has had. (See above for question and answer options.)
  - An alternative approach to structuring the item would be to state the “question” as an assertion (e.g., “Attending this course has increased the likelihood...”) and to phrase the answer options as ranging from “strongly disagree” to “strongly agree.”
  - It also might be useful to split this question into two items: one specific to purchase and one specific to practices.
- For the purposes of this report we have assumed that the responses to the item as written can be interpreted as follows:

Relative to the assertion that the class has increased the likelihood of the participant or participants' company purchasing EE equipment or implementing EE practices in the future:

- A response of “4” means the participant agrees with the assertion.
- A response of “5” means the participant strongly agrees with the assertion.

Scoring for Impact on Likelihood of EE Purchases or Practices is based on the number of participants that responded with a 4 or 5 (somewhat or very likely) in response to the question asking whether the class increased the likelihood of purchasing EE equipment or implementing EE practices.

- For example, a class in which 70% of the students responded with a 4 or 5, the class would score 70%.
- As another example, an instructor for whom 70% of the instructor's students responded with a 4 or 5, the instructor would score 70%.

The total number of responses considered in scoring for this item is 10,510 (out of 12,973 actual responses).

### Score Ranges by Class (Question B)

There were a total of 176 classes.

- Ten classes (6%) fell below the goal of 50%:
  - 3R's - Lighting Workshop Retrofit, Relight, Redesign/Lighting Workshop* (34%)
  - Benefits of Precision Farming* (40%)
  - Community-Scale Site Planning for Sustainability* (48%)
  - Field Verification and Diagnostic Testing of Photovoltaic Systems* (35%)
  - Fundamentals of Pump Troubleshooting* (20%)
  - Green Window: New Title 24 Nonresidential Windows Energy Rating System* (38%)
  - Hands-On Programmable Logic Controllers (PLC) ControlLogix 5000* (36%)
  - Improving Energy Efficiency in Drip Irrigation* (43%)
  - On-Farm SCADA Electronic Monitoring and Control* (44%)
  - Selling Energy Efficiency and/or Green Building to Building Owners* (45%)
- Nine classes (5%) scored 100%:
  - 15th Annual Water Conference* (2 respondents)
  - Contractor Workshop* (32 respondents)
  - Energy Savings 101* (7 respondents)
  - eQuest Employee Training* (3 respondents)
  - Fundamentals of Energy Efficiency in FoodService* (28 respondents)
  - Industrial Customer Forum* (3 respondents)
  - Lighting Hype and Best Practices* (2 respondents)
  - Not Your Plain Vanilla Lighting Retrofit Class* (4 respondents)
  - Title 24 Duct Installation Standards and Diagnostic Testing* (1 respondent)
- The range of scores by class is:
 

Scoring 75 – 100%	60 classes	(34%)
Scoring 50 – 74%	106 classes	(60%)
Scoring 1 – 49%	10 classes	(6%)
Scoring 0%	0 classes	(0%)

## Appendix F-1: Updated EC Exit Survey Items A through G

### *Score Ranges by Instructor (Question B)*

There were a total of 63 instructors.

- Nine instructors (14%) fell below the goal of 50%.
- One instructor scored 100%:
- The range of scores by instructor is:

Scoring 75 – 100%	19 instructors	(30%)
Scoring 50 – 74%	35 instructors	(56%)
Scoring 1 – 49%	9 instructors	(14%)
Scoring 0%	0 instructors	(0%)

### *Score Ranges by Location (Question B)*

There were a total of 14 different locations.

- No locations fell below the goal of 50%:
- Scores by different locations:
  - AgTAC 64%
  - CTAC 70%
  - Others 73%
- The range of scores by location is:

Scoring 75 – 100%	7 locations	(50%)
Scoring 50 – 74%	7 locations	(50%)
Scoring 1 – 49%	0 locations	(0%)
Scoring 0%	0 locations	(0%)

### *Score Ranges by Technology (Question B)*

There were a total of 10 different technology areas. The range of scores by technology area is:

Scoring 75 – 100%	0 tech areas	(0%)
Scoring 50 – 74%	0 tech areas	(0%)
Scoring 1 – 49%	0 tech areas	(0%)
Scoring 0%	0 tech areas	(0%)

## Purchase Decision Time Frame

The Exit Survey item that addresses Purchase Decision Time Frame is:

**Survey question C:** *Will you/your company be making equipment purchase decisions for your business facility in the near future? (Check one)*

*Next 6 Months* \_\_\_\_\_, *6-12 Months* \_\_\_\_\_, *1-2 Years* \_\_\_\_\_, *Beyond 2 Years* \_\_\_\_\_, *Other (specify)* \_\_\_\_\_,  
*No* \_\_\_\_\_

*EC goal: (No specific goal for Purchase Decision Timeframe indicated in Program Theory documentation.)*

**47% of the respondents indicated that they or their company would be making equipment purchase decisions within the year.**

**69% indicated they'd be making equipment purchase decisions over some period of time.**

Table xF-3. Participants' responses to Purchase Decision Time Frame item in Exit Survey

Participants' Responses to Purchase Decision Time Frame in Exit Survey					
Next 6 Months	6-12 Months	1-2 Years	Beyond 2 Years	No	Other
30%	18%	14%	8%	27%	4%

### *How This Item Was Scored*

Scoring for Purchase Decision Time Frame is based on the number of participants that indicated they or their company would be making equipment purchase decisions within the year (responded “Next 6 months” or “6-12 months”).

- For example, for a class in which 70% of the respondents said they or their company would be making purchase decisions within the year, the class would score 70%.
- As another example, for an instructor for whom 70% of the instructor’s students said they or their company would be making purchase decisions within the year, the class would score 70%.

The total number of responses considered in scoring for this item is 9,575 (out of a possible maximum of 12,973 participants).

- With respect to the respondents that indicated that they or their company would be making equipment purchase decisions within the year, the range of scores by class is:
 

Scoring 75 – 100%	0 classes	(0%)
Scoring 50 – 74%	0 classes	(0%)
Scoring 1 – 49%	173 classes	(99%)
Scoring 0%	2 class	(1%)

### *Score Ranges by Instructor (Question C)*

There were a total of 62 instructors.

- 39 instructors (52%) fell below the goal of 50%.
- No instructors (0%) scored 100%.
- With respect to the respondents that indicated that they or their company would be making equipment purchase decisions within the year, the range of scores by instructor is:
 

Scoring 75 – 100%	1 instructor	(2%)
Scoring 50 – 74%	22 instructors	(35%)
Scoring 1 – 49%	38 instructors	(61%)
Scoring 0%	1 instructors	(2%)

### *Score Ranges by Location (Question C)*

There were a total of 12 locations.

- With respect to the respondents that indicated that they or their company would be making equipment purchase decisions within the year, the scores by different locations are:
  - AgTAC 44%
  - CTAC 47%
  - Others 57%
- With respect to the respondents that indicated that they or their company would be making equipment purchase decisions within the year, the range of scores by location is:
 

Scoring 75 – 100%	1 locations	(7%)
Scoring 50 – 74%	8 locations	(57%)
Scoring 1 – 49%	5 locations	(36%)

## Appendix F-1: Updated EC Exit Survey Items A through G

Scoring 0%                      0 locations      (0%)

### Score Ranges by Technology (Question C)

- With respect to the respondents that indicated that they or their company would be making equipment purchase decisions within the year, the range of scores by technology area is:

Scoring 75 – 100%      0 tech areas      (0%)  
 Scoring 50 – 74%      0 tech area      (0%)  
 Scoring 1 – 49%      0 tech areas      (0%)  
 Scoring 0%              0 tech areas      (0%)

### Types of Equipment Considered

**Survey question D:** Are you/your company planning to upgrade or add any of the following? (Check as many as appropriate)

Lighting \_\_\_\_\_, HVAC \_\_\_\_\_, Industrial Processing \_\_\_\_\_, Pumping \_\_\_\_\_, Other \_\_\_\_\_ (specify)  
 No \_\_\_\_\_

*EC goal: (No specific goal for Types of Equipment Considered indicated in Program Theory documentation.)*

**77% of the respondents indicated that they or their company were planning to upgrade or add one or more of the types of equipment listed on the Exit Survey.**

**Table xF-4. Participants’ responses to Types of Equipment Considered for Addition or Upgrade item in Exit Survey**

Participants’ Responses to Types of Equipment Considered for Add or Upgrade					
Lighting	HVAC	Industrial Processing	Pumping	Other	None
29%	28%	7%	13%	15%	8%

There was a very rough correlation between the technology area a class focused on and the types of equipment that participants indicated were under consideration. For example, lighting and HVAC represent the majority of planned upgrades and additions — and roughly 45% of the classes had lighting or HVAC as a key subject matter area.

The general focus of the classes relative to the types of equipment listed on the Exit Survey was:

- Lighting      0%
- HVAC          0%
- Mixed\*       0%
- Industrial    0%
- Pumping     0%
- Other         0%

\* “Mixed” refers to classes that encompass a range of technologies, including lighting and HVAC — or that address a technology area that is related to lighting or HVAC. For example, *Managing Your Residential Energy Costs* addresses lighting and HVAC issues, and *Motor Efficiency* can be considered related to HVAC since motors and drives are significant components in an HVAC system.

### *How This Item Was Scored (Question D)*

Scoring for Types of Equipment Considered is based on the number of participants that indicated they or their company was planning to upgrade or add one or more of the types of equipment listed on the Exit Survey.

- For example, for a class in which 70% of the students in the class said they or their company were planning to upgrade or add some kind of equipment, the class would score 70%.
- As another example, for an instructor for whom 70% of the instructor’s students said they or their company were planning to upgrade or add some kind of equipment, the instructor would score 70%.

The total number of responses considered in scoring for this item is 9,422 (out of a possible maximum of 12,973 participants).

### *Score Ranges by Class (Question D)*

There were a total of 175 classes.

- With respect to participants whose company was planning to upgrade or add some kind of equipment 4 class (2% of all classes) scored less than 50%:
  - *Cook, Chill & Re-therm Technologies for the Foodservice Industry / Energy Efficiency in Cook Chill & Retherm Technologies* (38%)
  - *EnergyPro 4.0 Mechanical* (43%)
  - *Fundamentals of Pump Troubleshooting* (38%)
  - *Green Window: New Title 24 Nonresidential Windows Energy Rating System* (32%)
- Four classes (2% of all classes) scored 100%:
  - *15th Annual Water Conference*
  - *Industrial Customer Forum*
  - *Lighting Hype and Best Practices*
  - *Metal Halide, Fluorescent and LEDs-Free for All in the Hi-bay Arena*
- The range of scores by class is:
 

Scoring 75 – 100%	100 classes	(57%)
Scoring 50 – 74%	71 classes	(41%)
Scoring 1 – 49%	4 classes	(2%)
Scoring 0%	0 classes	(0%)

### *Score Ranges by Instructor (Question D)*

There were a total of 62 instructors.

- With respect to participants whose company was planning to upgrade or add some kind of equipment 1 instructor (2% of all instructors) scored less than 50%.
- One instructor scored 100%.
- The range of scores by instructor is:
 

Scoring 75 – 100%	34 instructors	(55%)
Scoring 50 – 74%	27 instructors	(44%)
Scoring 1 – 49%	1 instructors	(2%)
Scoring 0%	0 instructors	(0%)

### *Score Ranges by Location (Question D)*

There were a total of 14 locations.

## Appendix F-1: Updated EC Exit Survey Items A through G

- With respect to participants whose company was planning to upgrade or add some kind of equipment none of the locations scored less than 50%.
- Scores by different locations:
  - AgTAC 74%
  - CTAC 77%
  - Others 85%
- The range of scores by location is:

Scoring 75 – 100%	13 locations	(93%)
Scoring 50 – 74%	1 locations	(7%)
Scoring 1 – 49%	0 locations	(0%)
Scoring 0%	0 locations	(0%)

### *Score Ranges by Technology (Question D)*

There were a total of 10 technology areas.

- With respect to participants whose company was planning to upgrade or add some kind of equipment one technology areas scored less than 50%:
- The range of scores by technology area is:

Scoring 75 – 100%	0 tech areas	(0%)
Scoring 50 – 74%	0 tech area	(0%)
Scoring 1 – 49%	0 tech areas	(0%)
Scoring 0%	0 tech areas	(0%)



## Edison Follow-up

It is important to note that for both Questions E and F, many of the participants who indicated that they would like SCE to follow up with additional information did **not** include contact information (item G on the Exit Survey).

### Request for Information about the Energy Audit Service

*Survey Question E: Would you like Southern California Edison to tell you more about our Energy Audit Service?*

- EC goal: 10% of participants will request referral to audit or rebate programs*  
**SCE has exceeded this goal, with 12% of the class participants providing a “full request” (a positive response and contact information) for information about the Energy Audit Service.**
- **35% of the respondents indicated that they would like SCE to follow-up with additional information about the Energy Audit Service.**
  - **Only 14% of those giving a positive response also provided contact information. (That is, 12% of the total respondents gave a “full request.”)**

**Table xF-5. Participants’ Request for Additional Energy Audit Service in Exit Survey**

Requested additional information on...	Yes “Partial”	Yes “Full”	No	NA
Energy Audit Service	19%	12%	59%	9%

#### *How This Item Was Scored (Question E)*

Scoring for Request for Information about Energy Audit Service is based on the number of participants that provided a positive answer to the question asking whether the participant would like SCE to provide more information about the Energy Audit Service.

There were two types of positive responses to Question E:

- “Partial request” for more information — If a participant:
  - Responded “Yes” (tell me more about the Energy Audit Service)
  - Did not provide contact information; that is, all “yes” answers are counted
- “Full request” for more information — If a participant:
  - Responded “Yes” (tell me more about the Energy Audit Service)
  - Provided contact information (phone number or email address or both)

Findings are included for two different categories:

- **All positive responses** — includes all respondents who answered “Yes” to Question E (both “partial requests” and “full requests” for more information about the Energy Audit Service)
- **Full requests only** — includes only those respondents who answered “Yes” to Question E and included either phone or email contact information

The total number of responses considered in scoring for this item is 11,766 (out of a possible maximum of 12,973 participants).

## Appendix F-1: Updated EC Exit Survey Items A through G

### Score Ranges by Class (Question E)

There were a total of 174 classes.

#### The “Lows”

- Considering all positive responses (“partial” and “full”), five classes (3%) fell below the goal of 10%:
  - *3R's - Lighting Workshop Retrofit, Relight, Redesign/Lighting Workshop* (6%)
  - *Foodservice Refrigeration "Advanced Level"* (8%)
  - *eQuest Employee Training* (0%)
  - *Industrial Customer Forum* (0%)
  - *South Bay Partnership* (0%)
- Considering only “full requests” (contact information included), 66 classes (38%) fell below the goal of 10%.

#### The “Highs”

- Considering all positive responses, 33 of the classes (19%) scored 50% or higher:
  - *15th Annual Water Conference* (50%)
  - *Are LEDES Ready for Prime Time?* (65%)
  - *Burger King Energy Efficiency Workshop and Meeting* (50%)
  - *CEC, (DOE) Pumping System Assessment Workshop* (53%)
  - *CEC, Fan System Assessment Training* (56%)
  - *Commercial Customer Forum* (62%)
  - *Computer Energy Efficiency* (55%)
  - *Contractor Workshop* (60%)
  - *Cool Coatings for Exterior HVAC Systems* (54%)
  - *Core Part 1* (61%)
  - *CSI Training Program* (67%)
  - *Design-Build Small Commercial Duct Design* (50%)
  - *Electrical System Analysis* (52%)
  - *Energy Policy Act of 2005* (64%)
  - *Food for Thought* (65%)
  - *Food Processing EE Workshop (EE Initiative)* (63%)
  - *FSU-CIT Variable Frequency Drives (VFD) for AG and Turf Irrigation Pumps* (50%)
  - *Fundamentals of Energy Efficiency in FoodService* (54%)
  - *Getting the Most from Your New SCADA System* (50%)
  - *Hot Rebates & Cool Savings for Foodservice* (52%)
  - *How to Conduct an Energy Efficiency Site Survey* (67%)
  - *How to Get Started with an Energy Efficiency Survey* (51%)
  - *Lighting Hype and Best Practices* (50%)
  - *Metal Halide, Fluorescent and LEDs-Free for All in the Hi-bay Arena* (67%)
  - *New Technology for Energy Efficiency in Wastewater Aeration* (63%)
  - *Not Your Plain Vanilla Lighting Retrofit Class* (50%)
  - *Principles of Electric Motors* (74%)
  - *Pump Efficiency* (57%)
  - *Pump Energy Efficiency and Water Source Protection* (67%)
  - *Save Energy, Save Money: An Introduction to Energy Efficiency & Rebates* (51%)
  - *Specifying Dishwashers & Water Heaters for Energy Efficiency* (53%)
  - *Title 24 Duct Acceptance Testing* (50%)
  - *UC/CSU Green Campus Training* (71%)

- Considering only “full requests,” 2 classes (1%) scored 50% or higher:
  - *Lighting Hype and Best Practices* (50%)
  - *UC/CSU Green Campus Training* (71%)

***The Range***

- Considering all positive responses (“partial” and “full”), the range of scores by class is:
 

Scoring 50 – 100%	35 classes	(20%)
Scoring 20 – 49%	121 classes	(70%)
Scoring 10 – 19%	13 classes	(7%)
Scoring 1 – 9%	2 classes	(1%)
Scoring 0%	3 classes	(2%)
- Considering only “full requests” (with contact information), the range of scores by class is:
 

Scoring 50 – 100%	13 class	(7%)
Scoring 20 – 49%	33 classes	(19%)
Scoring 10 – 19%	67 classes	(39%)
Scoring 1 – 9%	45 classes	(26%)
Scoring 0%	16 classes	(9%)

***Score Ranges by Instructor (Question E)***

There were a total of 62 instructors.

***The “Lows”***

- Considering all positive responses, 1 instructor (2%) fell below the goal of 10%.
- Considering only “full requests,” 36 instructors (58%) fell below the goal of 10%.

***The “Highs”***

- Considering all positive responses, 14 instructors (23%) scored 50% or higher:
- Considering only “full requests,” no instructor (0%) scored 50% or higher:

***The Range***

- Considering all positive responses, the range of scores by instructor is:
 

Scoring 50 – 100%	15 instructors	(24%)
Scoring 20 – 49%	45 instructors	(73%)
Scoring 10 – 19%	2 instructors	(3%)
Scoring 1 – 9%	0 instructor	(0%)
Scoring 0%	0 instructors	(0%)
- Considering only “full requests,” the range of scores by class is:
 

Scoring 50 – 100%	1 instructor	(2%)
Scoring 20 – 49%	10 instructors	(16%)
Scoring 10 – 19%	30 instructors	(48%)
Scoring 1 – 9%	15 instructors	(24%)
Scoring 0%	6 instructors	(10%)

***Score Ranges by Location (Question E)***

There were a total of 4 locations.

***The “Lows”***

- Considering all positive responses, no location (0%) fell below the goal of 10%.
- Considering only “full requests,” one locations (7%) fell below the goal of 10%:
  - Oxnard (7%) — (Would be 40% if all positive responses were considered.)

## Appendix F-1: Updated EC Exit Survey Items A through G

### *The “Highs”*

- Considering all positive responses, six locations (43%) scored 50% or higher:
  - Cathedral City (63%)
  - Palm Desert (63%)
  - Santa Barbara (90%)
  - Temecula (54%)
  - Ventura (73%)
  - Whittier (54%)
- Considering only “full requests,” no location (0%) scored 50% or higher:

### *Scores by Different Locations:*

- Considering all positive responses:
  - AgTAC 45%
  - CTAC 41%
  - Others 54%
- Considering only “full requests:”
  - AgTAC 11%
  - CTAC 13%
  - Others 25%

### *The Range*

- Considering all positive responses, the range of scores by location is:

Scoring 50 – 100%	6 locations	(43%)
Scoring 20 – 49%	8 locations	(57%)
Scoring 10 – 19%	0 location	(0%)
Scoring 1 – 9%	0 locations	(0%)
Scoring 0%	0 locations	(0%)
- Considering only “full requests,” the range of scores by class is:

Scoring 50 – 100%	0 locations	(0%)
Scoring 20 – 49%	11 locations	(79%)
Scoring 10 – 19%	2 locations	(14%)
Scoring 1 – 9%	1 locations	(7%)
Scoring 0%	0 location	(0%)

### *Score Ranges by Technology (Question E)*

#### *The “Lows”*

- Considering all positive responses, no technology areas (0%) fell below the goal of 10%.

#### *The “Highs”*

- Considering all positive responses, no technology area (0%) scored 50% or higher:
- Considering only “full requests,” no technology area (0%) scored 50% or higher:

**The Range**

- Considering all positive responses, the range of scores by location is:
  - Scoring 50 – 100%      0 tech areas      (0%)
  - Scoring 20 – 49%      0 tech areas      (0%)
  - Scoring 19 – 10%      0 tech areas      (0%)
  - Scoring 1 – 9%      0 tech areas      (0%)
  - Scoring 0%      0 tech areas      (0%)
- Considering only “full requests,” the range of scores by class is:
  - Scoring 50 – 100%      0 tech areas      (0%)
  - Scoring 20 – 49%      0 tech areas      (0%)
  - Scoring 19 – 10%      0 tech areas      (0%)
  - Scoring 1 – 9%      0 tech areas      (0%)
  - Scoring 0%      0 tech areas      (0%)

**Request for Information about Energy Efficiency Programs**

*Survey Question F: Would you like Southern California Edison to tell you more about our Energy Efficiency programs?*

*EC goal: 10% of participants will request referral to audit or rebate programs*

**SCE has exceeded this goal, with 15% of the class participants providing a “full request” (a positive response and contact information) for information about energy efficiency programs.**

- **49% of the respondents indicated that they would like SCE to follow-up with additional information about energy efficiency programs.**
- **Only 16% of those giving a positive response also provided contact information. (That is, 14% of the total respondents gave a “full request.”)**

**Table xF-6. Participants’ requests for more information on EE programs in Exit Survey**

Requested additional information on...	Yes	Yes	No	NA
	“Partial”	“Full”		
Energy Efficiency Programs	26%	14%	50%	9%

**How This Item Was Scored (Question F)**

Scoring for Request for Information about Energy Efficiency Programs is based on the number of participants that provided a positive answer to the question asking whether the participant would like SCE to provide more information about the energy efficiency programs.

There were two types of positive responses to Question F:

- “Partial request” for more information — If a participant:
  - Responded “Yes” (tell me more about the EE programs)
  - Did not provide contact information; that is, all “yes” answers are counted
- “Full request” for more information — If a participant:
  - Responded “Yes” (tell me more about the EE programs)
  - Provided contact information (phone number or email address or both)

Findings are included for two different categories:

## Appendix F-1: Updated EC Exit Survey Items A through G

- **All positive responses** — includes all respondents who answered “Yes” to Question F (both “partial requests” and “full requests” for more information about EE programs)
- **Full requests only** — includes only those respondents who answered “Yes” to Question F and included either phone or email contact information

The total number of responses considered in scoring for this item is 11,771 (out of a possible maximum of 12,973 participants).

### *Score Ranges by Class (Question F)*

There were a total of 174 classes.

#### ***The “Lows”***

- Considering all positive responses (“partial” and “full”), 4 classes (2%) fell below the goal of 10%:
  - *Commercial Refrigeration* (9%)
  - *eQuest Employee Training* (0%)
  - *Industrial Customer Forum* (0%)
  - *South Bay Partnership* (8%)

Considering only “full requests” (contact information included), 40 classes (23%) fell below the goal of 10%.

#### ***The “Highs”***

- Considering all positive responses, 63 of the classes (36%) scored 50% or higher.
- Considering only “full requests,” 3 class (13%) scored 50% or higher:
  - *15th Annual Water Conference* (50%)
  - *Lighting Hype and Best Practices* (50%)
  - *UC/CSU Green Campus Training* (50%)

#### ***The Range***

- Considering all positive responses (“partial” and “full”), the range of scores by class is:

Scoring 50 – 100%	63 classes	(36%)
Scoring 20 – 49%	102 classes	(59%)
Scoring 19 – 10%	5 classes	(3%)
Scoring 1 – 9%	2 classes	(1%)
Scoring 0%	2 classes	(1%)
- Considering only “full requests” (contact information included), the range of scores by class is:

Scoring 50 – 100%	3 class	(2%)
Scoring 20 – 49%	50 classes	(29%)
Scoring 10 – 19%	81 classes	(47%)
Scoring 1 – 9%	31 classes	(18%)
Scoring 0%	9 classes	(5%)

### *Score Ranges by Instructor (Question F)*

There were a total of 62 instructors.

#### ***The “Lows”***

- Considering all positive responses, no instructor (0%) fell below the goal of 10%.
- Considering only “full requests,” 8 instructors (13%) fell below the goal of 10%.

***The “Highs”***

- Considering all positive responses, 29 instructors (47%) scored 50% or higher:
- Considering only “full requests,” no instructor (0%) scored 50% or higher:

***The Range***

- Considering all positive responses, the range of scores by instructor is:
 

Scoring 50 – 100%	0 instructors	(0%)
Scoring 20 – 49%	15 instructors	(24%)
Scoring 19 – 10%	9 instructors	(63%)
Scoring 1 – 9%	4 instructors	(6%)
Scoring 0%	4 instructors	(6%)
- Considering only “full requests,” the range of scores by class is:
 

Scoring 50 – 100%	29 instructor	(47%)
Scoring 20 – 49%	31 instructors	(50%)
Scoring 10 – 19%	2 instructors	(3%)
Scoring 1 – 9%	0 instructors	(0%)
Scoring 0%	0 instructors	(0%)

***Score Ranges by Location (Question F)***

There were a total of 14 locations.

***The “Lows”***

- Considering all positive responses, no locations (0%) fell below the goal of 10%.
- Considering only “full requests,” no locations (0%) fell below the goal of 10%:

***The “Highs”***

- Considering all positive responses, eight locations (50%) scored 50% or higher:
  - Antelope Valley (54%)
  - Cathedral City (65%)
  - Irvine Company (50%)
  - Palm Desert (67%)
  - Santa Barbara (91%)
  - Temecula (55%)
  - Ventura (75%)
  - Whittier (54%)
- Considering only “full requests,” no location (0%) scored 50% or higher:

***Scores by Different Locations:***

- Considering all positive responses:
  - AgTAC 48%
  - CTAC 44%
  - Others 56%
- Considering only “full requests:”
  - AgTAC 14%
  - CTAC 16%
  - Others 27%

## Appendix F-1: Updated EC Exit Survey Items A through G

### *The Range*

- Considering all positive responses, the range of scores by location is:

Scoring 50 – 100%	8 locations	(57%)
Scoring 20 – 49%	6 locations	(43%)
Scoring 19 – 10%	0 locations	(0%)
Scoring 1 – 9%	0 locations	(0%)
Scoring 0%	0 locations	(0%)
- Considering only “full requests,” the range of scores by class is:

Scoring 50 – 100%	0 locations	(0%)
Scoring 20 – 49%	11 locations	(79%)
Scoring 10 – 19%	3 locations	(21%)
Scoring 1 – 9%	0 location	(0%)
Scoring 0%	0 location	(0%)

### *Score Ranges by Technology (Question G)*

There were a total of 10 technology areas.

#### *The “Lows”*

- Considering all positive responses, no technology areas fell below the goal of 10%.
- Considering only “full requests,” two technology areas fell below the goal of 10%:
  - EMS & Electronic Controls
  - PV & Solar

#### *The “Highs”*

- Considering all positive responses, two technology areas (20%) scored 50% or higher:
  - Electricity (General) (52%)
  - Food Service (58%)