Aloha Systems

Evaluation, Measurement, and Verification
Final Report

Community Energy Partnership
2004-2005 Energy Efficiency Program

CPUC Reference Numbers 1196-04 and 1201-04

Facilitating Partner: The Energy Coalition
Partner Utilities: Southern California Edison and Southern California Gas Company

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EXECUTIVE SUMMARY

The Community Energy Partnership met its measurable goals. This was primarily the result of providing more installed measures than stipulated in the program implementation plan. Our analyses typically reduced the savings associated with any one of the measurable items or activities. However, the quantity of measures provided was sufficient to over-compensate for this per-unit reduction. These savings estimates were greater than the goal for both electric and natural gas energy savings, and slightly less than the goal for demand reduction.

Table A summarizes the goals and savings estimates for the various components of the Community Energy Partnership program. The therm goal listed below is less than the goal 917,440 therm goal we were trying to achieve.

Table A: Summary of Gross Goals and Estimates

Measure Category	Program Goal			Savings Estimate		
	kWh per yr	Peak kW	Therm per yr	kWh per yr	Peak kW	Therm per yr
Res Ltg Tune-Up	1,800,000	144	0	1,805,065	182	0
Res Other Tune-Up	1,320,000	120	46,080	422,384	20	45,049
Bus Ltg Tune-Up	450,000	180	0	244,833	54	0
Bus Other Tune-Up	250,000	160	27,360	20,052	0	2,225
Non-Tune-Up CFLs	4,436,800	771	9,600	3,636,513	397	0
Municipal Facilities	3,750,000	1,500	150,000	3,750,000	1,500	150,000
School Facilities	1,875,000	1,875	37,500	2,187,500	1,400	43,750
PEAK Households	4,800,000	500	480,000	6,281,760	720	502,541
Totals	**18,681,800**	**5,250**	**750,540**	**18,348,107**	**4,273**	**743,565**

The program slightly exceeded its net electric and gas energy savings goals. The demand goal was almost met, and the lifecycle energy savings goals were very close to being met. The lifecycle energy goals were not exceeded because we decreased the EUL of PEAK education. Table B presents the goals contained in the program implementation plan and the net program achievements assessed through this evaluation.

Table B: Comparison of Goals and Evaluation Results			
	Net PIP Goal	Net Evaluated	% Goal
Net Coincident Peak Reduction	4,298 kW	3,569 kW	85%
Net Annual Electric Energy Savings	15,262,440 kWh	15,974,570 kWh	105%
Net Lifecycle Electric Energy Savings	76,312,200 kWh	73,591,090 kWh	96%
Net Annual Gas Energy Savings	615,120 Th	695,694 Th	113%
Net Lifecycle Gas Savings	3,075,600 Th	2,975,929 Th	97%

The program was well received by the participants with 86% reporting high or very high satisfaction. A significant portion of participants also indicate that they have told others about the program, supporting the program's hypothesis that enthusiasm for energy efficiency can be spread from one customer to another.

Curriculum improvements that match the PEAK curriculum to state standards appear to have eliminated the problem of partial implementation observed in prior years. Initial start-up delays led to suboptimal performance during the first year. However, once these problems passed, the program was able to catch up and still exceed its two-year goals.

The partners, and particularly the Energy Coalition staff, were complimented on their communication skills, enthusiasm, and dedication at a personal level. However, there was a general feeling that everyone – Coalition, utility, and city employees alike – was either overworked or given too many responsibilities in addition to their CEP duties to be able to fully accomplish the multitude of tasks that could have been done. This short-staffing obviously did not hinder the ability of the program to achieve its measurable goals – tune-ups, light distributions, community events, PEAK, etc. However, our general observation is that the goal of establishing "energy efficiency communities" was seriously hampered by the lack of staff time available.

We make twenty-five recommendations based on our observations. These recommendations are presented in greater detail in the concluding chapter of this report and are summarized as follows. Their order flows from the report structure and does not imply ranking or importance.

1. Review the "energy district" concept and determine whether it should be maintained in future programs or scrapped altogether.

2. The term "partner" and its meaning should be clarified.

3. School districts should be full partners.

4. Be cautious about aggressive expansion of the program.

5. Staffing levels should be increased. Increased staffing levels may impact the program cost effectiveness.

6. Implementers of future programs should not redefine measures midstream. This may be necessary if measures are determined no longer cost effective or vise verse.

7. The ratio of PEAK households to PEAK students should be explored.

8. There should be both district-level and campus-level PEAK coordinators.

9. PEAK forums should be established in each school district.

10. PEAK teachers should not shy away from experiences that encourage students to bring in, share, and discuss their own home's energy use, attitudes, and utility bills.

11. PEAK should continue working to develop energy clubs and similar extracurricular activities.

12. An Energy Coalition staff member should visit each PEAK campus at least once each school year.

13. Direct communication links between the utility program managers and the tune-up contractors should be established. SCG welcomes the opportunity to work closer with contractors to improve awareness of all programs available to eligible customers.

14. Utilities should use their customer databases to assist with lead generation for tune-ups. This is not likely due to the need to preserve customers confidentiality.

15. All parties should work diligently toward a seamless transition between program years, expeditious approval of contracts, and prompt disbursement of funds.

16. A person with construction and contracting experience should be directly responsible for the tune-up and direct installation aspects of the program. SCG will work with EC and TU contractors to improve the distribution of materials.

17. Roles, expectations, and required time commitments of city team leaders should be clarified in the beginning.

18. An electronic newsletter for city team leaders should be prepared by the Energy Coalition on a regular basis.

19. Tune-up technicians should carry applications for Express Efficiency and/or other relevant utility programs and be encouraged to provide these materials directly to the customers.

20. A complete roster of the CEP team members and their contact information should be provided to all team members.

21. The Partnership should consider raising the dollar limit on small business tune-ups direct installations to $1,000.

22. Partner cities should designate an upper-level team member (department head, city manager, council member, etc.) in addition to the team leader with day-to-day responsibility for Partnership activities.

23. City staff members with significant technical expertise should be used for the benefit of other cities and the Partnership in general.

24. Meetings and forums where team members can interact, share, and learn from each other should be held regularly.

25. The educational roles of the tune-up technicians should always be emphasized.

The Community Energy Partnership is a vibrant dance of three unique types of organizations. Each partner should strive to focus on the benefits brought by this diversity.

ACKNOWLEDGMENTS AND THANKS

Special thanks are due to Dr. Jane Peters and her colleagues at Research Into Action. RIA, located in Portland, Oregon, served as Aloha's subcontractor on this job providing expertise in process evaluation. Jane was a particularly gracious partner, providing invaluable assistance as we nuanced our various endeavors to evaluate the processes and human interactions of this multifaceted project. It was a delight to work with such an expert in this field.

Thanks are also due to the entire complement of people involved in the CEP team. Ted Flanigan and all of his staff at The Energy Coalition were always available for whatever we needed, whether it was discussing program strategy, listening to our feedback and advice, or chasing down some trivial detail like how many CFLs were given away at a particular event. The utility program managers, the city team leaders, various PEAK school district personnel, and installation contractors and technicians were also most helpful and understanding, working with us to share their thoughts and provide us with the information we requested. Special thanks are due particularly to Dr. Carol Yin of Southern California Edison for her assistance, guidance, and direction in managing the research plan. Dr. Beverly Huff and Dr. Dorothy Terman, the educational consultants conducting the academic evaluation of PEAK, have been gracious, cooperative, and enthusiastic partners in the joint evaluation of PEAK and are thus duly thanked.

Many Aloha Systems staff members were involved with the project. Gina Jojola served as project manager. Mario Arreola, Roberta Close, Gregory Griggs, Kenan Hneide, Scott Jakubowski, Amichai Kotev, Clarity Mills, Jennifer Nguyen, Robert Prodonovich, Jonathan Samson, and Luis Sanchez all provided assistance. Dr. Paul Shirey, professor of statistics at U.C. Irvine, assisted us with sample sizing and selection. This project is truly a combined effort of our many different talents and strengths.

Mark Shirilau

REPORT STRUCTURE

The report is broken down into major chapters that focus on different aspects of the research. Following is a brief description of these chapters:

- **Introduction** describes the program, delineates its goals, and presents the researchable issues.
- **Discussion of CPUC Objectives** discusses the various EM&V objectives of the Public Utilities Commission and how our evaluation addresses them.
- **Researchable Issue Results** presents and answers the specific questions delineated as "researchable issues" in the EM&V plan. Each researchable issue question forms the header for the sections of this chapter. This chapter contains the calculations of our savings estimates.
- **Net Savings** presents the net annual and net life-cycle energy savings estimates. All calculations within the text of the report discuss gross savings. This chapter applies net-to-gross ratios and expected useful lives to the various measures to determine net savings values. This chapter also includes the standardized CPUC reporting tables.
- **Process Interviews and Feedback** presents the results of the mid-term process interviews of the full spectrum of CEP team members.
- **Inter-Organizational Relationships** presents discussions of the various inter-organizational relationships specified for evaluation in the EM&V plan.
- **Conclusion and Recommendations** summarizes the evaluation's findings and provides 27 specific recommendations.
- **Appendices** include the participant and non-participant survey instruments with the results of the survey added in red, the PEAK student and teacher questionnaires, and the guidelines for the interviews of team members. The appendices also include copies of the event follow-up reports that were submitted to the Energy Coalition during the course of the program.

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INTRODUCTION

The Community Energy Partnership was managed by The Energy Coalition (TEC), a nonprofit corporation dedicated to the wise use of energy, in partnership with Southern California Edison and the Southern California Gas Company. The project was carried out in conjunction with the cities of Brea, Cathedral City, Corona, Hermosa Beach, Irvine, Moreno Valley, Palm Desert, San Bernardino, Santa Clarita, and Santa Monica.

The Community Energy Partnership was specifically designed to cover a wide range of geographic and demographic spectra. The program was based upon five activities within each of the cities, including:

- Developing partnerships between the cities and the utilities in selected neighborhood energy districts
- Targeting underserved communities through energy efficiency tune-ups in their homes and small businesses
- Using the PEAK Student Energy Actions program as a key educational component to help spread the energy conservation message within the neighborhood energy districts
- Helping utility programs improve their marketing and overall effectiveness
- Generating an energy consciousness that is continuously created and maintained within each city.

The Energy Coalition worked with local governments to jointly identify key energy districts that became the focal points for the provision of services provided to underserved customer segments. Rather than generically focusing on an entire city, specific strategies were directed toward the chosen "energy districts" within the cities. The districts were selected by TEC working together with city staff. The definition and concept of an "energy district" was not exactly established, and each city used its own criteria for selecting the district. Some cities established very firmly defined districts, and others targeted general areas. Some cities effectively established their entire city as the "energy district."

The work of this project can be roughly categorized into two groups – educational/informational programs and physical implementation programs. These two groups are not entirely discrete, and in many cases they were implemented concurrently. The work was designed to overcome the three main barriers to energy efficiency by teaching about efficiency, providing financial assistance with efficiency improvements, and making the improvements easy and convenient.

Program Segments

The program is segmented because of the various outreach aspects and target markets that make up the project. The program-based segments were:

- *Community Promotions*. Various programs to distribute compact fluorescent lamps (CFLs) and fluorescent torchieres at significantly reduced prices through a variety of means.
- *Mobile Homes*. A comprehensive outreach to 1,200 mobile home households to provide them with lighting retrofits, programmable thermostats, outdoor lighting, and miscellaneous efficiency measures.
- *Rental Apartments*. A comprehensive outreach to 1,200 apartment households to provide them with lighting retrofits, programmable thermostats, common area efficiency improvements, and miscellaneous efficiency measures.
- *Owner-Occupied Apartments*. A comprehensive outreach to 1,200 condominium households to provide them with lighting retrofits, programmable thermostats, and miscellaneous efficiency measures.
- *Small Businesses*. A comprehensive outreach to 300 small businesses providing and promoting energy efficient measures such as lighting, thermostats, and miscellaneous measures.
- *PEAK Students*. Implementation of The Energy Coalition's PEAK Student Energy Actions program in various school districts to reach 12,000 elementary and/or middle school students and distribute 19,500 CFLs through school fundraising activities.
- *PEAK Households*. As PEAK students become household energy managers, energy saving will be generated from 8,000 homes incorporating actions focused on lighting, refrigeration, air conditioning, and water heating measures.
- *PEAK School Districts*. In addition to teaching students how to save energy at home, the PEAK program includes a Saving Energy at School (SEAS) component that involves students in managing school energy use. Furthermore, The Energy Coalition will provide additional technical services and funding to the school districts to help them reduce energy use in school facilities. This will be implemented in the various school districts participating in the PEAK program.
- *Municipal Energy Actions*. Direct assistance will be provided to the participating cities to assist them in reducing energy use in municipal facilities such as community centers, libraries, and police and fire stations. This will involve a variety of strategies from developing master energy plans to assessment of energy-saving potential to incentives for specific energy efficiency measures.

Program Theory

The program implementer hypothesized that by working in close partnership with city governments, school districts, and electric and gas utilities the effective partnership would be strengthened by those close links. This partnership could then produce energy savings through direct installation of energy efficiency measures as well as behavioral changes by residential and small commercial energy users. Participants would be influenced through multiple channels including classroom education, community outreach activities, and direct door-to-door contacts. Once influenced, some participants would in turn influence their own friends, family, or associates.

Baseline Information

We originally intended to study potential participants prior to their contact by Partnership personnel. For example, we had hoped to survey an apartment complex that was targeted for a marketing effort before that effort began. This proved to be impossible because we were not given the necessary information in advance. There were several reasons for this inability ranging from security concerns within some of the gated communities to spontaneous marketing efforts by the Partnership. Only a small number of these surveys were actually conducted.

We did work closely with the installation contractors and were able to obtain pre-existing product information, such as wattage of incandescent bulbs removed, for all of the customers receiving energy efficiency tune-ups. We also gathered information about prior knowledge and use of energy-efficiency devices such as compact fluorescent lamps.

Additionally, we conducted surveys of non-participants. In most cases non-participants were neighbors of business or residential participants who were contacted by selecting homes or businesses not on the tune-up list and visiting them.

Energy Efficiency Measure Information

Table 1 provides energy efficiency measure information taken from the program implementation plan and spreadsheets, including the implementer's per-unit peak demand and energy savings, effective useful lifetime (EUL), and net-to-gross ratios. The table also provides the installation quantity goals for each measure.

Table 1: CEP Energy Efficiency Measures, Per-Unit Values and Goals

Unit Definition	Measure / Activity Name	Savings per Unit (kW)	Savings per Unit (kWh)	Savings per Unit (Therm)	EUL	NTG	Unit Goals
CFLs Provided to Students	PEAK Students	0.0168	107.2	n/a	5	0.80	19,500
Household efficiency actions	PEAK Households	0.0625	600	60.0	5	0.80	8,000
School District Facilities	PEAK School Districts	312.5000	312,500	6,250.0	5	0.80	6
Municipal Energy Management	Municipal Energy Actions	150.0000	375,000	15,000.0	5	0.80	10
23-watt Compact Fluorescents	Community Promotions	0.0168	107.2	0.8*	5	0.80	12,000
58-watt Fluorescent Torchieres	Community Promotions	0.0605	265	n/a	5	1.00	4,000
Lighting Measures	Mobile Home Activities	0.0400	500	n/a	5	0.80	1,200
Miscellaneous Efficiency Measures	Mobile Home Activities	0.0200	250	16.0	5	0.80	1,200
Programmable Thermostats	Mobile Home Activities	0.0400	350	included in misc.	5	0.80	400
Lighting Measures	Rental Apartment Activities	0.0400	500	n/a	5	0.80	1,200
Miscellaneous Efficiency Measures	Rental Apartment Activities	0.0200	250	16.0	5	0.80	1,200
Programmable Thermostats	Rental Apartment Activities	0.0400	350	included in misc.	5	0.80	400
Lighting Measures	Owner-Occupied Apt Activities	0.0400	500	n/a	5	0.80	1,200
Miscellaneous Efficiency Measures	Owner-Occupied Apt Activities	0.0200	250	16.0	5	0.80	1,200
Programmable Thermostats	Owner-Occupied Apt Activities	0.0400	350	included in misc.	5	0.80	400
Lighting Measures	Small Business Tune-Ups	0.6000	1,500	n/a	5	0.95	300
Miscellaneous Efficiency Measures	Small Business Tune-Ups	0.2000	500	96.0	5	0.95	300
Programmable Thermostats	Small Business Tune-Ups	1.0000	1,000	included in misc.	5	0.95	100

*We note that the implementation plan assigns 0.8 therms of gas savings to each CFL given away in a community event. We simply report that number here and do not concur with its logic. The evaluation analysis detailed in this report does not assign gas savings to CFL distributions.

Net Energy and Demand Goals

The anticipated net energy savings and peak demand reduction results for the Community Energy Partnership are shown in Table 2.

Table 2: Net Energy and Peak Demand Goals	
Net Coincident Peak Reduction	4,298 kW
Net Annual Electric Energy Savings	15,262,440 kWh
Net Lifecycle Electric Energy Savings	76,312,200 kWh
Net Annual Gas Energy Savings	615,120 Therms
Net Lifecycle Gas Savings	3,075,600 Therms

Researchable Issues

Table 3 lists the researchable issues for the Community Energy Partnership evaluation along with the means by which we assessed them.

Table 3: Researchable Issues

Issue	Measure Description	Method of Assessment
Were data accurately entered into the database?	Residential Activities, Small Business Tune-ups	Compare hardcopy installation reports with database record for a sample of sites.
How many measures were implemented?	Residential Activities, Small Business Tune-ups	Tabulate data from CEP database.
What are the total energy savings and demand reductions based on the original per-unit savings values?	Residential Activities, Small Business Tune-ups, Community Promotions, PEAK Students	Multiply measure count by appropriate per-unit values based on geography.
Are underlying assumptions of lighting hours of operation accurate?	Residential Activities	Meter a sample of sites with lighting measures installed.
Were the implementer's per-unit values appropriate?	Residential Activities, Small Business Tune-ups	Calculate energy savings based upon actual measures installed, rather than quantity of tune-ups conducted.
What was baseline awareness toward and prior implementation of energy efficiency?	Residential Activities, Community Promotions	Survey participants and non-participants
What changes in awareness and attitude were instilled by the program?	Residential Activities, Small Business Tune-ups, Community Promotions	Conduct survey of tune-up participants and non-participants.
Were participants pleased with the program?	Residential Activities, Small Business Tune-ups	Conduct survey of participants.
Did participants tell others about energy efficiency? Did this knowledge dissemination produce any known changes in equipment or behavior by associates of participants?	Residential Activities, Small Business Tune-ups	Conduct survey of participants.
How can the tune-up and community outreach processes be improved?	Residential Activities, Community Promotions, Small Business Tune-ups	Directly observe and interview team players; survey participants and non-participants.
How many school districts implemented PEAK?	PEAK Students	Review contracts; interview personnel.

Table 3: Researchable Issues		
Issue	**Measure Description**	**Method of Assessment**
How many students were taught the PEAK curriculum?	PEAK Students	Tabulate information provided by CEP and/or school districts.
Did teachers present the entire curriculum?	PEAK Students	Survey teachers.
Did students learn about energy efficiency through the PEAK program?	PEAK Students	Survey students
Did students discuss energy efficiency with their families and did the families learn?	PEAK Households	Survey students*
Did students or their families implement any behavioral or equipment changes as a result of PEAK?	PEAK Households	Survey students*
Did students or families tell others about energy efficiency as a result of participating in PEAK? Did this knowledge dissemination produce any known changes in equipment or behavior?	PEAK Students, PEAK Households	Survey students*
How much energy savings and demand reduction was achieved through PEAK?	PEAK Students, PEAK Households	Conduct engineering analysis based upon reported activities resulting from PEAK
Were student and household awareness and activity related to amount of teacher time spent on PEAK?	PEAK Students, PEAK Households	Observe differences in survey results based upon teacher.
How can the information transfer from Partnership to district to teacher to student to parent be improved?	PEAK Students, PEAK Households	Directly observe and interview team players; survey participants.
What energy savings were achieved at school facilities?	PEAK School Districts	Conduct pre- and post-PEAK studies.
What energy savings were achieved at municipal facilities?	Municipal Energy Actions	Conduct pre- and post-program studies.
Were the advantages and strengths of the three partners – The Energy Coalition, SCE, and SCG – optimally used? What improvement could be made?	Partnership	Observe and comment; interview TEC, SCE, SCG personnel; interview municipal partners, contractors, and other team players.
How can the overall process be improved?	Partnership, Res & Sm Bus Activities, Comm Promotions, PEAK Students/Households, Municipal Energy Actions	Observe and comment. Interview team players. Survey participants and non-participants.

*Originally we planned to survey a small sample of PEAK students and their parents. When the opportunity arose to survey several thousand PEAK students in conjunction with the academic review, we eliminated the parent survey, which had not been well received by the school administrators and was not proving feasible.

DISCUSSION OF CPUC OBJECTIVES

The Community Energy Partnership is not only diverse, but has an interconnected nature to its diversity. City governments, school districts, government employees, homeowners' associations, apartment owners, adult residents, and children all participate in vital, overlapping efforts to optimize the energy efficiency of the communities in which they work and live.

The evaluation, measurement, and verification tasks therefore could run the gamut from engineering measurement of equipment improvements in city buildings to estimating the conservation impact of holding an educational forum with senior citizens. As the program evolved, we worked closely with Partnership personnel to assure that our efforts and resources were used in a manner to optimize the value of the EM&V process.

The CPUC's specific objectives, from Chapter 6 of the *Energy Efficiency Policy Manual*, are covered in this plan as discussed below:

Measuring level of energy and peak demand savings achieved. In some situations we could use a relatively straightforward assessment of the energy savings and demand reduction achieved by making physical changes such as installing light bulbs or thermostats. For residential lighting, traditional measurement and verification approaches based upon the *International Performance Measurement & Verification Protocol* (IPMVP) were used to determine operating hours and demand reductions. The metering conducted to estimate savings of lighting measures was conducted in accordance with Option A of the IPMVP.

The CEP also had many situations where the primary energy savings were behavioral in nature. Furthermore, these behavioral changes were spread out over a large number of participants. The PEAK program is a prime example; its primary energy savings in both homes and schools were either directly behavioral (such as turning off lights) or were physical results inspired by behavioral or attitudinal changes (such as a student convincing his or her parents to buy an energy-efficient refrigerator). These benefits are virtually impossible to measure directly in any cost-effective manner, so we developed indirect means of assessing them.

We provided net energy savings and demand reductions by multiplying gross savings by a net-to-gross (NTG) ratio for each measure or program component. The NTG ratios used in the program implementation plan were the deemed values provided by the CPUC. Specific assessment of the NTG ratios was beyond the budgetary scope of this project.

We provided net program life savings by multiplying the net savings for each measure by that measure's expected useful life (EUL). Both the program plan and our evaluation relied on deemed EUL values. Both annual and lifetime savings impacts are provided in this report.

Measuring cost-effectiveness. The energy savings and demand reduction numbers provided in this report should be usable as revised parameters for calculations of the standard cost-effectiveness tests. By combining these values with The Energy Coalition's actual costs for implementing various aspects of the program, *ex-post* cost-effectiveness calculations could be determined not only for the project as a whole but for its individual components as well.

Providing up-front market assessments and baseline analysis. For the Community Energy Partnership, the baseline analysis was more a matter of awareness than of technology. For the most part, the technologies (such as CFLs) and the old technologies they replace (such as incandescent lamps) are straightforward. The primary baseline issue was assessing prior awareness of the various technologies and behaviors taught through the components of the program. We worked with the installation contractors to gather prior use information for all tune-up participants. We also worked with the academic evaluators of PEAK to gather such information from the entire population of PEAK students.

We also conducted surveys of non-participants who were eligible for the program but did not participate. This helped determine baseline for awareness and usage of the various efficiency technologies. It also enabled us to estimate the market transformation component of the program, and thereby assess the value of the program that exceeds the direct value of the physical equipment supplied. (For example, there is some energy savings that will be achieved in the close-knit communities even among those not initially participating. When one neighbor sees that three of his neighbors have and like their compact fluorescent lights, he may go to the home improvement store and buy some, even though the direct sale program is completed.)

Providing ongoing feedback and corrective and constructive guidance regarding the implementation of the program. Aloha Systems personnel had frequent communications with CEP personnel through ongoing meetings, emails, memoranda, etc. Our staff people also observed many of the community events and conference meetings. These events ranged from equipment distribution events, some of which had hundreds of participants, to brainstorming meetings involving, for example, facilities managers from participating school districts.

After each such event that we attended, we provided a written report to CEP personnel assessing the event and providing recommendations that could improve the process, enhance performance, or increase overall cost-effectiveness. These assessments and observations included general commentary on the actual operation and documented any anecdotal information gathered from participants. We offered suggestions where we believed either the overall energy savings or the cost-effectiveness (*i.e.*, energy savings per dollar expended) could be increased. This information proved valuable to CEP staff members as they moved onward in the project, and many times they consulted with us regarding program improvements. Copies of these event commentaries are included as Appendix 8 to this report.

Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory and approach. There are several components to the Community Energy Partnership theory, and each of them has different indicators of effectiveness. Our EM&V plan measured these indicators to assess whether the anticipated program outcomes were achieved. Furthermore, the Community Energy Partnership was designed to evolve in response to community needs and interests by allowing the cities and schools to provide input and consult with Coalition staff in order to develop a tailored program that best suits their efficiency needs. We therefore allowed the EM&V plan to evolve along with the Community Energy Partnership in order to best measure the effectiveness of the specific programs as they are actually implemented.

Assessing the overall levels of performance and success of the program. As with almost every aspect of the Community Energy Partnership, its overall performance and success were based upon a number of factors. The directly attributable kWh and therm savings and kW reductions are clearly a major component. However, the project was much broader in scope than that, and its effects, performance, and success are likely to be far more reaching than what can be easily measured with either a datalogger or a questionnaire.

Our EM&V analysis clearly presents the engineering and behavioral information gathered and analyzed. It also assesses the not-so-specific aspects of the program in order to provide an accurate and clear picture of the value of this innovative, diverse, comprehensive, and interwoven approach to energy efficiency.

The assessment also discusses the additional benefits of various components of the program. Water savings were achieved through some of the program components. Some additional benefits are not directly related to energy efficiency, but nonetheless are laudable uses of public funds that contribute to the overall benefits of society. Among these are the safety benefits such the reduced fire risk achieved by replacing hazardous high-wattage halogen torchieres or helping establish egress routes for residents. Although we do not develop actual dollar-based cost-benefit figures for such aspects of the program, we include them in the overall discussion of the project's performance and success.

Informing decisions regarding compensation and final payments. The information we present should enable The Energy Coalition, Southern California Edison, the Southern California Gas Company, and the CPUC to accurately determine whether the program has met its stated objectives.

Helping to assess whether there is a continuing need for the program. Ultimately, this is the most important question of the entire EM&V process. We discuss whether the performance and results of the Community Energy Partnership continue to warrant expansion into even more communities.

RESEARCHABLE ISSUE RESULTS

The following section discusses the results of our evaluation. These results are presented in connection to the "researchable issues" described above.

Were data accurately entered into the database?

The residential tune-ups in mobile homes, apartments, and condominiums were a major component of the program. Residential measures included lighting, thermostats, miscellaneous (measures such as aerators and air conditioning filters), and common-area equipment or facilities changes. All measures installed in the residential and small business sectors were entered into a master database maintained by The Energy Coalition and updated by the installation contractors. The database was analyzed for the total quantity of measures installed per program sector and city. The measures installed in small businesses included mostly lighting and thermostat installations, including T-8 fluorescent fixtures that were common in the small business sector.

We worked with the Energy Coalition to have some of this information collected by the installation contractors through their tune-up documentation. These documents were completed for 100% of the tune-ups conducted. The contractors were for the most part very diligent when gathering the information we requested and entering it into the database. This information collected on the tune-up survey included:

- Size of each compact fluorescent lamp installed.
- Wattage of incandescent light bulbs removed.
- Whether the resident had other CFLs.
- Number of fluorescent torchieres delivered.
- Number and type, if any, of other lighting products distributed.
- Type of heating system present.
- Type of cooling system present.
- Whether a programmable thermostat was installed
- Number and type, if any, of fans distributed.

In all cases where the measures were installed by The Energy Coalition or its contractors, the installers were required to provide certain specific information. Aloha Systems worked closely with The Energy Coalition to assure that the installer-collected information included everything necessary to evaluate energy savings of the installed equipment. This included forms to be filled out by the installer, the resident, or both

installer and resident in conjunction. The information included quantities, types, and sizes of equipment installed as well as quantities, types, and sizes of equipment removed. This information was stored in a master electronic database that was made available to Aloha staff on an ongoing basis for analysis.

We compared the hardcopy installation reports of 136 installations (68 for each of the two contractors) with the database information. The discrepancies were much lower than the tolerance levels we had determined acceptable. (Inaccuracies of 5% would have triggered a further survey to establish whether our sample was representative; 10% would have triggered mandatory correction by the implementers or, if not corrected, a scaling factor when using quantities from the database.)[1]

At our first comparison we found four (3%) written installation reports that had not been entered into the database. Later verification found that two of these reports had been entered into the database since the first check. Thus only two of the written forms were not in the final database. This potentially means that the database underestimates installation by 1% to 2%. This is considered within the tolerance limits and does not result in a scaling factor.

The database was not checked in the inverse – that is pulling a database record and searching for the hardcopy. This was considered beyond the scope of our verification and essentially a moot point. Installation quantities used for energy savings calculations are taken from the database, not the paperwork. Customer check-ups and verifications were also taken from the electronic database, so if there had been database entries that did not represent actual work, the customer surveys would have been the better means to locate such problems. (None were found to exist.)

A few database errors were found when the details of the database were compared with the details of the written installation record. However, these errors were rare, trivial, and had a tendency to cancel one another. For example, one customer had two faucet aerators on the hardcopy and three in the database while another had four in the hardcopy and three in the database. Most of the discrepancies involved table fans and showerheads, presumably because it was easy for the installer to forget to fill in this information. These discrepancies represented less than 0.1% of the datapoints entered. We discussed these discrepancies with the installation contractors and were told that the database entries were adjusted from paperwork when an apparent discrepancy was discovered. (An example would be no fan being marked on the paper for one apartment when all the other apartments in that complex had received fans.) The adjustments from the paper documents were made only after verbal verification with the installation technician and matching known product inventories. We therefore believe that the database is the more accurate document, and concluded that, yes, the data were entered accurately into the database.

[1] These thresholds were determined based upon our arbitrary assessment of what level of discrepancy should warrant the efforts of adjustment and/or correction. They were established in the EM&V plan.

How many measures were implemented?

Tune-Ups

For the residential and small business tune-ups, the official "measures" according to the program implementation plan are "lighting," "miscellaneous," and "programmable thermostats." Other than thermostats, the "measures" typically included more than one energy-saving device. The residential measure count was further broken down by type of home (mobile home, apartment, or condominium), although the per-unit savings attributed to each type of unit were the same. The three housing-stock segments are similar to each other in many ways. They all involve discrete communities with specifically designed outreach programs. The energy efficiency measures installed or recommended were for the most part the same.

We verified the physical installation of the energy efficiency measures. These surveys verified that the installations actually took place and provided some information regarding the persistence of the measures (*e.g.*, that a compact fluorescent lamp was still where the contractor installed it and that a clock thermostat was still being used and not overridden). A total of 192 on-site verifications were originally planned (64 in each housing sector). Two hundred fifteen were actually conducted in the locations as indicated in the following table. Of these 131 were in apartments, 54 were in mobile homes, and 30 were in condominiums. Table 4 lists the location of the verifications.

Table 4:
Location of Residential On-Site Verifications

City	Verifications
Brea	20
Cathedral City	20
Corona	12
Hermosa Beach	16
Irvine	62
Moreno Valley	19
Palm Desert	20
San Bernardino	13
Santa Clarita	19
Santa Monica	14
Total	**215**

Table 5 lists the specific tune-up goals tracked on the CPUC spreadsheet, the quantities reported on the Partnership's final CPUC report spreadsheet, and the quantities verified by Aloha Systems' inspections of various internal Partnership documents. The "total residential" category is not part of the CPUC spreadsheet, but is included as the sum of the mobile home, apartment, and condominium tune ups. We have always agreed with the Partnership that the specific breakdown of mobile home, apartment, and condominium tune-ups was not important since each tune-up is allocated the same per-unit savings. Therefore, the total residential number provides a better assessment as to whether the Partnership met its goals.

Table 5: Number of Tune-Ups Conducted

Measure or Activity	Two-Year Goal	Reported 12/31/05	Verified 12/31/05
Mobile home lighting	1,200	1,073	1,072
Mobile home miscellaneous	1,200	1,073	1,072
Mobile home thermostats	400	357	620 \ 10 *
Apartment lighting	1,200	2,380	2,408
Apartment miscellaneous	1,200	2,380	2,408
Apartment thermostats	400	791	1226 \ 15 *
Condominium lighting	1,200	382	382
Condominium miscellaneous	1,200	382	382
Condominium thermostats	400	127	253 \ 9 *
Total residential lighting	**3,600**	**3,835**	**3,862**
Total residential miscellaneous	**3,600**	**3,862**	**3,862**
Total residential thermostats	**1,200**	**1,275**	**2,099 \ 34 ***
Small business lighting	300	298	298
Small business miscellaneous	300	298	298
Small business thermostats	100	98	19\16 (d)

*See discussion below.

The CPUC spreadsheet lists installation of clock thermostats as a separate line item. The database of customers noted to have received a thermostat lists far fewer thermostats than reported in the Partnership's final report. In speaking with both Edison and Energy Coalition staff regarding this discrepancy, it was ascertained that the numbers reported were those customers with whom HVAC issues were discussed, thermostats adjusted, etc. This number is not verifiable because these discussions were not noted in the contractor's report sheet prepared for each customer.

In the "verified" column we have shown two numbers for each of the types of customer. The first (larger) number is the number of customers who received some sort of HVAC-related equipment, most typically a table fan. The second (smaller) number is the number of thermostats actually reported as installed. For residential customers the number of customers receiving fans – with whom the contractors presumably discussed HVAC issues since they were required to explain why the fans were given and how to use them properly – exceeded the number of "thermostats" reported on the final CPUC spreadsheet. For business customers these were far lower. Because there was a major change in personnel at the Energy Coalition, including departure of the top three managers running operations in 2005, it was not possible to ascertain how the numbers that were reported were derived; thus it is not possible to determine their accuracy. We understand the logic reported to be behind the reporting of any HVAC measure in the "thermostat" line – simply a way to track energy savings – though our discussion of these various numbers does not imply our support of that reporting decision. If the generic approach to the numbers is taken, we believe the reported numbers are clearly justifiable.

The number reported under "thermostats" lies between these two extremes. In the calculation of energy savings and demand reduction, we use the "verified" quantities for lighting and miscellaneous measures. For "thermostats" we use the number reported by the Partnership. The verified and reported quantities for lighting and miscellaneous measures tracked very closely, and we were able to pinpoint the minor discrepancies to understand what caused them. In spite of the fact that no one presently involved with the Partnership can describe where the reported numbers come from, it does lie within the range bounded by (a) people documented to have received a thermostat and (b) people documented to have received any sort of HVAC-related measure. In fact, it lies pretty much toward the middle of this range, thus enhancing its apparent reasonableness.

We recommend that the implementers of future programs should not redefine measures midstream. Likewise, they should not use terms with readily apparent specific meanings (*e.g.* "thermostats") when they intend to count less specific measures (*e.g.*, "discussion of HVAC control and conservation.")

Other Hardware Distributions

At some of the community events compact fluorescent lamps (CFLs) were given away or sold, and fluorescent torchieres were often offered for exchange to participants who brought in halogen torchieres to be discarded.

Energy efficient lighting products were also distributed to PEAK students and through community events. Table 6 gives the goals, quantities reported by the Partnership to the CPUC, and the quantities verified by Aloha's inspection of detailed Partnership documents and spreadsheets.

Table 6: Quantity of Non-Tune-Up Hardware Distributed

Measure or Activity	Two-Year Goal	Reported 12/31/05	Verified 12/31/05
CFLs provided to PEAK students	19,500	24,576	24,576
CFLs provided through community events	12,000	22,873	21,693
Torchieres provided at community events	4,000	3,220	3,187

The 24,576 PEAK-related CFLs include 19,620 bulbs provided to students to take home as well as 4,956 bulbs provided for PEAK students to distribute at fundraising events.

For community events, it is possible that the discrepancy between the 21,693 CFLS and 3,187 torchieres documented at individual events and the 22,873 total CFLs and 3,220 torchieres reported by the Partnership in its final report is merely a matter of incomplete records. In the case of CFLs, the total two-year projected total was significantly exceeded.

Practices

Three practices that are broad in scope and not tracked to specific hardware items or customer visits are included in the program implementation plan:

- *Municipal Energy Actions* – cities that develop city energy management plans and thereby instill energy efficiency awareness within the city's own employees, thus resulting in energy savings for the city in its own facilities.
- *PEAK School Districts* – school districts that participate in the PEAK program and thereby instill energy efficiency awareness within the school's own community – administrators, staff, faculty, and students – thus resulting in energy savings for the district in its own facilities
- *PEAK Households* – homes in which PEAK students learn about energy efficiency and come home to implement efficiency actions, measure installation, or other energy-saving and/or demand-reducing activities in their homes.

The "practices" for the municipal and school district facilities were simply counted by enumerating the cities and school districts that agreed to work with the Partnership on energy efficiency, either by developing municipal energy plans or by implementing the PEAK student program in some manner within the school district. By the end of the two-year Partnership program, all 10 cities had participated in some manner. Seven school districts that have territories overlapping one of the cities had agreed to implement PEAK.

We interviewed the city team leaders of all ten partner cities. During these interviews we verified the city's active participation in the program and also gathered the team leaders' overall assessment of the CEP within their respective cities. The results of these interviews were collected and provided as an evaluative tool in the middle of the program to allow the Partnership to assess its effectiveness and continue refinement. (They also form a portion of the Process Interviews Chapter of this report.)

We inspected the websites of the partner cities. All ten of the cities have some information about energy efficiency on their municipal websites:

- www.ci.brea.ca.us/article.cfm?id=909
- www.cathedralcity.gov/Planning/GeneralPlan/documents/pdf/ChIV_Bio.pdf
- www.discovercorona.com/depts/planning/EIRupdate/FTBR/CoronaTBR.pdf
- www.hermosabch.org/building/energy.html
- www.cityofirvine.org/about/irvine_saves.asp
- www.moreno-valley.ca.us/community/news/news_03/06-04_volunteers.htm
- www.cityofpalmdesert.org/CS_EnergyPrograms.asp
- www.ci.san-bernardino.ca.us/depts/publicserv/environmental_projects/default.asp
- www.santa-clarita.com/cityhall/cmo/environment/SCactiv1.pdf
- http://santa-monica.org/cityclerk/council/wrapup/1999/19991012.htm

There were originally two components to the school district program. One is direct assistance, both financial and technical, from The Energy Coalition. The second is the school-based impact of the PEAK program. The direct assistance aspect of the program was refocused toward education at the request of the school districts. School district facilities personnel worked in collaboration with Energy Coalition staff to direct program activities toward involving students in the effort to save energy at schools. Energy savings were achieved in the school districts through behavioral changes implemented as a result of awareness instilled by PEAK. Decisions to make facilities changes or retrofits by the school districts were enhanced by the greater awareness of energy efficiency instilled by PEAK at all levels of the school organizations.

We interviewed various school personnel in all seven participating districts in order to assess the overall impact of the PEAK program in addition to its directly measurable effects on campus energy use.

Four school districts had signed memoranda of understanding to implement PEAK at a district level:

- Corona-Norco Unified School District
- Desert Sands Unified School District
- Irvine Unified School District
- Santa Monica-Malibu Unified School District

The Partnership began implementing PEAK at single schools within three additional school districts:

- Hermosa Beach City School District
- Moreno Valley Unified School District
- San Bernardino City Unified School District

The Partnership thus met its goal for municipal energy actions and exceeded its goal for PEAK school districts. Because the specific tracking goals were simply signing up the cities and districts, without delineation of any specific hardware measures or detailed activities, the change in focus from direct installation assistance toward administrative and educational assistance cannot strictly be interpreted as a failure to meet the program goals.

Likewise “Peak Households” are defined as homes in which at least one student was going to participate in the PEAK program. This was tracked by the memoranda of understanding between the Energy Coalition and the school district by listing the number of students to be taught in the agreement. In previous years we noted that this number was a promise rather than a reported fact and that it also covered a wide range of actual activities ranging from full implementation of the PEAK curriculum to a much briefer discussion of energy. There had been prior problems with some teachers not having or taking the time to adequately instill the concepts. This problem has been greatly reduced by a modification of the PEAK curriculum to make it track more closely with the required science curriculum of

the state, and our discussions with teachers and administrators demonstrated a far great incidence of full implementation of the curriculum. The problem of counting "participants" who only received a small portion of the education has been eliminated.

The school districts have not provided actual counts of students who did participate in the curriculum. However, each PEAK student is given a CFL to take home at the beginning of PEAK class, and the Energy Coalition has an accurate count of CFLs distributed to the schools. This CFL count is separate from those distributed at community events and is the most accurate count of PEAK students actually taught. (We are pleased to note that the Energy Coalition has since required school districts to provide a more accurate count of PEAK students to them for the 2006 program.)

Table 7 lists the school districts and the number of students who were taught the PEAK curriculum and received a CFL. Note that the MOU numbers differ, sometimes significantly, from the students taught because the MOUs cover school years, and the CFL counts are for the 2004-05 program period (calendar years). Schools with on-going PEAK programs had higher actual counts resulting from prior MOUs, and new districts (such as Corona-Norco) have lower counts because some of the MOU students will be taught in 2006.

Table 7: PEAK Students by District

District	Schools	MOU Students	CFLs Given to Students
Corona-Norco Unified	29	15,239	10,080
Desert Sands Unified	4	1,000	3,130
Irvine Unified	22	2,000	4,000
Santa Monica-Malibu Unified	5	2,000	2,120
Hermosa Beach City	1	100	0*
Moreno Valley Unified	1	132	140
San Bernardino Unified	1	120	150
Total	**63**	**20,591**	**19,620**

* Hermosa Beach was given 300 CFLs in January 2006.

Because some households have more than one student receiving PEAK instruction, the number of PEAK households is less than the number of PEAK students. The text of the Program Implementation Plan discusses a factor of 0.75 to convert students to households:

> "For the 2004-2005 program years, the Community Energy Partnership will engage approximately 8,000 PEAK households. Note that this participation is 75% of the number of PEAK students, reflecting the fact that often a household has more than one child in the program, and that some older students have already been through the program and thus their homes' savings are not double counted. PEAK households, incidentally, cut across

income brackets and represent an area where the Community Energy Partnership addresses single family homes."[2]

One notes, however, that 8,000 is in fact 2/3, not 3/4, of the 12,000 PEAK students. The original implementation plan submitted to the CPUC planned for 12 cities, 16,000 PEAK students, and 12,000 PEAK households (or 75% of the PEAK students). The project was approved with a reduced budget and the implementation plan was revised to include fewer measures. It was at this revision that an error appears to have been made. The number of PEAK students was reduced from 16,000 to 12,000, and the number of households from 12,000 to 8,000. It seems as if it should have been 9,000 households, and this error should have been caught when the plan was reviewed prior to approval.

The proper relationship between PEAK students and PEAK households remains unclear. Nor is it a ratio that is static over the course of the program. If a school district first adopts PEAK, usually for fourth grade students, the only households with multiple PEAK students are those with two students in the fourth grade. In 2002 twins accounted for 3.11% of births.[3] There may be other reasons to have two students in the fourth grade at the same time (blended families, less-than-one-year age difference, or grade advancement or hold-back). However, it seems like the minimum ratio for school districts first adopting peak in only one grade (a typical pattern) would be on the order of 0.95, meaning that 1,000 PEAK students would represent 950 PEAK households in those districts.

As the school district continues teaching PEAK, or if it teaches PEAK in several grades, the proportion of PEAK students with an older sibling or housemate who has been taught the PEAK curriculum increases. Based on census information about the number of siblings, we estimate 55% as a theoretical lower limit to the ratio of PEAK households to PEAK students.[4]

There is no fully agreed value for the PEAK household-to-student ratio, and everyone agrees that all of the numbers used are rough estimates. Both the Energy Coalition and Edison have agreed that the 2/3 ratio is appropriate to use in this evaluation, in part because it underlies the values for PEAK students and households accepted in the implementation plan (in spite of what the text of the plan says). We note, however, that many reports prepared by the Energy Coalition use the 75% value. In this analysis we use the 66.7% value because it is the conservative approach, not because we believe it is necessarily more appropriate than the 75% value. We regret not having asked PEAK students a simple question like "Do you have a brother, sister, or other person in your house who also took PEAK this year or took it in a previous year?"

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[2] Ted Flanigan, "Community Energy Partnership Program Implementation Plan," p. 20 of January 21, 2004, edition.

[3] Joyce Martin, et al, "Births: Final Data for 2002." *National Vital Statistics Reports*, Vol 42, No. 10, Dec 17, 2003, Centers for Disease Control. (On the internet at www.cdc.gov/nchs/data/nvsr/nvsr52/nvsr52_10.pdf)

[4] This value assumes full implementation of PEAK in one grade in a school district for a number of years and/or full implementation in several grades. Our analysis is based in part on information about numbers of siblings gathered from the U.S. Census Bureau's report, "Living Arrangements of Children: 2001." Table 4. (July 2005, available on the internet at www.census.gov/prod/2005pubs/p70-104.pdf.

Based on this ratio, the 19,620 PEAK students result in 13,087 PEAK households. The Partnership reported 15,540 households, which is approximately 75% of the PEAK students counted by MOU. The goal of 8,000 households was significantly exceeded, primarily because of the very large commitment made by the Corona-Norco Unified School District.

Based on the original per-unit values, what are the total energy savings and demand reductions?[5]

Electric Energy Savings

These energy savings are calculated by multiplying the verified quantity of measures by the per-unit energy savings for a single measure. Table 8 calculates these savings estimates. We separate out the tunes-ups and hardware and tally a subtotal for these measures because their energy savings are more easily quantifiable than the broadly defined and less certain energy savings associated with municipal or school facilities and PEAK student households.

Table 8: Electric Energy Savings Based on Original Per-Unit Values

Measure or Activity	Per-Unit Annual kWh Savings	Two-Year Goal	Annual kWh Savings Goal	Verified 12/31/05	Energy Savings Estimate
Mobile home lighting	500.0	1,200	600,000	1,072	536,000
Mobile home miscellaneous	250.0	1,200	300,000	1,072	268,000
Mobile home thermostats	350.0	400	140,000	357	124,950
Apartment lighting	500.0	1,200	600,000	2,408	1,204,000
Apartment miscellaneous	250.0	1,200	300,000	2,408	602,000
Apartment thermostats	350.0	400	140,000	791	276,850
Condominium lighting	500.0	1,200	600,000	382	191,000
Condominium miscellaneous	250.0	1,200	300,000	382	95,500
Condominium thermostats	350.0	400	140,000	127	44,450
Small business lighting	1,500.0	300	450,000	298	447,000
Small business miscellaneous	500.0	300	150,000	298	149,000
Small business thermostats	1,000.0	100	100,000	98	98,000
CFLs provided to PEAK students	107.2	19,500	2,090,400	24,576	2,634,547
Community event CFLs	107.2	12,000	1,286,400	21,693	2,354,437
Community event torchieres	265.0	4,000	1,060,000	3,187	984,146
Total Tune-Ups and Hardware			**8,256,800**		**10,009,880**
Municipal Energy Actions	375,000.0	10	3,750,000	10	3,750,000
PEAK School Districts	312,500.0	6	1,875,000	7	2,187,500
PEAK Households	600.0	8,000	4,800,000	13,087	7,852,200
Grand Total			**15,306,800**		**23,799,580**

[5] We had originally termed these "*ex-ante* savings," but this use of *ex-ante* is not consistent with the CPUC's standard definition of the word.

The 10,009,880 kWh/year energy savings for the tune-ups and hardware distribution is 121% of the goal for this segment of the program (8,256,800 kWh/year) primarily because the quantity of compact fluorescent lights distributed to or by PEAK students and through community events significantly exceeded the proposed quantity. The overall quantity of tune-ups was also greater than the total proposed number, so this also contributed to the increase in energy savings.

The 23,799,580 kWh/year total energy savings based on the original per-unit estimates is 155% of the overall program goal of 15,306,800 kWh/year. This very significant increase is the result of the hardware reasons above combined with having many more students participating in the PEAK program.

Demand Reduction

These demand reductions are calculated by multiplying the verified quantity of measures by the per-unit demand reduction for a single measure. Table 9 calculates these demand reduction estimates.

Table 9: Electric Demand Reduction Based on Original Per-Unit Values

Measure or Activity	Per-Unit kW Reduction	Two-Year Goal	kW Reduction Goal	Verified 12/31/05	kW Reduction
Mobile home lighting	0.0400	1,200	48.0	1,072	42.9
Mobile home miscellaneous	0.0200	1,200	24.0	1,072	21.4
Mobile home thermostats	0.0400	400	16.0	357	14.3
Apartment lighting	0.0400	1,200	48.0	2,408	96.3
Apartment miscellaneous	0.0200	1,200	24.0	2,408	48.2
Apartment thermostats	0.0400	400	16.0	791	31.6
Condominium lighting	0.0400	1,200	48.0	382	15.3
Condominium miscellaneous	0.0200	1,200	24.0	382	7.6
Condominium thermostats	0.0400	400	16.0	127	5.1
Small business lighting	0.6000	300	180.0	298	178.8
Small business miscellaneous	0.2000	300	60.0	298	59.6
Small business thermostats	1.0000	100	100.0	98	98.0
CFLs provided to PEAK students	0.0168	19,500	327.6	24,576	412.9
Community event CFLs	0.0168	12,000	201.6	21,693	364.4
Community event torchieres	0.0605	4,000	242.0	3,187	192.8
Total Tune-Ups and Hardware			**1,375.2**		**1,589.2**
Municipal Energy Actions	150.0000	10	1,500.0	10	1,500.0
PEAK School Districts	312.5000	6	1,875.0	7	2,187.5
PEAK Households	0.0625	8,000	500.0	13,087	817.9
Grand Total			**5,250.2**		**6,094.6**

The 1,589 kW demand reduction for the tune-ups and hardware distribution is 116% of the goal for this segment of the program (1,375 kW). As with the increased energy savings, this is primarily because the quantity of compact fluorescent lights distributed to or by PEAK students and through community events significantly exceeded the proposed quantity. The overall quantity of tune-ups was also greater than the total proposed number, so this also contributed to the increase in demand reduction. The 6,095 kW overall demand reduction is 116% of the 5,250 kW goal.

Therm Savings

These energy savings are calculated by multiplying the verified quantity of measures by the per-unit gas energy savings for a single measure. Table 10 calculates these gas energy savings estimates.

Table 10: Gas Energy Savings Based on Original Per-Unit Values

Measure or Activity	Per-Unit Therm Savings	Two-Year Goal	Therm Reduction Goal	Verified 12/31/05	Therm Savings
Mobile home tune-ups	16.0	1,200	19,200	1,072	17,152
Apartment tune-ups	16.0	1,200	19,200	2,408	38,528
Condominium tune-ups	16.0	1,200	19,200	382	6,112
Small business tune-ups	96.0	300	28,800	298	28,608
Community event CFLs	0.8	12,000	9,600	21,693	17,354
Total Tune-Ups and Hardware			**96,000**		**107,754**
Municipal Energy Actions	15,000.0	10	150,000	10	150,000
PEAK School Districts	6,250.0	6	37,500	7	43,750
PEAK Households	60.0	8,000	480,000	13,087	785,220
			763,500		**1,086,724**

The 107,754 therm/year natural gas savings for the tune-ups and hardware distribution is 112% of the goal for this segment of the program (96,000 therm/year). As with the increased electric energy savings, this increase is primarily because the quantity of community event information distribution (which is tracked by the number of CFLs distributed). The overall quantity of tune-ups was also greater than the total proposed number, so this also contributed to the increase in demand reduction.

The 1,086,724 therm/year overall gas energy savings based on the original per-unit values is 142% of the 763,500 therm/year goal. As with the electric energy savings, the high ratio of achieved savings to the goal is caused mainly be increasing the number of PEAK students.

Are underlying assumptions of lighting hours of operation accurate?

Three variables contribute to the energy savings and demand reduction of a lighting energy-efficiency measure: (1) the wattage of the previous lamp, (2) the wattage of the new lamp, and (3) the hours of operation (assumed to be the same before and after the lamp change, unless controls are used). We conducted our evaluation of lighting energy savings in accordance with Option A of the IPMVP.

The wattages of the old and new lamps were not measured, but the values were recorded by the contractors during the tune-up. They document the size and quantity of CFLs installed and the size and quantity of incandescent lamps removed. This information was available for all of the tune-ups and was assessed with a sample consisting of the entire population.

We installed dataloggers on a total of 76 residential lighting fixtures that had received new lights during tune-ups. In many cases the loggers were installed on fixtures with more than one bulb, so they represented a total of 160 compact fluorescent lamps and five fluorescent torchieres. The dataloggers were installed in multiple locations in a given customer's home in order to monitor the full spectrum of usage of the lamps and fixtures distributed by the program. Twenty-four customers participated in the monitoring program. The monitors were left in place for a period of two to four weeks. We also asked the customers how long each day they believed they used each of the lights being monitored. This allowed us to directly compare customer perception with measured reality.

The loggers also provided load profile information for the lamps. This was used to assess peak-period operation and thus estimate coincident peak demand reduction of the lighting measures.

The dataloggers recorded daily average usage times ranging from zero to 9 hours and 35 minutes. The overall daily average usage was 2 hours 57 minutes when counting on a fixture basis. When counting on a lamp basis, the average is 2 hours 38 minutes (because, on average, the multi-lamp fixtures were used for slightly less time than the single-lamp fixtures). The dataloggers were installed in six different groups. Table 11 presents the average information for each of the groups.

Table 11: Lighting Logger Results

Type	City	Fixture Qty	Daily Avg Hrs	Lamp Qty	Daily Avg Hrs	Claimed Hours	On-Peak On Time
Mobile	Corona	10	1:02	13	1:04	1:42	3.7 %
Mobile	S Bern	6	5:34	8	6:34	2:50	26.6 %
Apt	Irvine	9	1:52	32	1:54	2:16	4.3 %
Apt	Irvine	13	1:44	50	1:27	1:55	10.0 %
Apt	Irvine	12	4:22	22	4:48	2:36	21.2 %
Apt	S Mon	9	4:21	13	4:20	2:50	16.7 %
Tot/Avg		**59**	**2:58**	**139**	**2:38**	**2:06**	**11.5 %**

The first three installation groups (by date of installation) had the lower averages and the last three installation sets had the higher averages. Each group had a small number of loggers that malfunctioned. (They are sometimes jarred by residents and the photocell brought out of proper placement.) The values from these malfunctioning loggers were not counted and they are not included in the table above. There is no known difference between the installation of the three earlier and three later sets, though the discrepancy is striking. The discrepancy also cannot be attributed to seasonal difference. When the first sets of loggers came in with some obvious malfunctions, they were recalibrated. It is *possible* that the earlier sets were not recording all lighting use, but careful review of the raw data does not clearly validate this hypothesis. It is also possible, though not very likely, that the later loggers were over compensated and picked up operation of other light fixtures in the room. This is not considered a likely explanation because these loggers did not record daylight, as might be expected from an over-compensated logger. Thus we consider all 59 logger records in Table 11 to have valid data.

Upon installation of the loggers, the customers were asked to estimate how many hours per day they used the particular light. Reported average use for the six groups ranged from 1 hour 42 minutes to 2 hours 50 minutes, so the variation was much less than the variation recorded by the loggers. However, we do note that the lower-use loggers also had lower reported usage times by the customers, which tends to confirm their accuracy.

There is also not much apparent distinction between mobile homes and apartments. The mobile homes represented the two metering groups with the highest and the lowest use, while the middle four groups were the apartments.

The cleanest approach appears to accept the average recorded usage time of approximately three hours per day (2 hours 58 minutes). This is significantly longer than the approximately two hours per day the customers reported on average using their lights. It is less than the approximately four hours per day assumed by the Partnership in calculating energy savings.

The program implementation plan indicated an annual savings of 500 kWh per residential tune-up. This was based on the assumption that the average tune-up would involve installation of five CFLs and that each CFL would save 100 kWh per year. This was further based on the assumption that a 23-watt CFL would replace an average 90W incandescent bulb and the DEER estimate of 107 kWh/yr for that size CFL.

A 23W CFL replacing an average 90W incandescent is a power reduction of 67 watts. The 500 kWh/yr assumption therefore implies the light operates 1,492 hours per year or 4.09 hours per day.

On-Peak Use and Demand Reduction. We separated out the recorded lighting use during the on-peak period from noon until 6:00 p.m. on weekdays. We then calculated a percentage of this 30-hour-per-week period during which the lights were on. This is the value given in the last column of the table above. The overall average was 11.5%.

Based upon the 67-watt power reduction of the CFL replacement, this represents an average on-peak demand reduction of 7.7 watts. The five CFLs assumed to be installed during a tune-up would provide an on-peak demand reduction of 38.5 watts. This is very close to the 40-watt value used in the program implementation plan.

Were the original per-unit values appropriate?

The original per-unit values for tune-ups were based upon up-front assumptions about how many products would be distributed during a tune-up. By calculating the energy savings based upon actual measures installed, rather than quantity of tune-ups conducted, we can assess the validity of the underlying assumptions.

Residential Tune-Up Lighting Measures

Out of the 3,862 residential units that received lighting measures, a total of 36,446 lighting products were distributed. This averages to 9.5 lighting products per residential unit, significantly more than the 5 products per unit assumed while calculating the per-tune-up energy savings. Table 12 delineates the breakdown of all lighting products installed:

Table 12: Residential Tune-Up Lighting Products Installed

Lighting Measures	Mobile Homes	Apartments	Condos	# of Products
11W cfl	167	6,500	22	**6,689**
15W cfl	4,300	10,894	961	**16,155**
20W cfl	7	530	44	**581**
23W cfl	1,902	3,209	755	**5,866**
30W cfl	0	19	0	**19**
Nightlight	936	2,866	88	**3,890**
Torchiere	32	28	12	**72**
Kitchen Light	424	516	38	**978**
Bathroom Light	171	613	20	**804**
Porch Light	481	611	287	**1,379**
Yard Light	12	1	0	**13**
Grand Total	**8,432**	**25,787**	**2,227**	**36,446**

The average operating time of the lights in the residences was 3.0 hours per day, or 1,095 hours per year, based upon our metering sample. Table 13 presents the annual energy savings of each measure based upon that average operating time:

Table 13: Lighting Energy Savings By Product				
Lighting Measures	**Power Reduction [watts]**	**Per Unit Savings [kWh/yr]**	**Total Installed**	**Total kWh/year**
11W CFL	29.0	31.755	6,689	**212,409**
15W CFL	45.0	49.275	16,155	**796,038**
20W CFL	55.0	60.225	581	**34,991**
23W CFL	77.0	84.315	5,866	**494,592**
30W CFL	95.0	104.025	19	**1,976**
Nightlight	0.0	0.000	3,890	**0**
Torchiere	256.0	308.790	72	**20,183**
Kitchen Light	90.0	98.550	978	**96,382**
Bathroom Light	90.0	98.550	804	**79,234**
Porch Light	45.0	49.275	1379	**67,950**
Yard Light	92.0	100.740	13	**1,310**
Grand Total			**36,446**	**1,805,065**

The power reduction levels were estimated by assuming the 11, 15, 20, and 23W CFLs replaced 40, 60, 75, and 100W incandescents, respectively, and that the 30W CFL replaced an even mix of 100W and 150W incandescents. Torchiere wattage reduction was based upon our observations of 100 turned-in torchieres, of which 93% had 300W bulbs and 7% had 500W bulbs, giving an average incandescent wattage of 314W and a demand reduction of 256W when replaced with a 58W torchiere. Kitchen and bathroom fixtures were assumed to be 30W CFL fixtures replacing 120W incandescent fixtures (two 60W bulbs), presumably a conservative estimate. Porch light fixtures were assumed to be a 15W CFL fixture replacing a 60W incandescent, and yard lights assumed to be a 150W flood replaced with a 58W CFL fixture.

The goal for lighting tune-ups was 600,000 kWh/year in each of the three housing-type segments, totaling 1,800,000 kWh/year, based upon the planned quantity of 3,600 tune-ups. The *ex-post* gross savings estimate of 1,805,065 kWh/year delineated above is remarkably close to both the goal. Three contrasting effects produced this similarity: (1) the operating time of a light was less than the original assumption, (2) more lamps were distributed in each tune-up than had been assumed, and (3) more tune-ups were conducted than originally planned. There were 3,862 tune-ups, so the average savings per lighting tune-up is 467 kWh, slightly less than the 500 kWh assumed in the implementation plan.

Demand Reduction. It is important to note that the total connected load power reduction achieved through the lighting retrofits is *not* the coincident peak load reduction. Our metering study showed that the CFLs distributed in tune-ups were used on average for 11.5% of the on-peak operating hours. Table 14 calculates the on-peak demand reduction associated with the tune-up lighting measures.

Table 14: Lighting Demand Reduction by Product

Lighting Measures	Power Reduction [watts]	On-Peak Operating Ratio	Total Installed	Total kW Reduction
11W CFL	29.0	0.115	6,689	22.31
15W CFL	45.0	0.115	16,155	83.60
20W CFL	55.0	0.115	581	3.67
23W CFL	77.0	0.115	5,866	51.94
30W CFL	95.0	0.115	19	0.21
Nightlight	0.0	0.000	3,890	0.00
Torchiere	256.0	0.115	72	2.12
Kitchen Light	90.0	0.115	978	10.12
Bathroom Light	90.0	0.115	804	8.32
Porch Light	45.0	0.000	1379	0.00
Yard Light	92.0	0.000	13	0.00
Grand Total			**36,446**	**182.30**

This 182.3 kW value is 27% higher than the program goal (144 kW). The average demand reduction for the 3,862 residential lighting tune-ups is 47.2 watts, or 18% greater than the 40W assumed in the implementation plan.

Residential Tune-Up Miscellaneous and Thermostat Measures

The Energy Coalition's implementation plan stipulated that *each* of the three sectors would save 300,000 kWh annually from 1,200 installations of miscellaneous efficiency measures. The combined energy savings goal of all three sectors equals 900,000 kWh with a total of 3,600 residential units receiving miscellaneous efficiency measures. The total demand reduction goal is 72 kW. Total gas savings goals were 46,080 therms annually.

The implementation plan also stipulated that each of the three sectors would save 140,000 kWh annually from 400 installations of "thermostats." The combined thermostat

savings goal of all three sectors was 420,000 kWh/year. The total thermostat demand reduction goal was 48 kW. Gas savings goals were not separately specified for thermostats.

For the purpose of this evaluation, we will combine the "miscellaneous" and "thermostat" categories. This is primarily because the Partnership's reporting of tune-up quantities with thermostats includes more than simply those relatively few homes that had programmable thermostats installed. By combining the two categories, our calculation of savings on a measure-by-measure basis should track properly, regardless of which measures were used to constitute a "thermostat" tune-up.

The total goals for these two categories were 1,320,000 kWh/year electric energy savings, 120 kW demand reduction, and 46,080 therms/year gas savings. The estimates derived from the 3,862 tune-ups conducted and based on original per-unit values are 1,411,750 kWh/year, 128.2 kW, and 49,434 therms/year.

Table 15 delineates the grand total of all miscellaneous measures and thermostats installed:

Table 15: Residential Tune-Up HVAC and Miscellaneous Products Installed

Miscellaneous Measures	Mobile Homes	Apartments	Condos	Total Products
Thermostat	10	15	9	**34**
AC Filters	4	2	0	**6**
Ceiling Fan	1	8	5	**14**
Table Fan	624	1,370	252	**2,246**
Standing Fan	2	1	0	**3**
Window Caulk	0	17	0	**17**
Door Caulk	0	2	1	**3**
Door Weatherstrip	7	62	0	**69**
Showerhead	803	2,080	431	**3,314**
Faucet Aerator	1,601	1,441	872	**3,914**
Pipe Insulation	0	12	0	**12**
Waterheater Wrap	124	56	8	**188**
Waterheater Strap	2	0	0	**2**
Smoke Detector Battery	36	35	43	**114**
Smoke Detector Install	362	545	358	**1,265**
Grand Total	**3,576**	**5,646**	**1,979**	**11,201**

Thermostats. Only 34 thermostats were actually reported as installed. The values used in the "thermostat" category included a variety of hardware and educational measures, including discussion of adjusting thermostats. The new DEER attributes zero savings to thermostats because it measures "above standards" rather than true replacement savings (we believe in general this "above standards" approach is a serious deficiency in the DEER database because most old measures replaced do not meet present standards).

In order to evaluate the thermostats, we relied upon the numbers estimated in our evaluation of the predecessor Six Cities Program.[6] This report discusses in detail the various estimates of thermostat savings, the discrepancies and problems in those estimates, and our rationale for the numbers we believe represent the savings achieved by installing a programmable thermostat in conjunction with a tune-up. Those values are 250 kWh/year and 30 therms/year of energy savings. No demand reduction is achieved.

Although there may be some differences between the 2002-03 and 2004-05 programs, the small number of thermostats installed does not warrant serious revisiting of this estimate.

AC Filters. Only 6 air conditioning filters were cleaned. The savings attributable to such cleaning is very difficult to estimate and is dependent on a large number of factors. Because of the small number, detailed analysis of this measure will not be provided, and an electricity savings estimate of 100 kWh/year, a demand reduction of 50 watts, and a gas savings of 10 therms/year per filter cleaning will be used.

Fans. Fans save energy when they are given to customers who have air conditioning and the customers either use the fan in place of the air conditioner or set the thermostat higher because of the cooling effect of circulating air. In previous years many fans had been given to customers who did not have air conditioning, thus not enabling these fans to save energy. In the 2004-05 program we found only a small number of fans given to customers who did not have air conditioning, as is delineated in Table 16. The "counted" column represents the number of fans we count for energy savings. It includes a portion of the "unspecified" fans based upon the ratio of fans installed in homes with and without air conditioning. This is the quantity that will be used to multiply by the per-unit energy savings.

[6] Aloha Systems, Inc. *Evaluation, Measurement, and Verification (EM&V) Report: The Energy Coalition 2003-2004 Energy Efficiency Program, CPUC Program Reference #232A-02.* Pages R-13 to R-15. (2005, Irvine, CA. Available on the CALMAC website, www.calmac.org, as report TEC0001.01.)

Table 16: AC Status of Homes with Fans Installed					
Fan Type	**Total**	**W/out AC**	**With AC**	**Unspecified**	**Counted**
Ceiling Fan	14	3	11	0	**11**
Table Fan	2,246	26	2,156	64	**2,219**
Standing Fan	3	0	3	0	**3**
Total	**2,263**	**29**	**2,170**	**64**	**2,233**

We believe that 150 kWh per year is a reasonable savings to attribute to the fans given away through tune-ups.[7] This represents approximately 30 to 40 hours per year of HVAC compressor operation eliminated in homes with central air conditioning (which were approximately 2/3 of the air conditioned homes receiving tune-ups). Obviously very aggressive use of fans in place of air conditioning would increase these savings. However, for each fan used in such an aggressive manner, there are very likely others that are seldom used to *replace* use of the air conditioner.

We do not attribute demand reduction to the fans. Because the system demand happens on very hot days, these are days when the fans are least likely to replace air conditioner usage.

Weatherization Measures. The energy savings of weatherization measures are difficult to accurately measure. Furthermore, some available studies and estimates are anti-intuitive. The DEER frequently gives negative savings for such measures as caulking and weatherstripping. Negative heating savings, both gas and electric, are also found in a SDG&E evaluation study[8] for weatherization measures. The DEER study is based upon modeling, and the SDG&E study is based upon statistical analysis of billing data and measure installation. It does not seem logical that weatherizing doors and caulking windows would increase heating energy use.

The SDG&E study does include a 151 kWh/year savings for space cooling resulting from a combination of installed weatherization measures similar to those in the CEP tune-ups. When the 37 kWh/year space heating increase is subtracted, the net annual savings attributable to the measures is 114 kWh/year. We will use this as an estimate for the installation of door weatherstripping. Zero savings are attributed to the other measures because they were typically installed in conjunction with door weatherstripping, which was also the case in the SDG&E program evaluated in the study.

Gas savings resulting from the weatherization measures in the study were slightly negative. We do not attribute a negative savings to the weatherization, as it seems a statistical oddity, so we leave gas savings at zero for these measures. The demand savings attributed in the study were 0.056 kW per household, and this value is used for door weatherstripping in this analysis.

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[7] *Ibid*. p. R-10.

[8] Patrick Kirkland. *1996 Residential Weatherization Incentives Program First Year Load Impact Evaluation*. (San Diego, CA: San Diego Gas and Electric Marketing Programs and Planning. CALMAC Study ID 989.)

Water Heating Measures. The showerheads, faucet aerators, and water heater wraps save electricity in homes with electric water heaters and save natural gas in homes with gas water heaters. Table 17 shows how many of each measure were installed in homes with electric water heaters and how many were installed in homes with gas water heaters. The small percent of homes where the water heater type was not indicated by the tune-up technician were allocated to gas or electric according to the gas/electric ratio for the known distributions.

Table 17: Water-Related Products by Water Heater Fuel Type

WH Measure	Total	Gas WH	Elec WH	Unspe-cified	Est Gas Total	Est Elec Total
Showerhead	3,314	2,343	830	141	**2,449**	**865**
Aerator	3,914	3,526	315	73	**3,593**	**321**
Pipe Insulation	12	11	1	0	**11**	**1**
WH Wrap	188	181	3	4	**185**	**3**

Electric energy savings, demand reduction, and therm savings estimates for the water heating measures can be found in the DEER.[9] The per-unit values are summarized as follows:

Low-flow showerhead	63.0 kWh/yr	13.9 W	8.06 Th/yr
Faucet aerators	47.3 kWh/yr	10.4 W	6.05 Th/yr
Pipe insulation	63.0 kWh/yr	13.9 W	8.06 Th/yr
Water heater blanket	242 kWh/yr	53 W	13 Th/yr

Safety Measures. Some of these measures have no associated energy savings and were installed as part of the customer-service and safety aspects of the tune-ups. Although they did not *directly* affect the electricity or gas savings of the program, these measures nonetheless provided a valuable community service. Furthermore, including these measured broadened the overall interest of the program, both from the standpoint of having building or mobile home park managers be interested in the service, and from the standpoint of reaching certain residents that may not be directly motivated by the energy conservation aspects of the program. These measures include water heater straps, smoke detectors, and smoke detector batteries.

[9] The values for showerheads, aerators, and pipe insulation are from the interactive version of the DEER available on the internet at http://eega.cpuc.ca.gov/deer. The interactive version does not give a value for water heater blankets, so that value is derived from Xenergy, Inc. *2001 DEER Update Study Final Report*, Ch.6, p. 117 [electric] and p. 124 [gas]. (Oakland, CA: Aug 2001.)

Summary. The table below presents a summary of the savings attributed by the various "miscellaneous" measures. The electric energy savings (kWh/yr), demand reduction (kW), and gas savings (Therm/yr) values shown on each line item are total savings for the various measure items.

Table 18: HVAC and Miscellaneous Savings by Product

Miscellaneous Measure	Quantity (Elec+Gas)	kWh/yr	kW	Therm/yr
Thermostats	34	8,500	0	1,020
AC Filters	6	600	0.3	60
Ceiling Fan	11	1,650	0	0
Table Fan	2,219	332,850	0	0
Standing Fan	3	450	0	0
Window Caulk	17	0	0	0
Door Caulk	3	0	0	0
Door Weatherstrip	69	7,866	3.9	0
Showerhead	865 + 2,449	54,495	12.0	19,739
Faucet Aerator	321+ 3,593	15,183	3.3	21,737
Pipe Insulation	1 + 11	63	0.0	88
Waterheater Wrap	3 + 185	727	0.2	2,405
Waterheater Strap	2	0	0	0
Smoke Detector Battery	114	0	0	0
Smoke Detector Install	1,265	0	0	0
Grand Total		**422,384**	**19.7**	**45,049**

The *ex-post* gas savings estimate of 45,049 therms per year is just slightly lower than the goal (46,080). However, the *ex-post* electric energy savings of 422,384 kWh per year is less than one-third of the goal (1,320,000). The peak demand reduction of 19.7 kW is only one-sixth of the goal (120 kW).

The per-unit electric savings for the "miscellaneous" tune-ups appears to have been overestimated and the inclusion of non-thermostat quantities in the "thermostat" category seems unwarranted. The gas savings is accurate because most of the tune-up measures that achieved definable savings were water heating measures and most of them were installed in homes with gas water heaters.

The program implementation plan discusses the intent to recommend, but not provide, such measures as high-efficiency refrigerators, dishwashers, and laundry appliances as well as shading concepts such as awnings, blinds, and trees. We are clearly convinced that these discussions and recommendations were made. There is little evidence, however, that many were implemented as a result of the recommendation. While we agree that these discussions do lead to energy conservation and demand reduction, it will not be in any quantity sufficient to make up two thirds of the electric energy-saving goal.

Small Business Tune-Up Lighting Measures

The Partnership's implementation plan stipulated that 300 small businesses would receive lighting measures along with tune-ups. At the conclusion of the program 298 tune-ups had been conducted. The savings goals are 450,000 kWh/year energy savings and 180 kW demand reduction. The demand reduction per unit (small business) is stipulated as 600 watts, with estimated annual energy savings of 1,500 kWh. Based upon the reasonable assumption that 100% of the small business lighting operates during the on-peak hours, the energy savings and demand reduction values carry an implicit assumption of 2,500 hours per year for the average operating time.

The total gross annual electricity savings of 298 small businesses receiving lighting is 477,000 kWh with a demand reduction of 178.8 kW based upon original per-unit values.

In the 298 small businesses that received tune-ups, a total of 940 measures were installed or distributed.

We estimate the average operating time of the lights in the small business to be 12 hours per day, or 4,380 hours per year. This estimate was derived for the Six Cities evaluation[10] and remains consistent with observations for the CEP as well. When asked how long the lights in their businesses operate each day, 20 of 35 respondents who answered the question said "9-12 hours," with higher (13-16) and lower (5-8) values receiving 7 responses each. Customers tend to under-estimate lighting operation, so we believe 12 hours – the upper end of the modal response – remains a good estimate.

The power reduction levels were estimated by assuming the 11, 15, 20, and 23W CFLs replaced 40, 60, 75, and 100W incandescents, respectively, and that the 30W CFL replaced an even mix of 100W and 150W incandescents. The T8 fluorescent fixtures were assumed to replace T12 fixtures with an even mix of energy-saving and "standard" bulbs and ballasts; this assumption is considered appropriate based on our observation of the types of business facilities receiving tune-ups and the general energy awareness of those caring for them.

The following table delineates the breakdown of all lighting fixtures or equipment installed and the associated demand reduction and energy savings.

[10] Aloha Systems, Inc. *Evaluation, Measurement, and Verification (EM&V) Report: The Energy Coalition 2003-2004 Energy Efficiency Program, CPUC Program Reference #232A-02.* Page B-15. (2005, Irvine, CA. Available on the CALMAC website, www.calmac.org, as report TEC0001.01.)

Table 19: Small Business Lighting Savings by Product					
Measure	**Power Reduction**	**Per Unit Savings**	**Total Installed**	**Total kW Reduction**	**Total kWh Svgs**
11W cfl	29.0	127.02	109	3.2	13,845
15W cfl	45.0	197.10	111	5.0	21,878
20W cfl	55.0	240.90	50	2.8	12,045
23W cfl	77.0	337.26	113	8.7	38,110
15W R30/FL cfl	50.0	219.00	215	10.8	47,085
20W R40/FL cfl	82.0	359.16	166	13.6	59,621
4 ft 1-lamp T8	25.5	111.69	1	0.0	112
4 ft 2-lamp T8	35.5	155.49	23	0.8	3,576
4 ft 4-lamp T8	56.0	245.28	48	2.7	11,773
8 ft 1-lamp T8	53.0	232.14	1	0.1	232
8 ft 2-lamp T8	77.0	337.26	39	3.0	13,153
Fluorescent Torchiere	256.0	1,121.28	2	0.5	2,243
Nightlight	0.0	0.00	5	0.0	0
Fluorescent Bath Light	90.0	394.20	34	3.1	13,403
Fluorescent Porch Light	77.0	337.26	8	0	2,698
Fluorescent Yard Light	77.0	337.26	14	0	4,722
Fluorescent Carport Light	77.0	337.26	1	0	337
Totals			**940**	**54.1**	**244,833**

This 244,833 kWh/year energy savings estimate is a little more than half of the goal (450,000). This savings represents an average of 822 kWh per small business tune-up, which is 55% of the 1500 kWh assumed in the implementation plan. The apparent reason for this is that the actual tune-ups installed fewer fixtures than had been anticipated in the program's planning.

For the most part, the lights installed in small businesses, other than the external lights (porch, post, and carport), operate during the day and contributed to coincident peak reduction. The 54.1 kW demand reduction is only 30% of the goal (180 kW). The demand reduction is reduced from the goal even more significantly than is the energy savings value because we assumed a longer annual operating time than what was assumed in the program plan, which increased energy savings but not demand reduction.

No gas savings were estimated for or achieved by the lighting measures.

Small Business Tune-Up Miscellaneous and Thermostat Measures

The Energy Coalition's implementation plan stipulated that 300 small businesses would receive "miscellaneous" efficiency measures and 100 would receive "thermostats." The issue of what was counted as a "thermostat" is discussed under the residential sections and is the same for small business. The demand reduction per unit (small business) is stipulated as 200 watts for the "miscellaneous" component and 1,000 watts for a "thermostat." Annual energy savings per unit are 500 kWh and 1,000 kWh for miscellaneous and "thermostat," respectively. Each tune-up is also supposed to save 91.2 therms/year of natural gas.

The combined goals for the miscellaneous and thermostat tune-ups are 250,000 kWh/year, 160 kW, and 27,360 therms/year. The combined estimates for the 298 miscellaneous and 98 thermostat tune-ups are 247,000 kWh/year, 157.6 kW, and 27,178 therms/year based upon the original per-unit values.

Table 20 lists the quantities of specific items installed during the small business tune-ups. The per-unit values are based on the residential values discussed above. For AC-related measures (filters, fans, weatherstripping), we used twice the per-unit residential value, primarily because the businesses are larger than the homes and are more likely to have AC running on any given day. For water-heater-related measures (showerheads, aerators, and wraps), we used the same values as for residences. Small businesses typically use the same water heaters as residences, so the wraps would be equivalent. Aerators may be used slightly more, but showers in small businesses are probably used less. For thermostats, we accept the 1,000 kWh/yr, which is four times the residential value, primarily because programmable thermostats are very appropriate for the regular schedules of most businesses. We likewise estimate the therm savings at 120 therms/year, or four times the residential estimate (30). We do not believe that thermostats save any demand because they do not shut off the AC during on-peak times in businesses. All of the air conditioners are electric and all water heaters are assumed to be gas.

Table 20: Small Business HVAC and Miscellaneous Savings by Product

Measure	Qty	Per Unit kWh/yr	Per Unit kW	Per Unit Therm/yr	**Total kWh/yr**	**Total kW**	**Total Therm/yr**
Prog Thermostats	16	1,000	0	120	**16,000**	**0**	**1,920**
AC Filters	1	200	0	10	**200**	**0**	**10**
Ceiling Fan	5	300	0	0	**1,500**	**0**	**0**
Standing Fan	1	300	0	0	**300**	**0**	**0**
Door Strip	9	228	0	0	**2,052**	**0**	**0**
Showerhead	4	0	0	8.06			**32**
Aerator	30	0	0	6.05			**182**
Water Heater Wrap	7	0	0	13.00			**91**
Water Heater Strap	1	0	0	0	**0**	**0**	**0**
Smoke Detector Install	45	0	0	0	**0**	**0**	**0**
Totals	**119**				**20,052**	**0**	**2,235**

These energy savings figures are less than 10% of the goal for both gas and electric energy, and the demand savings are zero. One cause of this is that the small business tune-ups did not actually install much non-lighting hardware. Another cause of this significant discrepancy is the fact that we do not allocate energy savings to informational or behavioral measures. The tune-ups discussed energy efficiency and such measures and setting thermostats higher. Actual savings from such changes are difficult to estimate, even if it were certain that they had been implemented. Given that implementation of a change such as setting a thermostat 2 degrees higher is highly uncertain and most probably non-persistent, long-term savings estimates from such actions become virtually impossible to estimate accurately. In and of itself that is not justification for using zero (the equivalent affect of not counting the measures), but we believe the actual long-term savings to be sufficiently low as to not warrant counting them.

We also remain confident that the demand reduction potential of all of the non-lighting measures in small businesses is either zero or very close to it. The only exception would be actual implementation of a recommendation to replace old HVAC or refrigeration equipment with a more efficient unit. We do not know whether (and tend to doubt that) this was ever done. Even if it were, however, those savings would most likely be attributed to a program such as Express Efficiency that would have been used to help fund the efficiency upgrade.

Non-Tune-Up Measures

The measures not included in tune-ups include two basic types: (1) lighting hardware distributed through other channels and (2) energy actions taken by city governments, school districts, and PEAK students. The following three tables present the goals and values for electric energy savings (kWh/yr), electric demand reduction (kW), and gas energy savings (therms/yr) based upon the original per-unit values.

Table 21: Electric Energy Savings of Non-Tune-Up Measures Based on Original Per-Unit Values

ELECTRIC ENERGY Measure or Activity	Per-Unit Annual kWh Savings	Two-Year Goal	Annual kWh Savings Goal	Verified 12/31/05	Savings Estimate
CFLs provided to PEAK students	107.2	19,500	2,090,400	24,576	2,634,547
Community event CFLs	107.2	12,000	1,286,400	21,693	2,354,437
Community event torchieres	265.0	4,000	1,060,000	3,187	844,555
Total Non-Tune-Up Hardware			**4,436,800**		**5,833,539**
Municipal Energy Actions	375,000.0	10	3,750,000	10	3,750,000
PEAK School Districts	312,500.0	6	1,875,000	7	2,187,500
PEAK Households	600.0	8,000	4,800,000	13,087	7,852,200
Total Practices			**10,425,000**		**13,789,700**

Table 22: Electric Demand Reduction of Non-Tune-Up Measures Based on Original Per-Unit Values					
ELECTRIC DEMAND Measure or Activity	**Per-Unit kW Reduction**	**Two-Year Goal**	**kW Reduction Goal**	**Verified 12/31/05**	**kW Reduction**
CFLs provided to PEAK students	0.0168	19,500	327.6	24,576	412.9
Community event CFLs	0.0168	12,000	201.6	21,693	364.4
Community event torchieres	0.0605	4,000	242.0	3,187	192.8
Total Non-Tune-Up Hardware			**771.2**		**970.1**
Municipal Energy Actions	150.0000	10	1,500.0	10	1,500.0
PEAK School Districts	312.5000	6	1,875.0	7	2,187.5
PEAK Households	0.0625	8,000	500.0	13,087	817.9
Total Practice			**3,875.0**		**4,505.4**

Table 23: Gas Energy Savings of Non-Tune-Up Measures Based on Original Per-Unit Values					
GAS ENERGY Measure or Activity	**Per-Unit Therm Savings**	**Two-Year Goal**	**Therm Reduction Goal**	**Verified 12/31/05**	**Therm Reduction**
Community event CFLs	0.80	12,000	9,600	21,693	17,354
Total Non-Tune-Up Hardware			**9,600**		**17,354**
Municipal Energy Actions	15,000.0	10	150,000	10	150,000
PEAK School Districts	6,250.0	6	37,500	7	43,750
PEAK Households	60.0	8,000	480,000	13,087	785,220
Total Practice			**667,500**		**978,970**

As noted above, we do not concur with the assignment of therm savings to CFL distributions. However, this section addresses savings estimates based upon the original per-unit values assigned in the PIP, and that includes 0.8 therms per CFL. This is corrected and assigned to zero in our *ex-post* analysis.

Hardware (Lighting) Measures. The program implementation plan calculated the energy savings by assuming that 23-watt CFLs replaced an average 90W incandescent light, resulting in a power reduction of 67 watts. They assumed 4.4 hours per day of operation, resulting in an annual savings of 107.2 kWh/year. A 16.8 watt on-peak demand reduction was estimated assuming the lamps ran during 25% of the on-peak time period.

We believe all of these assumptions are high and adjust the *ex-post* savings values accordingly. It is true that the 23W CFLs distributed give the same light as a 90W incandescent. And the assumption of replacing 90 watts with 23 (through a mix of 75W and 100W incandescent bulbs) makes sense for the tune-ups, where contractors select the appropriate size of CFL for approximate lumen-for-lumen replacement. However, in the distribution events, where customers have only one size CFL available, we believe they will be used to replace a variety of incandescent bulbs, including situations in which they will increase the lighting levels. We assume that the CFLs will be used to replace 60W, 75W, and 100W incandescent bulbs on an equal basis, leading to an average pre-CFL incandescent power of 78.3 watts.

The Energy Coalition reported that customers preferred 20W CFLs, and the model of CFL distributed was changed during the course of the program. The PEAK student CFLs included 19,782 20W and 4,794 23W bulbs, for an average power of 20.6 watts. The community event distributions included 12,370 20W, 8,247 23W, and 1,076 25W bulbs, for an average power of 21.4 watts. Therefore, the average power reduction of a PEAK CFL is 57.7 watts, and the average power reduction of a community event CFL is 56.9 watts.

We also use the 3 hr/day usage figure obtained from the metering sample and the 11.5% on-peak period usage percentage. For PEAK CFLs, this results in an energy savings of 63.3 kWh/yr per bulb and a demand reduction of 6.6 watts per bulb. For community event CFLs the energy savings are 62.3 kWh/yr per bulb and the demand reduction is 6.5 watts per bulb.

For torchieres we use the same per-unit values we used for torchieres given away during a tune-up – 308.8 kWh/yr energy savings and 29.4 watts peak demand reduction.

The program plan attributes gas savings to the distribution of compact fluorescent lamps at community events. The reasoning appears to be that people receiving CFLs also receive information on other energy saving opportunities. This argument is difficult to accept and begs even more questions (such as "Why not increase kWh savings because customers learn about air conditioning conservation?"). We set the gas savings for all CFL distributions to zero.

Practices. It is far more difficult to quantify and/or measure the energy savings of the remaining three practices – municipal facilities, school facilities, and PEAK households.

For PEAK school district facilities, the implementation plan estimated energy based upon an assumed 5% decrease in energy consumption as a result of PEAK. The school districts were categorized as "large" or "small" with total annual electric energy consumptions of 20,000,000 kWh and 5,000,000 kWh, respectively. They assume three large and three small districts, resulting in an average annual consumption of 12,500,000 kWh per district. Energy savings at 5% of this value equals 625,000 kWh/year. The narrative of the program implementation plan discusses this methodology but then goes on to calculate the savings erroneously, arriving at 312,500 kWh/year, which is actually a savings assumption of 2.5%.

The district-wide annual consumption estimates are reasonable. From July 2004 to June 2005, the Irvine Unified School District used 23,047,714 kWh. Table 24 lists the participating school districts and the number of schools in each district:

Table 24: PEAK School District Sizes

Number of Schools	District
41	Corona-Norco USD
34	Irvine USD
27	Desert Sands USD
16	Santa Monica-Malibu USD
62*	San Bernardino City USD
37*	Moreno Valley USD
2*	Hermosa Beach City SD

*Entire district did not participate.

The first four instituted district-wide PEAK participation (though part of Desert Sands extends outside of the SCE service territory). The final three instituted PEAK on a trial basis in only one school. Although we only have exact consumption numbers for the Irvine USD, the total consumption of Corona-Norco USD and Desert Sands USD are surely greater. Corona-Norco is warmer and larger than Irvine. Although Desert Sands is slightly smaller than Irvine, it is in Palm Desert and presumably has very high energy consumption associated with its very hot climate.

We believe the 5% energy savings is fully achievable when PEAK is fully implemented. That will be a gradual process over the course of time. Irvine USD, for example, implemented a multimillion-dollar energy efficiency upgrade that replaced many lights and some HVAC units and installed new control systems on several campuses. This project participated in SPC and Express Efficiency and its energy savings are attributed to those programs, and it was proposed to the district board by the sales staff of a large contractor specializing in energy services. However, when we asked district staff about any relationship between the project and PEAK, the general response was that it was easier to convince the board to go ahead with the project because of the energy efficiency awareness that PEAK had instilled within the district. The SPC savings alone from this project are estimated at 1,188,672 kWh/year, which is nearly 5% of the district total, even though it does not include all schools and SPC savings are calculated “above baseline” as opposed to true energy savings.

However, we note that it is probably premature to assign PEAK energy savings to school sites in which PEAK is not being taught. Since it is presently an elementary school

program, the energy use of the elementary schools – not the entire district – is a more appropriate quantity to multiply by 5%. In Irvine USD, for example, the elementary school campuses consumed 8,298,911 kWh in the 2004-05 school year, just a little more than one-third of the district total.

When all these competing factors are viewed together, we believe the 312,500 kWh/year per school district is indeed a reasonable estimate. We note that this is 2.5% of the originally estimated average district energy consumption. We believe that 5% of the overall total is both a good goal and reasonably achievable, but caution that this goal will only be reached as PEAK's influence reaches out directly in some form to all of the district's campuses, not just its elementary schools.

The 312.5 kW demand reduction per district is based upon an assumption of achieving 10% demand reduction in three large (5 MW) and three small (1.25 MW) school districts. The district-wide peak demand estimate is probably low. The sum of the peak demands for the 22 largest schools in the Irvine USD (those with interval meters and demands greater than 200 kW) is 8.3 MW. Total demand for the district is probably about 10.4 MW. Desert Sands and Corona-Norco would be even larger. However, we do not believe it is realistic to achieve a 10% demand reduction as a result of PEAK, at least not on a district-wide basis in the beginning of the program.

We do believe that PEAK is well qualified to instill energy savings and emergency demand reduction in both school facilities and students' homes. Establishing a culture of energy awareness enables conservation through behavioral changes such as teachers or students shutting off unnecessary lights. PEAK's focus on teaching the nature of electric demand should make it an ideal counterpart to a school's participation in a demand response program where certain days call for extraordinary measures. However, for standard day-to-day load management, we find this awareness lacking in ability to produce substantial change. It only takes 15 minutes in a month to establish a facility's peak demand, and the awareness-based activities such as turning off lights or turning up thermostats are not sufficiently consistent or coordinated to produce a reduction in peak demand.

Even though the 312.5 kW value is based on an underestimate of school district demand, we still believe it is too high. For the *ex-post* calculation we reduce the per-district demand reduction to 200 kW.

Based on our decision to accept the estimate of electric energy savings, we also accept the Partnership's estimate of gas energy savings, 5,000 therms/year per district.

For municipal facilities the 375,000 kWh/yr per city was derived from an estimate of 5% energy savings and a city-wide average annual energy consumption of 7,500,000 kWh. As the Partnership's implementation plan points out, the energy use of a city depends on a large number of factors including the size of the city, the number of city facilities, and the climate zone. The number of facilities is not necessarily correlated directly to population. For example, one city may have its own police department, and another may contract with the county sheriff, thus making the local police office actually a county, not city, building.

We believe that a city-wide 5% energy savings is reasonable. Unlike the schools – which were only ancillary partners as opposed to full partners like the city governments – the entire city is participating in the Partnership. The elected officials approved participation in a formal manner, and one or more city employees were given specific duties related to the Partnership and energy management. The Partnership also conducted awareness events for city employees, and these were generally well attended. Furthermore, energy use at municipal facilities is typically in more direct control of employees than the energy use in schools is in the control of the faculty or students.

We therefore accept the 375,000 kWh/yr for a city's energy savings estimate. We also accept the 150 kW demand reduction estimate, which we believe is more reasonable than the higher value used for school districts. We accept the 12,000 therm/year gas savings estimate as well, though we question why the city value is 2.4 times greater than the school district value. It seems just as likely that the school district value is too low as the municipal value being too high.

For PEAK student households, the program theory is that students learn about energy efficiency at school and bring that knowledge home to their families. Energy savings is achieved by the changes made by the students and other members of their families. These changes may be through installation of energy efficiency measures and/or behavior changes. The PEAK program has been in effect for several years, and there seems no doubt as to its *ability* to inspire young students and, through that inspiration, to achieve results. The more substantial questions relate to what portion of students actually become engaged in the PEAK process and to what extent they are able to bring such engagement to their families and achieve actual energy savings.

The Energy Coalition and Aloha Systems have previously conducted research on the effectiveness of the PEAK program during the Six Cities Energy Project. Interviews with district as well as school personnel were conducted and parent and student surveys were distributed and analyzed. In the past we found it extremely difficult to get meaningful information from these surveys. The school districts did not force participation. Nor would they release names of students to enable us to contact them directly. Some teachers distributed our surveys and returned them, but these were also the teachers most enthused about the program, so the results were not representative of those students with less enthusiastic teachers.

A major breakthrough occurred, both for the implementation and evaluation of PEAK, when the PEAK curriculum was adjusted so as to more closely match the state-mandated science curriculum. This has greatly reduced the problem observed in Six Cities where PEAK was only partially implemented in many classrooms. Furthermore, it has facilitated a 100% student survey in conjunction with curriculum assessment. The Energy Coalition has hired educational consultants to conduct this survey of both students and teachers as well as to interview PEAK team leaders. We have worked closely with these consultants and have been allowed to add questions to the survey that focus on energy conservation awareness, behavior, and attitude. (The educational assessment components of the survey have "correct" answers and assesses whether PEAK taught scientific

concepts; our segment does not have "correct" answers and assesses behavior change and attitudes.)

This assessment is on-going at the time of preparation of this report. The student surveys were conducted in the spring of 2006 and the analysis of the results done during the summer. We will present the results of those surveys as an addendum to this report.

The Partnership assumes that a PEAK household will reduce its energy consumption by 10%. This amounts to 600 kWh and 48 therms per year based on an assumed consumption of 500 kWh and 40 therms per month. (The implementation plan sites a government estimate of California residential energy consumption at 6,087 kWh/year and 470 therms/year.)

We believe this estimate is reasonable for a student that buys into the PEAK concept and brings it home. Clearly diligent behavioral changes and a few minor equipment changes could reduce energy use in people's homes by 10%. The success of the California 20/20 Program demonstrates the ability of people to reduce their consumption by 20%.

Obviously all PEAK students do not fully participate in the program. As with any other school curriculum, some students will excel and others will do poorly. Some will bring the message home, and others will forget it the moment they walk out the classroom door. Some will instill conservation even exceeding 20%. Individual savings of 50% or more in some households are clearly possible, particularly if one or more family members had been uninformed about energy use and wasteful in behavior. In other homes, even diligent attention will not be able to reduce savings by 10%. Perhaps ironically, those homes that already pay high attention to efficiency will be less likely to improve even more.

We do not intend to ascertain the accuracy of the 10% savings estimate *for a household in which the student brought the information home*. Such a study is beyond the scope of this evaluation. However, we are in the process of estimating what portion of the students actually heard the message and brought it home. That will be addressed in a supplement to follow at a later date upon completion of the academic analysis of the PEAK program. For the mean time, we will estimate a factor of 0.8, meaning that 80% of PEAK students come home and teach their families what they learned. (Students are directly taught the importance of involving their families as part of the PEAK curriculum, and this is emphasized several times throughout the course.) Thus we estimate 480 kWh/year for electric energy savings, 0.055 kW demand response, and 38.4 therms/year for gas energy savings as the per-unit *ex-post* values, which are subject to modification when the results of the PEAK survey are analyzed.

As previously discussed, we accept the number of CFLs distributed to PEAK students as the best available count of actual students taught the PEAK curriculum. The 24,576 PEAK-related CFLs were distributed. This includes 19,620 bulbs provided to students to take home as well as 4,956 bulbs provided for PEAK students to distribute at fundraising events. We therefore estimate 19,620 students were actually taught PEAK. We

multiply this number by the 0.667 student-to-household conversion factor to get 13,087 PEAK households.[11]

Table 25 lists the savings we believe can best be attributed to these non-tune-up measures.

Table 25: Savings of Non-Tune-Up Measures and Practices

Measure	Qty	Per Unit kWh/yr	Per Unit kW	Per Unit Therm/yr	**Total kWh/yr**	**Total kW**	**Total Th/yr**
CFLs provided to PEAK students	24,576	57.7	0.0066	0	**1,418,035**	**162.2**	**0**
Community event CFLs	21,693	56.9	0.0065	0	**1,234,332**	**141.0**	**0**
Community event torchieres	3,187	308.8	0.0294	0	**984,146**	**93.7**	**0**
Total Non-Tune-Up Hardware					**3,636,513**	**396.9**	**0**
Municipal Energy Actions	10	375,000	150.0000	15,000	**3,750,000**	**1,500.0**	**150,000**
PEAK School Districts	7	312,500	200.0000	6,250	**2,187,500**	**1,400.0**	**43,750**
PEAK Student Households	13,087	480	0.055	38.4	**6,281,760**	**719.8**	**502,541**
Total Practice					**12,219,260**	**3,619.8**	**696,291**

[11] This number represents the "double-counting" associated with a home having more than one PEAK student and should not be confused with the multiplier used to scale out students who do not bring the information home. This value is discussed in greater detail on pages 19-21 of this report.

Summary

Table 26 presents a summary of the program's gross savings goals and our estimates for the major subcategories of the CEP. The energy values exceed the goal primarily because the greater implementation quantities overcame per-unit estimates that were too high.

Table 26: Goals and Savings Summary

Measure Category	Program Goal			Savings Estimate		
	kWh per yr	Peak kW	Therm per yr	kWh per yr	Peak kW	Therm per yr
Res Ltg Tune-Up	1,800,000	144	0	1,805,065	182	0
Res Other Tune-Up	1,320,000	120	46,080	422,384	20	45,049
Bus Ltg Tune-Up	450,000	180	0	244,833	54	0
Bus Other Tune-Up	250,000	160	27,360	20,052	0	2,235
Non-Tune-Up CFLs	4,436,800	771	9,600	3,636,513	397	0
Municipal Facilities	3,750,000	1,500	150,000	3,750,000	1,500	150,000
School Facilities	1,875,000	1,875	37,500	2,187,500	1,400	43,750
PEAK Households	4,800,000	500	480,000	6,281,760	720	502,541
Totals	**18,681,800**	**5,250**	**750,540**	**18,348,107**	**4,273**	**743,575**

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What was baseline awareness toward and prior implementation of energy efficiency?

Pre-Tune-Up Surveys. Surveys were conducted with a small sample of potential residential tune-up participants before they had been contacted for their tune-ups (16 residential customers in Palm Desert). We had originally planned for a larger sample, but found this not feasible. The information about where tune-ups were going to be conducted was seldom provided with more than a day or two of lead time, and in most cases was provided after the fact. Generally, once the management of the apartment or mobile home complex gave permission to the Partnership to conduct tune-ups, they began immediately.

In exchange for the pre-tune-up surveys, we gathered information on replaced equipment from the tune-up participants. This provided the baseline information for the program. We also increased the number of post-tune-up attitudinal surveys in lieu of conducting pre-tune-up attitudinal surveys.

Post-Tune-Up Surveys. Attitudinal and behavioral surveys were conducted after participants received their tune-ups. The surveys asked qualitative, behavioral, attitudinal, and information transfer questions about the following topics:

- Reception of energy conservation information prior to the CEP
- Attendance at an energy rally and perceptions of it
- Motivations for participating in the tune-up
- Pre- and post-tune-up awareness of energy use and commitment to conservation
- Equipment received and whether it was installed
- Educational information received during the tune-up
- Whether they spread the word about energy efficiency
- Whether they were satisfied with the program

The post-tune-up surveys were conducted with 328 residential participants and 56 small commercial participants. Customers were selected from each of the cities. Table 27 shows the number of participant surveys in each of the cities. The interviews were conducted by telephone or in person by Aloha Systems employees, who identified themselves by name and explained that Aloha was conducting the evaluation of the Community Energy Partnership on behalf of the Public Utilities Commission. Participants were randomly selected from the database. They were prompted with information about the tune-up, including the date it was conducted. This both let the customer remember exactly what we were evaluating and enhanced the perception of our validity. If the person who was present at the tune-up was not home, we left messages. Several people called back.

Five attempts were made to reach a randomly selected person. If no contact was made or if a person was not willing to participate in the survey, another customer was selected.

Table 27: Location of Post-Tune-Up Surveys		
City	**Residential**	**Business**
Brea	57	8
Cathedral City	32	6
Corona	13	5
Hermosa Beach	16	5
Irvine	60	5
Moreno Valley	28	4
Palm Desert	49	5
San Bernardino	33	3
Santa Clarita	28	0
Santa Monica	12	15
Total	**328**	**56**

Non-participant Surveys. A total of 68 residential and 56 commercial non-participants were surveyed to elicit reasons why they did not participate in the program and to gather recommendations for program improvements that could have increased participation. The non-participants were selected by visiting homes or businesses located in the neighborhoods or complexes where tune-ups had been provided but who were not included on the list of participants. The surveys were conducted door-to-door, and we estimate about 75% of people who were asked actually participated in our brief survey.

Since non-participants are quite possibly not interested in the program or its success, these surveys were designed to be very brief and conducted at the door. They focused on four areas:

- Awareness of either the energy efficiency measures distributed and/or the Community Energy Partnership in particular
- Existence of any of the energy efficiency measures in the non-participant's home (by simple self-reporting, not inspection)
- Reasons for not participating in the program (unaware, unavailable at the time, uninterested, etc.)
- General attitude toward energy efficiency (nuisance, costly, "already done what I can," etc.)

Table 28 shows the number of non-participant surveys in each of the cities.

Table 28: Location of Non-Participant Surveys		
City	**Residential**	**Business**
Brea	10	5
Cathedral City	6	3
Corona	10	5
Hermosa Beach	10	6
Irvine	6	8
Moreno Valley	0	6
Palm Desert	8	5
San Bernardino	8	8
Santa Clarita	0	0
Santa Monica	10	10
Total	**68**	**56**

We surveyed both small business and residential non-participants regarding their use of energy efficient light bulbs. The majority did not use them, as detailed in the Table 29.

Table 29: Non-Participant Use of Energy Efficient Lighting *"Do you currently use energy efficient light bulbs in your home/business?"*						
Response	**Residential**			**Small Business**		
	Number of Responses	% of Total	% of knowing*	Number of Responses	% of Total	% of knowing*
Yes	23	34 %	35 %	19	34 %	49 %
No	42	62 %	65 %	20	36 %	51 %
DK/NA*	3	4 %	n/a	17	30 %	
Total	**68**			**56**		

* "Don't Know" or "No Answer," including both those who stated that they did not know and those for whom an answer to the question was not recorded. The "% of knowing" column excludes these respondents.

We also asked whether they used other types of energy-efficient products in their home/business. Likewise, the majority did not, as detailed in Table 30.

Table 30: Non-Participant Use of Other Energy Efficient Products *"Do you currently use other types of energy-efficient products in your home/business?*						
Response	**Residential**			**Small Business**		
	Number of Responses	% of Total	% of knowing*	Number of Responses	% of Total	% of knowing*
Yes	19	28 %	32 %	11	20 %	29 %
No	41	60 %	68 %	27	48 %	71 %
DK/NA*	8	12 %	n/a	18	32 %	
Total	**68**			**56**		

* "Don't Know" or "No Answer," including both those who stated that they did not know and those for whom an answer to the question was not recorded. The "% of knowing" column excludes these respondents.

We asked small business participants whether they were aware of and used compact fluorescent lights. Over three quarters (77%) were *not aware* of compact fluorescent lights. Only three (5%) of the surveyed participants *used* them prior to having the tune-up. Likewise, we asked residential customers it they were already using energy efficient light bulbs before their energy tune-up. Only 75 (25%) of the 293 respondents indicated that they were. Tables 31 and 32 show this information.

Table 31: Small Business Prior Awareness and Use of CFLs *"Did you know what a CFL was before the tune-up?"* *"If yes, did you use CFLs before the tune-up?"*		
Response	**Quantity**	**Percent**
Not Aware	43	77%
Aware, Not Used	4	7%
Used	9	16%
Total	**56**	**100%**

Table 32: Residential Participant Prior Use of CFLs *"Before the energy tune-up were you already using energy-efficient light bulbs?"*		
Response	**Quantity**	**Percent**
No	213	73%
Yes	75	25%
Don't Know	5	2%
Total	**293**	**100%**

This 25% prior use of energy efficient lights reported by the participating residents differs significantly from recent research on residential appliance and lighting saturation, which demonstrates approximately 50% of residences have one or more compact fluorescent lamps. Even when segmenting the population to more closely match the targeted tune-up recipient, there is still a discrepancy. For apartments and condominiums in the SCE service territory, 38.5% of households with incomes less than $25k, and 47.2% of households with incomes between $25k and $50k, had compact fluorescent lights.[12]

The source of this discrepancy is not clear. The 2005 state-wide saturation survey was conducted by well-qualified research consultants and involved on-site inspections. Unlike some older surveys conducted by mail or telephone, the understanding or lack thereof of the surveyed customers was not a factor.

The city leaders and tune-up contractors specifically targeted neighborhoods and complexes where they felt the services were most needed, so the lower saturation of CFLs may demonstrate that this targeting was indeed effective. Another possible explanation for the discrepancy is bias on the part of the participant respondents. These people were overwhelmingly satisfied with the free services provided by the program. Some of them may have reported what they thought we wanted to hear or what they thought would make the program look better.

We also asked the participants and non-participants about their commitment to conserving energy. For non-participant businesses 28% said "very low" or "somewhat low" and 45% responded with some version of "don't know." Participant businesses were more likely to give a specific answer, but 45% said "very low" or "somewhat low." Only one residential non-participant answered "Don't know," but 38% said "very low" or "somewhat low." Residential participants had similar results, with 38% saying their commitment was "very low" or "somewhat low." Table 33 indicates the percent of respondents giving each answer. For the participants we specifically asked the question, "*Before the energy tune-up*, how would you rate…" Toward the end of the survey we asked "*After the energy tune-up*"; those responses are discussed in the next section.

[12] RLW Analytics. *2005 California IOU Lighting Survey*. Available for analysis at www.calresest.com.

Table 33: Commitment to Conserving Energy *"(Before the energy tune-up,) How would you rate your commitment to conserving energy in your home/business?"*						
Sector	**Qty**	**Very Low**	**Somewhat Low**	**Somewhat High**	**Very High**	**Other/ Don't Know**
Small Business Non-Participants	56	2%	26%	20%	5%	47%
Small Business Participants	56	4%	41%	27%	12%	16%
Residential Non-Participants	68	13%	25%	43%	18%	1%
Residential Participants	326	4%	34%	40%	18%	4%

We asked participants about their awareness of energy efficiency before the tune-up. Nearly half (47%) of the businesses rated themselves low, and one-fifth (19%) said they didn't know. Only about one-third (34%) rated themselves high. Similarly, 44% of residential participants ranked themselves low. Table 34 indicates the percent of respondents giving each answer.

Table 34: Awareness of Energy Use *"Before the energy tune-up, how would you rate your level of awareness of energy use in your home/business?"*						
Sector	**Qty**	**Very Low**	**Somewhat Low**	**Somewhat High**	**Very High**	**Other/ Don't Know**
Small Business Participants	56	4%	43%	25%	9%	19%
Residential Participants	326	6%	38%	38%	14%	4%

What changes in awareness and attitude were instilled by the program?

Obviously awareness of specific hardware items distributed through the tune-ups increased dramatically. Three quarters of the surveyed small businesses were not aware of compact fluorescent lights prior to the tune-up, and surely they all became aware of them during the tune-up.

Regarding awareness in general, we specifically asked the participants questions relating to "before the tune-up" and "after the tune-up." Those answering somewhat or very high increased from 34% to 73%. Nineteen respondents (34% of the total) moved from "somewhat low" to "somewhat high" as a result of the tune-up. Three respondents (5%) moved from "somewhat high" to "very high." No one answered "very low" after the tune-up, and one respondent even moved from "very low" to "very high."

About one-third of residential participants indicated that their awareness remained the same (and of this third, 77% already had high awareness). The remaining two-thirds increased their awareness. Respondents claiming their awareness was somewhat or very high increased from 171 (52%) to 276 (85%). Table 35 indicates the percent of respondents giving each answer.

Table 35: Comparison of Before and After Levels of Awareness
"Before/after the energy tune-up, how would you rate your level of awareness of energy use in your home/business?"

Sector	Qty	Very Low	Somewhat Low	Somewhat High	Very High	Other/ Don't Know
Small Business ***Before*** Tune-Up	56	4%	43%	25%	9%	19%
Small Business ***After*** Tune-Up	56	0%	9%	61%	12%	18%
Residential ***Before*** Tune-Up	326	6%	38%	38%	14%	4%
Residential ***After*** Tune-Up	324	1%	9%	44%	43%	3%

We also asked "before" and "after" questions regarding commitment to saving energy. Those small businesses answering somewhat or very high increased from 39% to 69%. Seventeen respondents (30% of the total) moved from "somewhat low" to "somewhat high" as a result of the tune-up. Three respondents (5%) moved from "somewhat high" to "very high."

As with awareness, about 30% of residential participants indicated that their commitment remained the same, but 80% of these already had high commitment. Over two-thirds of the respondents claimed increased commitment, with those indicating somewhat or very high commitment increasing from 58% to 87%. Table 36 indicates the percent of small business and residential respondents giving each answer.

Table 36: Comparison of Before and After Commitment to Conservation
"Before/after the energy tune-up, how would you rate your commitment to conserving energy in your home/business?

Sector	Qty	Very Low	Somewhat Low	Somewhat High	Very High	Other/ Don't Know
Small Business ***Before*** Tune-Up	56	4%	41%	27%	12%	16%
Small Business ***After*** Tune-Up	56	2%	9%	55%	14%	20%
Residential ***Before*** Tune-Up	326	4%	34%	40%	18%	4%
Residential ***After*** Tune-Up	326	1%	9%	44%	43%	3%

Another measure of attitude toward conservation energy efficiency is whether customers have retained the new devices after their tune-ups and whether they plan to purchase additional similar devices. We asked specific questions of both residential and small business participants regarding their products. Table 37 presents the information for residential customers.

Table 37: Residential Retention and Purchase of CFLs

Question Asked	Total Responses	Yes	No	Don't Know
Have you removed any of the new light bulbs that were installed by you or the contractor?	292	8%	92%	0%
Have you purchased any energy-efficient light bulbs since the tune-up	291	16%	83%	1%
Do you plan to install or purchase further energy-efficient lighting as a result of what you learned from your tune-up experience?	292	72%	14%	13%

The interviews were conducted between one month and one year after the tune-up. Of the 23 people who had replaced a CFL, about half replaced it with another CFL and half replaced it with an incandescent bulb. Although only 16% of the people actually had purchased additional CFLs, nearly three-fourths (72%) report an intention to do so. This difference seems very reasonable given that the participants had recently had up to ten CFLs installed in their house, so the need to have already purchased additional ones is small.

Table 38 presents the results of several attitudinal questions asked of small business tune-up recipients.

Table 38: Small Business Attitudinal Responses

Question Asked	Total Responses	Yes	No	Don't Know
Are you still currently using CFLs in your business?	14	64%	7%	29%
After the tune-up, have you purchased more CFLs for your business?	14	7%	57%	36%
Is the [new programmable] thermostat still being used and not overridden?	2	100%	0%	0%
Do you understand how to use your new thermostat?	2	100%	0%	0%
Have you removed your new thermostat?	2	0%	100%	0%

Were participants pleased with the program?

Two hundred twenty residential program participants answered the question, "On a scale of 1 to 5, with 1 being very low and 5 being very high, how would you rate your overall satisfaction with the program?" The mean response was 4.45, and 89% of the customers answered with either a 4 or a 5. Table 39 gives a summary of the answers.

Table 39: Overall Program Satisfaction
"On a scale of 1 to 5, with 1 being very low and 5 being very high, how would you rate your overall satisfaction with the program?" Sample Size 220

Residential Participants	**Rating**					
ANSWER	1	2	3	4	5	AVERAGE
Quantity	2	4	19	63	132	4.45
PERCENT	**1%**	**2%**	**8%**	**29%**	**60%**	

Fifty-six small business tune-up participants were asked about their satisfaction, and 68% responded "very satisfied." No one clamed to be unsatisfied. Unlike the residential survey, the small business survey included descriptions for three categories, rather than five numerical ratings. Table 40 gives a summary of the answers.

Table 40: Satisfaction with Tune-Up
"How satisfied are you with your tune-up?" Sample Size: 56

Business Participants	**Rating**			
ANSWER	Not Satisfied	Somewhat Satisfied	Very Satisfied	Don't Know
Quantity	0	12	38	6
PERCENT	**0%**	**21%**	**68%**	**11%**

Did participants tell others about energy efficiency? Did this knowledge dissemination produce any known changes in equipment or behavior by associates of participants?

Three hundred twenty-three (323) residential program participants were asked if they told friends, family, or neighbors about the tune-up. Two hundred twenty of them (68%) said that they had. Of those, 161 (78% of those told, or 50% of the overall total) said that they were interested in receiving a tune-up. The residential participants were also asked if they have given any advice to friends, family, or neighbors on how to conserve energy based upon what they learned in their tune-up. One hundred sixty-seven (52%) said that they had.

The residential survey participants were also asked whether they told other people about CFLs that they received. Table 41 lists some of the questions and their responses.

Table 41: "Spreading the Word" by Residential Tune-Up Participants

Question Asked	Total Responses	Yes	No	Don't Know
Have you told your friends, family, or neighbors about your free energy tune-up?	323	68%	31%	< 1%
From what you learned through this program, have you given any advice to friends, family, or neighbors on how to conserve energy?	322	52%	47%	1%
Have you told other people about the new light bulbs you received from the tune-up?	294	63%	46%	< 1%
Did you recommend the light bulbs you received to other people?	292	61%	37%	2%

The small business participants were asked if they told other people about the CFLs that they received. Only 14 of the 56 surveyed participants received CFLs, so they were the only ones asked this question. Of those 14 people, five (36%) said that they had told friends and family about their CFLs.

How can the tune-up and community outreach processes be improved?

Both the residential and small business participants were asked if they had any recommendations to improve the program. The vast majority did not.

During the middle of 2005 we conducted interviews with key program personnel, including Energy Coalition, utility, city, and contractor employees. These interviews focused on various successes and problems with the program, and resulted in several suggestions. The results of these interviews are discussed in a following chapter of this report.

Overall recommendations, based upon program personnel interviews, customer surveys, and Aloha staff observations will be presented at the conclusion of this report.

How many school districts implemented PEAK?

Seven school districts implemented PEAK. Four implemented it on a district-wide basis throughout the elementary schools.

- Corona-Norco Unified School District
- Irvine Unified School District
- Desert Sands Unified School District
- Santa Monica-Malibu Unified School District

Three other districts initiated PEAK on a trial basis in one elementary school in each of the districts:

- San Bernardino City Unified School District
- Moreno Valley Unified School District
- Hermosa Beach City School District

How many students were taught the PEAK curriculum?

The school districts did not provide detailed information about how many students actually participated in the PEAK program. Nor did they provide details as to what extent the program was implemented by each teacher. However, our general observation has been that partial implementation – a serious problem in the 2002-03 program – has been reduced or eliminated by enhancing the PEAK curriculum to better match the requirements of the state-wide science curriculum.

As discussed in the section on savings estimates, each student is provided a single compact fluorescent light when taught PEAK. The number of CFLs given to the school districts for this purpose is therefore a close approximation of the number of students taught the PEAK curriculum. Table 42 provides those numbers for each district:

Table 42: PEAK Students by District

District	MOU Students	CFLs
Corona-Norco Unified	15,239	10,080
Desert Sands Unified	1,000	3,130
Irvine Unified	2,000	4,000
Santa Monica-Malibu Unified	2,000	2,120
Hermosa Beach City	100	0
Moreno Valley Unified	132	140
San Bernardino Unified	120	150
Total	**20,591**	**19,620**

Did teachers present the entire curriculum?

Yes. This had been a significant problem in the past, including during the predecessor Six Cities Energy Program. However, PEAK has since been revised to fulfill many specific requirements of the state's elementary school science curriculum. Teachers can now present the PEAK curriculum as part of science classes, rather than as merely supplemental material. This has decreased the sense held by some teachers that "this is something that is not required, not part of my evaluation, or not helping the students pass standardized tests."

In our interviews with school district PEAK coordinators, we discussed this issue specifically. It was consistently felt that the coordination with the statewide science requirements eliminated the problem and all districts reported that teachers are implementing the program in its entirety.

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report. The teacher survey will provide specific answers and details about which lessons are implemented by each teacher. A copy of the student survey is included as Appendix 5 to this report, and a copy of the teacher survey is included as Appendix 6.

Did students learn about energy efficiency through the PEAK program?

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report. The student survey will provide specific information about how much the students learned. There are two components to the student survey. One part has specific right answers and will judge whether a student has learned (or previously knew) many of the details of the PEAK curriculum. Another part asks questions about what they have done because of PEAK and what they thought about the program.

The survey was developed by the Energy Coalition's academic consultants. The first component with specific correct answers was developed solely by these consultants and is contained in Part 1 and Part 2 of the survey instrument (included as Appendix 5). The second component that evaluates actions taken and attitudes about the program was developed in conjunction with Aloha Systems and utility staff so that the survey would be useful to this evaluation as well as the academic evaluation of PEAK.

Did students discuss energy efficiency with their families and did the families learn?

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report. The student survey will provide specific information about how much the students learned. There are two components to the student survey. One part asks questions about what they have done because of PEAK, including actions taken at home and discussions with other people.

Did students or their families implement any behavioral or equipment changes as a result of PEAK?

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report. The student survey will provide specific information about how much the students learned. There are two components to the student survey. One part asks questions about what they have done because of PEAK, including actions taken at home and discussions with other people.

Did students or families tell others about energy efficiency as a result of participating in PEAK? Did this knowledge dissemination produce any known changes in equipment or behavior?

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report. The student survey will provide specific information about how much the students learned. There are two components to the student survey. One part asks questions about what they have done because of PEAK, including actions taken at home and discussions with other people.

How much energy savings and demand reduction was achieved through PEAK?

This has already been calculated above. We do not intend to adjust the assumption that a PEAK household saves 5% of its energy consumption if a PEAK student conveys information to other members of the household. However, we do anticipate introducing a factor to account for the percentage of PEAK students who claim to have *not* brought the information home. This information will be derived from the student survey being conducted and will be addressed in the supplement to this report.

Were student and household awareness and activity related to amount of teacher time spent on PEAK?

In conjunction with the academic review of PEAK, we are conducting a comprehensive survey of both PEAK students and teachers. The results of this survey will be presented as a supplement to this report.

At this point we are not fully sure whether data will be available in sufficient detail to cross tabulate. Because the surveys are being administered by the school districts (under the coordination of Partnership academic consultants), this may vary from district to district. We are also not sure this question is still relevant, given the general reporting – to be substantiated later – that PEAK is being much more comprehensively taught than it had in previous years. If there is a discrepancy from one teacher to another on the amount of time spent on PEAK, and if we have individual data by student or classroom with which we can make comparisons from one classroom to another, we will do so.

How can the information transfer from Partnership to district to teacher to student to parent be improved?

Although PEAK has a uniform curriculum "textbook," there is no uniform strategy toward implementing it. Some school districts have each classroom teacher teach the subject. Other districts have "science specialists" who go from classroom to classroom teaching science material, and these specialists teach PEAK.

Central coordination on a district-wide basis also varies. In some districts the PEAK coordinator is someone very high in the administration, and some teachers have felt awkward contacting the coordinator directly. Other districts have an opposite problem, having assigned the coordination role to a classroom teacher who has little opportunity to contact colleagues at other schools. In some situations, it would probably be a good idea to have both district-level and campus-level PEAK coordinators, with Energy Coalition staff keeping both levels "in the loop" regarding PEAK.

The information transfer seems to have been greatly improved by the new curriculum. Based upon a few in-person interviews, teachers seem pleased with it. The teacher survey to be completed with the academic evaluation of PEAK will shed more light on this subject. Because the new curriculum closely parallels certain aspects of the statewide educational requirements, the teachers have also been more diligent in teaching the entire curriculum to their students.

The Energy Coalition provides teacher training, and we have observed such training events. The training sessions seemed very productive, and judging by the questions asked by the teachers, very important. Teacher education could be enhanced by providing on-going opportunities for teachers to share their PEAK experiences with one another. This should also include regular classroom teachers even in districts where PEAK is actually taught by science specialists. These forums would enhance the "energy community" aspect of the program.

Parent involvement is solicited in a number of ways. Each PEAK students is given a letter to take home along with the take-home CFL at the beginning of the program. In addition, each academic unit of PEAK includes prompts for the teachers to engage the students in applying energy-saving concepts in their home, school, or community. An example is conducting a home lighting audit with their parents. Many students become involved in the community events of the CEP, and the parents of these students thereby become involved directly in promoting energy efficiency.

It remains important to try to reach every household through multiple avenues. We were disappointed in our interviewing to hear a few people raise concerns about "privacy" along with attempts to involve parents. Specifically, some PEAK classes have included an exercise where students were asked to bring in their electric bills and/or track their daily energy use by reading the electric meter at home. Some schools have shied away from this exercise believing it could infringe upon "privacy" issues or make some students or parents uncomfortable. Energy conservation is too important a message to ignore because of some obscure privacy concern. We believe that these exercises that ask students to bring

information regarding their home to class will markedly increase the involvement of parents in the program, which in turn will facilitate the program's ultimate goal of saving energy and reducing demand.

We understand that some parents sadly do not engage in their children's educational process, and we certainly do not suggest that students should be penalized or embarrassed by their parents' lack of interest or cooperation. On the other hand, we do not think the potential benefits of an activity such as the bill analysis should be dismissed just because a few parents might not cooperate.

The entire PEAK program seems weak on the community aspect of the Partnership. Clearly this aspect is included in principle and intent, but it is weak in actual implementation. This is partly (or mostly) because of the outspread nature of PEAK, existing in many classrooms in many schools in many districts. Various discussions about clubs and other activities have been made, and few, to our knowledge, have materialized. We understand the difficulty with getting such efforts off the ground, but we encourage staff to work toward that goal anyway. This will be especially critical if PEAK is to reach its goals of saving energy at campus facilities.

Each district participating in PEAK should have a district-wide group, perhaps including facilities and academic personnel, that meets regularly with the Energy Coalition PEAK staff. Each school should have a similar group. Ideally the Energy Coalition would have sufficient staff resources so that each PEAK campus (not just district) were visited by a Coalition employee at least once each school year. This would be a major step forward toward the goal of developing a "community" around the PEAK concept.

What energy savings were achieved at school facilities?

This was discussed in the energy savings sections above on pages 41-43.

What energy savings were achieved at municipal facilities?

This was discussed in the energy savings sections above on pages 43-44.

Were the advantages and strengths of the three partners – The Energy Coalition, SCE, and SCG – optimally used? What improvement could be made?

During the entire course of the CEP, we observed a wide variety of activities, including team meetings, training sessions, PEAK classrooms, residential and small business tune-ups, community events, and major gatherings of all CEP staff and associates. We also interviewed representatives from virtually every aspect of the program, including utility and Energy Coalition managers and staff, city team leaders, PEAK teachers and administrators, installation contractors, and tune-up technicians. Through this in-depth, comprehensive personal interaction with the CEP, we were able to understand the interactions of the various players observed from an intimate yet objective viewpoint.

The Energy Coalition's main strength and advantage is its small size, relatively non-bureaucratic nature, flexibility, and charismatic enthusiasm. The utilities' main strengths are their connection with the overall energy efficiency arena, the trust associated with them, and their connection to the customer base.

The Energy Coalitions strength was dominant throughout the program. However, at times it is strained by the size of the program and/or the limits to its staff. One of the Coalition's main tasks in the program was keeping the communication going, fanning the flames of enthusiasm, and helping the other players understand their tasks and responsibilities. Particularly in the initial phases of the program, as the number of cities was increased from six to ten, this strain was apparent. To some extent it resolved itself as time moved on and as a new operations manager was hired.

The utilities' main strengths were not optimally used at all times. This is not necessarily the utilities' fault, as sometimes they were available but unaware of a need. Perhaps the most important communication link that was relatively weak was the contractor-utility link. More meetings should have been held with the utilities, the installation contractors' management, and the Energy Coalition operations manager. This would have enhanced an important team and resolved the issue regarding what programs should be promoted. Everyone seemed to want to promote other programs, but the contractors wanted more specifics and the utility program managers were unaware of that desire.

Another example where utility resources were not optimally used is in lead generation. The utilities each have the vast resource of their customer database that could have been used to very effectively target tune-ups. Rather than relying on city personnel (as originally set up) or contractors (as later implemented), the utilities could have provided lists of neighborhoods, including specific customer contact information, for tune-up solicitation. Ideally, a simple analysis of billing history could have been programmed to enable the utility customer information system to generate not just blind lists of names, but customers that seemed specifically ideally suited for a tune-up. One would not want to limit tune-ups to these customers, but the contractors could have known that Apartment 10 was probably a better lead than Apartment 12. This vast and highly beneficial resource

was, as best we can tell, totally wasted by lack of use. Future partnership programs should make use of this and do better target marketing.

The utilities note that their input was not initially welcomed. This presumably was a result of the original intent for the city team leaders to be solely responsible for lead generation. This problem has been recognized and corrected.

The utilities also note that they are not allowed to share customer information. This is unfortunate and seems contrary to the very notion of a "partnership." If there are rules that prohibit or appear to prohibit the full and effective use of utility customer information for the goal of energy efficiency, the CPUC should direct the utilities to revise these rules to eliminate the roadblock.

How can the overall process be improved?

This subject will be discussed in the concluding chapter of this report.

NET AND LIFE-CYCLE SAVINGS AND CPUC SPREADSHEETS

All savings figures presented in the report thus far have been gross annual values. This is so that we can focus on actual values associated with the technologies and measures and their implementation, without clouding those analyses with external concepts such as net-to-gross ratios and expected useful lives. This section applies NTG and EUL values to the gross annual values in order to determine net annual and life-cycle savings.

Table 43 estimates the actual savings. In making those calculations we adjust a small number of ratios in accordance with our explanation. For the most part we accept the estimates provided by the implementers and explain our rationale. Complex NTG and/or EUL analyses were beyond the scope of work of this evaluation.

Table 43: Net and Life-Cycle Savings

	Gross Savings				Net Savings				Net Lifecycle	
Sector	**MWh per yr**	**Peak kW**	**kTh per yr**	**NTG**	**MWh per yr**	**Peak kW**	**kTh per yr**	**EUL**	**MWh**	**kTherm**
Res Ltg Tune-Up	1,805	182	0	0.8	1,444	146	0	5	7,220	0
Res Other Tune-Up	422	20	45	0.8	338	16	36	5	1,690	180
Bus Ltg Tune-Up	245	54	0	0.95	233	51	0	5	1,163	0
Bus Other Tune-Up	20	0	2	0.95	19	0	2	5	95	11
Non-Tune-Up CFLs	3,637	397	0	0.8*	2,909	316	0	5	14,546	0
Municipal Facilities	3,750	1,500	150	0.8	3,000	1,200	120	5	15,000	600
School Facilities	2,188	1,400	44	0.8	1,750	1,120	35	5	8,750	175
PEAK Households	6,282	720	503	1.0	6,282	720	503	4	25,127	2,010
Totals	**18,348**	**4,273**	**744**		**15,975**	**3,569**	**696**		**73,591**	**2,976**

* The program spreadsheets list the NTG ratio for torchieres as 1.0. This category includes both CFLs (listed as 0.8 NTG) and torchieres, though CFLs dominate. We do not understand why torchieres were given a unity NTG. Like CFLs, fluorescent torchieres are readily available in the open market. We use the default 0.8 value for both.

We apply several multipliers when calculating PEAK household savings. First is the 0.667 multiplier to account for multi-student households. There are also multipliers for students that do not come home and tell anyone what they learned, and therefore do not result in energy changes. The kWh/household value itself is also an estimate based upon what we anticipate an "average" household would accomplish, which takes into account those households where energy efficiency is already the norm as well as those who have never heard of the subject. We believe the NTG ratio for PEAK households is actually redundant, being already addressed in the various multipliers. We therefore set it to 1.0.

Conversely, we believe that the EUL for PEAK households is high. While some of the activities include hardware modifications (such as buying more CFLs), many of the PEAK household savings result from behavioral changes, which may have EULs of two years or even less. We consider the 4-year EUL a lenient compromise.

We concur with the other NTG ratios assumed by the Partnership, including the 0.95 value for business tune-ups. Our surveys of these customers showed very low energy awareness before the tune-up. Furthermore, a variety of factors make small businesses even less likely than residents to install minor efficiency upgrades.

Tables 44 and 45 present the program-wide sums for goals as well as our net savings estimates.

Table 44:
Net Energy and Peak Demand Goals

Net Coincident Peak Reduction	4,298 kW
Net Annual Electric Energy Savings	15,262,440 kWh
Net Lifecycle Electric Energy Savings	76,312,200 kWh
Net Annual Gas Energy Savings	615,120 Therms
Net Lifecycle Gas Savings	3,075,600 Therms

Table 45:
Net *Ex-Post* Energy and Peak Demand Savings

Net Coincident Peak Reduction	3,569 kW	85%
Net Annual Electric Energy Savings	15,974,570 kWh	105%
Net Lifecycle Electric Energy Savings	73,591,090 kWh	96%
Net Annual Gas Energy Savings	695,694 Th	113%
Net Lifecycle Gas Savings	2,975,929 Th	97%

The CPUC reporting spreadsheets require breakdown of net savings estimates by year. In order to break out the 2004 and 2005 savings estimates, we multiplied the two-year values by the percent of each measure group reported installed during 2004 to calculate the 2004 savings. These values are shown in Table 46.

Table 46: Calculation of 2004 One-Year Net Savings

	Two-Year Savings			2004 Installation Percent	2004 Savings		
Sector	**MWh per yr**	**Peak kW**	**kTh per yr**		**MWh per yr**	**Peak kW**	**kTh per yr**
Res Ltg Tune-Up	1,444	146	0	1.7%	25	2	0
Res Other Tune-Up	338	16	36	1.7%	6	0	1
Bus Ltg Tune-Up	233	51	0	5.7%	13	3	0
Bus Other Tune-Up	19	0	2	5.7%	1	0	0
Non-Tune-Up CFLs	2,909	316	0	54.6%	1,589	173	0
Municipal Facilities	3,000	1,200	120	30%	900	360	36
School Facilities	1,750	1,120	35	42.9%	750	480	15
PEAK Households	6,282	720	503	24.7%	1,552	178	124
Totals	**15,975**	**3,569**	**696**		**4,836**	**1,196**	**176**

The three CPUC program reporting spreadsheets (SCE, SCG, and the combined program total) are shown on the following three pages.

SCE Program Energy Impacts for This 2004-2005 Program

Program ID:	1196-04							
Program Name:	Community Energy Partnership							
	Year	Calendar Year	Gross Program-Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program-Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program-Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
	1	2004		4,836		1,196		
	2	2005	18,682	15,975	5,250	3,569		
	3	2006	18,682	15,975	5,250	3,569		
	4	2007	18,682	15,975	5,250	3,569		
	5	2008	18,682	14,422	5,250	3,391		
	6	2009	18,682	6,408	5,250	2,048		
	7	2010						
	8	2011						
	9	2012						
	10	2013						
	11	2014						
	12	2015						
	13	2016						
	14	2017						
	15	2018						
	16	2019						
	17	2020						
	18	2021						
	19	2022						
	20	2023						
	TOTAL	**2004-2023**	93,409	73,591				

SCG Program Energy Impacts for This 2004-2005 Program

Program ID:	1201-04							
Program Name:	Community Energy Partnership							
	Year	**Calendar Year**	**Gross Program-Projected MWh Savings**	**Net Evaluation Confirmed Program MWh Savings**	**Gross Program-Projected Peak MW Savings**	**Evaluation Projected Peak MW Savings****	**Gross Program-Projected Therm Savings**	**Net Evaluation Confirmed Program Therm Savings**
	1	2004						175,861
	2	2005					750,540	695,694
	3	2006					750,540	695,694
	4	2007					750,540	695,694
	5	2008					750,540	571,566
	6	2009					750,540	141,420
	7	2010						
	8	2011						
	9	2012						
	10	2013						
	11	2014						
	12	2015						
	13	2016						
	14	2017						
	15	2018						
	16	2019						
	17	2020						
	18	2021						
	19	2022						
	20	2023						
	TOTAL	**2004-2023**					3,752,700	2,975,929

Sum Of Energy Impacts for This 2004-2005 Program

Program IDs*:	1196-04 and 1201-04							
Program Name:	Community Energy Partnership							
	Year	**Calendar Year**	**Gross Program-Projected MWh Savings**	**Net Evaluation Confirmed Program MWh Savings**	**Gross Program-Projected Peak MW Savings**	**Evaluation Projected Peak MW Savings****	**Gross Program-Projected Therm Savings**	**Net Evaluation Confirmed Program Therm Savings**
	1	2004		4,836		1,196		175,861
	2	2005	18,682	15,975	5,250	3,569	750,540	695,694
	3	2006	18,682	15,975	5,250	3,569	750,540	695,694
	4	2007	18,682	15,975	5,250	3,569	750,540	695,694
	5	2008	18,682	14,422	5,250	3,391	750,540	571,566
	6	2009	18,682	6,408	5,250	2,048	750,540	141,420
	7	2010						
	8	2011						
	9	2012						
	10	2013						
	11	2014						
	12	2015						
	13	2016						
	14	2017						
	15	2018						
	16	2019						
	17	2020						
	18	2021						
	19	2022						
	20	2023						
	TOTAL	**2004-2023**	93,409	73,591			3,752,700	2,975,929

PROCESS INTERVIEWS AND FEEDBACK

During the first half of 2005, we interviewed a total of twenty-four key participants in the Partnership. These included the three key managers at The Energy Coalition, three utility employees involved with the project, management staff of the two installation contractors, and sixteen city employees, including at least one from each of the ten partner cities. The information gathered from these interviews was published in a preliminary feedback report on October 12, 2005, which was distributed to the CPUC and the CEP partners.

The discussion narratives presented in the 10/12/2005 report have been reorganized (using a primary subject sort rather than a primary sort based upon the interviewee's organization type) and are presented here in this section of the final report. The preliminary report also included conclusions and recommendations that are not specifically presented here, but have been subsumed into the overall conclusions and recommendations as deemed appropriate. In reading the following discussions, it is important to remember that they are based on interviews several months before the program's end. One should also bear in mind that the purpose of the interim report was primarily instructional rather than evaluational. The goal was to help improve the remainder of the program based upon feedback, not evaluate its success. To a limited extent we have changed the tone of the following narratives to make them less didactic and more evaluative. However, we have also striven to keep the original tone and thoughts of the interviewees because we believe they convey important information, much of which is personal opinion, but nonetheless a reflection of the intricacies of the process of this complex program involving many different players.

In some cases issues were realized and/or corrected, resulting in a clear change since the time of the interviews. In such cases we note these changes by use of italicized text following the commentary. The commentaries are presented on the following categories:

- Program Start-Up
- Operational Issues
- Utility Partnerships
- City Partnerships
- Marketing and Reaching Energy Consumers
- Tune-Ups and Events
- PEAK Activities
- City Team Views of Support, Roles, and Meetings
- Contractor Views of Training and Program Benefits
- Utility Views of Program Delivery

Program Start-Up

ENERGY COALITION VIEWS

Overall the staff had a very positive view of the first ten months of the CEP. All ten partner cities were actively engaged in working with the Coalition by February 2004, and the PEAK Student Energy Actions program was well underway.

However, the Energy Coalition felt that the lag between CEP project approval by the CPUC and contract signing with the utility caused a problem. The CEP proposal was approved for funding in December 2003 and the contract was signed April 24, 2004. This time lag created challenges for the Coalition. They had been implementing the Six Cities Program and had anticipated being able to transition straight to the CEP. The Coalition had begun the process of working with the cities to gain commitments and agreements prior to preparing the proposal to the CPUC. Thus, the new cities were ready to get started and to accomplish their goals by the time the proposal was approved; the Coalition wanted to begin implementation as soon as possible, but the funding was not available.

The Coalition did use reserve funds to maintain as much momentum as possible during the lag before CEP funds were available, but these funds were not sufficient to allow the Coalition to be fully operational. Staff did report, however, that despite this difficulty the transition was essentially seamless.

The original budget for a twelve-city CEP was $7 million, or $583,333 per city. Two cities backed out and the CPUC accepted the proposal for ten cities. The approved budget for a ten-city CEP was $5 million, or an average of $500,000 per city. Among the ramifications of the reduced budget was that the Partnership could not establish a satellite facility as originally planned. Instead it had to offer all services from a central office, substantially increasing travel time within the larger geographic area of the ten-city Partnership.

Additionally, some anticipated staff increases could not be achieved, further stretching human resources. However, the Coalition was able to increase the staff level from 2.75 full-time-equivalent (FTE) employees for six cities to 8 FTE for ten cities. This allowed for more formal specialization of responsibilities among the staff and was a significant improvement.

CONTRACTOR VIEWS

Overall, the contractors were not satisfied with the volume of work generated in the cities during the Partnership's first year. Work was described as slow and inconsistent. A number of factors attributed to this inactivity. It was suggested that the Coalition was preoccupied with issues other than tune-ups. This was followed by inadequate lead generation activity by city team leaders throughout the year, which was then followed by extremely wet weather conditions during the winter of 2004.

Timing was critical in certain cities where contractors only had a few months to conduct tune-ups due to weather conditions and resident availability. In one case, contractors were ready to begin work in a city, but "the program itself was not ready."

Contractors understood the intent of allowing city team leaders more involvement in the program, but felt city employees were already overworked and did not have the time necessary to generate leads for the program. Contractors expressed a strong desire to generate leads for the program but were not authorized as part of their contract with the Coalition. *This situation was recognized and the contractors were allowed to generate their own leads for tune-ups.*

In April 2005, contractors indicated that things were finally taking a turn for the better. The loss of the Coalition's operations manager in December 2004 was the turning point. The communications manager took over responsibility on an interim basis up until the position was filled in February 2005. Although Coalition staff resources were stretched thin at this point, contractors expressed strong satisfaction for the way the communications manager juggled both hats. From February to April 2005, contractors were in constant contact with the new operations manager. Although it took some time for the operations manager to get up to speed on the program, contractors were excited that the new manager showed interest in them as a business partner and that their issues were being addressed.

The Coalition operations manager began working in collaboration with the contractors to revitalize their enthusiasm for the program and address their issues. Weekly meetings were established as a result of one contractor's desire to shore up communication issues. By April of 2005 contractors were once again allowed to generate leads for the program.

UTILITY STAFF VIEWS

Prior to the start of the program, some staff were skeptical how the program would accomplish its goals because so much was riding on the educational and training components of the program, and one utility has concerns about the administrative costs of the program. In general, utility staff saw two basic elements of the program – partnerships and energy savings. They tended to view the city relationships developed by the Coalition as beneficial. At the same time, they had some concerns about energy savings, particularly gas measures, as well as other areas such as direct install and education in which initial progress had not met expectations.

The CEP was viewed as a beneficial supplement to large-scale programs offered by the utility partners. Most utility programs were described as mass scale and the utilities saw the CEP as a way to augment their efforts with smaller localized programs with unique community-based approach. The demonstration projects, education, outreach, excitement, and neighborhood organization were mentioned as important aspects of the program. The utility partners strongly valued the CEP's potential to "leverage funds" by informing customers about other programs.

CITY TEAM LEADER VIEWS

Most team leaders believe their city's "blessing" is a substantial benefit to the program. They also believe their involvement makes the program more personal than "the general utility programs," and that city sponsorship adds an element of trust.

The only significant negative issue raised by city team leaders was an initial sense of confusion regarding the program's definition and the specific expectations for the cities and their staffs. Some attributed this confusion to inadequate communication from the Coalition. This has resulted in not having a clear understanding of the Coalition's responsibilities or what it can provide to the cities. Some team leaders felt they received mixed signals from the Coalition, and some were unable to carryout CEP duties because they were not sure what those duties were. The mixed signal issue appears most significantly with respect to the criteria for lead generation. The team leaders believe regular, on-going, and consistent communication will solve this problem. One team leader suggested adopting the PEAK e-newsletter format.

According to most team leaders and Coalition personnel, additional Coalition staffing needs to be achieved in tandem with the increased demands and quantity of partner cities. Some team leaders feel the Coalition has not grown fast enough in the ten cities program, but at the same time these contacts note that the Coalition has "always managed to be there when you need them… and are enthusiastic at the same time."

Most team leaders were very satisfied about the program's delivery, value to the community, and its "potential to have a huge impact on a lot of people through very little effort." The Coalition and the program concept were described very positively. One mentioned that the CEP's city-based approach is an advantage over the community-based approach of the previous program. Another team leader reported that the "concept is unique and fantastic and selfless. We respect them as an organization."

Initial views of the program were generally positive. A few team leaders felt they became more negative as the program progressed. Reasons cited for this increased negativity include:

- The amount of time to get activities off the ground
- Not being able to try new things
- Lack of follow-through and communication
- Too many "false starts"
- Natural disasters
- A "big staffing change" at the Coalition [losing the operations manager]

Some team leaders feel the communication issue has not been corrected and has gotten worse as the program has expanded.

Most team leaders reported no problems getting volunteers for various events, but two did indicate difficulty with this. One team leader felt a little disadvantage being a "new

city," and one felt it would be beneficial to have another "old city" guide the new cities through the process. A few cities felt the energy district idea was unnecessary.

Overall, most team leaders feel the program is doing "surprisingly well" considering its staffing levels. One team leader stated, "They have held up their end, they are very energetic, which is refreshing. It was great to have fresh enthusiasm." Others described situations in which the Coalition staff "pulled through and stepped it up" when assistance was needed. Generally, team leaders feel the Coalition is doing its best "with what they got," but feel, at times, the Coalition is stretched too thin and is unable to provide the needed support.

Operational Issues

ENERGY COALITION VIEWS

By February 2005, most of the concerns resulting from the funding delays, reduced number of cities, reduced resources, and elimination of the planned satellite office were past. Even the loss of the operations manager, which had occurred in December 2004, had been resolved. There was a new operations manager and some additional new hires and the project was well underway. The Coalition did report that having ten cities spread throughout Southern California sometimes precludes some cities from having even, steady communication on program activities.

The Coalition also mentioned an additional funding problem. It believes that the disbursement checks received from the utility arrive between two and four weeks later than the contractual agreements specify. The Coalition has to use reserve funds to maintain activities.

CONTRACTOR VIEWS

Contractors are highly satisfied with the progress made by the new operations manager. They are encouraged by the increased communication received from the Coalition and their engagement in the lead generation process, which resulted in increased work activity.

The contractors' suggestions for program improvement continue to be acknowledged by Coalition staff. Described as a team effort, contractors have provided feedback to the Coalition throughout the development of the program, and they are satisfied with the attention their feedback receives. They cited several examples of specific recommendations they have made that have been implemented as the program evolved.

The two installation contractors continue to work with each other in a relationship described as cooperative. They assist each other when supplies are low, they share vendor contact and cost information, and they have even mentored each other on how to process the paperwork for various utility incentive programs.

UTILITY STAFF VIEWS

All three staff members said they would recommend the CEP to other utilities. One utility employee also reported having discussed the CEP with their colleagues at PG&E as they "are not shy about sharing" the good things that are being done.

Generally, the contacts believe the program is going in the right direction. They realize the program targets only a small portion of their customers, but hope it continues to draw attention to energy efficiency. They are particularly impressed with the Coalition's ability to penetrate school districts and local governments. They consider it a proven concept that partnerships between cities and utilities can work when an organizations such as the CEP facilitates the process. They view the Coalition staff as very effective.

The utility representatives believe they have good relationships with the CEP team, but feel that more face-to-face interaction would be beneficial. They consider the CEP a valuable program to continue to support. They believe it can be tweaked and modified as needed as it moves from city to city.

Utility Partnerships

ENERGY COALITION VIEWS

Energy Coalition staff reported that currently there is not enough functional interaction between them and utility staff. The Coalition had hoped that SCE would locate a staff member in the Coalition office to facilitate coordination, but that did not happen. They do note, however, that the SCE program manager does attend meetings and will usually be somewhere if asked.

The Coalition felt that the utility was not strongly supportive of some of its innovative marketing or implementation techniques. The Coalition pursued some of these ideas independently of the utility. *(Utility personnel have responded that the specific activities for which the Coalition wanted this support, some of which involved international activities, were clearly beyond the scope of the program and even beyond the scope of what it considered legitimate use of public goods charge [PGC] funds.)*

Energy Coalition staff would like to improve their own and their contractors' understanding of the utilities. They are also open to coordinating more with utilities. At the same time, the Coalition acknowledges a mixed response from the cities about utility involvement. Some of the Partnership cities (including some of the more active ones) have hostile relationships with one of the utilities concerning issues unrelated to the Partnership. Other cities have positive relationships and want more involvement. Energy Coalition staff were occasionally put in a mediatory position regarding these complex relationships.

CONTRACTOR VIEWS

In general, the contractors described the partnership model as a good tool; however utility involvement was characterized as minimal. They want more information. They indicate that they received about thirty different hand-outs on various utility rebate programs to distribute to tune-up participants. However no further program insight or training was received on these programs. The contractors were not necessarily able to assist customers because they did not understand which of the thirty programs were best applicable to their customers. Utility staff have indicated that their accessibility to the contractors had been limited but they feel this problem has now been resolved.

The contractors also want to offer customers the chance to receive a utility program application on the spot and answer any questions they might have about the process. They don't feel providing contact information is sufficient. If they were allowed to assist customers with other program applications, they feel it may increase customer interest and participation in certain rebate programs. "Making the most out of an opportunity" is how one contractor described it.

Contractors are unclear what the utilities want from them. It was suggested that utilities should specify two to three different rebate programs to target for small business and residential tune-up recipients. This would reduce the number of programs the contractors and customers have to choose from, as well as increase the opportunity to

understand each program's requirements and application processes beyond a superficial level. They also believe it would be helpful for them to be given routine updates on funding availability in each applicable program. There was some concern that installers would generate interest in a rebate program that had run out of funds and had already closed.

UTILITY STAFF VIEWS

The utilities see the partnership as an effective means to capture customer diversity. Although it was mentioned that the CEP targets underserved customers "very well," they saw a need for greater coordinated efforts with other utility programs. There is concern that participation in a CEP tune-up could preclude participation in other available programs that could provide greater benefits to a customer. The utilities see a primary role for the CEP to be a vehicle by which customers can participate in an optimal set of programs, rather than only providing tune-ups and generic information. They would like to see other programs interfaced with the tune-ups.

Utility staff realize they do not have the time commitment necessary to participate in all events the Coalition desires. No additional staff can be assigned to the partnership and these staff members feel that the utility's funds are paying the Coalition to be their representatives.

Some utility staff reported philosophical differences with the Coalition staff regarding CPUC reporting. It had taken some discussion to sort out what the CPUC requirements were and how the CEP should prepare its reports. The staff member said this issue has been resolved.

The utilities expect the Coalition to market the CEP and the utilities' programs. None of the three utility staff members were aware of any promotional or marketing efforts made on the CEP's behalf by the utilities and none of them saw it as their role to outreach for the CEP to individual customers who might be eligible.

CITY TEAM LEADER VIEWS

City team leaders were fairly well divided as to whether they felt the utilities were involved adequately or should be either more or less involved than they presently are. The views by the different cities regarding the utilities ranged from very positive to very negative. General views of the utilities appear to influence each city's opinion regarding the desired level of utility involvement in the CEP.

Almost all team leaders believe that utilities could and should do more to help with outreach and lead generation. Examples cited include:

- Provide customer account information for all customers that meet CEP eligibility criteria
- Provide utility bill inserts regarding the CEP to eligible customers

Some team leaders felt communication with the utilities was difficult, indicating that direct contact was nonexistent. Some felt the utilities did not know how to work with the cities. Some team leaders strongly felt that utility personnel should not be present at team leader meetings. There is concern that utility staff were acting as "watchdogs," and believed team leaders would be more open and honest in sharing information and insights if utility staff were not there. (We note that this issue pertains primarily to one utility and not the other, as the contentious relationships primarily arise from electric municipalization efforts in one or more of the partner cities. As noted before, these efforts are not directly related to the partnership but, particularly within the cities, may involve the same staff members.)

Other team leaders favored increased utility participation and offered some suggestions such as clarifying the specific roles of the utilities and their staff to the team leaders, as well as having the utilities present their program offerings so that team leaders can gain a better understanding of their programs. These team leaders believe that funding more high-level, large-scale demonstration projects would also help.

City Partnerships

ENERGY COALITION VIEWS

The CEP focuses on involving elected city leaders such as mayors and city councils to spread the message to all communities within their city. These city officials have helped promote the Partnership by generating attention and raising awareness at city council meetings or other city-related events. Additionally, elected city leaders are able to influence the adoption of energy plans or green building standards. Most cities have existing programs for environmental services such as recycling, water, waste treatment, or housing services; the Coalition is able to offer cities an additional environmental service: energy efficiency education and direct install services.

Coalition staff estimated that about half of the cities they approach eventually agree to participate. Reasons for nonparticipation typically involve the city not having enough staffing resources or not having room in their budget. Staff report that they do not apply pressure when they encounter resistance from a city, even if the Coalition has invested a significant amount of effort.

When the Coalition identifies a new city that is interested in participating, the first step in the process is to gain a city's formal commitment to the CEP effort. This is accomplished through an MOU signed by the city council, the mayor and the Coalition. At this point and throughout the process, the Coalition tries to get the city council to set energy efficiency goals for the city.

The active involvement of city officials is seen as a key to ongoing success, and the Coalition makes an effort to be in front of city councils at least once every six months to keep them informed about activities. Staff noted that one concern arising from working with elected officials is that they are not always re-elected. However, staff indicated there were no collapses in relationships following the last election; it just took a bit of time to reconnect with new officials.

As part of the partnership agreement, the city must make a commitment to provide a contact person, who becomes the "team leader" for the CEP at the city. Team leaders are sometimes the head of a community service department such as economic development or public works, but in other cities they are subordinate administrative personnel. The city must commit to providing an office for the Partnership; the intention is that Partnership activities come to be seen as part of the city.

Team leaders are brought together occasionally for field trips, business meetings and trainings where they can get to know each other, gain resources from one another, and also learn about how other cities have invested in energy efficiency and what challenges they faced. The Coalition staff believes that fostering communication among the team leaders helps encourage them to stay involved with the program. Over time the Coalition staff work with each city to identify how the city can be more proactive about energy efficiency.

CONTRACTOR VIEWS

Contractors described city participation as having made great progress for the program. Although lead generation by city team leaders was not as successful among all cities, some cities were able to provide many more leads and feedback to the contractors. Direct communication with team leaders in 2004 had been minimal. By April 2005, however, contractors were talking directly with city team leaders. This led to more involved direct working relationships between the cities and the contractors.

UTILITY STAFF VIEWS

There is a concern that city team leaders are not aware of how they can help the utilities. It was suggested that team leaders could help the utilities by being aware of and promoting various efficiency programs. For example, the utilities would like to see the cities distribute information at public places, such as civic centers and permit offices. The utility staff realize they may need to take on a larger role to help the cities accomplish this, but feel the cities are obligated by the partnership relationship to provide this outreach.

The utilities expressed concern that the Coalition personnel sometimes perpetuate negative perceptions of the utilities that are held by some of the cities. Utility staff believe that the Energy Coalition staff should do more to develop positive views of the utilities among various team leader members.

CITY TEAM LEADER VIEWS

We asked the team leaders how interested they felt their city governments were in the CEP. Five of the thirteen respondents said “very interested,” seven said “interested,” and one “did not know.” Interest tended to grow over time as newer cities tend to be less interested according to survey results.

Marketing and Reaching Energy Consumers

ENERGY COALITION VIEWS

After receiving a city's formal commitment to the program, the Coalition begins the work of identifying who the stakeholders are in the city and planning a marketing and communications strategy to reach the various important audiences, including trade associations and anyone in the city already involved in working locally toward energy efficiency. Planning the communications strategy also includes learning about what media outlets or information sources would be effective ways to reach the targeted audiences.

Soon after the city commits to participating, a kickoff event is held, usually focused on city employees. This enables the Coalition to gain support from city employees, to explain the program to them, and to distribute some energy efficient light bulbs to people who can then be advocates to community members for the Partnership. By February 2005, all of the initial kickoff activities with cities had been completed.

Each city's team leader works with the Energy Coalition to identify a target area in the city for Partnership activities. They look for areas with a large proportion of populations typically defined as underserved. Services are not, however, limited to these populations, but are open to all city residents.

Once the target areas are established, the Coalition staff will reach out to area businesses and residents. They raise awareness about program activities, generate interest in energy efficiency, recruit participants for tune-ups, and also, where possible, identify leads on potential energy-efficiency improvement projects.

CITY TEAM LEADER VIEWS

Community events are perceived positively, and most feedback from citizens has been positive. Some of the older cities sense they are achieving a high level of saturation regarding the standard events such as CFL distributions, torchiere trade-ins, and tune-ups.

Some comments and suggestions regarding outreach include:

- Continue the "feet on the street" approach.
- Tie all the planned events in a city together in a unified manner to help increase awareness.
- Have information on energy efficiency, solar power, and related subjects available for residents when they ask.
- Make sure contractors coordinate lead generation with the city team leaders.
- Provide team leaders specific eligibility requirement guidelines for commercial demonstration project to avoid marketing to ineligible or inappropriate customers.

- Move away from tune-ups to "spreading the message."
- Develop joint efforts that incorporate city and CEP programs.

A few initial Partnership energy districts were reported as too problematic (high crimes/drugs) or too affluent to meet "underserved" criteria. This resulted in a need to relocate those energy districts. One team leader reported specific feedback from small business owners regarding the demonstration projects. Specifically, these business owners felt they did not have time for the open house and publicity requirements and therefore were not able to participate.

Some team leaders report good success "piggy-backing" CEP events onto larger community activities. Promoting the CEP through city newsletters, water bills, television stations, and other municipal tools is also reported to be successful. However, one team leader reported that using a city-wide publication resulted in resentment by citizens not living in the specific energy district. Some team leaders believe incorporating their city's logo onto marketing literature is helpful.

CONTRACTOR VIEWS

An energy district's boundaries sometimes affect lead generation. On occasion, strict boundaries have prevented what seem to be geographically close communities from being targeted. Contractors indicated that some cities have flexible boundaries while others are rigid. The contractors suggested that all energy districts should be allowed to spread their boundaries if resistance or saturation is evident.

UTILITY VIEWS

Two of the three utility staff interviewed are satisfied with how the marketing and educational materials present the utilities as partners in the program. The other utility person felt that the Coalition dominates the image projected, and it is not sufficiently clear that the program is funded by *utility* ratepayer dollars.

All utility staff reported being somewhat satisfied with the current marketing activities. They believe the Coalition is doing a good job promoting events and PEAK, as well as using the media and organizing community events. They hope these efforts produce actual results and wish additional marketing of other utility programs would occur.

Tune-Ups and Events

ENERGY COALITION VIEWS

Coalition staff believe an important consequence of doing the tune-ups, in addition to directly installing measures that begin saving energy immediately, is getting the participants talking about and working on energy efficiency. It also helps empower them with the knowledge that there are tangible steps they can take toward conserving energy.

In addition to canvassing neighborhoods and businesses to recruit participants in the tune-ups, the Coalition stages various events to help generate interest and leads. Events such as energy-efficient bulb and fan sales or giveaways, energy rallies, and torchiere trade-ins have all been used as part of the Partnership.

In their initial contractual agreement with the Energy Coalition in the CEP, contractors were not allowed to help generate leads. (This was a change from the 2002-03 program.) The Coalition felt that limiting contractor responsibility in generating leads will improve the quality and length of tune-ups. This proved problematic from the standpoint of getting customers to sign up for tune-ups and was also a dissatisfaction point for the contractors. A midstream programmatic change enabled the contractors to provide leads for tune-ups.

While the two installation contractors attend meetings and trainings together, they do not work together – one or the other is assigned to work in a given location. However, the two contractors have cooperated independently of the Coalition to help train each others' staff, and there have been occasions when one of the firms, unable to complete some work it had been assigned, handed it off to the other firm.

Coalition staff indicated that attendees of community events are often reluctant to divulge personal information, even if they were interested in receiving a tune-up. As a result, they try to ask for as little personal information as possible. This is characterized as a key to successful recruiting. They also try very hard to eliminate unnecessary paperwork and restrictions on participation, believing that this could may lead to negative experiences that might undermine the message of energy efficiency. For example, the Coalition will allow residents of non-partner cities to participate if they express a great deal of interest while attending an event in a partner city. Not letting them participate would weaken the overall strategy.

CONTRACTOR VIEWS

In the CEP program, small business tune-up participants receive $500 worth of product and labor as opposed to the $1,000 they received during the Six Cities program. Contractors noted that this reduction increased difficulty in generating small business interest. After the fixed-fee of $100 is deducted, some small business owners were reported as being dissatisfied with the amount of product they would receive with $400 and declined

participation. Some small business owners were disappointed that only a few of their T12 lamps were replaced due to the limited allowance.

One of the contractors has been successful in mitigating this issue by leveraging funds offered by the Express Efficiency rebate program for small businesses. This contractor has since trained the other contractor on the Express Efficiency rebate application process. The contractors report that satisfaction among the small businesses improved with this approach.

PEAK Activities

ENERGY COALITION VIEWS

In prior years, PEAK activities were promoted and coordinated by one teacher, who championed the program to the school and the district. This was not as successful as the Energy Coalition had hoped. The Coalition developed a new approach by hiring its own curriculum specialist to revise the curriculum and to run the PEAK program coordination and training activities. This, along with the Partnership's approach of cultivating the assistance of city officials, has resulted in the Coalition having greater success in getting PEAK implemented. As of February 2005, there were more districts interested in participating than funds available.

The PEAK effort begins with the Coalition staff contacting the superintendents and school boards of the school districts in the CEP cities and giving a brief presentation. The cities' team leaders typically assist in establishing these meetings. During the presentation, the school officials are exposed to PEAK materials and toolkits, and receive information about how much class time will be required. The Coalition believes PEAK is attractive to schools because it is free, hands-on, standards-based, and socially relevant.

Once a school district agrees to participate by signing an MOU, the superintendent assigns a district staff person to serve as a PEAK Ambassador and to work with the PEAK (Coalition) staff. Districts choose the time of year for PEAK implementation. The ambassadors make decisions about which grade levels will use the curriculum and coordinate teacher training. In most districts, ambassadors also recruit teachers to participate and use the lesson plans and other program materials. Some school districts have required all teachers of related subjects to participate. Participating teachers are asked to attend a training session and sign an MOU agreeing to incorporate ten hours of PEAK activities in the classroom, use the PEAK curriculum, and keep an informal log of their activities.

Each student gets a CFL, a flyer, and a cover letter informing the parents that their child is learning about energy efficiency. Students are prompted to talk to their parents about the material they are learning, but there are no materials directed to parents per se. CEP staff believe students will use their newly acquired knowledge at home, at school, and in the community to help conserve energy.

There are a number of extra ways some participating schools have chosen to promote energy efficiency, and the Coalition works with schools on these ideas when schools express interest. Some schools choose to have a fundraiser where they sell CFLs. Some schools have wanted to hold after-school activities open to all students at the school. PEAK has worked to develop materials for these extracurricular activities. If a school wants to do an energy efficiency improvement project, they can also work with the Coalition and its contractors to explore that.

The Coalition likes PEAK schools to be located in an energy district so that PEAK activities can be coordinated with other aspects of the Partnership. Such coordination is valuable because students can be sent home with tune-up worksheets, which can help

identify leads; involvement of students in street fairs and other events also help generate public interest and attract press coverage.

Key PEAK activities during the first eight months of the CEP project were the hiring of a curriculum specialist as part of the Coalition staff to manage PEAK and the redesign of the PEAK curriculum to conform to California curriculum standards. Additionally, a natural gas fuel component was added to the program materials and a software tool, taking the form of a computer game, was created to help engage students with the subject matter. The new PEAK manager also developed training materials to introduce the revised curriculum to teachers and developed an e-newsletter to keep teachers motivated and informed about PEAK throughout the school year. Additionally, activities and contests were designed to help keep the program rolling throughout the year. Contest winners are typically honored before city council meetings, providing additional opportunities to generate public interest and awareness.

Working in tandem with the PEAK program coordinator and using the Six Cities final evaluation report as a guideline, the new PEAK manager improved on a number of issues that surfaced during the 2002-2003 Six Cities Program. During the PEAK manager's first week on staff, objectives were set out and a framework was developed. This resolved the issue of not having an operational plan of attack for the school year. Table 47 describes what issues the operational plan addressed:

Table 47: Issues Addressed by PEAK Operational Plan

Issues	Actions Taken
Lack of direct/consistent involvement and communication with teachers and ambassadors.	A proactive approach will be taken in the 2004-2005 school years. Monthly PEAK teacher e-newsletter and well-planned contests throughout the school year will be implemented to keep up rapport among teachers. PEAK outreach assistant will be responsible for "on the ground" in classroom work.
PEAK needs to be self-sufficient and self-sustaining.	According to the PEAK program manager "The PEAK program is organized in a different way that is more useful…. The message of energy efficiency is being clearly integrated in the classroom."
New student software needs to be finalized and made available in a timely manner.	A timeline for completion was set. The new software program allows students to simulate energy-efficient changes and allows students to set up their house "as is."
Internal systems need to address tracking components.	Cleaned-up systems that existed and developed programmatic tracking systems of teachers, students, and tool-kits.
Non-existence of marketing and outreach materials.	A one-page PEAK overview was developed.
The PIP required four natural gas labs to be added to curriculum.	The lesson structure was reorganized to include these units.

Table 47 (continued): Issues Addressed by PEAK Operational Plan	
Issues	**Actions Taken**
The Six Cities PEAK curriculum design and format did not project to teachers user-friendliness or its ability to address educational standards of the state.	The CEP PEAK curriculum was redesigned to clearly address these issues. 12 lesson units were established each containing the classroom time of the lesson, a lesson description, learning objectives, the PEAK Student Actions, vocabulary words, and descriptions on which California academic content standards are being addressed.
During the Six Cities PEAK, some teachers did not know the procedure for requesting additional supplies for student toolkits.	A resource section was included in the CEP PEAK curriculum teacher handbook that contains a tool kit supply reorder form that can be faxed directly to the Coalition.

According to staff a key goal in using the Coalition staff for PEAK is to ensure that the energy efficiency message is conveyed in the curriculum and in the training of teachers. PEAK staff expressed a desire for a better way to evaluate the effectiveness of their efforts and reported they are working on this.

CITY TEAM LEADER VIEWS

Team leaders generally had very positive opinions about PEAK. They believe both faculty and students have been very excited about it and that it has been successful at getting out the message of energy savings. They feel the PEAK participants have a better understanding of the power system's statewide peak demand. One team leader suggested that PEAK should establish graduates, with certificates of completion of the program. Another suggested developing a college-level version of PEAK that would address student housing and campus facilities.

City Team Views of Support, Roles, and Meetings

Team leaders expressed significant positive and negative aspects of communication with the Energy Coalition. Generally, they appreciate the positive, energetic, and inspiring nature of particular Coalition staff members.

Some long-term team leaders were frustrated with the limited energy efficiency knowledge of some new Coalition staff. On the other hand, some team leaders appreciate the proactive approach of the Coalition staff, their willingness to "come in and start doing things," and their ability to fill gaps and help with initial fund acquisition.

A few cited the PEAK newsletter as an example of excellent communication. They wish a similar tool were used for city activities, and included tune-up progress.

Some reported difficulty getting in touch with Coalition staff when they are "out of the office." They believe increasing the Coalition staff size would alleviate this problem.

Overall, six of thirteen reported being "highly satisfied" with the support they receive from the Coalition. Six were "satisfied," and only one was "not satisfied."

The city team leaders are responsible for coordination between the city and the Energy Coalition, as well as helping interface with customers and organizations in their cities. They conduct a wide variety of activities and range in level from staff personnel to department managers. Team leaders were initially responsible for lead generation.

The Coalition looks for active cities and specifies a full-time equivalent expectation for city staff participation. However, 63% of the team leaders said that there is "not a required amount of time that they need to spend on the program." One quarter of the team leaders stated that they do not have enough staffing resources to accommodate involvement but "jostle things around to make it work."

Some team leaders are unclear as to who is actually responsible for generating leads within their cities; others felt lead generation is a joint effort and shared with the Coalition; some stated that the responsibility has fallen on the Coalition. The team leaders noted that the flexibility of the program in sharing responsibilities was necessary and important and cannot change but has also led to an issue of undefined roles. Initially, team leaders reported taking responsibility for lead generation. However over the course of the first year, they have seen contractors and Coalition staff take on those responsibilities. Some noted that it is important to keep them updated on any changes to their roles and expectations before others proceed to take over responsibility.

On a similar note, some team leaders are concerned that events and activities are occurring in their cities without their knowledge. They feel they have lost control of activities occurring within their own city and would like the Coalition to communicate with them on a more consistent basis.

Almost all of the city team leaders have spoken to other employees within their city regarding what they have learned by being part of the CEP. Most also report that other city employees help with the CEP. A significant number of team leaders want to take

ownership of the program within their city. Some do not know how to do so. These leaders feel that the Coalition would not give them "ownership" because their focus on "other city duties" is sometimes "perceived as disinterest" in CEP responsibilities.

Some team leaders liked the rotating locations of the meetings. Others would prefer a single, central location. One suggested that future cities should be selected based on geographic proximity to current partner cities. Another suggested grouping team leader meetings into regions to decrease commute length.

The team leaders overwhelmingly find the team leader meetings beneficial with thirteen out of fourteen saying so. The benefits included:

- Camaraderie and meeting people
- Discussion of what worked and what did not
- Learning about energy issues
- Showing off successes
- Learning from more experienced cities
- Avoiding repetition of prior mistakes
- Finding ways to get internal city departments interested
- Peer assistance toward solving specific problems
- Creative marketing
- Learning about current Coalition activities
- Learning what other cities are doing
- The Excel spreadsheets listing each city's activities

Some team leaders offered suggestions to improve the meetings. They included:

- More preparation by the Coalition, but not a "rigid agenda"
- Goals for each meeting
- Fun and games are good, but more discussion time is needed
- Meet every other month rather than quarterly
- Do not have utility personnel in attendance
- Send out "meeting minutes wrap-up" to everyone to help those not able to attend
- Give more time to the new cities

Some team leaders would like more specific feedback about the success of events – how many bulbs distributed, torchieres traded in, participants, etc. Some expressed a desire for direct interaction between cities in which city participants have the floor, not just city-Coalition interaction.

Contractor Views of Training and Program Benefits

Per their contract with the Coalition, contractors are required to have all employees (involved in the CEP) attend a training workshop. Training workshops were conducted by the Energy Coalition at Edison's CTAC or at the contractors' offices. Training workshops were reported as highly beneficial and have made installers more efficient and knowledgeable. One contractor stated that no employee will conduct a tune-up without being trained by the Coalition, while the other contractor said new employees sometimes do not receive direct training from Coalition and instead receive it in-house.

According to one contractor, many people that received training are no longer part of the company. The turn-over rate of employees has created a constant need for additional training throughout the program cycle.

Training workshops were described as an opportunity to hear feedback on past mistakes, what not to do, and how to do it right. Contractors expressed a desire for workshops to be more constructive in terms of addressing important measures. Contractors suggested that time should be spent problem solving innovative ways to approach the issues that occur in the field. One suggested that field training is best in training new employees.

Contractors would like to receive overall feedback from the Energy Coalition regarding customer satisfaction – both negative and positive. They do tend to hear some of the complaints about their work, but they rarely hear positive feedback. They also have never received feedback from city team leaders and would like to know their opinions.

The contractors indicate that their employees are motivated because they are working for a program that is endorsed by the cities, and that makes their job a lot easier. Some cities have even given installers their business cards to hand out during tune-ups to alleviate skepticism. The cities with more money and resources tend to do better than the cities with limited resources.

The contractors see the Energy Coalition as different in that it's all about the people, even to the point of enhancing the communication skills of tune-up installers. Installers have acquired abilities to address customer concerns about the program and educate customers on the benefits of energy efficiency. In addition, they have learned how to engage customers in conversation, and have polished their professional image. They have turned into "sales people" and deal with incidents differently now than prior to the program.

The contractors also cited examples of how the program has had positive affects on the behaviors of residents in the community.

Utility Views of Program Delivery

The utility contacts perceive the Energy Coalition as having the ability to do outreach in the community "in a way that is cost-effective." The contacts noted that the Coalition has accomplished this by aggregating existing frameworks and bringing people together to create a critical mass. This framework also makes it more cost-effective for the utilities to deal with the cities since it allows the utilities to deal with "one team" rather than ten individual local entities.

Initially, the utility contacts felt that the Coalition did not want to promote programs other than the CEP and wanted to focus on Coalition activities, not utility programs. Although the Coalition staff has provided references and comments regarding utility programs at team leader meetings, actual presentations have not occurred. By the time of our mid-term interviews, the utility staff felt this has been improved.

Contacts noted that a barrier to program delivery is the inability to offer a "full service solution" to the customer. In performing energy tune-ups, the utilities suggested that contractors should carry all available program information so that when a customer receives an audit, the contractor can then use this information to best approach the customer regarding participating in other utility programs. *Contractors are interested in doing this but want the utilities to select one or two programs for them to focus on, not be responsible for the whole spectrum of utility programs available.*

There is an expectation that some "take-up" of utility programs will occur through the CEP, however the interview also found that no processes have been established to track an increase in utility program participation as a result of the CEP. There is also belief that the PEAK component could be a huge benefit for two reasons – it involves behavioral change, especially to parents, and it provides an incentive to upgrade old inefficient appliances.

INTER-ORGANIZATIONAL RELATIONSHIPS

The EM&V plan listed a series of interactive relationships that we would explore, evaluate, and provide recommendations. Those relationships are the following:

- The Energy Coalition (TEC) – utility partnership
- SCE-SCG interaction
- TEC-utility-CPUC interaction
- TEC-city partnership
- Utility-city partnership
- TEC-school coordination and cooperation
- Utility-school interactions
- TEC-contractor interactions
- Utility-contractor interactions
- Contractor-contractor interactions
- City-contractor interactions
- Internal staff relationships at TEC
- Individual TEC-utility staff relationships
- Individual TEC-contractor staff relationships
- Contractor-customer interactions
- Administrator-principal-teacher interactions within schools
- City-school district interactions
- CPUC→Utility→TEC→Contractor cash flow
- CPUC-utility-TEC-contractor administrative requirements and procedures

This chapter of the report provides sections on each of these relationships along with our observations. The information we provide includes the opinions of various Partnership staff (Energy Coalition, utility, city, school, and contractor employees). It also includes our professional thoughts based upon direct observation of many Partnership activities and our many years of experience with both utility energy efficiency programs and interactive team work.

Communication, Coordination, and Staffing

One generic issue occurs throughout most of the relationships, and that is communication. Although most topics are discussed as they relate to the specific relationship in which they arise, this issue is sufficiently common and prominent to discuss on its own, thus avoiding duplicating comments in multiple sections.

The Partnership is made up of several different organizations. In fact, the term *partnership* itself is used to refer to several relationships, sometimes excluding others. The Community Energy Partnership grew out of the Six Cities Program, a non-utility energy efficiency program in which the Energy Coalition and the six cities were the "partners." The reformatting of the CPUC funding to emphasize "partnership" activities between utilities and other organizations during the 2004-05 program cycle created the new concept of the "SCE-SCG-TEC Partnership." While this transition was keen in the eyes of the CPUC, the utilities, and the Energy Coalition, it was largely invisible to the other partners.

As with any multiparty partnership, the various relationships can be complex and sometimes at odds with one another. We strongly caution that the "partnership" concept be interpreted in an inclusive, rather than exclusive, manner. Sometimes complex organisms are best described by what they are not. The Community Energy Partnership is *not* an arrangement between two utilities and a non-profit organization to which other groups (such as cities) are invited to join in some subordinate manner. Likewise, the Community Energy Partnership is no longer an arrangement between city governments and a non-profit organization that receives funds from the utilities. *At the least* it is a partnership between thirteen different entities – two utilities, ten cities, and a non-profit organization. One might also consider the school districts "partners," and perhaps even the installation contractors. While each partner may have a specific role, it is not constructive to create a "class system" within the partnership. This is especially true regarding the utilities and the cities – both of which could have an understandable but nonetheless illegitimate claim to being the only "true partners" of the Energy Coalition.

We also would hope that the Partnership team of utilities, cities, Energy Coalition, and perhaps school districts would reach consensus on all decisions. This may not occur at all times in reality, and there should be a formal process in place by which non-consensus decisions are made. This process should be fair and equitable to all concerned. We realize that this is not easily defined. A one-vote-per-entity rule would give the cities clear dominance. The other extreme – voting by controlling funds – is equally problematic. A team that is used to working together on a consistent basis should be able to handle the nuances of complex decision-making. The cities may have more to say, for example, on selecting outreach activities than formatting CPUC reports, and vice versa for the utilities.

We also point out that communication – or more correctly the lack thereof – was the one complaint that surfaced in almost all areas. It was not a loud cry because there is a general feeling that the people are personally easy to work with and an understanding that most of the lack of communication came from having too much work and too little time. Because this trait tends to describe most of the players in the Partnership, there was a lot of mutual sympathy. This sympathy is a good thing when it comes to maintaining personal

relationships (which were mostly described as positive). Nonetheless, it is not an excuse to overlook the underlying problem of understaffing.

The program met its goals, and from that aspect it may have been staffed at the right level. But, "met its goals" in this sense has to do with technical measuring criteria – conducting tune-ups, distributing light bulbs, teaching students, etc. – and ignores the more elusive goal of building a community of energy efficiency. This larger (and perhaps more important) goal is what suffered most from the lack of coordination and communication, which in turn was caused by understaffing.

If the goal of building a truly meaningful community around energy efficiency is to be achieved, future partners – utilities, cities, and school districts – must be willing to provide the staffing levels needed, and the budgeting must include adequate funds to provide for sufficient staffing within the Energy Coalition.

The Energy Coalition originally thought Southern California Edison was going to provide a full-time program manager who would have dedicated office space within the Coalition office. Whether this thought was a misunderstanding or not, it is still a good idea. It would also be a good idea for the Gas Company. This sort of dedicated staff would enable the utilities to establish themselves as full partners and would facilitate direct relationships between the utilities and the other partners and team players.

Likewise the cities should consider providing a full-time dedicated staff member. Perhaps the city employee would not have to be solely responsible for the Partnership activities, but should be limited to energy-related duties. This would reduce the problem of cities feeling out of the loop with activities within their cities. It would also greatly enhance the "energy efficiency community" aspect of the Partnership because there would be a full-time presence within each of the communities. Perhaps dedication to provide such a person should be part of the selection criteria for choosing which cities become partners.

The Energy Coalition (TEC) – utility partnership

Generally the Energy Coalition as well as both utilities report good working relationships. In the early stages of the two-year program, the utilities reported not being as much a part of the team planning process as they would like, but they report this problem as having been amended. Presumably it was a remnant of the transition from "non-utility program" in 2002-03 to "utility partnership program" in 2004-05.

Also initially, the Energy Coalition felt it was not getting as much assistance from Edison as it had anticipated. This is one of the staff load issues already discussed. The Partnership adjusted, and at least the disappointment and resentment was abated. This does not mean that the Partnership would not have benefited had full-time staff member from one or even both utilities been available. We believe such commitment on the utilities' part clearly would have enhanced the Partnership.

SCE-SCG interaction

Both Edison and the Gas Company report satisfaction with each other's participation in the program.

If the utilities increase the amount of staff time they are able to dedicate to the Partnership, the SCE-SCG relationship would become even more dynamic and interactive. This would be particularly true if both utilities supplied a staff person who had an office in the Energy Coalition headquarters. Future program funding allocations should consider this possibility.

TEC-utility-CPUC interaction

There were initial disagreements between the Energy Coalition and the utilities regarding the required reports to be filed with the CPUC. Generally this can be attributed to a difference in style and approach with regard to the CPUC (as well as formalities in general). These issues, as best we can tell, resolved themselves early in the program period.

A related issue, though it only involves the utility commission indirectly, is the issue of what is an appropriate Partnership activity. The Energy Coalition mentions specific examples of things it wanted to do but could not get the utilities to approve. The utilities responded that some of these things are clearly outside the scope of appropriate uses of public goods charge (PGC) funds. Basically, the Energy Coalition is a liberally minded organization that seeks to use a variety of avenues to reach its goal, some of them very

novel, innovative, or "outside the box." The utilities are more conservative organizations that are used to responding under the scrutiny of regulation.

We do not believe there is a clear "right" answer to this question. It is true that some of the Energy Coalition's ideas were beyond the scope of normal uses of PGC funds. Whether such ideas were appropriate or not is a matter of opinion. It is probably also true that these innovative ideas would have benefited the overall goal of the program. We see both sides of the coin.

The magic of partnership programs – the Community Energy Partnership as well as others – is that they blend the strengths of many organizations, hopefully in a manner that mitigates weaknesses. Among the major benefits brought by non-utility organizations such as the Energy Coalition are flexibility and innovation. On the other hand, one of the major benefits brought by the utilities is their long experience working within the political realm of the (de/re)regulated environment. The Partnership will flourish when it operates somewhere between unbridled enthusiasm and stagnant repetition. All of the partners, as well as the regulatory authorities, should bear that in mind.

TEC-city partnership

For the most part the relationships between the cities and the Energy Coalition were positive. The cities were not randomly assigned to the program, but rather were selected and encouraged by the Energy Coalition, so this positive relationship is to be expected. The city team leaders and the Energy Coalition managerial staff generally had positive personal and professional opinions of one another.

The main difficulty between the Coalition and the cities is the communication/ coordination issue resulting from overworked staff. Some city team leaders felt out of the loop because they were not always informed about what was going on in their cities. Energy Coalition staff also wished that team leaders from some cities had been more readily available for participation in the program. The staff members on both sides were aware of the issue, though it was often beyond their personal control due to work loads and (for city employees) non-Partnership assignments.

Several interesting comments were received regarding the level of team leader within the city. This varied from city to city. Team leaders with high level positions (such as department heads) had ready access to mayors, city managers, and council members. However, these people generally had less time available than lower level employees. According to some, the higher level staff are also less connected with the daily goings-on of the city and its residents, and therefore cannot bring as much practical hands-on experience to the table. One Energy Coalition manager wisely suggested that each city should have both a management and a staff-level contact person. We concur and recommend that for the future.

City team leaders also varied significantly in their prior knowledge of energy. Some cities had true experts on staff. Others had little if any prior knowledge of the subject. This affected their relationship with the Coalition in a variety of ways. Those with little experience needed more coaching and guidance. At least one very experienced city team leader wished that he had been called upon by the Partnership to provide more services, including outside of his city. These technically advanced team leaders also believed that the Coalition itself needed more staff with sophisticated technical expertise.

The city team leader meetings are very important. They were fairly well attended, but the ability to attend meeting would be even greater if city leaders were allocated a larger portion of their workload (perhaps even 100%) to the Partnership. The team leader meetings provide a valuable learning tool. Generally they were geared in a presentation format, with certain subjects or items presented, usually by the Energy Coalition, at each meeting.

There is also great educational value in a sharing forum arrangement. One of the most constructive meetings we attended was early in the program where new team leaders where there and given the opportunity to ask questions. The interaction between experienced and new team leaders was very informative. Such meetings should be encouraged. We also believe that team leaders should be encouraged to contact each other directly to share experiences. A master roster would be very beneficial, including names, telephone numbers, addresses, and email addresses. Although this information was available from the Energy Coalition, providing it in an easy-to-use format, updated from time to time, would be beneficial to everyone.

We also believe it is important to have an energy expert available at all team leader meetings. Some of the questions are programmatic, but some of the questions raised are technical in nature. Having someone there who can simply answer complex technical questions would be a benefit. We have on occasion noticed technically erroneous beliefs being mentioned by new or non-technical city staff, so having someone at the gathering who could correct any misinformation would help the entire group grow in understanding.

Some of the city team leaders specifically expressed concern over the management changes that took place at the Energy Coalition in December 2005. They also indicated that they had never been told a reason for this dramatic change. Since this change occurred at the end of the program period on which we are reporting, we have the luxury on not commenting on its potential affects for the future. We do believe the city team leaders, as partners in the partnership, should have immediately been given an accurate explanation.

Utility-city partnership

The relationship between the partner utilities and partner cities is the most diverse and most controversial. Some of the partner cities have strained relationships with a utility that have nothing to do with the Partnership (for example, municipalization issues). These cities have viewed the increased role of the utilities in the CEP as a negative, or at best problematic. Other cities have very positive relationships with the utilities, and still others are excited about developing a relationship that has been trivial in the past.

The issue surfaced with respect to the city team leader meetings. Some city team leaders (more than one) specifically said that the utilities should not be present at the meetings. They felt like they were being spied upon and that they could not speak openly if there was a utility employee in the room. As noted above, these concerns were directed only at one utility, not the other, and were related to electric municipalization efforts within the cities concerned, and not related to the partnership or to the specific utility staff involved with the partnership.

In the preliminary feedback report we made a recommendation to have some team leader meetings without utility presence and other team leader meetings with the utility program manager there. This suggestion was not well received by the utilities. They pointed out – legitimately so – that it makes them less than full partners in the partnership.

The Energy Coalition was aware of the problem. As its former manager pointed out, the cities interested in the Partnership are those that take an active role in energy matters anyway. There are many cities that have no relationship, positive or negative, with their utilities, but this is because of lack of interest on the cities' part, and the same lack of interest will make them not interested in the Partnership. This is very insightful.

Communication is probably the answer to this problem. Team leaders from cities that have difficult relationships with one or both of the utilities should be taught that the utilities are very large organizations that have thousands of employees. The program manager for the Partnership works in the Energy Efficiency Department. Unlike the city, where the team leader is probably either directly involved in the controversy or at least knows (or even sits next to) the person who is, the utility program manager very likely does not even know the players in the areas of the utility causing problems for the city. This may help alleviate the "spied on" feeling.

Likewise, the utility program managers should be aware upfront of the problems with every city, and should be given (if available) the specifics of the contention between the city and the utility. This way they are not walking into the hornets' nest blindly.

Both of these roles of nurturing other partners belong to the Energy Coalition. Another role of the Energy Coalition in this arena is assuring that the team leader meetings stay on the subject of the Partnership. If the team leader from one city wants to have an open discussion about municipalization with the team leader from another city, they should be free to do so on their own time. Meanwhile, the partnership team leader meetings can focus on Partnership issues, none of which to our understanding was a matter of contention between any city and any utility.

TEC-school coordination and cooperation

This has improved significantly with the increase in PEAK-related staff at the Energy Coalition. The Coalition has been more specific with the school districts regarding the expectations of the program, and this appears to have led to better and more complete implementation of the PEAK curriculum in each classroom delegated.

School district personnel associated with PEAK consistently report good relationships with the Energy Coalition and its staff. As with the city team leaders, the PEAK coordinators from the schools tend to be overworked. Dedicating more time for them will allow for even better coordination of the PEAK program.

The part of the program that seems to suffer most from this lack of time is the community-building aspect. None of the school districts has turned into the full "energy efficiency community" envisioned by PEAK. Teaching the curriculum is only part of that process. The remainder is up to a consistent effort between the Coalition, the utilities, and the district PEAK coordinator.

As mentioned before, the school districts are the odd "partners" without a clear seat at the table. This should be explored in future programs. Perhaps it need not be a formal seat or voting right. But inviting PEAK coordinators to the city team leader meetings is probably a good idea.

Utility-school interactions

Both the utilities and the school coordinators reported that they have virtually no direct interaction. If the utilities and school districts both increase staffing levels dedicated to the Partnership, there would be more direct interaction. Inviting school district coordinators to team leader meetings would also facilitate direct communication between the utility program managers and the PEAK coordinators of the various school districts.

TEC-contractor interactions

Both the contractors and the Coalition felt that they have good relationships. We have sensed this as well. The tune-up database is an excellent example. This complex record of tune-ups was actually developed by one of the contractors by working in conjunction with the Coalition. It has proven very useful. Its design and usability reflect good teamwork, including the willingness to work with us as evaluators to make sure that the installers and the database track the information we needed to evaluate energy savings.

The contractors appreciated the construction management background of the new operations manager hired in 2005 (who has since left). Several team members commented on the value of having a person in this position who has a background in the construction industry. We encourage the Coalition to bear this in mind when they hire a replacement.

Utility-contractor interactions

Both the utilities and the contractors reported that they have virtually no direct interaction. This has proven problematic with regard to supplying tune-up participants with information on other utility programs. Everyone agrees that this should be done, but lack of communication significantly inhibited it happening. In the contractors' view the utilities provided too much information to give to the customers, and contractors were left with having to figure out what they should provide. On the other hand, the utilities thought they had done their part and were not aware that contractors were confused and ignoring the subject in many cases.

The Coalition should hold regular – probably monthly – meeting with both contractors present together. Both utility program managers should also attend these meetings. All of the confusion about other utility programs could have been avoided by this regular interaction.

Contractor-contractor interactions

Both contractors report that they get along well with each other and cooperate. This is a benefit of the "service territory" concept applied to the contractors. Each of the two contractors is responsible for specific cities, and no city has both contractors working in it. Thus the contractors are "siblings" rather than competitors. This is a good practice that should be repeated as the program expands.

City-contractor interactions

There was only minimal direct interaction between the contractors and the city team leaders. This is unfortunate. The lead-generation issue is a prime example of how better communication could improve the program. Initially the city team leaders were responsible for generating leads for tune-ups. The theory was that they knew their cities and knew which areas would be the best targets. The city would then contact apartment managers, etc., or would provide the names to the Coalition to do so. This was slow to take effect, and the first year of the program produced very few tune-ups.

The contractors had generated their own leads in prior program years, and they petitioned to do so again. This change was implemented and contractors began generating leads without the city team leaders' participation. This led eventually to activities happening in a city without the team leader knowing about it.

A combined approach could have been used instead of the "either-or" situation that resulted. The team leader of a city could have worked with its assigned contractor to discuss specific areas. The contractors could have provided the leg-work, going door to door to solicit tune-ups, for example. But the strategy of where to work, who to approach, etc., could have been developed by the contractor and team leader working together, possibly with input from the Coalition and utilities as well. (The utilities are the ones with the best customer databases, and these should have been used in the lead generation process.)

One solution may be to require the contractors to attend the team leader meetings. Another solution would be to require the contractors to meet individually with each team leader in their service territory at least four times per year. In any case, increased direct interaction between the contractors and the city team leaders could only help improve the program.

Internal staff relationships at TEC

Due to the major changes in Energy Coalition management at the end of the program year, we believe it is both irrelevant and inappropriate to comment further on this subject.

Individual TEC-utility staff relationships

Most of the major players at the Energy Coalition during the 2004-05 program year are no longer there. The prior relationships these people had with utility staff are therefore moot.

Individual TEC-contractor staff relationships

The contractors were pleased with their interactions with TEC staff. They congratulated the ability of one manager to "wear two hats" after the departure of the first operations manager. They were especially pleased with the hiring of the new operations manager. He was viewed as a successful team leader due to his familiarity and background with the construction industry.

Contractor-customer interactions

Customers were overwhelming satisfied with their tune-ups. No commercial customers reported dissatisfaction, and only 3% of residential customers did so.

Contractors were supposed to provide education to the customers, not simply install devices. In the past there had been a problem with device-focused tune-ups, and the Energy Coalition thought this was because the contractors are paid on a device basis, not for educating the customers.

It is difficult to tell how much education was provided by the contractors. The general sense is that this has improved over previous program years, in part because the Coalition has brought the subject up with the management staff of the installation contractors.

In our survey of residential tune-up participants, we did ask if the contractor left informational handouts during the tune-up. Of the 326 people surveyed, 183 (56%) said yes, 17% said no, and 27% said they did not know. We cannot categorically conclude that contractors did not leave materials in 17% of the tune-ups. They were supposed to leave materials tailored to their particular situation. It is possible that they did leave them and the customers never read them, and therefore never learned they were educational materials as opposed to forms and other program-related papers. Nonetheless, it does seem safe to conclude that at least 17% of the tune-ups did not include much verbal education. Ideally the contractor would not just leave educational papers, but would go over them, at least briefly, with the customer. In such a case the customer would have known they were educational materials, even if the customer never actually read them.

We also asked customers if they were currently aware of available energy-efficiency rebate programs form the utilities. Over three-fourths (77%) said "No." Clearly the contractors were not doing a sufficient job of telling customers about other programs.

Assuring that contractors spend the necessary time on the educational component of the tune-ups may involve a payment arrangement that values the time it takes to do the education. One possibility would be to decrease the labor component of the per-unit payments for lamps, fans, etc. and establish or increase the flat per-tune-up payment. In order to receive the per-tune-up portion of the payment, the contractor would have to turn in a simple form that specifically checks off educational categories that were discussed between the contractor and customer. This form should be separate from the more complicated tune-up record form in order to avoid customers from merely signing a form without reading it.

Administrator-principal-teacher interactions within schools

These vary from district to district, though our general observation is that they are weak. Many school systems suffer from the classic "staff-field" problem of large organizations. The district administration is the "staff" and the individual schools are the "field." In some cases union-management issues have even been observed to worsen the communication and trust between people who should all be on the same page.

PEAK *could* become an example of community building that supersedes and even mitigates these issues. This would take agreement and cooperation from the school district, but it would also take considerable work on the part of the Coalition's PEAK staff. This is yet one more argument for increasing staff time throughout the Partnership program.

We have mentioned previously that the instructional component of PEAK has been improved and seems to be working well, with most PEAK teachers implementing the full curriculum. We have also mentioned that the "energy efficiency community" goal of PEAK is still in its prenatal stages. Though everyone seems to desire this, sufficient work has not been put into it to make it take place. We envision this as a natural place for intra-district communications to flourish as well. Imagine energy community meetings led by an Energy Coalition person but involving the district facilities director, some principals, several enthused PEAK teachers, and perhaps even the superintendent or assistant superintendent. The subject is energy efficiency, and everyone is learning how they can work together to make an even greater difference in their schools – the result is greater than the sum of the parts. Once developed, this community with open communications would facilitate the continued evolution of PEAK and the easy elimination of questions or roadblocks that hinder its progress along the way. We would no longer hear a comment like one we actually heard from a teacher, that the PEAK coordinator was so high up in the district administration that she felt she could not contact her directly with a simple question.

City-school district interactions

As with several other relationships between specific groups of partners, this interaction was relatively weak. There is a tendency to separate the PEAK aspects of the Partnership from the other components such as tune-ups and community events. The former is left to the school district, and the latter to the city. To be sure in some cities there is already a working relationship between city staff and school district staff, and these relationships have benefited the Partnership. However, we believe that regular interaction between the city and school district, and bringing the city team leader into more direct association with PEAK, will enhance the partnership aspect of the CEP and will benefit the concept of a growing "energy efficiency community."

CPUC→Utility→TEC→Contractor cash flow

The problem of the delays in getting the contract signed was frequently mentioned as a problem by the Energy Coalition managers. Part of the difficulty was caused by the conversion of the program to a "partnership" rather than a "non-utility" program, the need to work out details, and differing visions of specific roles held by the Energy Coalition and the utilities.

The program was approved by the CPUC on December 18 2003, but with a reduced budget that required a re-submission of the program implementation plan and budget within 45 days, or about February 1, 2004. The Energy Coalition submitted this to Edison (the lead utility) on January 29, 2004.

A draft agreement was sent by Edison to the Energy Coalition in the first week of February for review and comment. The Coalition had significantly different understandings regarding the roles of each partner. The agreement went through several iterations and therefore was not finalized until April 2004. This caused a program gap and was cited by contractors and some cities as a source of problems. Furthermore, the Energy Coalition indicated that it had to use reserve funds to "float" financing of the project because of the delays between expenditures and eventual payment from the utilities.

The CPUC, utilities, and implementers should work diligently to modify the system so that programs approved by the CPUC do not wait months for fine technical details to be worked out in purchase orders and contracts. Likewise, the payment system should be revised so that program funds are released promptly. Many programs have multi-tiered cash flow streams – contractors purchase items for installation and pay technicians, then bill the non-utility partner, which in turn bills the utility. Developing a cash flow system that allows earlier payment by the utility to the implementer would allow implementers to focus on their technical expertise rather than serving as financial institutions, and it would ultimately lower the cost of the programs and improve their cost-effectiveness.

CPUC-utility-TEC-contractor administrative requirements and procedures

In general new partners to the team are amazed by the level of detail required in various reports. However, this tends to be an "initial shock" reaction, and we have heard no long-term complaints from these people. The contractors' detailed documentation of each customer visited form the backbone of the reports submitted, and they have come to view this as part of their job. In fact, now that the electronic database is in place, the contractors find it a useful tool for managing their own employees and business.

The bulk of the reporting requirements have been the responsibility of the Energy Coalition. The utilities are used to doing this work themselves, and there initially was discussion between the utilities and Coalition about this subject. We believe the function properly lies within the Energy Coalition. Although utilities are experienced at this sort of reporting, utility staff time is too valuable to be spent on program documentation and reporting requirements. The utilities would be better off allocating all possible labor expenses to directly helping with the program implementation. The utility program managers can be networking with city team leaders while an Energy Coalition clerk fills out CPUC spreadsheets. This would be a better arrangement than the opposite.

CONCLUSION AND RECOMMENDATIONS

Savings Goals and Estimates

The Community Energy Partnership met its measurable goals. This was primarily the result of providing more installed measures than stipulated in the program implementation plan. Our analyses typically reduced the savings associated with any one of the measurable items or activities. However, the quantity of measures provided was sufficient to over-compensate for this per-unit reduction. These savings estimates were greater than the goal for both electric and natural gas energy savings, and slightly less than the goal for demand reduction.

Table 48 summarizes the goals and savings estimates for the various components of the Community Energy Partnership program.

Table 48: Summary of Gross Goals and Estimates

Measure Category	Program Goal			Savings Estimate		
	kWh per yr	Peak kW	Therm per yr	kWh per yr	Peak kW	Therm per yr
Res Ltg Tune-Up	1,800,000	144	0	1,805,065	182	0
Res Other Tune-Up	1,320,000	120	46,080	422,384	20	45,049
Bus Ltg Tune-Up	450,000	180	0	244,833	54	0
Bus Other Tune-Up	250,000	160	27,360	20,052	0	2,235
Non-Tune-Up CFLs	4,436,800	771	9,600	3,636,513	397	0
Municipal Facilities	3,750,000	1,500	150,000	3,750,000	1,500	150,000
School Facilities	1,875,000	1,875	37,500	2,187,500	1,400	43,750
PEAK Households	4,800,000	500	480,000	6,281,760	720	502,541
Totals	**18,681,800**	**5,250**	**750,540**	**18,348,107**	**4,273**	**743,575**

The program slightly exceeded its net electric and gas energy savings goals. The demand goal was almost met, and the lifecycle energy savings goals were very close to being met. The lifecycle energy goals were not exceeded because we decreased the EUL of PEAK education. Table 49 presents the goals contained in the program implementation plan, and Table 50 presents the net program achievements assessed through this evaluation.

Table 44: Net Energy and Peak Demand Goals	
Net Coincident Peak Reduction	4,298 kW
Net Annual Electric Energy Savings	15,262,440 kWh
Net Lifecycle Electric Energy Savings	76,312,200 kWh
Net Annual Gas Energy Savings	615,120 Therms
Net Lifecycle Gas Savings	3,075,600 Therms

Table 45: Net *Ex-Post* Energy and Peak Demand Savings		
Net Coincident Peak Reduction	3,569 kW	85%
Net Annual Electric Energy Savings	15,974,570 kWh	105%
Net Lifecycle Electric Energy Savings	73,591,090 kWh	96%
Net Annual Gas Energy Savings	695,694 Th	113%
Net Lifecycle Gas Savings	2,975,929 Th	97%

Customer Satisfaction, Attitudes, and Other Findings

The program was well received by the participants. Only 3% of residential participants, and no small business participants, indicated dissatisfaction with the program.

A significant portion of both residential (1/2 to 2/3, depending on the aspect of the program discussed) and business participants (over 1/3) claim to have told others about the program. The program goal of spreading enthusiasm about energy conservation occurs in at least a significant portion of the customer population.

Curriculum improvements that match the PEAK curriculum to state standards appear to have eliminated the problem of partial implementation observed in prior years. Surveyed teachers and administrators indicate full implementation of the curriculum and general satisfaction with the program.

Initial start-up delays were caused by several factors, including a time lag of several months between program approval and contract signature. This led to suboptimal performance during the first year, and some partners were frustrated by what they viewed as an unnecessary interruption in program flow. However, once these problems passed with time, the program was able to catch up and still exceed its two-year goals.

The partners, and particularly the Energy Coalition staff, were complimented on their communication skills, enthusiasm, and dedication at a personal level. However, there was a general feeling that everyone – Coalition, utility, and city employees alike – was either overworked or given too many non-CEP responsibilities to be able to fully accomplish the multitude of tasks that could have been done. This short-staffing obviously did not hinder the ability of the program to achieve its measurable goals – tune-ups, light distributions, community events, PEAK, etc.

However, our general observation is that the goal of establishing "energy efficiency communities" was seriously hampered by the lack of staff time available. Future programs should bear this in mind. We believe that the energy efficiency community is a very important idea – and a workable concept. It simply takes time, lots of it from all partners, and constant communication between the partners and with the community. This may appear like "administrative overhead" without incremental measurable results, but such a concern is short-sighted and misses the potential magic that the Community Energy Partnership desires to – *and can* – instill enthusiasm for energy efficiency in its partner communities.

Recommendations

Following are twenty-seven specific recommendations that we believe will improve the program in the future. These recommendations are gathered from our own observations and professional expertise as well as the comments of various team members. They are presented in an order the roughly tracks the flow of this report. The order does not indicate a priority or ranking of importance.

1. Review the "energy district" concept and determine whether it should be maintained in future programs or scrapped altogether. Though the concept is rather clearly defined, the idea was not implemented consistently from city to city and in some cases established energy districts were redefined or practically ignored. The original concept has merit – that focusing limited efforts in a smaller area will better facilitate the development of an energy-conscious community. In practice this was almost always diluted. Contractors had to conduct tune-ups outside of the districts in order to reach quantity goals. School districts implemented PEAK in schools outside of the energy districts. Community events were sometimes geographically located outside of the energy district. Cities cannot discriminate in favor of some residents over others. These are all valid concerns fighting in opposition to a hypothetically good concept. The CEP team – Energy Coalition, utilities, and partner cities (and school districts?) – should seriously contemplate the advantages and disadvantages of continuing with the energy district concept. If they decide in

its favor, the districts should be defined in a manner to enable them to be meaningful and maintained. If they decide against the concept, it should be eliminated altogether to avoid confusion.

2. The term "partner" and its meaning should be clarified. In prior years the term referred to the Energy Coalition and the cities. In 2004-05 the utilities came on board as "partners" as one of the many "partnership programs" approved by the Public Utilities Commission. The term *partner* can easily apply to the Energy Coalition, the utilities, and the cities (and even perhaps the school districts), but in order to be meaningful some sort of mechanism should be established to enable major program decisions to be made with the participation of all of the partners. We understand that the goals and desires of the various partners are not always congruent, and we realize that this concept of "partnership" may sometimes be easier if ignored. We do not pretend to know a simple solution, but do boldly suggest "consensus" as an ideal standard. After all, the mission of all the partners with respect to this venture is the same.

3. School districts should be full partners. PEAK is a key component of the CEP. It is implemented by school districts. Districts are chosen to be at least partially overlapping with partner cities. But school districts are independent government agencies without direct relationships with the municipalities in the same locations. We do not see a downside to inviting the school districts into full partnership. They already sign memoranda of understanding to implement PEAK. Giving them official "partner" status, having them designate a "team leader" in the same manner as the city governments, and inviting those team leaders to the team leader meetings would enhance the school districts' buy-in and commitment to the Partnership's overall goals.

4. The program is successful and worthy of replication. However, we caution against overly aggressive expansion of the program. This is particularly true if the true partnership concept recommended above is adopted. While the desire to expand throughout the state is noble, it would quickly become unwieldy. Ten cities in a partnership presented enough logistical problems under the current quasi-partner arrangement. Consideration should be given to splitting into two partnerships of five or six cities each, presumably split geographically. This could then be expanded in similar-sized blocks, with each partnership being able to make its own decisions by consensus (or otherwise). This would facilitate more team leader participation and interaction. As managing partner, the Energy Coalition would have to develop an internal organization that could effectively handle the two or more different partnerships within the overall program.

5. Staffing levels should be increased. The community-building aspects of the Partnership would be significantly enhanced if each utility and each city would devote at least a half-time, and preferably a dedicated full-time, staff member, and the Energy Coalition had sufficient staffing to attend to each partner's needs.

Although the existing staffing levels were adequate for achieving the measurable goals, the increased staffing will greatly improve the chance of achieving the "energy community" concept that instills the social awareness of energy efficiency, conservation, and demand response.

6. Implementers of future programs should not redefine measures midstream. Likewise, they should not use terms with readily apparent specific meanings (*e.g.* "thermostats") when they intend to count less specific measures (*e.g.*, "discussion of HVAC control and conservation").

7. The ratio of PEAK households to PEAK students should be explored. This is one of many critical parameters in estimating the energy-saving value of the PEAK program. We believe a simple question such as, "Do you have a brother, sister, or other person in your house who also took PEAK this year or took it in a previous year?" should be included in the next survey of PEAK students.

8. There should be both district-level and campus-level PEAK coordinators. The district-level person would remain "team leader," but PEAK staff at the Energy Coalition should keep both levels "in the loop" and campus-level coordinators should be free to contact Energy Coalition and/or utility personnel.

9. PEAK forums should be established in each school district, and all personnel involved in PEAK, including classroom teachers as well as coordinators, should be encouraged to attend. This will provide on-going education for the faculty and also enhance the "energy community" aspect of the program by facilitating informal information exchange.

10. PEAK teachers should not shy away from experiences that encourage students to bring in, share, and discuss their own home's energy use, attitudes, and utility bills. This adds a real world dimension to PEAK and also increases parent involvement and awareness, which in turn results in greater energy savings and demand reduction.

11. PEAK should continue working to develop energy clubs and similar extracurricular activities. This will enhance the energy community aspect of the program and facilitate greater PEAK-related energy savings and even demand response. A school community that is fully committed to the PEAK concepts should be capable of producing very significant demand response during power emergencies.

12. An Energy Coalition staff member should visit each PEAK campus at least once each school year.

13. Direct communication links between the utility program managers and the tune-up contractors should be established. This will enhance the ability of the CEP to provide its participants with information about other utility programs.

14. Utilities should use their customer databases to assist with lead generation for tune-ups. When a partner city targets a particular area for tune-ups it could send letters addressed personally to the residents or businesses by using the utility customer information. (Local government data often includes property owners, but not often tenants.) An even more proactive approach would be to use utility billing information to help target neighborhoods or even individual customers that appear ripe for tune-up assistance. If this effective team use of information is hampered by confidentiality rules, the CPUC should direct the utilities to amend those rules.

15. All parties should work diligently toward a seamless transition between program years, expeditious approval of contracts, and prompt disbursement of funds.

16. A person with construction and contracting experience should be directly responsible for the tune-up and direct installation aspects of the program. When such a person was hired midstream (who has since resigned), the installation contractors reported marked improvements.

17. Roles, expectations, and required time commitments of city team leaders should be clarified in the beginning and agreed to by the city manager and/or city council. We do not necessarily believe this must be the same for each city, but on the other hand do not believe an endless variety of models is functional. Perhaps two or three options, possibly based on city size, full- or part-time staff commitment, and level of team leader within the city (manager, clerk, etc.) could be available for cities to choose from. Resources contributed by the Partnership to the city can then be allocated in conjunction with the city's level of allocation of its own staff resources.

18. An electronic newsletter for city team leaders, similar to the PEAK newsletter, should be prepared by the Energy Coalition on a regular (probably monthly) basis.

19. Tune-up technicians should carry applications for Express Efficiency and/or other relevant utility programs and be encouraged to provide these materials directly to the customers if they feel the customer would benefit from them. Utility team leaders should work with the contractors to select a small number of other utility programs appropriate for the customers receiving the tune-ups.

20. A complete roster of the CEP team members and their contact information should be provided to all team members. This should include all Energy Coalition staff and their roles, the utility program managers, the city team leaders, the PEAK coordinators, and the various contractors and consultants. This roster should be

prepared by the Energy Coalition and updated as needed to maintain its accuracy. All team members should feel free to contact any other team member.

21. The Partnership should consider raising the dollar limit on small business tune-ups direct installations to $1,000.

22. Partner cities should designate an upper-level team member (department head, city manager, council member, etc.) in addition to the team leader with day-to-day responsibility for Partnership activities. These managerial team members should maintain regular communication with Energy Coalition and utility CEP staff, and vice versa.

23. Some cities have staff members with significant technical expertise. These resources should be used for the benefit of other cities and the Partnership in general, particularly if these people are interested and willing to do so.

24. Meetings and forums where team members can interact, share, and learn from each other should be held regularly. At least some of these should have loosely driven agendas so the focus can follow the present concerns of the team. An energy expert should be in attendance at these meetings so technical questions can be answered if they arise and so the forum does follow a discussion into technical error.

25. The educational roles of the tune-up technicians should always be emphasized. The installation contractors should make sure that their employees always discuss general energy efficiency concepts during tune-ups and leave appropriate literature for the customers. The Energy Coalition should make sure that all installation technicians are adequately trained to effectively and accurately instruct the customers.

The Community Energy Partnership is a vibrant dance of three unique types of organizations – the Energy Coalition, the utilities, and local governments. Each of these three have very strong points and some serious shortcomings. Each partner should strive to focus on the benefits brought by this diversity. The Partnership can be a dynamic, enthusiastic, and creative entity while working within the general parameters of regulated programs and providing benefits to local citizens.

Appendices

Residential Post-Tune-up
Telephone Survey

Call Log Attempts and Results

Call Log Attempt #1

Date	Time	Call log code	Reason code	Surveyor	Person you spoke with at time of call	Male	Female

Notes:

CALL BACK INFORMATION

Call Back Date	Call Back Time	Contact person (if different from list)	Male or Female	Notes:

Call Log Attempt #2

Date	Time	Call log code	Reason code	Surveyor	Person you spoke with at time of call	Male	Female

Notes:

CALL BACK INFORMATION

Call Back Date	Call Back Time	Contact person (if different from list)	Male or Female	Notes:

Call Log Attempt #3

Date	Time	Call log code	Reason code	Surveyor	Person you spoke with at time of call	Male	Female

Notes:

CALL BACK INFORMATION

Call Back Date	Call Back Time	Contact person (if different from list)	Male or Female	Notes:

Call Log Attempt #4 (if needed)

Time	Call log code	Reason code	Surveyor	Person you spoke with at time of call	Notes

Call Log Codes:

1 = Completed	5 = No Answer	9 = Disconnected Number
2 = Call Back	6 = Refusal (Soft)	10 = Fax Number
3 = Left Message	7 = Refusal (Hard)	0 = Termination / Incomplete
4 = Busy Tone	8 = Wrong Number	

Reason Codes

A = Not available	E = Too busy
B = Not interested	F = Never heard of program
C = Out of Town	G = Other
D = No time	

Approximate number of months since tune-up: _____

Mark ONLY those statements that apply:

- _____ Yes, this *resident* participated in a pre-tune-up survey. (Need 64 of the 384.)
- _____ No, this *resident* did not participate in a pre-tune-up survey. (Need 64 of the 384.)
- _____ Yes, this resident received a programmable thermostat. (Need 58 of the 384.)
- _____ Yes, this resident completed the post-tune-up survey. (Need 384.)

- Can I please speak to _____?
  _____Yes
  _____No
  _____Not available at this time --- if this ask "When would be a good time to call back? Answer:_____
  _____Don't know who was present for the tune-up
  _____Speaking
  _____Other:_____

(INTRODUCTION) READ: Hi, my name is _____. We're conducting a survey on the free energy tune-up that your home received on _____. I assure you that this is not a sales call and that the information you provide will be kept strictly confidential.

If NO or NOT AVAILABLE, READ: Since we are interested in people who participated in the energy tune-up and are familiar with the products and services they received, we cannot include you in this survey. Thanks for your time.
Request call back info.

IF YOU ARE SPEAKING TO A PARTICIPANT OF A TUNE-UP, ASK:

1. Do you have a few minutes to take the survey? It will take approximately 10 minutes. **328 Responses**
   ☐Yes **327 (99%)**
   ☐No, If no, ask: If you don't mind, I would like to ask why you choose not to participate in the survey? **1 (1%)**
   ___I don't have time --- if this ask "Would you like me to call back at a different time or day?__Y,__N.
   ___I'm not interested
   ___I don't like surveys
   ___I don't remember the tune-up
   ___Prefer not to answer
   ___Other:_____

READ: Let's start the survey…

2. Have you ever received energy conservation information prior to this program? **328 Responses**
   ☐Yes **87 (26%)**
   ☐No **213 (65%)**
   ☐Don't remember **28 (9%)**

3. How did you first hear about the free energy tune-up? **328 Responses**
   ☐Door hanger **3 (1%)** ☐Property Manager **85 (26%)**
   ☐Newspaper **12 (3%)** ☐Family member/Relative **6 (2%)**
   ☐Mailer **13 (4%)** ☐Neighbor **13 (4%)**
   ☐Flyer **43 (13%)** ☐Contractor **76 (23%)**
   ☐Don't remember **15 (4%)** ☐Energy Rally **4 (1%)** ☐Other: **58 (20%)**

4. Did you attend an energy rally or presentation? **323 Responses**
   ☐Yes **33 (10%)**
   ☐No, If No, skip to Q12 **288 (89%)**
   ☐Don't remember If DR, skip to Q12 **2 (1%)**

5. Thinking about the energy rally, did you notice any energy related advertising or information materials displayed during the presentation? **33 Responses**
   ☐Yes **25 (75%)**
   ☐No, **If No, skip to Q7 3 (9%)**
   ☐Don't remember If DR, skip to Q7. **5 (16%)**

6. What type of energy related advertising or informational materials did you notice? (multiple answers okay) **25 Responses**
   - ☐Peak hours chart/graph **7 (28%)**
   - ☐Picture of partner cities / Cities with energy districts
   - ☐Pictures from other energy tune-ups
   - ☐Sample/display of compact fluorescent lights **3 (12%)**
   - ☐Non-specific energy-saving material **9 (36%)**
   - ☐Other:_____
   - ☐Don't remember **6 (24%)**

7. What would you say were the main messages of the speaker during the presentation? **33 Responses**
   - ☐Reduce/decrease energy use **23 (70%)**
   - ☐Use major appliances during off peak hours
   - ☐Flex Your Power now campaign
   - ☐Sign-up for energy tune-up **1 (3%)**
   - ☐Same as message of advertising/information materials
   - ☐Non-specific energy-saving message **3 (9%)**
   - ☐Other**: 4 (12%)**_____
   - ☐Other: _____
   - ☐Don't remember **2 (6%)**

8. What was the most important benefit the energy rally brought to you? **33 Responses**
   - ☐Free products **11 (33%)**
   - ☐Information/Education **11 (33%)**
   - ☐Other answer **10 (30%)**_____
     _____
   - ☐Don't remember
   - ☐Nothing **1 (4%)**

9. Were any city leaders or representatives present during the energy rally or tune-up process? **52 Responses**
   ☐Yes, If yes, ask: "How did the city's involvement in this program affect your perception of the program? (Open-ended) **6 (12%)**_____
   _____
   _____

   Then ask: "How did the city's involvement affect your perception of the city?
   _____
   _____
   _____

   ☐No **16 (31%)**
   ☐DK **30 (57%)**

10. Were any representatives from Edison or The Gas Company present during the energy rally or tune-up process? **52 Responses**
    ☐Yes, **8 (15%)**
    If yes, **(7 Responses),** ask: "From which utility? ☐Edison **5 (71%)** ☐ The Gas Company
    ☐ Don't remember **2 (29%)**

    Then ask: "How did their involvement affect your perception of the program? (Open-ended)
    _____
    _____
    _____

    Then ask: "How did _____'s involvement affect your perception of this utility company?
    _____

    ☐No **28 (54%)**
    ☐DK **16 (31%)**

11. Do you have any comments or recommendations about the energy rally? **33 Responses**
    ☐Yes, **10 (30%),** If yes, ask What are they? Answer: _____
    ☐No **23 (70%)**
    ☐Other:_____

12. What was your primary motivation for signing up for the energy tune-up? **327 Responses**
    - ☐Receive free products **96 (29%)**
    - ☐Program was free **35 (11%)**
    - ☐I want to conserve energy **124 (38%)**
    - ☐I wanted to learn how I can save more money and energy **44 (13%)**
    - ☐Other: **27 (8%)**_____
    - ☐Don't remember **1 (1%)**

13. What was the primary benefit you received as a result of the energy tune-up? **327 Responses**
    - ☐Receive free products **103 (31%)**
    - ☐Reduced electric bill **152 (46%)**
    - ☐Received energy reducing information/education **36 (11%)**
    - ☐Other: **25 (8%)**_____
    - ☐Don't remember **11 (4%)**

Assessment of Attitudes and Behaviors

14. Before the energy tune-up, how would you rate your awareness of energy use in your home: **326 Responses**
    a. ____ very low **20 (6%)**
    b. ____ somewhat low **124 (38%)**
    c. ____somewhat high **125 (38%)**
    d. ____very high **46 (14%)**
    e. ____Other answer _____ , (do not read out loud) **8 (3%)**
    f. ____DK, (do not read out loud) **3 (1%)**
    g. ____N/A

15. Before the energy tune-up, how would you rate your commitment to conserving energy in your home: **326 Responses**
    a. ____ very low **14 (4%)**
    b. ____ somewhat low **111 (34%)**
    c. ____somewhat high **129 (40%)**
    d. ____very high **59 (18%)**
    e. ____Other answer_____ , (do not read out loud) **8 (2%)**
    f. ____DK, (do not read out loud) **4 (1%)**
    g. ____N/A **1 (1%)**

16. **After** the energy tune-up, how would you rate your awareness of energy use in your home: **324 Responses**

a. ____ very low **2 (1%)**	**5 (2%)**	**Values allocating "the same" to response given in #14**
b. ____ somewhat low **10 (3%)**	**31 (10%)**	
c. ____somewhat high **89 (27%)**	**150 (46%)**	
d. ____very high, or **105 (32%)**	**126 (39%)**	
e. ____ the same **106 (32%)**		

    f. ____Other answer_____ , (do not read out loud) **10 (3%)**
    g. ____DK, (do not read out loud) **1 (<1%)**
    h. ____N/A **1 (<1%)**

17. After the energy tune-up, how would you rate your commitment to conserving energy in your home: **326 Responses**

a. ____ very low **1 (1%)**	**3 (1%)**	**Values allocating "the same" to response given in #15**
b. ____ somewhat low **9 (2%)**	**28 (9%)**	
c. ____somewhat high **88 (27%)**	**143 (44%)**	
d. ____very high, or **117 (35%)**	**140 (43%)**	
e. ____ the same **99 (30%)**		

    f. ____Other answer_____ , (do not read out loud) **9 (3%)**
    g. ____DK, (do not read out loud) **2 (<1%)**
    h. ____N/A **1 (<1%)**

If customer received CFLs

Ask these questions only if you know the database shows that the customer received CFLs. **If the database shows zero, skip to question 25.**

Mark ONLY those statements that apply:

- ____Resident did not receive any CFLs according to the database.

18. Did you receive (energy-efficient) compact fluorescent light bulbs during your tune-up? (Prompt description of a CFL as "Those swirly-looking light-bulbs." **310 Responses**
    ☐Yes **295 (95%)**
    ☐No, **15 (5%)** If no, ask "We show that you received _____ light bulbs, are you sure you did not receive these? __Yes, __No
    If customer says they still did not receive them, move to **Q25.**
    ☐DK, If DK, ask "We show that you received _____ light bulbs, are you sure you did not receive these? __Yes, __No
    If customer says they still did not receive them, move to **Q25.**

19. When the contractor replaced your old light bulbs with the new ones, were you allowed to keep the old light bulbs? **293 Responses**
    ☐Yes **169 (58%)**
    ☐No **98 (33%)**
    ☐DK **26 (9%)**

20. Did the contractor explain to you why you were receiving new light bulbs? **292 Responses**
    ☐ Yes, **227 (78%)** If yes, ask: What was the explanation that the contractor gave? **225 Responses**
    ☐Use less energy **207 (92%)**
    ☐Don't remember **9 (4%)**
    ☐Other: **9 (4%)**_____
    ☐ No **51 (17%)**
    ☐ DK **14 (5%)**

21. Did the contractor install all the new light bulbs for you? **294 Responses**
    ☐ Yes **274 (93%)**
    ☐ No, **16 (5%)** If no, ask "Why not"
    Answer:_____
    Then ask, "How many of those extra light bulbs have you installed since the tune-up? Answer: _____
    ☐DK **3 (1%)**
    ☐ Other**: 1 (1%)**_____

22. Have you removed any of the new light bulbs that were installed by you or the contractor? **292 Responses**
    ☐ Yes **23 (8%)**, If yes, ask: "Were they replaced with a regular (incandescent) light bulb or another energy-efficient light bulb? **21 Respones**
    ☐ regular **10 (48%)**
    ☐ energy efficient **9 (43%)**
    ☐ Don't know
    ☐ Other: **2 (9%)**_____
    ☐ No **269 (92%)**
    ☐ DK
    ☐ Other:_____

23. Have you told other people about the new light bulbs you received from the tune-up? **294 Responses**
    ☐Yes **185 (63%)**
    ☐No **108 (46%)**
    ☐DK **1 (1%)**
    ☐ Other:_____

24. Did you recommend the light bulbs you received to other people? **292 Responses**
    ☐Yes **178 (61%)**
    ☐No **109 (37%)**
    ☐DK **5 (2%)**
    ☐ Other:_____

25. Before your energy tune-up were you already using energy efficient light bulbs? **293 Responses**
    ☐Yes **75 (25%)**

☐No **213 (73%)**
☐DK **5 (2%)**
☐ Other:_____

26. Have you purchased any energy-efficient light bulbs since the tune-up? **291 Responses**
☐Yes **48 (16%)**
☐No **241 (83%)**
☐DK **2 (1%)**
☐ Other:_____

27. Do you plan to install or purchase further energy-efficient lighting as a result of what you learned from your tune-up experience? **292 Responses**
☐Yes **209 (72%)**
☐No, **42 (14%)**
☐DK **40 (13%)**
☐ Other: **1 (1%)**_____

If customer received a FAN

Ask these questions only if you know the database shows that the customer received a ceiling, table or standing fan. **If the database shows zero, skip to next section.**
Mark ONLY those statements that apply:
- ____Resident did not receive any fans according to the database.

28. Did you receive a (fan type) fan during your tune-up? **238 Responses**
☐Yes **148 (62%)**
☐No, **88 (37%)** If no, ask "We show that you received a (fan type) fan, are you sure you did not receive this? __Yes, __No
If customer says they still did not receive a fan, **move to next section.**
☐DK, **2 (1%)** If no, ask "We show that you received a (fan type) fan, are you sure you did not receive this? __Yes, __No
If customer says they still did not receive a fan, **move to next section.**

29. Did the contractor leave the fan fully assembled? **148 Responses**
☐Yes **111 (75%)**
☐No **31 (21%)**, If no, ask "Why not?
Answer:_____
Then ask: "Have you assembled the fan since the tune-up? **27 Responses**
☐ Yes **12 (44%)**
☐ No, If no, skip to Q31 **14 (52%)**
☐ Don't know, If don't know, skip to Q31 **1 (4%)**
☐DK **4 (3%)**
☐ Other: **2 (1%)**_____

30. What room do you use your fan in? (Check all that apply.) 140 Responses
☐ Living room **39 (28%)**
☐ Dining room **4 (4%)**
☐ Master Bedroom **26 (18%)**
☐ Other Bedroom **10 (7%)**
☐ *Currently in storage* **41(29%)**
☐ Other: **20 (14%)**_____

31. Does your home have an air conditioner? 148 Responses
☐Yes 122 (82%), If yes, ask "What type of air conditioner do you have? **118 Responses**
☐ Central **60 (51%)**
☐ Swamp cooler **8 (6%)**
☐ Wall/window cooler **29 (24%)**
☐ Don't know **19 (18%)**
☐ Other: **2 (1%)**_____
☐No, If no, skip to Q37 **18 (12%)**
☐DK, If Don't know, skip to Q37 **8 (6%)**

32. On a **hot summer** day, how often do you use your air conditioner? (Prompt.) **119 Responses**
☐ Always **26 (22%)**

☐ Usually **30 (25%)**
☐ Occasionally, or **46 (39%)**
☐ Never **6 (5%)**
☐ Depends: on what?_____ , (do not read out loud) **8 (7%)**
☐ DK, (do not read out loud) **3 (2%)**

33. On a **warm summer** day, how often do you use your air conditioner? (Prompt.) **119 Responses**
☐ Always **9 (7%)**
☐ Usually **14 (12%)**
☐ Occasionally, or **61 (51%)**
☐ Never **26 (22%)**
☐ Depends: on what?_____ , (do not read out loud) **5 (5%)**
☐ DK, (do not read out loud) **3 (3%)**

34. In the summer, what temperature do you normally set your *air conditioner* to when it's on? (Read answers) **118 Responses**
☐ Less than 74 degrees **25 (21%)**
☐ 75-76 degrees **13 (11%)**
☐ 77-78 degrees **19 (16%)**
☐ 79-80 degrees **8 (7%)**
☐ 81-82 degrees **6 (5%)**
☐ Over 82 degrees **5 (4%)**
☐ DK **20 (17%)**
☐ Other: **21 (19%)**_____

35. In the winter, what temperature do you normally set your *heater* to when it's on? (Read answers) **118 Responses**
☐ Less than 64 degrees **2 (2%)**
☐ 65-66 degrees
☐ 67-68 degrees **6 (5%)**
☐ 69-70 degrees **11 (9%)**
☐ 71-72 degrees **16 (13%)**
☐ 73-74 degrees **12 (11%)**
☐ Over 75 degrees **26 (22%)**
☐ DK **17 (14%)**
☐ Other: **27 (24%)**_____

36. Does using your fan cause you to use your air conditioner less? **118 Responses**
☐Yes **86 (73%)**
☐No **12 (10%)**
☐DK **20 (17%)**

37. Did the contractor explain to you why you were receiving a fan? **143 Responses**
☐Yes **103 (72%)**, if yes, ask: What was the explanation that the contractor gave? **103 Responses**
☐To decrease AC use /Use instead of the AC **44 (43%)**
☐To save energy **37 (37%)**
☐Don't remember **11 (10%)**
☐Other: 11 **(10%)**_____
☐No **22 (15%)**
☐DK **18 (13%)**

If Customer Received Showerhead(s)

Ask these questions only if you know the database shows that the customer received a showerhead. **If the database shows zero, skip to next section.**

Mark ONLY those statements that apply:

- ____Resident did not receive any showerheads according to the database.

38. Did you receive a showerhead during your tune-up? **245 Responses**
    - ☐Yes **200 (82%)**
    - ☐No **44 (17%)**, If no, ask "We show that you received __ showerhead(s), are you sure you did not receive any?__Yes, __No
      If customer says they still did not receive a showerhead, **move to next section.**
    - ☐DK **1 (1%)**, If no, ask "We show that you received __ showerhead(s), are you sure you did not receive any? __Yes, __No
      If customer says they still did not receive a showerhead, **move to next section.**

39. Did the contractor install the showerhead during the tune-up? **198 Responses**
    - ☐Yes **190 (96%)**
    - ☐No **8 (4%)**, If no, ask: "Has it been installed since the tune-up? **7 Responses**
      - ☐Yes **2 (29%)**
      - ☐ No **5 (71%)**, if no, ask "Why hasn't the showerhead been installed? **5 Responses**
        - ☐ Don't know how to do it
        - ☐ Missing a piece **1 (20%)**
        - ☐ Don't have time
        - ☐ I like my old one better **1 (20%)**
        - ☐ Other: **3 (60%)** _____
        - ☐ DK
      - ☐ DK
    - ☐DK

40. Have you replaced the new showerhead(s) for any reason? **195 Responses**
    - ☐Yes **12 (6%)**, If yes, ask: What is your primary reason for replacing the showerhead(s)? **10 Responses**
      - ☐does not have an extension hose **1 (10%)**
      - ☐don't remember **1 (10%)**
      - ☐Other: **8 (80%)** _____
    - ☐No **183 (94%)**
    - ☐DK

41. Did the contractor explain to you why you were receiving a new showerhead? **194 Responses**
    - ☐Yes **146 (75%)**, if Yes, ask: What was the contractor's explanation? **144 Responses**
      - ☐Uses less water **116 (81%)**
      - ☐Don't remember **7 (5%)**
      - ☐Other: **21 (14%)**_____
    - ☐No **41 (21%)**
    - ☐DK **7 (4%)**

If Customer Received Programmable Thermostat

Ask these questions only if you know the database shows that the customer received programmable thermostat. **If the database shows zero, skip to next section.**

Mark ONLY those statements that apply:

- ____Resident did not receive a programmable thermostat according to the database.

42. Did you receive a programmable thermostat during your tune-up? **135 Responses**
    - ☐Yes **12 (9%)**
    - ☐No **123 (91%)**, If no, ask "According to data that we received, it shows you received __ new thermostat (s), are you sure you did not receive any? _Yes, _No
      If customer says they still did not receive a programmable thermostat, **move to next section.**
    - ☐DK, If no, ask "According to data that we received, it shows you received __ new thermostat (s), are you sure you did not receive any? _Yes, _No
      If customer says they still did not receive a programmable thermostat, **move to next section.**

43. Did the contractor install the new thermostat during the tune-up? **11 Responses**
    - ☐Yes, **10 (91%)**
    - ☐No **1 (9%)**, If no, ask: "Has it been installed since the tune-up? **1 Response**

☐Yes **1 (100%)**
☐No, If no, skip to Q48.
☐DK, If Don't know, skip to Q48.

☐DK

44. Do you feel your new thermostat was installed properly? **12 Responses**
☐Yes, **10 (84%)**
☐No **1 (8%)**, If no, ask: "Why do you feel it was not installed properly? (Open-ended question.)

_____
_____
_____
_____
_____
_____

☐DK **1 (8%)**

45. Do you understand how to operate your new thermostat? **12 Responses**
☐Yes **11 (92%)**
☐No
☐DK **1 (8%)**

46. Have you removed your new thermostat? **12 Responses**
☐Yes, If yes, ask: "What is your primary reason for removing the new thermostat?
☐It doesn't work /broken
☐I don't know how to operate/program it
☐I like manual thermostats
☐I don't remember
☐Other: _____
☐No **12 (100%)**
☐DK

47. Do you like your new thermostat better than your old thermostat? **12 Responses**
☐Yes **12 (100%)**, If yes, ask: "Why do you like it better?" (Open-ended)

_____
_____
_____

☐No, If no, ask: "Why don't you like it better?" (Open-ended) _____
_____
_____
☐DK

48. Did the contractor explain to you why you were receiving a new thermostat? **12 Responses**
☐Yes **9 (75%)**, If yes, ask: "What was the contractor's explanation? **9 Responses**
☐ It helps reduce the amount of energy I use **4 (44%)**
☐ It's programmable **1 (11%)**
☐Don't remember **1 (11%)**
☐Other: **3 (34%)**_____
☐No **1 (9%)**
☐DK **2 (16%)**

Education received during tune-up

49. Did the contractor leave you with informational handouts during the tune-up? **326 Responses**
    □ Yes **183 (56%)**, If yes, ask: Which ones did you receive? **121 Responses**
    ☐ _____
    ☐ _____
    ☐ _____
    ☐ Other: _____
    ☐ Don't remember
    □ No **56 (17%)**
    □ DK **87 (27%)**

50. Are you *currently aware* of available energy-efficiency rebate programs you're eligible for? 321 Responses
    □ Yes **57 (18%)**, If yes, ask: "How did you hear about them? (Open-ended.)_____
    _____
    Then ask: "Which rebate programs are you aware of?"_____
    _____
    □ No **246 (77%)**
    □ DK **18 (5%)**

51. If you *were interested* in participating in a rebate program, would you know how to apply? **323 Responses**
    ☐ Yes **55 (17%)**
    ☐ No **254 (79%)**
    ☐ DK **14 (4%)**

52. Do you have internet access? 321 Responses
    ☐ Yes **198 (62%)**,
    ☐ No **123 (38%)**
    If yes, ask: "Since your tune-up, have you looked into any of the rebate programs available online through Edison or The Gas Co.? **200 Responses**
    ☐ Yes 3 (1%), If yes, which one? **2 Responses** ☐ Edison **1 (50%)** ☐ The Gas Co. ☐ Don't remember **1(50%)**
    ☐ No **184 (92%)**
    ☐ DK **13 (7%)**

53. Since the energy tune-up, have you *called* Edison or The Gas Company as a result of your interest in a rebate program? **322 Responses**
    ☐ Yes **13 (4%)**
    ☐ No 307 **(95%)**
    ☐ DK **2 (1%)**

54. Thinking about the energy tune-up, were you shown how to perform maintenance checks on anything in your home? **319 Responses**
    ☐ Yes **61(19%)**
    ☐ No **228 (71%)**
    ☐ DK **30 (10%)**

55. What were the top three *recommendations* you remember receiving from the energy tune-up? (Do not prompt. Open-ended.) **225 Responses**
    ☐ Recommendation1: _____
    ☐ Recommendation2: _____
    ☐ Recommendation3: _____
    ☐ I didn't receive any recommendations (Skip to Q57)
    ☐ Don't remember / Don't know (Skip to Q57)

56. Have you followed up with any of the recommendations given from the tune-up? (Check corresponding answer) **117 Responses**
☐Yes **64 (55%)**, If yes, ask: "Which ones would they be?"

☐No **44 (38%)**
☐DK **9 (7%)**

57. Do you plan to make other energy-efficient upgrades as a result of what you learned from the energy tune-up? **322 Responses**
☐Yes **101 (31%)**, If yes, ask: "What would they be?"

☐No **104 (32%)**
☐DK **117 (47%)**

58. Thinking back to the energy rally or tune-up, do you remember hearing about the Flex Your Power Now campaign? **323 Responses**
☐Yes **42 (13%)**, If yes, ask: "Was that the first time you've ever heard of Flex Your Power Now? **48 Responses**
☐Yes **18 (37%)**
☐No **28 (58%)**
☐DK **2 (5%)**
☐No, **247 (76%)**
☐DK **34 (11%)**

59. Do you know what a Power Alert is? **321 Responses**
☐Yes **111 (34%)**, If yes, ask: What would you do during a Power Alert? (Do not prompt. Mark appropriate answer(s). **115 Responses**
☐Nothing **7 (6%)**
☐D/K **5 (6%)**
☐Turn off appliances **73 (62%)**
☐Turn off lights **3 (2%)**
☐Change thermostat **1 (1%)**
☐Run appliances off-peak hours **26 (23%)**
☐Other:_____
☐No **200 (62%)**
☐DK **10 (4%)**

60. Do you remember hearing about Energy Star products through this program? **322 Responses**
☐Yes **84 (26%)**, If yes, ask: "Was this the first time you've ever heard of an Energy Star product? **91 Responses**
☐Yes **25 (27%)**
☐No **64 (70%)**
☐DK **2 (3%)**
☐No **214 (66%)**
☐DK **24 (8%)**

Spreading the word

61. Have you told your friends, family or neighbors about your free energy tune-up? **323 Responses**
☐Yes **220 (68%)**, If yes, ask: "Were any of your friends, family or neighbors interested in receiving a free energy tune-up? **207 Responses**
☐Yes **161 (78%)**
☐No **22 (11%)**
☐DK **24 (11%)**
☐No **102 (31%)**
☐DK **1 (1%)**

62. From what you learned through this program, have you given any advice to friends, family, or neighbors on how to conserve energy? **322 Responses**
☐Yes **167 (52%)**
☐No **153 (47%)**
☐DK **2 (1%)**

Satisfaction of Partnership

63. On a scale of 1 to 5, with 1 being VERY low and 5 being VERY high, how would you rate your overall satisfaction with the program? **220 Responses**
Answer:
☐ 1 **2 (1%)**
☐ 2 **4 (2%)**
☐ 3 **19 (8%)**
☐ 4 **63 (29%)**
☐ 5 **132 (60%)**

Then ask: "Why did you rate it this number?" (Open-ended) _____
_____

64. What recommendations do you have to improve your overall satisfaction with the services, products, or information received? **311 Responses**
☐No recommendations given **243 (78%)**
☐Other: **68 (22%)**_____

READ: "The following questions are for informational purposes only."

65. Could you please tell me your age? **174 Responses**
a. ____18 to 24 **15 (9%)**
b. ____25 to 34 **20 (11%)**
c. ____35 to 44 **22 (12%)**
d. ____44 to 54 **34 (20%)**
e. ____55 to 64 **22 (12%)**
f. ____65 or over **55 (32%)**
g. ____Prefer not to answer **6 (4%)**

66. Is English your first language? 186 **Responses**
a. ___Yes **149 (80%)**
b. ___ No **37 (20%)**, If no, ask: What is your first language? 36 **Responses**
a. __ Spanish **30 (83%)**
b. __ French **1 (3%)**
c. __ Russian
d. __ Other: 5 **(14%)**_____

67. What is the category that best describes your annual household income? (Prompt) **165 Responses**

a. ____Less than $25,000 **89 (54%)**
b. ____$25,000 to just under $50,000 **19 (11%)**
c. ____$50,000 to just under $75,000 **9 (5%)**
d. ____$75,000 to just under $100,000 **11 (7%)**
e. ____$100,000 or over **2 (2%)**
f. ____Prefer not to answer **35 (21%)**

68. How many people live at this residence? **167 Responses**

a. ____ 1 **54 (32%)**
b. ____ 2 **62 (37%)**
c. ____ 3 **19 (11%)**
d. ____ 4 **20 (12%)**
e. ____ Other: **10 (6%)**_____
f. ____ Don't know
g. ____ Prefer not to answer **1 (2%)**

69. In general, did you feel the survey questions were easy to understand?

☐No, If no, ask "Do you have anything specific that you would like to mention?

_____
_____
_____
_____

☐Yes

70. Do you have any recommendations that would help improve the quality of this survey?

☐No
☐Yes, If yes, ask: What are your recommendations?

_____
_____

END OF SURVEY!
THANK YOU FOR YOUR PARTICIPATION

Small Businesses
Tune-Ups

BACKGROUND AND INFORMATION PRIOR TO TUNE-UP

1. Have you ever received energy conservation information prior to this program? **56 Responses**
   - ☐ Yes **15 (27%)**
   - ☐ No **21 (37%)**
   - ☐ DK **20 (36%)**

2. How did you first hear about the free energy tune-up? **56 Responses**
   - ☐ Door hanger **0 (0%)**
   - ☐ Newspaper **0 (0%)**
   - ☐ Mailer **0 (0%)**
   - ☐ Flyer **0 (0%)**
   - ☐ Energy Rally **0 (0%)**
   - ☐ Property Manager **2 (4%)**
   - ☐ Family member/Relative **0 (0%)**
   - ☐ Business neighbor **0 (0%)**
   - ☐ Contractor **26 (46%)**
   - ☐ Don't remember/DK **18 (32%)**
   - ☐ Other: **10 (18%)** _____

3. How much of an issue is energy conservation to you and your business? **56 Responses**
   - ☐ Not an issue **7 (13%)**
   - ☐ Somewhat of an issue **30 (54%)**
   - ☐ Big issue **13 (23%)**
   - ☐ DK **6 (10%)**

4. What motivates you to conserve energy? **56 Responses**
   - ☐ Bills are too high **24 (42%)**
   - ☐ Energy crisis **11 (20%)**
   - ☐ Protect the environment **1 (2%)**
   - ☐ Other: **1 (2%)** _____
   - ☐ DK **19 (34%)**

5. Before the energy tune-up, how would you rate your level of awareness of energy use in your business? **56 Responses**
   - ☐ Very low **2 (3%)**
   - ☐ Somewhat low **24 (43%)**
   - ☐ Somewhat high **14 (25%)**
   - ☐ Very high **5 (9%)**
   - ☐ DK **11 (20%)**

6. Before the energy tune-up, how would you rate your level of commitment to conserving energy in your business? **56 R**
   - ☐ Very low **2 (3%)**
   - ☐ Somewhat low **23 (41%)**
   - ☐ Somewhat high **15 (27%)**
   - ☐ Very high **7 (13%)**
   - ☐ DK **9 (16%)**

7. Before the tune-up, would you say your electric bill was: **56 Responses**
   - ☐ Low **1 (2%)**
   - ☐ Reasonable **26 (46%)**
   - ☐ High **17 (30%)**
   - ☐ Too High **7 (13%)**
   - ☐ DK **5 (9%)**

10. What was your primary motivation for signing up for the energy tune-up? **56 Responses**
    - ☐ Receive free products **36 (64%)**
    - ☐ Program was free **1 (2%)**
    - ☐ I want to conserve energy **14 (25%)**
    - ☐ I wanted to learn how I can save more money and energy **1 (2%)**
    - ☐ Other: **0 (0%)** _____
    - ☐ DK **4 (7%)**

LIGHTING AND COMPACT FLUORESCENT LIGHT BULBS (CFLs)

11. Did you know what a CFL was before the tune-up? **56 Responses**
    - ☐ Yes → If yes, did you use CFLs before the tune-up? **13 (23%)**
      - ☐ Yes **9 (70%)**
      - ☐ No → If no, what were the reasons why you did not use CFLs? **4 (30%)**
        - ☐ Didn't know what they were **0 (0%)**
        - ☐ Too expensive **0 (0%)**
        - ☐ Didn't fit in my lamps **2 (50%)**
        - ☐ Didn't like how they looked **0 (0%)**
        - ☐ Other: **1 (25%)** _____
        - ☐ DK **1 (25%)**
    - ☐ No **43 (77%)**

13. Please estimate the hours of operation for the lights in your business. **56 Responses**
    - ☐ 1-4 hours **0 (0%)**
    - ☐ 5-8 hours **8 (14%)**
    - ☐ 9-12 hours **19 (34%)**
    - ☐ 13-16 hours **7 (12%)**
    - ☐ 17-20 hours **1 (2%)**
    - ☐ 21-24 hours **0 (0%)**
    - ☐ Depends **0 (0%)**
    - ☐ DK **21 (38%)**

14. Did you receive any CFLs during your tune-up? **56 Responses**
    - ☐ Yes **14 (25%)**
    - ☐ No **32 (57%)** → If no, skip to question 23
    - ☐ DK **10 (18%)**

16. Did the contractor install the CFLs for you? **14 Responses**
    - ☐ Yes 10 **(71%)**
    - ☐ No 1 **(7%)**
    - ☐ DK 3 **(21%)**

17. Are you still currently using CFLs in your business? **14 Responses**
    - ☐ Yes **9 (64%)**
    - ☐ No **1 (7%)** → If no, what was the reason why you took them out?
      - ☐ Not bright enough
      - ☐ Don't how they look
      - ☐ Too expensive to replace
      - ☐ Other: **1 (100%)** _____
      - ☐ DK
    - ☐ DK **4 (29%)**

18. Where are the CFLs located in your business?

    _____

    _____

19. After the tune-up, have you purchased more CFLs for your business? **14 Responses**
    - ☐ Yes → If yes, how many? **1 (7%)**
      - ☐ 1-3 **1 (100%)**
      - ☐ 4+
    - ☐ No **8 (57%)**
    - ☐ DK **5 (36%)**

20. Have you told your friends and family about CFLs? **14 Responses**
    - ☐ Yes **5 (36%)**
    - ☐ No **9 (64%)**

21. How satisfied are you with the quality of the CFLs? **14 Responses**
    - ☐ Not satisfied **0 (0%)**
    - ☐ Somewhat satisfied **5 (36%)**
    - ☐ Very satisfied **7 (50%)**
    - ☐ DK **2 (14%)**

22. How do you feel about the quality of work of CFLs compared to the light bulbs regularly used at your business? **14 R**
    - ☐ CFLs work worse **1 (7%)**
    - ☐ CFLs are the same **1 (7%)**
    - ☐ CFLs work better **6 (43%)**
    - ☐ DK **6 (43%)**

PROGRAMMABLE THERMOSTATS

23. What type of thermostat was your business using? **56 Responses**
    - ☐ Programmable **4 (7%)**
    - ☐ Manual **2 (4%)**
    - ☐ DK **50 (89%)**

24. How did you previously control the heater or air conditional? **56 Responses**
    - ☐ Set at one temperature **0 (0%)**
    - ☐ Turned on when needed **3 (5%)**
    - ☐ Left on all day **0 (0%)**
    - ☐ Other: **0 (0%)** _____
    - ☐ DK **53 (95%)**

25. How often did you use the thermostat during the summer? **56 Responses**
    - ☐ Never **0 (0%)**
    - ☐ Occasionally **1 (2%)**
    - ☐ Very often **5 (9%)**
    - ☐ Always **0 (0%)**
    - ☐ DK **50 (89%)**

26. How often did you use the thermostat during the winter? **56 Responses**
    - ☐ Never **1 (2%)**
    - ☐ Occasionally **3 (5%)**
    - ☐ Very often **1 (2%)**
    - ☐ Always **0 (0%)**
    - ☐ DK **51 (91%)**

27. Did you receive a programmable thermostat during the tune-up? **56 Responses**
    - ☐ Yes **2 (4%)**
    - ☐ No **10 (18%)** → If no, skip to question 36
    - ☐ DK **44 (78%)**

28. Did the contractor install the new thermostat during the tune-up? **2 Responses**
    - ☐ Yes **2 (100%)**
    - ☐ No **0 (0%)**
    - ☐ DK **0 (0%)**

29. Is the thermostat still being used and not overridden? **2 Responses**
    - ☐ Yes **2 (100%)**
    - ☐ No **0 (0%)**
    - ☐ DK **0 (0%)**

30. Do you understand how to use your new thermostat? **2 Responses**
    - ☐ Yes **2 (100%)**
    - ☐ No **0 (0%)**
    - ☐ DK **0 (0%)**

31. Have you removed your new thermostat? **2 Responses**
    - ☐ Yes **0 (0%)** → If yes, for what reason?
        - ☐ It doesn't work
        - ☐ I don't know how to operate it
        - ☐ I prefer manual thermostats
        - ☐ Other: _____
        - ☐ DK
    - ☐ No **2 (100%)**
    - ☐ DK **0 (0%)**

32. How often do you use the new thermostat during the summer? **2 Responses**
    - ☐ Never **0 (0%)**
    - ☐ Occasionally **1 (50%)**
    - ☐ Very often **1 (50%)**
    - ☐ Always **0 (0%)**
    - ☐ DK **0 (0%)**

33. How often do you use the new thermostat during the winter? **2 Responses**
    - ☐ Never **0 (0%)**
    - ☐ Occasionally **1 (50%)**
    - ☐ Very often **1 (50%)**
    - ☐ Always **0 (0%)**
    - ☐ DK **0 (0%)**

34. How satisfied are you with the programmable thermostat? **2 Responses**
    - ☐ Not satisfied **0 (0%)**
    - ☐ Somewhat satisfied **0 (0%)**
    - ☐ Very satisfied **2 (100%)**
    - ☐ DK **0 (0%)**

35. Do you prefer using the new thermostat over the old thermostat? **2 Responses**
    - ☐ Yes **2 (100%)**
    - ☐ No **0 (0%)**
    - ☐ DK **0 (0%)**

FANS

36. Was your business using any fans prior to the tune-up? **56 Responses**
    - ☐ Yes **0 (0%)**
    - ☐ No **53 (95%)** → If no, skip to question 38
    - ☐ DK **3 (5%)**

37. How many fans were in your business prior to the tune-up? **3 Responses**
    - ☐ 1
    - ☐ 2
    - ☐ 3
    - ☐ 4
    - ☐ 5
    - ☐ 5+
    - ☐ DK **3 (100%)**

38. Did you receive fans during the tune-up? 56 Responses
    - ☐ Yes **0 (0%)**
    - ☐ No **56 (100%)** → If no, skip to question 43
    - ☐ DK **0 (0%)**

39. How many fans did you receive? **0 Responses**
    - ☐ 1
    - ☐ 2
    - ☐ 3
    - ☐ 4
    - ☐ 5+
    - ☐ DK

40. Did the contractor leave the fan(s) fully assembled? **0 Responses**
    - ☐ Yes
    - ☐ No
    - ☐ DK

41. Are you using the fan(s) as an alternative to using the air conditioner? **0 Responses**
    - ☐ Yes
    - ☐ No
    - ☐ DK

42. How satisfied are you with the fans given during the tune-up? **0 Responses**
    - ☐ Not satisfied
    - ☐ Somewhat satisfied
    - ☐ Very satisfied
    - ☐ DK

PARTICIPATION AND SATISFACTIN OF TUNE-UP

43. How satisfied are you with how much you are paying for electric bills after the tune-up? **56 Responses**
    - ☐ Not satisfied 3 **(5%)**
    - ☐ Somewhat satisfied **33 (59%)**
    - ☐ Very Satisfied **10 (18%)**
    - ☐ DK **10 (18%)**

44. Are you saving more money when it comes to electricity? **56 Responses**
    - ☐ Yes **22 (39%)**
    - ☐ No **5 (9%)**
    - ☐ DK **29 (52%)**

45. How satisfied are you with the products you have received from the tune-up? **56 Responses**
    - ☐ Not satisfied **0 (0%)**
    - ☐ Somewhat satisfied **12 (21%)**
    - ☐ Very satisfied **35 (63%)**
    - ☐ DK **9 (16%)**

46. Are there any problems with the products given to your business from the tune-ups? **56 Responses**
    - ☐ Yes **7 (13%)** → If yes, what? _____
    - ☐ No **42 (75%)** _____
    - ☐ DK **7 (12 %)** _____

47. Do you feel you need more energy efficient products? **56 Responses**
    - ☐ Yes **6 (11%)** → If yes, what? _____
    - ☐ No **19 (34%)** _____
    - ☐ DK **31 (55%)** _____

48. After the energy tune-up, how would you rate your level of awareness of energy use in your business? **56 Responses**
    - ☐ Very low **0 (0%)**
    - ☐ Somewhat low **5 (9%)**
    - ☐ Somewhat high **34 (61%)**
    - ☐ Very high **7 (13%)**
    - ☐ DK **10 (18%)**

49. After the energy tune-up, how would you rate your level of commitment to conserving energy in your business? **56 R**
    - ☐ Very low **1 (2%)**
    - ☐ Somewhat low **5 (9%)**
    - ☐ Somewhat high **31 (55%)**
    - ☐ Very high **8 (14%)**
    - ☐ DK **11 (20%)**

51. How satisfied are you with your tune-up? **56 Responses**
    - ☐ Not satisfied **0 (0%)**
    - ☐ Somewhat satisfied **12 (21%)**
    - ☐ Very satisfied **38 (68%)**
    - ☐ DK **6 (11%)**

52. Are there any recommendations do you would like to include to improve your overall satisfaction with the services, products, or information received? **56 Responses**
    - ☐ Yes **4 (7%)** → If yes, what? _____
    - ☐ No **34 (61%)** _____
    - ☐ DK **18 (32%)** _____

53. Is there anything that you would like to include in this survey that has not been included? **56 Responses**
    - ☐ Yes **1 (2%)** → If yes, what? _____
    - ☐ No **36 (64%)** _____
    - ☐ DK **19 (34%)** _____

Non-Participant Survey_Residents

Date:	Approximate Time: AM / PM		Address:		
City:	☐ Brea	☐ Cathedral City	☐ Corona	☐ H.ermosa Beach	☐ Irvine
	☐ Moreno Valley	☐ Palm Desert	☐ San Bernardino	☐ Santa Clarita	☐ Santa Monica

READ: Hi, my name is _____ and our company works for the Public Utilities Commission. We are conducting an evaluation survey of a local program called the Community Energy Partnership. According to a list we received, we understand that your residence did not participate in the program.

1. Have you heard about the Community Energy Partnership program? **68 Responses**
   a. Yes **20 (30%)**
   b. No **40 (58%)**
      If no, ask: Have you heard about a program that gave free energy tune-ups to residents in this community?
      a. Yes **15 (38%)**
      b. No **25 (62%)**
         If no, ask: Did you hear about a program that gave away free light bulbs and other energy-efficient products to residents in this community?
         a. Yes **10 (40%)**
         b. No **15 (60%)**
   c. Don't recall **8 (12%)**
   d. Question Not asked **0 (0%)**

2. Do you remember receiving any advertisements announcing the program? **68 Responses**
   a. Yes **25 (37%)**
   b. No **18 (26%)**
   c. Don't recall **25 (37%)**
   d. Question Not asked **0 (0%)**

3. What was your reason for not participating in the program? **68 Responses**
   a. No time/ Too busy **12 (18%)**
   b. Not interested **11 (16%)**
   c. Unaware of program **14 (21%)**
   d. Not available for tune- up date **10 (15%)**
   e. Skepticism **6 (9%)** if this, ask: What could have been done to decrease your skepticism about this program?
      Answer:_____
      _____
      _____
      _____
   f. Don't recall **10 (15%)**
   g. Other: _____ **5 (6%)**
   h. Question Not asked **0 (0%)**

4. Do you currently use energy-efficient light bulbs in your home? **68 Responses**
   a. Yes **23 (24%)**
   b. No **42 (62%)**
   c. Don't recall **3 (4%)**
   d. Not asked **0 (0%)**

5. Do you currently use other types of energy-efficient products in your home? **68 Responses**
   a. Yes **19 (28%)**
   b. No **41 (60%)**
   c. Don't recall **8 (12%)**
   d. Question not asked **0 (0%)**

6. How would you rate your commitment to conserving energy in your home: **68 Responses**
   a. ____ very low **9 (13%)**
   b. ____ somewhat low **17 (25%)**
   c. ____somewhat high **29 (43%)**
   d. ____very high **12 (18%)**
   e. ____Other answer_____ , (do not read out loud) **0 (0%)**
   f. ____DK, (do not read out loud) **1 (1%)**
   g. ____Question not asked **0 (0%)**

7. Do you have any recommendations that would help increases the chances of your participation in this program in the future? **68 R**
   a. No **57 (84%)**
   b. Yes **11 (16%)** If yes, ask: What are your recommendations?
   Answer:_____
   _____
   _____
   _____
   _____

Non-Participant Survey_Residents

Date:	Approximate Time: AM / PM	Address:

City:	☐ Brea	☐ Cathedral City	☐ Corona	☐ H.ermosa Beach	☐ Irvine
	☐ Moreno Valley	☐ Palm Desert	☐ San Bernardino	☐ Santa Clarita	☐ Santa Monica

READ: Hi, my name is _____ and our company works for the Public Utilities Commission. We are conducting an evaluation survey of a local program called the Community Energy Partnership. According to a list we received, we understand that your residence did not participate in the program.

1. Have you heard about the Community Energy Partnership program?
   ¿Ha oído del programa de la Coalición de Energia?
   a. Yes **Sí.**
   b. **No**, If no, ask: Have you heard about a program that gave free energy tune-ups to residents in this community?
      ¿Ha oído de un programa que diera "tune-ups" libres para ahorrar la energía?
      a. Yes **Sí.**
      b. **No**, If no, ask: Did you hear about a program that gave away free light bulbs and other energy-efficient products to residents in this community?
         ¿Ha oído de un programa que diera bombillas libres y otros productos de conservación de la energía a los vecinos de esta comunidad?
         a. Yes **Sí**
         b. No
   c. Don't recall **No sé.**
   d. Question Not asked

2. Do you remember receiving any advertisements announcing the program?
   ¿Recueda usted recibiendo anuncios de este programa?
   a. Yes **Sí.**
   b. **No**
   c. Don't recall **No sé.**
   d. Question Not asked

3. What was your reason for not participating in the program?
   ¿Por qué no participó usted en el programa?
   a. No time/ Too busy **No tengo tiempo.**
   b. Not interested **No estabo interestado**.
   c. Unaware of program **No supe del programa.**
   d. Not available for tune- up date **No pude participar en el día que ellos estaban trabajando**.
   e. Skepticism, if this, ask: What could have been done to decrease your skepticism about this program?
      Estaba dificil creérlo.
      Answer:_____
      _____
      _____
      _____
   f. Don't recall **No sé.**
   g. Other: _____
   h. Question Not asked

4. Do you currently use energy-efficient light bulbs in your home?
¿Usa usted las bombillas eficientes (compactas fluorescents) en su casa hoy?
    a. Yes **Sí.**
    b. **No**
    c. Don't recall **No sé.**
    d. Not asked

5. Do you currently use other types of energy-efficient products in your home?
¿Usa usted otros productos eficientes en su casa?
    a. Yes **Sí.**
    b. **No**
    c. Don't recall **No sé.**
    d. Question not asked

6. How would you rate your commitment to conserving energy in your home:
¿Cómo clasificaría su devoción a ahorrar la energía en su casa?
    a. ____ very low **muy bajo**
    b. ____ somewhat low **algo bajo**
    c. ____somewhat high **algo alto**
    d. ____very high **muy alto**
    e. ____Other answer_____ , (do not read out loud)
    f. ____DK, (do not read out loud)
    g. ____Question not asked

7. Do you have any recommendations that would help increases the chances of your participation in this program in the future?
¿Tiene usted recomendaciones que ayudaría aumentar su participación en un programa como esto en el futuro?
    a. No
    b. Yes, **Sí.** If yes, ask: What are your recommendations? **¿Qué son sus recomendaciones?**

    Answer:_____
    _____
    _____
    _____
    _____
    _____

Non-Participant Survey_Businesses

Business Name:				Business Type:	
Date:	Approximate Time: AM / PM			Address:	
City:	☐ Brea	☐ Cathedral City	☐ Corona	☐ H.ermosa Beach	☐ Irvine
	☐ Moreno Valley	☐ Palm Desert	☐ San Bernardino	☐ Santa Clarita	☐ Santa Monica

READ: Hi, my name is _____ and our company works for the Public Utilities Commission. We are conducting an evaluation survey of a local program called the Community Energy Partnership. According to a list we received, we understand that your residence did not participate in the program.

1. Have you heard about the Community Energy Partnership program? **56 Responses**
   a. Yes **3 (5%)**
   b. No **26 (47%)**
      If no, ask: Have you heard about a program that gave free energy tune-ups to businesses in this community?
      a. Yes **1 (4%)**
      b. No **25 (96%)**
         If no, ask: Did you hear about a program that gave away free light bulbs and other energy-efficient products to businesses in this community?
         a. Yes **1 (6%)**
         b. No **24 (94%)**
   c. Don't recall **27 (48%)**
   d. Question Not asked **0 (0%)**

2. Do you remember receiving any advertisements announcing the program? **56 Responses**
   a. Yes **1 (2%)**
   b. No **18 (32%)**
   c. Don't recall **37 (66%)**
   d. Question Not asked **0 (0%)**

3. What was your reason for not participating in the program? **56 Responses**
   a. No time/ Too busy **4 (7%)**
   b. Not interested **5 (9%)**
   c. Unaware of program **26 (46%)**
   d. Not available for tune- up date **0 (0%)**
   e. Skepticism **0 (0%)** if this, ask: What could have been done to decrease your skepticism about this program?
      Answer:_____
      _____
      _____
      _____
      _____
      _____
      _____
      _____
   f. Don't recall **15 (27%)**
   g. Other: _____ **5 (9%)**
   h. Question Not asked **1 (2%)**

4. Do you currently use energy-efficient light bulbs in your business? **56 Responses**
    a. Yes **19 (34%)**
    b. No **20 (36%)**
    c. Don't recall **17 (30%)**
    d. Not asked **0 (0%)**
5. Do you currently use other types of energy-efficient products in your business? **56 Responses**
    a. Yes **11 (20%)**
    b. No **27 (48%)**
    c. Don't recall **18 (32%)**
    d. Question not asked 0 **(0%)**

6. How would you rate your commitment to conserving energy in your business: **56 Responses**
    a. ____ very low **1 (2%)**
    b. ____ somewhat low **15 (26%)**
    c. ____somewhat high **11 (20%)**
    d. ____very high **3 (5%)**
    e. ____Other answer_____ , (do not read out loud) **1 (2%)**
    f. ____DK, (do not read out loud) **25 (45%)**
    g. ____Question not asked **0 (0%)**

7. Do you have any recommendations that would help increases the chances of your participation in this program in the future? **56 R**
    a. No **54 (97%)**
    b. Yes **2 (3%)** If yes, ask: What are your recommendations?
    Answer:_____
    _____
    _____
    _____
    _____
    _____
    _____
    _____

This survey was written by the Energy Coalition's academic consultants. Aloha Systems and the utilities cooperated with these consultants on Part 3 to develop a mutually useful instrument. Parts 1 and 2 were developed and used solely in the academic evaluation.

PEAK Student Assessment/Survey

Directions: ***Read each question carefully. Find the number corresponding to the question on the answer sheet. Now completely fill in the circle corresponding to the correct answer using a #2 pencil.***

PART 1: Energy Science

1. Electrical energy can be turned into heat or mechanical energy. What else can electrical energy be converted to?

    a. Sound and light*
    b. Nuclear fission
    c. Photosynthesis
    d. Renewable resources

2. When you digest food you convert _____ energy into the energy you need to live and grow.

    a. Mechanical
    b. Nuclear
    c. Electrical
    d. Chemical*

3. Which of the following converts electrical energy into motion?

    a. Light switch
    b. Electric stove
    c. Light bulb
    d. Electric fan*

4. If electricity **CANNOT** pass through an object, it may be called:

    a. A metal
    b. A salt
    c. An insulator*
    d. A conductor

5. In order for a flashlight bulb to light up you need:

    a. An unconnected wire and a battery
    b. A complete circuit*
    c. An open circuit
    d. An unconnected bulb, 2 batteries and 2 wires

6. A device that uses electricity to produce a magnetic field is a/an:

    a. Battery
    b. Electromagnet*
    c. Resistor
    d. Light bulb

7. The filament in an incandescent light bulb provides

    a. Resistance to the flow of electricity*
    b. Kinetic energy
    c. Electromagnetism
    d. Static electricity

8. A circuit with more than one path for current is called a:

    a. Series circuit
    b. Closed circuit
    c. Short circuit
    d. Parallel circuit*

9. If you have a series circuit with 4 light bulbs, when you unscrew one of the light bulbs what will happen?

    a. All the lights will go out.*
    b. Nothing will happen.
    c. All the other lights will remain lit.
    d. The battery will blow up.

10. A generator in a power plant converts:

    a. Mechanical energy to electricity*
    b. Electricity to mechanical energy
    c. Mechanical energy to chemical energy
    d. Kinetic energy to potential energy

11. When fuel is burned, most of the energy released becomes:

a. Kinetic energy
b. Chemical energy
c. Heat energy*
d. Light energy

12. Solar cells generate electricity from:

a. Water
b. Light*
c. Pressure
d. Chemical change

13. Lightning is an example of:

a. A generator
b. Magnetism
c. Static electricity*
d. An electromagnet

14. Electricity that is connected to or released to Earth is:

a. Current
b. Insulated
c. A circuit
d. Grounded*

15. Natural gas is considered:

a. A non-renewable resource*
b. A renewable resource
c. An endangered resource
d. A photovoltaic resource

16. Fossil fuels include:

a. Natural gas
b. Coal
c. Oil
d. All of the above*

17. Heat energy tends to flow:

a. From cooler areas to hotter areas
b. From the ocean to the land
c. From hotter areas to cooler areas*
d. From the land to the ocean

PART 2: Energy Conservation

18. What items can keep your house cool?

a. Shade trees
b. Insulation
c. Ceiling fans
d. All of the above*

19. What is a reasonable temperature setting for your air conditioner?

a. 60 degrees
b. 78 degrees*
c. 85 degrees
d. 93 degrees

20. When you install energy saving measures, you may also

a. Help clean the environment
b. Become a more responsible citizen
c. Save money
d. All of the above*

21. What is the peak demand time?

a. When electricity is least expensive
b. The time of day, usually during the summer months, when consumers use the most energy*
c. The time of year that consumers use the most solar energy
d. When people demand peak performance

22. Why is it important to shift time of use off peak demand?

a. Blackouts happen when everybody uses energy at the same time.
b. Because you are responsible for your energy consumption
c. Because shifting use can lower the price of energy
d. All of the above*

23. When is the **BEST** time to use appliances in your home?

a. Noon
b. After 7:00 pm*
c. After 3:00 pm
d. Never

24. What is a renewable energy source?

a. A fossil fuel
b. A source of energy that can be used and replaced*
c. New energy efficient appliances
d. Energy from newly discovered parts of the universe

25. Which of these statements can be used to describe renewable energy sources?

a. They will eventually run out.
b. They pollute.
c. They usually do not need to be burned.*
d. They are made from fossils.

26. What is **NOT** a way to use natural gas safely?

a. Use space heaters safely.
b. Use the oven to warm the house.*
c. When cooking, make the flame fit the pot.
d. Look for the blue flame.

27. How much **LESS** energy does a compact fluorescent light (CFL) bulb use than a regular light bulb?

a. 10% less energy
b. 25% less energy
c. 43% less energy
d. 75% less energy*

28. What label are appliances stamped with if they are energy efficient?

a. Energy Star*
b. Efficiency Plus
c. Energy Saver
d. Energy Efficient

PART 3: Energy Use

For the all remaining questions, there are no "right or wrong" answers and you are NOT graded on this part.

29. How many compact fluorescent lights (CFLs) did you have in your home before this school year started?

    a. none
    b. 1 to 2
    c. 3 to 5
    d. 6 or more
    e. Don't know

30. How many CFLs did your family buy and install this school year so far?

    a. none
    b. 1 to 2
    c. 3 to 5
    d. 6 or more
    e. Don't know

31. In what rooms have you installed CFLs this school year? *(Check ALL that apply. Leave the answer blank on your answer sheet if you have not installed any CFL's or you don't know.)*

    a. Living room and/or kitchen
    b. Bedroom and/or bathroom
    c. Hall and/or closet
    d. Other

32. Have you discussed what you learned in PEAK with any of the following people? *(Check ALL that apply and leave the answer blank on your answer sheet if you have not discussed this with anyone.)*

    a. Parents or other adults in your home
    b. Brothers, sisters, or other kids in your home
    c. Adult relatives or neighbors
    d. Friends or other kids

33. Which best describes your actions at home right now? *(Remember, there are no "right or wrong" answers and you are not graded on this.)*

    a. I practice energy conservation now but also practiced it during the last school year.
    b. I practice much more energy conservation now than I did during the last school year.
    c I practice some more energy conservation now than I did during the last school year.
    d. I really don't practice much energy conservation.

34. How do you think MOST of your classmates behave as a result of PEAK?

    a. They already practiced energy conservation before PEAK.
    b. They are much more energy-conserving now.
    c. They are somewhat more energy-conserving now.
    d. They really don't practice conservation.
    e. I don't know

.

35. How did you feel about your participation in the PEAK Program?

    a. I really enjoyed it.
    b. I liked it pretty well.
    c. I didn't care one way or another
    d. I didn't much care for it.
    e. I really didn't like it at all.

36. Are you doing anything at school this year to help the school save energy? If yes, please write what you are doing on the back of your answer sheet.

    a. Yes
    b. No

37. On the back of your answer sheet, please list specific things you have started doing today at your home to conserve energy, shift peak demand, and/or be more energy efficient.

PEAK Student Energy Actions
Teacher Activity Log and Review

Teacher Name:

School:

School District:

Phone Number:

E-mail:

Please indicate the PEAK Units you taught during the school year and rate each lesson on a scale of 1 – 5:
(1=Poor; 2=Needs Improvement; 3=Satisfactory; 4=Above Average; 5=Excellent)

Unit Taught	Assessment (1=Poor; 5=Excellent)					Additional Comments
Unit 1 Powerline-The Electricity Story	1	2	3	4	5	
Unit 2 Conductors & Insulators	1	2	3	4	5	
Unit 3 Electricity & Magnetism	1	2	3	4	5	
Unit 4 Circuits	1	2	3	4	5	
Unit 5 Converting Energy into Electricity	1	2	3	4	5	
Unit 6 Building a Lightbulb	1	2	3	4	5	
Unit 7 Sticking with Static	1	2	3	4	5	
Unit 8 Natural Gas Safety	1	2	3	4	5	
Unit 9 Introduction to Natural Gas	1	2	3	4	5	

Unit 10 Keeping Heat In and Out	1 2 3 4 5	
Unit 11 A Healthy Energy Future	1 2 3 4 5	

Please answer the following questions (One = Strongly Agree, five= strongly disagree)

1. Overall the lessons were easy to set up.

   1 2 3 4 5

2. Everything I needed was in the Tool Kit.

   1 2 3 4 5

3. Overall students understood what the lessons represented.

   1 2 3 4 5

4. Overall the students enjoyed the lessons.

   1 2 3 4 5

5. Students had a successful experience completing the lab activities.

   1 2 3 4 5

6. Students understand the concept of Peak Demand.

   1 2 3 4 5

7. Students understand and consistently participate in the four energy actions that PEAK emphasizes.

   1 2 3 4 5

8. Students made energy efficient changes at home.

   1 2 3 4 5

9. Students were eager to make energy efficient changes at school.

   1 2 3 4 5

10. Students understand that their personal energy consumption effects the environment.

    1 2 3 4 5

Please answer the following questions:

1. What unique activities did your students engage in, if any?

2. Did any students go above and beyond their normal assignments to make their school, home, or community more energy efficient?

3. Did your students feel prompted to volunteer in their communities? If so, in what capacity?

Thank you!! Your comments will help us better serve you and your students. Additional comments can be included on the back of this page.

Please send or fax to:

15615 Alton Parkway, Suite 245, Irvine, CA 92618

or (949) 701-4646

ATTN: PEAK

ENERGY COALITION MANAGING DIRECTOR

1. ***The Energy Coalition ↔ city partnerships***

    a. How does the Community Energy Partnership's progress this year compare to the progress of the Six Cities program?

    b. What is your expectation for the role the cities will each play? (does it vary by city?)

    c. What are each of the cities doing to help the project?

    d. What are you doing to get them more in line with your expectations?
        i. Specify cities.
        ii. Refer back to problems he cited.

    e. How much staff time are the cities expected to devote to the project?
        i. Are there any changes or improvements you would like to see regarding the amount of time they devote to the project?

    f. In regards to generating leads for the program, how do cities access and utilize residential or small business contact information?
        i. Is this working for your efforts to reach residential and small businesses?

    g. Do you feel the city facilities are undergoing sufficient energy upgrades as a result of the Partnership?
        i. What would you do differently?

    h. How do you work with cities to transfer positive experiences among the cities?

2. ***Utility ↔ city partnership***

    a. How do the utilities help with customer contact information?
        i. Is there any thing that you would like to see done differently?

    b. Do city staff members interact directly with Edison or the Gas Company?
        i. Is there anything that you would like to see done differently?

3. ***The Energy Coalition ↔ Utility partnership***

    i. Who are your contacts at Edison and how often do you meet or talk about the project?

a. What is different in this "partnership" relationship as compared to the "non-utility implementer" relationship of the Six Cities program?

    i. What is the process that is used for payment between Edison and TEC
    ii. Have you had any problems with this?
    iii. How does this affect the sub-contractors?

b. Are there any changes or improvements you would like to see in your relationship with Edison? Why do you say that?

c. What do you think is the most effective aspect of the partnership?

4. ***Utility ↔ contractor interactions***

a. Does the utility staff ever deal directly with sub-contractors, PEAK schools, residential or small business customers, or other partners in the program?
    i. Would it help if they did (more)?
    ii. What specifically could they do to help?

5. ***SCE ↔ SCG interaction***

a. How do Edison and the Gas Company work together?

b. What are the strengths and weaknesses of this relationship?

c. Could this be improved? How?

6. ***The Energy Coalition ↔ Utility ↔ CPUC interactions***

a. How has the utility partnership arrangement affected your relationship with the CPUC?

7. The Energy Coalition ↔ contractor interactions

a. Is one or both of the contractors actively generating leads for the program?
    i. What are they doing?
    ii. Are the contractors able to generate the leads you need?

b. Do you feel the contractors are satisfied with the program?

c. Have there been any changes in the contractor's role or expectations?
    i. Have you had to make any changes because of problems?
    ii. What will you do to prevent similar situations from happening in the future?

d. What is your perception of how well the two contractors work together?
    i. Have you had any sense that they compete with each other?

e. Would more interaction between them be beneficial?

f. Some cities have wished to use local contractors. What would the effect of this change be on your program?
    i. If a city only wanted local contractors involved would that be possible?

8. City ↔ contractor interactions

a. Do the cities interact with the contractors?
    i. If so, what has the experience been with these interactions?

9. The Energy Coalition ↔ school coordination and cooperation

a. In the Six Cities program, it was difficult to know exactly how many students participated in PEAK and even uncertain as to what "participation" involved. *What has been done by the schools or TEC to resolve these problems?*

b. How many energy efficiency upgrades have occurred at the PEAK schools?
    i. How does this compare to your expectations?

10. Internal staff relations at The Energy Coalition

a. What types of administrative changes have occurred at The Energy Coalition?

b. What affects have these had on the organization and program?

c. Do you expect to make additional changes?
    i. Do you feel the budgeted staffing levels were adequate?

d. Besides the installation contractors, what other contractors does TEC use to support the program?
    i. Are there any changes or improvements you would like to see?

11. General questions

a. How would you describe the marketing efforts of the program?
    i. Do they differ by city?
    ii. What has been the most effective marketing strategy for the program?
    iii. What was it that led you to feel it was effective?
    iv. Are there any changes or improvements you would like to see?

ENERGY COALITION OPERATIONS MANAGER

The Energy Coalition ↔ city partnerships

a. What is your role in the program?

b. How long have you had this responsibility?

c. What were your initial views of the program?

d. How would you describe the progress of the CEP for its first year?

    a. What do you attribute it to?

e. What is your expectation for the role the cities will each play? (does it vary by city?)

f. What are each of the cities doing to help the project?

g. What are you doing to get them more in line with your expectations? [i.e. Specify cities; Refer back to problems cited.]

h. How much staff time are the cities expected to devote to the project?

i. Are there any changes or improvements you would like to see regarding the amount of time they [cities] devote to the project?

j. How do you work with cities to transfer positive experiences among the cities?

The Energy Coalition ↔ contractor interactions

a. Have there been any changes in the contractors' role or expectations?
b. Have you had to make any changes because of issues within certain cities?
c. What will you do to prevent similar situations from happening in the future?

d. Is one or both of the contractors actively generating leads for the program?

    a. When did this occur and why?
    b. What are they doing?

e. Are the contractors able to generate the leads you need?

f. Do you feel the contractors are satisfied with the program?

g. What is your perception of how well the two contractors work together?
h. Have you had any sense that they compete with each other?

i. Would more interaction between them be beneficial?

j. Some cities have wished to use local contractors. What would the effect of this change be on your program?
k. If a city only wanted local contractors involved would that be possible?

City ↔ contractor interactions

l. Do the cities interact with the contractors?
m. If so, what has the experience been with these interactions?

Internal staff relations at The Energy Coalition

n. What types of administrative changes have occurred at The Energy Coalition?

o. What affects have these had on the organization and program?

p. Do you expect to make additional changes?
q. Do you feel the budgeted staffing levels were adequate?
r. Are there any changes or improvements you would like to see?

General questions

s. In regards to residential tune-ups, what has been most effective in securing consent from property managers?
t. Does it vary by city? (Cite cities)
u. Does it vary by sector (i.e. apartment, condo, mobile home)
v. What have your experiences been with the property managers?
w. Are there any changes or improvements that you would like to see?

x. How would you describe the marketing efforts of the program?
y. Do they differ by city?
z. What do you think is the most effective marketing strategy for the program?
aa. Are there any changes or improvements you would like to see in the marketing efforts?

ENERGY COALITION COMMUNICATIONS MANAGER

1. ***The Energy Coalition ↔ city partnerships***

    a. How does the Community Energy Partnership's progress this year compare to the progress of the Six Cities program?

    b. What is your expectation for the role the cities will each play? (does it vary by city?)

    c. What are each of the cities doing to help the project?

    d. What are you doing to get them more in line with your expectations?
        i. Specify cities.
        ii. Refer back to problems he cited.

    e. How much staff time are the cities expected to devote to the project?
        i. Are there any changes or improvements you would like to see regarding the amount of time they devote to the project?

    f. In regards to generating leads for the program, how do cities access and utilize residential or small business contact information?

    g. Do you feel the city facilities are undergoing sufficient energy upgrades as a result of the Partnership?
        i. What would you do differently?

    h. How do you work with cities to transfer positive experiences among the cities?

2. ***The Energy Coalition ↔ contractor interactions***

    a. Is one or both of the contractors actively generating leads for the program?
        i. What are they doing?
        ii. Are the contractors able to generate the leads you need?

    b. Do you feel the contractors are satisfied with the program?

    c. Have there been any changes in the contractors' role or expectations?
        i. Have you had to make any changes because of problems?
        ii. What will you do to prevent similar situations from happening in the future?

    d. What is your perception of how well the two contractors work together?
        i. Have you had any sense that they compete with each other?

    e. Would more interaction between them be beneficial?

f. Some cities have wished to use local contractors. What would the effect of this change be on your program?
    i. If a city only wanted local contractors involved would that be possible?

3. City ↔ contractor interactions

a. Do the cities interact with the contractors?
    i. If so, what has the experience been with these interactions?

4. The Energy Coalition ↔ school coordination and cooperation

a. In the Six Cities program, it was difficult to know exactly how many students participated in PEAK and even uncertain as to what "participation" involved. *What has been done by the schools or TEC to resolve these problems?*

b. How many energy efficiency upgrades have occurred at the PEAK schools?
    i. How does this compare to your expectations?

5. Internal staff relations at The Energy Coalition

a. What types of administrative changes have occurred at The Energy Coalition?

b. What affects have these had on the organization and program?

c. Do you expect to make additional changes?
    i. Do you feel the budgeted staffing levels were adequate?

d. Besides the installation contractors, what other contractors does TEC use to support the program?
    i. Are there any changes or improvements you would like to see?

6. General questions

a. In regards to residential tune-ups, what has been most effective in securing consent from property managers?
    i. Does it vary by city? (Cite cities)
    ii. Does it vary by sector (i.e. apartment, condo, mobile home)
    iii. What have your experiences been with the property managers?
    iv. Are there any changes or improvements that you would like to see?

b. How would you describe the marketing efforts of the program?
    i. Do they differ by city?
    ii. What do you think is the most effective marketing strategy for the program?
    iii. Are there any changes or improvements you would like to see in the marketing efforts?

ENERGY COALITION PEAK PROGRAM MANAGER

1. **What are your goals for PEAK?**

    a. How does the PEAK program of the Community Energy Partnership compare to the PEAK program of the Six Cities?

    b. What resources do you have and how are you using them?

    c. Who do you feel are the key role players within each of the school systems?
        i. Describe their roles?
        ii. What are your expectations for each of these role players? (Does it vary by district / school?)

    d. What is PEAK's start and end cycle for the program year? (How does that compare to the CEP start and end dates?)

2. **Teachers**

    a. How are teachers recruited for PEAK?

    b. What is your expectation for the role teachers play in PEAK? (Does it vary by school?)
        i. Have you had to make any changes?

    c. How many teachers have been trained through PEAK?
        i. What has been their response from the training workshops?

    d. What has been their response regarding the supplies received?
        i. What is the procedure for receiving supplies?
        ii. Does it vary by school?

    e. What is your perception of how well the teachers work together?
        i. Have you had any sense that they help each other?
        ii. Would more interaction among them be beneficial?

    f. Do you feel the teachers are satisfied with the program this year?

    g. In the Six Cities program, it was reported that some teachers, due to budget cuts, were required to teach science and integrate PEAK in their curriculum. Some teachers admitted having no experience or knowledge in this field and were therefore uncomfortable implementing PEAK. What has been done to address these concerns?
        i. What procedures have been set up in the event a teacher opts out of PEAK?

ii. How is this tracked?

h. In the Six Cities program, it was reported that some teachers felt they had no time to implement PEAK because they were too busy teaching "standards of the state." What has been done to address this concern?

3. Students

a. How are students recruited to participate in PEAK?

b. How many students are expected to participate in PEAK during the program cycle?

c. In the Six Cities program, it was difficult to know exactly how many students participated in PEAK and even uncertain as to what "participation" involved. What has been done to address these concerns?

d. Do you feel students are receiving adequate PEAK instruction from their teachers?

e. What do you feel makes an effective PEAK student?

f. Do you feel students are satisfied with the program?

4. Parents

a. How many parents are expected to participate in PEAK?

b. What are your expectations for the role parents play in the program?
   i. Do parents ever contribute to the program?
   ii. If so, in what ways?
   iii. Would it help if they did more?

c. What is your perception of how well they have incorporated energy-saving activities within their home?
   i. What is your perception of the extent of their energy savings activities?
   ii. How would you like to see their energy-saving activities tracked?

d. Do you feel the parents are satisfied with the program?

5. Schools

a. What is your approach to selecting schools for PEAK?

b. How many schools are participating in PEAK?

c. What is your feeling about how well the schools have been in supplying you with requested information?
    i. Do you feel this can be improved?

d. How many energy efficiency upgrades have occurred at the PEAK schools?
    ii. How does this compare to your expectations?

6. School Districts

a. Do you feel the goals of district office and the goals of teachers in the classroom for PEAK match?

b. Do you feel the school districts are implementing sufficient energy upgrades in their facilities and schools as a result of PEAK?
    i. How have resources been used to implement energy upgrades?
    ii. What process is used to initiate energy-efficiency upgrades within the schools?

    iii. Administrative

c. What types of administrative changes have occurred in PEAK?

d. How has the utility partnership affected PEAK?

e. Does the utility staff ever deal directly with schools or teachers?
    i. Would it help if they did (more or less)?

CITY TEAM LEADERS

For reference during the interview, the term "Community Energy Partnership" program will be replaced by the term "The Program."

Background

1. What is the main business or activity performed in your department?

2. How did you first learn about The Program? [check all that apply]
   a. Supervisor or co-worker ……..…..0
   b. Employee ……...….1
   c. Utility mailing or advertisement ..…..2
   d. Utility representative ……..…….....3
   e. Colleague or friend …….……..….4
   f. TEC representative …….…...……5
   g. Other ……...….6

3. [If Other:] Describe: [open]

4. How long have you personally been involved in The Program? [open]

5. Did you take over for someone else?
   N Y DK

6. [If yes:] What, if any, effects has this had on The Program effort in your city?

7. What were your initial views of The Program? [open]

8. Have those views changed since then?
   N Y DK
9. [If Y:] In what way?

10. [If “old” city:] How does the Community Energy Partnership progress this year compare to the progress of the Six Cities program? [open]

Team Leader Roles and Responsibilities

11. What is the role you play in The Program? What are you doing to help the project? [open]

12. What has The Energy Coalition done to assist you in your role? [open]

13. Who is responsible for ensuring new leads are generated within the energy districts?

14. Do you have any ideas that would help generate new leads to the program?

15. Do you feel the utilities could and should help in generating leads?
N Y They already do DK.

16. [If Y:] In what way and why? [open]

17. Do you feel The Energy Coalition could and should help in generating leads?
N Y They already do DK

18. [If Y:] Why? [open]

19. Do you feel installation contractors could and should help in generating leads?
N Y They already do DK

20. [If Y:] Why? [open]

Influence of CEP on Work Activities

21. Approximately how many FTE are devoted to CEP program activities by city staff?
    a. (assuming 2080 hrs/year =1 FTE)
    b. DK

22. Is there a required amount you are obligated to commit to the program?

    N Y DK

23. Do you feel your city has adequate staffing resources to accommodate involvement in The Program? N Y DK

24. [If N:] How can this issue be resolved?

City Policy

25. Have any changes occurred or will occur to city policy as a result of The Program? N Y DK

26. [If yes:] What? [open]

Energy Districts

27. How was your city's energy district selected? [open]

28. How would you describe the demographics of your city's energy district? [open]

29. Do you know of any plans for modifying the energy district? N Y DK

30. [If yes:] What are they?

31. Have any community events or activities occurred in your city through The Program? N Y DK [If yes:] Please describe.

32. How was or will a community event or activity be organized? [open]

33. Have any challenges been brought to your attention about organizing community events? N Y DK [If yes:] Please describe.

34. Are there any issues in getting volunteers to participate? N Y DK

35. [If yes:] Please describe. How have these issues been addressed? [open]

36. Have city departments played a role in any of the activities? [i.e. Fire, Police]

    N Y DK

37. [If yes:] What were their contributions?

38. Have you received any feedback on how the community is responding?

    N Y DK

39. [If yes:] What has that feedback been?

40. How would you describe the community support of program activities? [open]

41. Have you seen any change in response to community interest since the program's inception? N Y DK

42. [If yes:] From a particular sector? N Y DK To what do you contribute the changes? [open]

Team Leader Meetings

43. How many team leader meetings have you attended? [open]

44. Would you say that team leader meetings are different than other meetings you have attended? N Y DK [If yes:] In what way?

45. What have you gained from attending a team leader meeting? [open]

46. Have meeting locations ever been an issue? N Y DK

a. [If Y:] Has this issue been resolved? N Y DK

i. [If N] How would you resolve the issue? [open]

47. What types of experiences do team leaders share at these meetings? [open]

a. Has this information been beneficial to you? N Y DK [If N or Y] How so?

48. What do you feel are the most important issues discussed at team leader meetings? [open]

49. Do you feel team leader meetings are a beneficial component of the program?

N Y DK

50. [If yes:] In what way? [open]

51. Do you have any recommendations for improving the team leader meetings?

N Y DK

52. [If Y:] What are they?

Assessment of Marketing
Marketing/ Strategy/ Demand

53. How does The Program marketing take advantage or coordinate with the marketing your city does for their programs? [open]

54. How satisfied are you with the current marketing activities? [Prompt] Very Satisfied Somewhat Satisfied or Not Satisfied.

    a. [If SS or NS:] Do you think additional methods are needed? [open]

TEC Staff

55. Who are your primary contacts at The Energy Coalition? [open]

    a. Have any issues come up relating to them? N Y DK [If Y:] Have those issues been resolved? N Y DK

56. Has turn-over at The Energy Coalition affected your involvement in the program? N Y DK [If Y:] In what way?

Utility Involvement

57. Do team leaders receive any other information about Southern California Edison or Southern California Gas programs? N Y DK [If yes:] Who presents the information? [open] What type of information? [open] (Brochures and verbal presentation/) When is the information given? [open] (Each meeting or selected meetings?)

58. Is information about utility programs integrated into the program activities or material in any way? N Y DK

59. Would you say that Southern California Edison's or Southern California Gas's level of involvement in The Program appears to be about right, or do you think the program would improve with more utility involvement, or less utility involvement?
    a. about right
    b. more involvement
    c. less involvement
    d. dk

60. [If "more involvement":] What type of involvement would you like to see? [open]

Future Demand for CEP

61. Have you recommended or would you recommend The Program to other city governments? N Y DK

62. [If N or DK:] Why do you say that? [Open]

63. Thus far, what has worked best about the program?

64. What is your vision for the program in your city?

65. How do you see your city evolving with the program?

66. In general, *is there anything that is not happening* that you would like to see happen? N Y DK {if Y:] What and why?

67. Is there anything we have not discussed that you would like the evaluation to include?

UTILITY STAFF

For reference during the interview, the term “Community Energy Partnership” program will be replaced by the term “the program.”

Evaluation of the CEP

1. What are you hoping or expecting to learn from this evaluation?

Background

2. What is your role in the program?

    a. How long have you had this responsibility? [open]

3. What were your initial views of the program? [open]

4. Have those views changed since then? N Y DK
    a. [If Y] In what way?

Role of Utility Staff in Program

5. Approximately how many FTE are devoted to program activities by utility staff? (assuming 2080 hrs/year = 1 FTE)

6. Is there a required amount of time you are expected to work on the program? N Y DK

7. Do you ever deal directly with the program's sub-contractors, PEAK schools, residential or small business customers, or other partners in the program? N Y DK
    a. [If Y] Which ones and what do you do?

8. Have you attended any of the team leader meetings? N Y DK (If N, skip to Q9)

    a. [If Y] How many? [open]

    b. What do you feel are the most important issues discussed at these meetings?

    c. Do you feel team leader meetings are a beneficial component of the program? N Y DK

d. [If Y] In what way? [open]

e. Do you have any recommendations for improving the team leader meetings? N Y DK

f. [If Y] What are they? [open]

Role of Utility in Program

9. What is the view of your utility management as to the utility role in the program? [open]

10. Are there expectations that this role will change over time? N Y DK

    a. [If Y] In what ways? [open]

11. What type of reaction have you had to utility involvement in the program from:

a. residential end use customers [open]

b. commercial end use customers [open]

12. How do the reactions to utility involvement in this program compare to experiences outside of the program? [open]

TEC Staff

13. Who are your primary contacts at The Energy Coalition and how often do you meet or talk about the program? [open]

14. Have any issues come up relating to them? N Y DK
    a. [If Y] Have those issues been resolved? N Y DK

15. Has turn-over at The Energy Coalition affected your involvement in the program? N Y DK

    a. [If Y] In what way?

16. Are there any changes or improvements you would like to see in your partnership with The Energy Coalition? N Y DK

    a. [If Y] What?

17. What do you think is the most effective aspect of the partnership with TEC? [open]

18. Do you think your utility should be more involved in program activities? N Y DK
    a. [If Y], In what ways ? [open]

Edison and The Gas Company Interaction

19. What have *you* gained from working in partnership with the other utility? [open]

20. What do you feel the *program* has gained from working in partnership with the two utilities? [open]

21. Are there things that you think could improve the partnership between the two utilities? N Y DK

    a. [If Y], What? [open]

22. Are there things that you think the other utility could do for the program that they are not currently doing? N Y DK

    a. [If Y] What?

Delivery/Logistics

23. What type of information do you provide to city team leaders about utility programs? [open]

    a. Who presents the information?

b. When is the information given?

Informational Content

24. Is information about utility programs integrated into the educational or marketing materials in any way? N Y DK

25. How prominently does the marketing and educational material present your utility as a partner in the program? [open]

26. What are you expectations for how the information will be used by the team leaders? [open]

27. What is your expectation for how program participants will respond to the information on utility programs? [open]

28. Have any concerns been expressed about how the program should be linked to your utility? N Y DK

Marketing/ Strategy/ Demand

29. What does your utility do to inform potential residents and small business owners about the program? [open]

    a. Who is involved in marketing? [open]

b. Do you promote the program using the same methods your utility uses for its other programs? N Y DK

c. [If Y] Explain what is similar. [open]

30. How satisfied are you with the current marketing activities conducted by TEC? [prompt] Would you say: very satisfied / somewhat satisfied / or not satisfied?

    a. [If SS or NS] Do you think any additional methods of approaches are needed? N Y DK

    b. [If Y] What? [open]

31. How well does the program fit with your portfolio of small business, residential, and educational programs? [open]

32. In what ways do you think the program *complements* your utility's activities? [open]

33. In what ways do you think *the program* benefits from your utility's involvement? [open]

34. In what ways do you think your *utility* benefits from its involvement in the program? [open]

35. What is your sense of how well the program is addressing the need for residents and small business owners to decrease energy use? [open]

36. Do you have a long term vision for the program? N Y DK

    a. [If Y] What? [open]

37. Do you anticipate that the program may shift from third party implementation to utility implementation? N Y DK

    a. [If Y] Why would that occur?[open]

38. Have you recommended or would you recommend this program to other utilities? N Y DK

    a. [If Y] What would you say? [open]

Conclusion

39. Thus far, what has worked best about the program? [open]

40. Do you have any concerns about the program? N Y DK
    a. [If Y] What are they?

41. Is there anything we have not discussed that you would like the evaluation to include? N Y DK
    a. [If Y] What?

CONTRACTORS

1. Describe the role your company plays in this program.

    A. What is your company contracted to do for the CEP?

    B. Is there anything your company does to help the program that is not in the contract?

    C. Are there things you feel you could do to help the program but don't do for whatever reason?

2. Have there been any changes in your role or expectations?

    A. Why did these changes occur?

    B. How have these changes affected the program?

    C. How, if at all, have these changes affected your business? (this may not be needed as it should surface if there is an issue.)

    D. Are there any changes or improvements you would like to see in your contract with TEC?

3. Which cities are assigned to you?

    A. Did you have any input with TEC regarding which cities are assigned to you?

    B. Are you satisfied with the volume of work in the cities that you were given?

    C. Has their location had an affect on the tune-up process?

    D. Are there any changes or improvements you would like to see regarding the location of future cities in the program?

4. Approximately how many tune-ups have you conducted so far in the CEP program?
    A. Residential? (by city)

    B. Small business? (by city)

5. How does the Community Energy Partnership's progress this year compare to the progress of the Six Cities program?

    A. How has this affected your business?

6. How many training workshops have your employees attended for the CEP program?

A. How have the training workshops changed since the Six Cities program?

B. How many employees are currently trained to conduct the tune-ups?
C. Have these training workshops adequately prepared your employees for the tune-ups? (why or why not?)

D. Do you feel more training is necessary?

E. Do you have more employees that need training?

F. Are all your employees who were trained being utilized by the program?

G. Do employees ever conduct tune-ups without being trained?

H. What type of changes or improvements would you like to see regarding the training workshops?

7. What is the process for conducting a tune-up?

A. Are there guidelines installation contractors follow during a tune-up?

B. Do any cities have special guidelines?

C. Which tune-up guidelines are most beneficial?

D. Which tune-up guidelines do you feel are not beneficial?

E. How do you ensure that installers follow the guidelines?

F. Are there any changes or improvements you would like to see regarding the guidelines?

8. What process do you use for entering tune-up information into the master database?

A. Who is responsible for entering the data?

B. Have the data entry requirements changed since the Six Cities program?

C. Are there any changes or improvements you would like to see regarding the process for entering tune-up information into the master database?

D. Have any issues come up regarding the software program?

E. Are there any changes or improvements you would like to see regarding the software program?

9. How has city team leader involvement affected the program?

A. Do you feel more involvement from them is necessary?

B. Are the cities able to generate the leads you need?

C. What would help in generating leads for the program?

D. Do the cities participate in the tune-up process?

a. If so, what has the experience been?

E. Are there any changes or improvements you would like to see regarding the city's involvement?

10. Topic: the “partnership” relationship as compared to the “non-utility implementer” relationship of the Six Cities program.

    A. Does the utility staff ever deal directly with you through the program?

    B. Would it help if they did (more)?

    C. What specifically could they do to help?
    D. Are there any changes or improvements you would like to see in your relationship with?
        a. Edison?

            1. What would you like?

        b. The Gas Company

            1. What would you like?

    E. What do you think is the most effective aspect of the partnership between TEC, Edison, and the Gas Company?

    F. What do you feel is least effective about the partnership?

11. What is the process that is used for payment between you and TEC?

A. Have you had any problems with this?

B. How does this affect your business? (this may not be needed as it should surface if there is an issue.)

12. How would you describe your relationship with TEC?

A. Are you satisfied with the program?

B. Under what circumstances do you meet with TEC personnel?

C. Would more interaction with TEC personnel be beneficial?

D. Are there any changes or improvements you would like to see in your relationship with TEC?

13. Who is your primary contact at TEC?

A. Has your primary contact changed since the Six Cities program?

B. What affects have these changes had on TEC and the program?

C. Are there any changes or improvements you would like to see?

14. What caused you to be interested in the program?

A. Are your employees enthusiastic about the program?

B. Has TEC's Energy Champions program had any affect on employee attitude towards the overall program?

C. Are there any changes or improvements you would like to see?

15. Have any issues been brought up by any of your employees regarding the program?

A. What were the issues?

B. How were these issues addressed by you or TEC staff?

16. How would you describe your relationship with the other contractor?

A. How much interaction do you have with them? (Would more interaction with them be beneficial?)
B. At what point do you feel more installation subcontractors would be necessary as the program continues to expand? (my guess is they won't think any as the whole point is probably to get bigger.)

17. What do you feel are the CEP program's strong points?

18. Do you have any recommendations that would improve the program?

19. Are there any areas that were not addressed that you would like to mention?

TARGET SAMPLE SIZE SELECTION

Target sample sizes were selected in order to provide a relative precision of 0.1 at the 90% confidence level. A coefficient of variation of 0.5 was assumed, which is presumed to be a very conservative estimate. The sample sizes were adjusted to correct for finite populations. The following table presents the populations being studied and the respective sample sizes required for this level of precision and confidence.

Measure Description	Unit Definition	Participants	Proposed Sample
Contractor Data Entry	Tune-ups entered into database	1,950 per contractor	66 per contractor
Community Promotions	Receives 23-watt CFL	6,000	67
Community Promotions	Receives 58-watt Fluorescent Torchiere	2,000	66
Residential Activities-Mobile Homes	Lighting and Miscellaneous Efficiency Measures	1,200	64
Residential Activities-Apartments	Lighting and Miscellaneous Efficiency Measures	1,200	64
Residential Activities-Condominiums	Lighting and Miscellaneous Efficiency Measures	1,200	64
Residential Activities-Mobile Homes	Programmable Thermostats	400	58
Residential Activities-Apartments	Programmable Thermostats	400	58
Residential Activities-Condominiums	Programmable Thermostats	400	58
Small Business Tune-ups	Lighting and Miscellaneous Efficiency Measures	300	56
Non-participants	Residential non-participant surveys	Very Large	68
PEAK Students	Students enrolled in program	12,000	68
PEAK Households	Household Efficiency Actions	8,000	68
PEAK School Districts	School District Facilities	6	6
Municipal Energy Actions	Municipal Energy Management/ Partner Cities	10	9