

# **Comprehensiveness in California's Small Business Retrofit Programs Within Local Government Partnerships**

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## **Abstract**

The California Public Utilities Commission (CPUC) directed the investor-owned utilities (IOUs) to consider programs that take advantage of the expertise, access and infrastructure of local agencies for implementing energy efficiency programs. This led to local government partnerships (LGP) between the IOUs and local governments.

The purpose of this study is to provide the CPUC with an assessment of the comprehensiveness of small business retrofit programs that are administered by LGP and determine if there is any correlation between the business model or theory of operation of a small business direct install program, and that comprehensiveness. Investor owned utilities in California have engaged with both local governments and contractors to perform audits and installation of energy efficiency measures in small businesses such as retail and food stores. This study focuses on LGP in examining comprehensiveness with regard to measures considered and installed and also the approaches taken to accomplish their goals.

## 1. Introduction

The California Public Utilities Commission (CPUC) directed the investor-owned utilities (IOUs) to consider programs that take advantage of the expertise, access and infrastructure of local agencies for implementing energy efficiency programs.<sup>1</sup> This led to local government partnerships (LGP) between the IOUs and local governments. There are about 600 local governments in California, and approximately 750,000 small businesses in the state.<sup>2</sup> Small and medium-sized businesses consume about 18% of all commercial energy in the state<sup>3</sup>.

The purpose of this study is to provide the CPUC with an assessment of the comprehensiveness of small business retrofit programs that are administered by LGP and determine if there is any correlation between the business model or theory of operation of a small business direct install program, and that comprehensiveness. Investor owned utilities in California have engaged with both local governments and contractors to perform audits and installation of energy efficiency measures in small businesses such as retail and food stores. This study focuses on LGP in examining comprehensiveness with regard to measures considered and installed and also the approaches taken to accomplish their goals.

The objectives of this project are to provide the CPUC and stakeholders with the following:

- A selected review of relevant evaluations on local government partnerships.
- A review of the structure and approach utilized by a select group of programs/cities carrying out small business retrofit programs. Included are methods to connect with hard-to-reach audiences, development of long-term relationships with end-users, and funding/management arrangements.
- A review of the comprehensiveness of measures considered and installed by such programs/cities.
- A review of the barriers to comprehensiveness,
- A summary of current best practices in small business retrofit programs.
- Recommendations on types of changes needed to develop approaches that would remove or lessen barriers to greater comprehensiveness in small business retrofit programs.

The objectives listed above are discussed in the following sections that constitute the rest of this paper:

- Analysis of Data from 2006-08 LGP Programs
- Previous Reports and Analyses of Small Business Retrofit Programs

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<sup>1</sup> D-07-10-032, October 18, 2008, p123.

<sup>2</sup> Defined as having less than 500 employees by US Small Business Administration. Number of businesses from U.S. Small Business Administration, Office of Advocacy, based on data provided by U.S. Census Bureau. Website [http://www.sba.gov/advo/research/st\\_06.pdf](http://www.sba.gov/advo/research/st_06.pdf).

<sup>3</sup> California Flex Your Power website, small and medium-sized businesses were not defined.

- Stakeholder Perspectives on Small Business Retrofit Programs
  - Summary Findings
  - Third party contractors versus LGPs
  - Barriers to Comprehensiveness
  - Recommendations
- Future Directions

## 2. Analysis of Data from 2006-08 LGP Programs

### 2.1. PG&E Programs

One of the ways to assess comprehensiveness is to estimate the energy savings from the measures installed in small businesses through LGP programs. We looked at sixteen Pacific Gas & Electric (PG&E) programs listed below in Table 1 for the 2006-08 period.<sup>4</sup> These were the programs that included small business energy efficiency retrofits in their descriptions. It was sometimes difficult to separate out entries that were small business from entries for other business types. We used the business type definitions in the tracking data base to help us carry out this task, but it was also necessary to individually remove other entries that appeared to be municipal buildings or large businesses. Municipal buildings, such as police and fire stations, sewage treatment plants and courts, were removed as were educational buildings such as colleges and educational services. The large businesses were removed by eliminating entries with greater than 100kW demand. Since it is likely that we removed some entries that should not have been removed and that we also kept some entries that should have been removed, this approach will cause some uncertainty in the absolute values of the energy savings results but should prove useful for estimating the percentage savings from different types of measures. In addition, where a government partnership had more than one contractor retrofitting commercial buildings of different sizes, we were unable to isolate entries by the program or contractor that served them. This poses a limitation for correlating savings, and measures replaced, with specific contractors in some partnerships.

**Table 1. PG&E LGP Programs From which Measure Data Were Obtained**

PG&E 2015	Association of Bay Area Governments (ABAG) Energy Watch
PG&E 2016	Ass. of Monterey Bay Area Governments (AMBAG) Energy Watch
PG&E 2017	Bakersfield and Kern County Energy Watch
PG&E 2020	East Bay Energy Watch
PG&E 2021	Fresno Energy Watch
PG&E 2024	Madera Energy Watch
PG&E 2025	Marin Energy Watch
PG&E 2026	Merced/Atwater Energy Watch
PG&E 2027	Mother lode Energy Watch
PG&E 2028	Redwood Coast Energy Watch
PG&E 2029	San Francisco Energy Watch
PG&E 2030	South San Joaquin Energy Watch
PG&E 2031	Santa Barbara County Energy Watch

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<sup>4</sup> The data shown in this section are based on program tracking data through Q4 2008 for PG&E and Q3 2008 for SCE, and were provided by Floyd Keneipp, Mohit Chhabra and Timea Zentai of Summit Blue, Walnut Creek, CA, March 20, 2009 after discussions with the author of this report. Interpretations are the responsibility of the author.

PG&E 2032	Sonoma County Energy Watch
PG&E 2033	Stockton Energy Watch
PG&E 2095	San Luis Obispo Energy Watch

In order to better understand the range of energy efficiency measures implemented for these 16 programs, we looked at the detailed descriptions of the measures installed and grouped them into 5 measure categories: lighting, HVAC (heating, ventilating, and air conditioning), refrigeration, vending machine controls, and other. In Table 2, for each of the programs, we present data that show how much energy was saved and what percent of the energy savings is due to each measure type. It is important to keep in mind that these are not the total energy savings for all sectors from these programs but an attempt to estimate savings for small businesses. As noted previously, we excluded municipal buildings and educational facilities, and we also attempted to remove all facilities with greater than 100 kW demand reduction.

The vast majority of the energy savings comes from electricity savings (~106,000,000 kWh). That savings is equivalent to the annual electricity used by about 10,000 average homes in the U.S. Two programs (2020 (San Francisco) and 2029 (East Bay)) account for about 60% of the electricity savings. It is clear that most of the electric energy saved comes from lighting measures. Twelve of the sixteen programs get at least 88% of their savings from lighting measures. Two of the larger programs (2020 and 2029), however, obtain only 48% of their electricity savings from lighting measures. Table 2 also shows the weighted (by total electricity savings for each program) average percentage electric energy savings from each of the five measure types. The weighted average percentage energy savings from lighting measures is about 66%. The total therms saved is about 400,000. That savings is equivalent to the annual natural gas use of about 400 average homes in the U.S.

**Table 2. Summary of Energy Savings from PG&E LGP Programs for Small Businesses 2006-08**

<b>Program</b>	<b>Total kW</b>	<b>Total kWh</b>	<b>Total Therms</b>	<b>Lighting</b>	<b>HVAC</b>	<b>Refrigeration</b>	<b>Other</b>	<b>Vending Machines</b>
ABAG	911	5,403,134	242,687	63%	2%	0%	36%	0%
AMBAG	2,021	8,807,232	12,099	95%	0%	0%	3%	1%
Bakersfield/ Kern	1,181	5,023,197	0	97%	0%	0%	1%	3%
East Bay	6,010	34,070,699	58,277	48%	3%	49%	0%	0%
Fresno	1,190	6,127,976	0	98%	0%	0%	0%	2%
Madera	16	53,508	0	97%	0%	0%	0%	3%
Marin	191	860,185	2,621	94%	2%	0%	3%	0%
Merced	77	339,284	0	100%	0%	0%	0%	0%
Motherlode	1,545	8,147,104	-314	99%	0%	0%	0%	1%
Redwood	275	1,373,215	48,182	88%	0%	0%	8%	4%
San Francisco	3,604	26,915,960	1,148	48%	2%	33%	9%	7%
San Joaquin	337	2,049,080	406	100%	0%	0%	0%	0%
Santa Barbara	163	932,058	-56	98%	0%	0%	0%	2%
Sonoma	462	3,019,362	52,209	46	18	0	35	0
Stockton	367	1,878,055	-77	100%	0%	0%	0%	0%
San Luis Obispo	242	1,888,517	36,521	95%	0	0%	0	5
Weighted Average				66%	2%	24%	6%	2%
Total	18,495	105,959,089	417,180					

In Table 3, we disaggregated the lighting energy savings into two categories: CFLs and all others. The percentage of lighting energy saved by CFL installations ranges from 5% to 76%. For the 14 programs that we have disaggregated lighting measure data, we find that six attained more than half of their lighting energy savings from CFL installations. Two of the programs (Marin and Sonoma) combined all of their lighting energy savings under one category, so we could not provide the percentage saved by CFLs for those programs.

**Table 3. Percentage of Lighting Energy Savings from CFL Installations**

<b>Program</b>	<b>Percent contribution to lighting energy savings from CFLs</b>
ABAG	5
AMBAG	68
Bakersfield/ Kern	43
East Bay	6
Fresno	68
Madera	13
Marin	<sup>5*</sup>
Merced	45
Motherlode	54
Redwood	22
San Francisco	20
San Joaquin	18
Santa Barbara	68
Sonoma	<sup>5*</sup>
Stockton	54
San Luis Obispo	76

Table 4 provides a detailed example of the range of measures implemented by one of the larger programs (San Francisco Energy Watch). The greatest savings come from lighting and refrigeration measures. Within lighting, there are many sub-categories such as fluorescent lamp system retrofits and occupancy sensor installation, but CFL installation and customized indoor lighting account for the greatest lighting energy savings. There are a large variety of refrigeration sub-categories such as strip curtains, automatic door closers for coolers and freezers, and anti-sweat heater controls.

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<sup>5</sup> We could not disaggregate because all of the lighting energy savings were combined under the measure description “energy efficient lighting”.

**Table 4. Measures Installed and Annual Energy Saved for San Francisco Energy Watch 2006-2008**

<b>MEASURE DESCRIPTION</b>	<b>kW</b>	<b>kWh</b>
ADJUSTABLE SPEED DRIVE - HVAC FAN, 100 HP MAX	41	232,178
BI-LEVEL LIGHTING – NEW CALCULATED	49	360,437
CFL EXT SCREW-IN	0	36,831
CFL INT HARDWIRED - > 04-30-2000	12	60,937
CFL INT SCREW-IN	434	2,345,220
CHANGE/ADD OTHER EQUIPMENT	17	40,599
COLD CATHODE LAMP - EXT	0	4,122
COLD CATHODE LAMP - INT	45	434,280
COMPUTER POWER MANAGEMENT	13	131,600
CUSTOM LIGHTING - EXTERIOR	0	18,526
CUSTOM LIGHTING - INTERIOR	22	121,243
FOOD SERVICE REFRIGERATION-AUTO CLOSER FOR GLASS REACH-IN COOLER DOOR	5	39,053
FOOD SERVICE REFRIGERATION-AUTO CLOSER FOR GLASS REACH-IN FREEZER DOOR	3	24,643
HUMIDISTAT CONTROL FOR ANTI-SWEAT HEATERS	21	318,302
HVAC – OTHER	10	101,032
LED EXIT SIGNS (NEW)	85	705,101
LIGHTING – OTHER	124	143,200
LIGHTING: INDOOR (CUSTOMIZED)	1,188	6,536,210
MF - INTERIOR PIN-BASED HARDWIRE FIXTURES	0	1,084
MF-COM – PHOTOCELLS	0	747
MOTOR: ECM EVAPORATOR	263	2,301,340
MULTIFAMILY OCCUPANCY SENSOR - WALL BOX OR CEILING (COMMON AREA)	0	634
NON-PROCESS BOILER CHANGE/ADD	0	0
OCCUPANCY SENSOR	2	1,919
PHOTOCELLS AND TIME CLOCKS	0	152,661
REFRIG: AUTO CLOSER: COOLER	1	5,189
REFRIG: AUTO CLOSER: FREEZER	1	5,627
REFRIG: DOOR GASKETS (GLASS): COOLER	148	1,295,730
REFRIGERATION (CUSTOMIZED)	622	5,803,386
SCREW-IN CFL (COMMON AREA)	3	37,127
STRIP CURTAINS FOR WALK-IN	201	1,760,213
T5-T8 RETROFITS - EXTERIOR	0	4,640
T5-T8 RETROFITS - INTERIOR	291	1,859,828
T8 AND T5 RETROFITS (COMMON AREA)	4	51,847
VENDING MACHINE CONTROLLER	0	1,980,471
Grand Total	3,604	26,915,960

There are 525 business types where energy efficiency measures have been installed across the 16 programs. For individual programs, the number of business types listed ranges from 2 to 330. In order to find out which business types are responsible for the greatest electric energy savings for all of the programs combined, we show the top 10 in Table 5. Each of the 10 individual kWh values are for all of the programs combined, and the grand total kWh saved is for all programs and all business types. Hotels/motels account for about 15% of all the electricity savings. Offices appear twice in that table. We believe that the distinction between these two occurrences might be that one references single tenant facilities or a project for a single tenant, while the other references whole building projects in a multi-tenant facility. In order to learn more about the comprehensiveness of these programs with regard to business types reached, future analyses might explore the reasons for such a wide variance in the range of business types being reached. This will require further investigation to see if common definitions are being used in listing the business types among all of the programs. It appears that this is not now always the case.

**Table 5. Electric Energy Savings by Business Types**

<b>NAICS DESCRIPTION</b>	<b>kWh/yr</b>
Hotels (except Casino Hotels) and Motels	15,977,340
Supermarkets and Other Grocery (except Convenience) Stores	7,352,560
Subsector: Food Services and Drinking Places	6,528,618
Limited-Service Restaurants	3,716,518
MULTI TENANT OFFICES	3,664,206
Beer, Wine, and Liquor Stores	2,818,899
Subsector: Nursing and Residential Care Facilities	2,795,748
All Other Amusement and Recreation Industries	2,630,296
OFFICES SINGLE OR MULTI TENANT	2,011,342
Full service restaurant	1,859,265
Grand Total	105,959,089

## 2.2. SCE Programs

We analyzed data from four Southern California Edison (SCE) programs (see Table 6) that we thought included small business retrofits. It turned out that there were no energy savings data for South Coast/Santa Barbara Partnership (SCE 2522). For South Bay Partnership (SCE 2520), there were only CFL measures in residential buildings. Therefore, the results tables below provide data for Community Energy Partnership (SCE 2524) and Palm Desert Partnership (SCE 2566) only. We did not have to remove municipal or large businesses from the SCE 2524 data set.

**Table 6. SCE LGP Programs From Which We Tried to Obtain Measure Data**

SCE 2520	South Bay Partnership
SCE 2522	South Coast/Santa Barbara Partnership
SCE 2524	Community Energy Partnership (Resource)
SCE 2566	Palm Desert Partnership

Almost 100% of the energy saved in SCE 2524 LGP is for lighting. Most of the lighting energy savings are equally divided (about 45% each) between CFLs and fluorescent lamp ballast systems. The only non-lighting measure is faucet aerators.

**Table 7. Measures Installed and Energy Savings Data for Community Energy Partnership (SCE 2524)**

Measure Name	kWh	kW	Lighting (kWh)
13 watt CFLs	5,362	1	2%
15 watt CFLs	73,587	19	22%
23 watt CFLs	14,056	4	4%
30 watt CFLs	2,396	1	1%
4 1-lamp T8 elec ballast2	602	0	0%
4 2-lamp T8 elec ballast2	31,426	6	10%
4 3-lamp T8 dual switch elec ballasts2	1,197	0	0%
4 3-lamp T8 elec ballast2	5,870	1	2%
4 4-lamp T8 dual switch elec ballasts2	19,490	6	6%
4 4-lamp T8 elec ballast2	44,310	13	14%
8 1-lamp T8 elec ballast2	253	0	0%
8 2-lamp T8 elec ballast2	31,788	6	10%
8 2-lamp to 4 4 T8 elec ballast2	8,270	2	3%
8 to 2 4 conversion w/T8 elec ballast2	52	0	0%
Exterior Light Fixtures	580	0	0%
Faucet Aerators	626	0	0%
Indoor Light Fixtures	830	0	0%
LED Exit Sign	9,485	1	3%
R30s 15 watt (exterior)	3,410	0	1%
R30s 15 watt (interior)	20,878	5	6%
R30s 15 watt CFLs (interior)	33,884	9	10%
R40s 23 watt (interior)	878	0	0%
R40s 23 watt CFLs (interior)	17,862	5	5%
Weather-stripping - foam tape	0	0	0%
Grand Total	327,095	78	99.8%

In Table 8, we show that four business types accounted for all of the energy savings with small retail and small offices together responsible for 85% of the total.

**Table 8. Electric Energy Savings by Business Type for SCE 2524**

<b>Business Type</b>	<b>kW</b>	<b>kWh</b>	<b>% kW</b>	<b>% kWh</b>
OFS: Office Small	29	120,296	37%	37%
RFF: Restaurant Fast Food	2	8,200	2%	3%
RSD: Restaurant Sit Down	10	44,507	13%	14%
RTS: Retail Small	37	154,093	48%	47%
Grand Total	78	327,095	100%	100%

The following two tables are for the Palm Desert Partnership. Table 9 shows the measures installed under that program. For Palm Desert, 99% of the energy saved is from lighting measures. Of those lighting energy savings, 72% comes from the installation of CFLs.

**Table 9. Measures Installed and Energy Saved for Palm Desert Partnership**

<b>MEASURE_DESCRIPTION</b>	<b>Total kWh</b>	<b>Total kW</b>	<b>Lighting %</b>
(1) 96" T-12 to (2) 48" T-8 Lamp with Elec. Bal.	1,145		0%
(2) 96" T-12 to (4) 48" T-8 Lamp with Elec. Bal.	4,957	7.4	1%
(2) U-Tube T-8 with Elec. Bal.	7,634	2.7	0%
(3) 48" T-12 to (2) 48" T-8 Lamp with High OutPut Elec. Bal.Refl	156,452	20.2	3%
(4) 48" T-12 to (2) 48" T-8 Lamp with High OutPut Elec. Bal.Refl	506,684	74.1	10%
12 EER or 14 SEER 2 tons	1,682	0.9	0%
2nd Gen. (1) 24" T-8 Lamp with Elec. Bal.	3,804	1.1	0%
2ND GEN. (1) 24" T-8 LAMP WITH ELEC. BAL.	601	0.1	0%
2nd Gen. (1) 36" T-8 Lamp with Elec. Bal.	190,736	14.6	4%
3rd Gen. (1) 48" T-8 Lamp with Elec. Bal	90,208	7.8	2%
3rd Gen. (2) 48" T-8 Lamp with Elec. Bal.	202,153	22.3	4%
3RD GEN. (2) 48" T-8 LAMP WITH ELEC. BAL.	8,613	1.9	0%
3rd Gen. (3) 48" T-8 Lamp with Elec. Bal.	12,119	3.2	0%
3rd Gen. (4) 48" T-8 Lamp with Elec. Bal.	98,242	14.6	2%
3RD GEN. (4) 48" T-8 LAMP WITH ELEC. BAL.	17,554	3.9	0%
COMMERCIAL AUDITS (BEHAVIOR & MORE)	2,909	0.9	
High Efficiency Exit Sign - LED	37,590	4.5	1%
HVAC DIAGNOSTICS AND REPAIR BY THE UNIT OF THE TON	58,653	10.5	
Screw-in Compact Fluorescent Lamp, >=27watts	145,777	22.6	3%
Screw-in Compact Fluorescent Lamp, 14-26 watts	158,051	23.8	3%
Screw-in Compact Fluorescent Lamp, 14-26 watts Reflector Lamp	2,451,118	197.6	47%
SCREW-IN COMPACT FLUORESCENT LAMP, 14-26 W Refl LAMP	47,609	8.4	1%
Screw-in Compact Fluorescent Lamp, 5 - 13 watts	991,725	149.9	19%
T-8 or T-5 Lamp and Electronic, 4-foot lamp installed	4,698	1.9	0%
<b>Grand Total</b>	<b>5,260,713</b>	<b>595.0</b>	<b>99%</b>

Electricity savings for the Palm Desert Partnership are mostly (83%) from the hotel/motel category (Table 10). Small offices and medical clinics each account for about 7.5% of the total electricity savings.

**Table 10. Electric Energy Savings by Business Type for Palm Desert**

<b>Business Type</b>	<b>Total kWh</b>	<b>Total kW</b>
Food Store	1,125	0.2
Hotel Motel	4,327,276	409.5
Medical Clinic	385,721	34.9
Restaurants-Fast Food	44,291	6.3
Restaurants-Sit Down	107,115	22.1
Small Office	395,184	122.0
Grand Total	5,260,713	595.0

We also obtained an approved list of measures used for small business tune-ups in the SCE territory. These measures are shown in Appendix C. They are mostly lighting measures as are the measures implemented in SCE 2524 and 2566.

### **2.3. Summary**

We conclude this section of the report with the following summary of our analysis of measures installed and business types reached for SCE and PG&E programs. We have data for 16 PG&E and two SCE LGP programs. There are not enough SCE programs to make any conclusions regarding a comparison of the two IOUs with respect to comprehensiveness, but we will report results for both utilities. For PG&E and SCE, lighting measures provide the majority of energy savings. For PG&E, there is a wide variation in the percentage of energy saved from lighting measures with some programs deriving large percentages of savings from refrigeration and other measures. For SCE, the two programs derive essentially all of their energy savings from lighting measures. For the PG&E programs, the percentage of lighting energy savings that come from CFL installations ranges from 5% to 76%, and for the two SCE programs the CFL percentages are 45% and 73%. For the PG&E programs, there is a wide variation in business types reached by each program, and for the two SCE programs, the number of business types is only four and six. However, for these two SCE programs, one business type listed as retail or food store could comprise many sub types that are listed separately in the PG&E programs. Therefore, additional investigation is needed to learn more about business types reached.

### **3. Previous Reports and Analyses of Small Business Retrofit Programs**

This is the first analysis of comprehensiveness in small commercial business retrofit programs. There have been other studies that have looked at specific energy efficiency topics in this sector. For example, two reports evaluated the accuracy of energy savings estimates in small commercial lighting retrofit programs: the Smart Lights and Right Lights programs. The evaluation of the Smart Lights Program, operating in the Berkeley/Oakland area, was found to have accurately estimated both energy savings and demand reductions.<sup>6</sup> The evaluation of the Right Lights Program, operating in Santa Cruz, Monterey, San Benito, Santa Clara, and San Mateo Counties, was also found to have accurately estimated both energy savings and demand reductions.<sup>7</sup>

Another effort that is designed to impact energy efficiency in small businesses is presently being carried out by the California Air Resources Board (CARB). They recently held a Public Workshop to discuss the development of a greenhouse gas (GHG) emission reductions toolkit.<sup>8</sup> The toolkit is intended to help small businesses decide how best to reduce GHG emissions and save money in the process.

### **4. Stakeholder Perspectives on Small Business Retrofit Programs**

At the beginning of this project, a meeting was held by the author and CPUC staff with a number of stakeholders in order to obtain comments and input to a draft list of programs/cities addressing small business retrofits and to select a sample to interview. The information needed for this study was mostly obtained through interviews with key staff (Appendix A) at IOUs, local governments, implementers of audits and retrofits and other stakeholders, as appropriate. All staff listed in Appendix A were interviewed. A small number of interviewees on the original list could not be reached or had left the business and other interviewees were substituted. Appendix B contains the list of questions that were asked during the interviews. The findings below are based on these interviews.

#### **4.1. Summary Findings**

Working arrangements. In order to promote small business retrofits, IOUs have a variety of contractual arrangements. Sometimes, they contract directly with private companies or non-profits. They may be chosen through a bidding process or not. Other times, the IOUs use local government partnerships where the IOU contracts with a local government or an intermediary between the IOU and local government. The intermediary may contract with a non-profit or for profit organization. In cases where the local government receives

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<sup>6</sup> "Impact Evaluation of the Berkeley/Oakland Smart Lights Small Commercial Lighting Program," ICF Consulting, San Francisco, CA, December, 19, 2003.

<sup>7</sup> "Evaluation of the 2004-2005 Right Lights Program," prepared for Ecology Action, Quantec, April 21, 2006.

<sup>8</sup> Public Workshop to Discuss Proposed Small Business GHG Emission Reductions Toolkit, California Air Resources Board, December 1, 2008.

funding from the IOU, it may contract with a for-profit or non-profit organization that carries out audits. The organization that does the auditing may also implement the measures themselves or hire contractors to do them: PG&E has proposed to contract directly in the 2009-2011 program cycle with private contractors, whom they would assign by geographic area. They would direct the contractors to check in regularly with local governments and use their insights about their communities.

Cost-effectiveness tests. Cost-effectiveness tests requirements are a major controlling factor with respect to the breadth of energy efficiency measures that can be implemented. It is presently difficult to meet the required benefit-to-cost (B/C) ratio for measures other than lighting using the existing total resource cost (TRC) definition. There was a lack of clarity and uniformity as to the required B/C value: different values, such as 1.3 and 1.6, were mentioned by the interviewees, apparently based on IOU requirements. A few programs were able to go significantly beyond installation of lighting measures only.

## **4.2. Third party contractors versus LGPs**

The IOUs have contracted directly with local governments and also directly with third party contractors chosen through a bidding process. The Peer Review Group (PRG) evaluated the process of selecting third party contractors.<sup>9</sup> Here, we look at the advantages and disadvantages of promoting energy efficient retrofits by each approach. Each one was brought up by at least several of the interviewees.

### *Benefits of Working with Local Governments*

1. Local governments (LGs) have a unique ability to reach small businesses through their existing network of contacts with such businesses. This can include public education outreach.
2. LGs lend credibility by providing their authority and trustworthiness to implementers of audits and retrofits.
3. LGs can set examples of their own in municipal buildings and can also present awards to high achieving small businesses.
4. LGs may already have existing climate action programs that can be utilized to advance small business retrofits.
5. LGs can improve the energy efficiency of existing commercial buildings by enacting ordinances (e.g., energy efficiency retrofits must be made at time of sale) or other approaches that spur efficiency actions in existing privately owned buildings.
6. LGs have a long-term outlook and can promote continuity of programs across funding cycles.

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<sup>9</sup> "Peer Review Group Report on the 2009-2011 Energy Efficiency Applications of SCE, SCGC, SDG&E and PG&E," Cheryl Cox, CPUC, and Lara Ettenson, NRDC, Sept 12, 2008.

7. LGs are often interested in enhancing local contractor development and fostering training of auditors and contractors to better carry out the implementation work, thereby, developing a valuable resource for retrofit programs.
8. LGs are sometimes interested in considering measures beyond lighting (such as refrigeration and HVAC tune-ups).

#### *Disadvantages of Working with Local Governments*

1. The greater bureaucracy of LGs can increase cost and time to make decisions.
2. In some cases, LGs do not have enough experienced personnel on their staff.
3. LGs can sometimes be diverted from small business retrofit goals by other associated goals (e.g., sustainability, green industry).

### **4.3. Barriers to Comprehensiveness**

In the section above, there was a comparison of third party arrangements and LGPs with respect to achieving the goal of carrying out small business retrofits. Many advantages and a few disadvantages of working with local governments were noted. Here, we list the specific barriers that were noted by interviewees within LGP arrangements. All of the barriers to comprehensiveness listed below were mentioned by at least several interviewees.

1. The difficulty and cost of reaching all small businesses.
2. The difficulty of overcoming the barrier to business owners of the initial cost of retrofits.
3. The difficulty in meeting a benefit-to-cost ratio equal to or greater than 1.3 for measures other than lighting with the present TRC definition.
4. Incentives are often too small to cost-effectively implement measures beyond lighting.
5. For some measures, there are no incentives (e.g., packaged air conditioners).
6. There are no payments for referrals to contractors who could implement additional measures.
7. The presence of split incentives when businesses rent space from others: the renters pay the utility bill, but the owners are responsible for investing in energy efficiency.
8. The difficulty in finding contractors who are trained and willing to do small jobs such as strip curtains for refrigerator cases.
9. Rebates are not available for equipment replacements (e.g., HVAC or refrigeration equipment).
10. Some local governments do not have personnel who are trained to manage retrofit programs. The money offered by IOUs are not sufficient to hire new personnel.

11. Some small businesses are hard to reach in rural areas.
12. The difficulty of convincing business owners that saving money through energy efficiency in difficult economic times is still worthwhile.

#### **4.4. Stakeholder Recommendations**

##### ***Best Practice***

Some of the most successful LGPs have improved their outreach to small businesses by pursuing several strategies. Local governments and/or implementers have made presentations to business groups (such as the Chamber of Commerce) in order to explain their programs. In some cases, interpreters have been used to reach business owners for whom English is a second language. Auditors have been accompanied by utility staff or local chamber of commerce representatives to lend credibility to the program when contacting businesses to set up audits.

Some programs are designed to allow some checking of building retrofits to make sure the work was done and done correctly and that the merchant was pleased. In some cases, post-implementation inspections have been used to educate business owners about additional measures that could be done at a future time or through other programs that are currently available. Training for auditors and implementers of measures has been required by some local governments.

Well designed and comprehensive data bases have allowed implementers to know which businesses have been contacted before and what measures had been installed and which businesses should be contacted again. Recognition and awards have also been used effectively as a public relations strategy. These took the form of a certificate to hang on a wall or place in a window, a newspaper advertisement or a jacket with an insignia.

##### ***Specific recommendations***

All of the specific recommendations listed below to enhance competitiveness came from interviewees. They are divided into two categories: those that impact the approach and those that impact cost-effectiveness.

##### **Approach**

1. Enhance the motivation of personnel at IOUs to support retrofit programs in small businesses.
2. Have cities/regions develop long-term plans to achieve comprehensive small business retrofits. Present budgets and kWh saved to IOUs.
3. Improve the training of auditors, particularly to look at measures in addition to lighting.
4. Utilize follow-up calls after each small business energy audit.

5. Use follow-up inspections after implementation to increase participation by small businesses.
6. Enhance or develop databases of potential customers to offer retrofits.
7. Saturate commercial neighborhoods to more efficiently reach a large number of businesses on foot in a shorter time period.

#### Cost effectiveness

1. Lower the benefit-to-cost ratio requirement so that it is closer to 1.0.
2. Consider including non-energy benefits (e.g., the monetization of carbon reduction benefits and health benefits) in TRC calculation on a measure by measure basis.
3. Allow the bundling of measures at the level of each business type in TRC test. Some programs appear to be doing this now.
4. Consider increasing incentives per kWh saved as the percentage of potential energy savings increases. For example, assume that the incentive is 10 cents/kWh for saving 1000 kWh per month at an individual business, then it could be 11 cents/kWh for savings beyond 1000 kWh per month. This could be done for larger aggregates of businesses.
5. Allow on-bill financing to cover the first costs to business owners that are not covered by incentives. This allows business owners to pay any first costs of installing energy efficiency measures over time as they pay their utility bills (which should be reduced by the retrofit). Assembly Bill 811 should allow cities and counties to offer low-interest loans for small business energy efficiency projects. The loan will be paid back through an assessment on property tax bills. Cities and counties may be able to use American Recovery and Reinvestment Act (ARRA) funds.
6. Develop methods to alleviate the split incentives problem with renters and landlords.<sup>10</sup> If tenants and landlords can work together to improve the energy efficiency of a space, and perhaps even share the costs, then landlords can improve the value of their property and renters can reduce their electricity bills.<sup>11</sup>

## **5. Future Directions**

In order to better assess the small business component of LGP programs, it is important to segregate small businesses from municipal buildings and larger businesses in the utility data bases. All programs should use the same measure descriptions for their databases. In order to foster more uniform analyses of small business retrofits in future studies, the CPUC should designate what definition of small business will be used. Each IOU should

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<sup>10</sup> One-half of the small business owners in California rent or lease their space, and the majority of tenants pay the utility bills, Flex Your Power Website for California

<sup>11</sup> U.S. Environmental Protection Agency's Upgrading Tenant Spaces, EPA 430-B-94-001B, December, 1994.

develop a long-term plan (beyond the three-year cycle) for their territory, working with the local governments and implementer organizations, that has the following objectives:

1. Gather data on all small business types in their service territory.
2. Estimate energy savings potential for a sample of businesses.
3. Set priorities to first reach those small businesses with the greatest potential for energy savings through energy efficiency retrofits.
4. Develop equipment inventories during audits of each business.

In order to determine the feasibility of carrying out all of the steps described above, the CPUC could develop and fund a pilot project that carries out these objectives. This pilot project could benefit from applying some of the pertinent market segmentation techniques for designing energy efficiency programs that are discussed in a recent paper.<sup>12</sup> The CPUC might also want to consider whether indirect market effects (participant and non-participant spillover) should be evaluated for small business retrofit programs.

Finally, here are some possible metrics for success in the achievement of comprehensiveness:

1. The percentage of small businesses of different types that were audited.
2. The percentage of audited businesses that had energy efficiency measures installed.
3. The percentage of potential energy savings actually achieved in each business type.
4. The dollars spent in each business per kWh and kW saved.
5. The percentage of program energy savings derived from measures other than lighting.

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<sup>12</sup> Steven Moss, M. Cubed, “Market Segmentation and Energy Efficiency Program Design,” CIEE, Oakland CA, November, 2008. Available at: <http://uc-ciee.org/energyeff/energyeff.html> [Click on “Market Segmentation White Paper”]

## **Appendix A. List of Contacts**

### *Utilities and Peer Review Group*

Gregory J. Hoaglin, PG&E Executive Manager, East Bay Service & Sales  
Leif Christensen, PG&E, oversees three local government partnerships.  
Cheryl Cox - Division of Ratepayer Advocates

*Association of Monterey Bay Area Governments (AMBAG)*  
Elisabeth Russell

### *Central Valley*

Jason MacDonald (Fresno City)  
Hector Huerta, Chief Operating Officer, RHA

### *East Bay*

Neil DeSnoo, (Berkeley)  
Scott Wentworth, (Oakland)  
Maria Sanders, (CESC)

### *Marin County*

Tim Rosenfeld, Marin Energy Management Team

### *Peninsula/Santa Cruz*

Aaron Brown, Divisional Operations Manager, Energy Division, Ecology Action

### *Redwood Coast*

Dana Boudreau, Eureka

### *San Francisco*

Ann Kelly Energy Efficiency Program Manager, City of San Francisco  
Cal Broomhead, Energy and Climate Programs Manager

### *Southern California*

Energy Coalition, Angela Davison, Director of Programs, 10 cities  
Staples, Jim Staples, his organization works with 5 LGPs: AMBAG, Kern County, San Luis Obispo, Santa Barbara, and the Mother Lode.

### *Ventura County*

Cheryl Collart, Executive Director, Ventura County Regional Energy Alliance

### *ADDITIONAL CONTACTS*

Floyd Keniepp, Evaluation Contractor, Summit Blue,  
Peter Lai, CPUC

## **Appendix B. Interview Guide**

### **2008 Small Business Retrofit Comprehensiveness Study**

#### **Introduction**

On behalf of the California Public Utilities Commission, I am conducting a brief study on energy efficiency retrofits in small businesses. I would like to ask you a few questions. We are particularly interested in the comprehensiveness of these small business programs and the role of LGPs. The interview should only take 25-30 minutes

#### **Name and Organization**

#### **STRUCTURE**

1. Please describe your organization, e.g., are you (implementer, government, third party contractor, other)?
2. What is your relationship with the investor-owned utilities? (none, participate in competitive bidding, other )
3. How are you funded? ( e.g., directly from IOU, local government, other)
4. What is the role of your organization with respect to small business retrofits (e.g., audits, installation, manager of others, etc)?

**Prompt** for question 4 above to more narrowly define individual's role.

1. What are your responsibilities regarding those Programs? What role do you play, if any, in:
  - a. planning, designing, managing, and administering the Program,
  - b. monitoring and management of implementation contractor activities
  - c. marketing the Program to customers,
  - d. Administering the delivery of financial incentives to customers
  - e. Administering the delivery of technical services to customers
  - f. estimating/evaluating energy and load impacts of the Program, and
  - g. other aspects of the Program?

#### **APPROACH**

1. Some utilities are trying to make more uniform the programs they manage in the arena of small business retrofits. What is your opinion of this effort?
2. What type of small businesses do you work with? (For example: retail, food, small factories/assembly plants)
3. What is your program delivery approach in reaching small businesses?

**Prompt** web site, emails, regular mail, endorsements, advertisements, door to door, local government assistance (e.g., promotion by government officials)

4. Do you feel your program is comprehensive with respect to the number and variety of measures installed? What measures are installed?
  - If yes, why?
  - If no, why?
5. Do you feel your program is comprehensive with respect to number and variety of businesses reached? What business types are reached?
  - If yes, why?
  - If no, why?
6. Do you promote innovative approaches to comprehensiveness?
  - If yes, what are they and why?
  - If no, why not?
7. What are the major obstacles to promoting innovative approaches to comprehensiveness?
8. What are the key indicators of success in promoting innovative approaches to comprehensiveness.
9. Would larger financial incentives have a significant impact on number of customers reached?

#### **OBSTACLES**

1. Are customers approached by multiple implementers?
  - If yes, does this cause confusion for customers?
2. Are there any requirements coming from the IOU that create obstacles to your goals?

**Prompt** e.g., administrative

3. Are there aspects of the approaches of other organizations that you interact with that create obstacles?
  - If yes, which aspects?
4. Is the method of calculating the Total Resource Cost (TRC) test an obstacle to comprehensiveness with respect to the scope of measures implemented?
5. Is the net-to-gross (NTG) requirement an obstacle to comprehensiveness with respect to the scope of measures implemented?

**Prompt** for 4&5 Please explain how

6. Is the level or number of years of funding an obstacle?

7. Should non-energy benefits (e.g., noise reduction and comfort) be accounted for in cost/benefit calculations, such as the TRC?

**Appendix C:**

**Approved Measures in SCE Territory**

13 watt CFLs - standard spiral
13 watt CFLs – globe
15 watt CFLs
15 watt CFLs (exterior)
20 watt CFLs
23 watt CFLs (exterior)
23 watt CFLs
30 watt CFLs
R30s 15 watt (exterior)
R30s 15 watt (interior)
R40s 23 watt (exterior)
R40s 23 watt (interior)
LED Exit Sign
4' 1-lamp T8, elec ballast <sup>2</sup>
4' 2-lamp T8, elec ballast <sup>2</sup>
4' 3-lamp T8, elec ballast <sup>2</sup>
4' 3-lamp T8, dual switch elec ballast <sup>2</sup>
4' 4-lamp T8, elec ballasts
4' 4-lamp T8, dual switch elec ballasts
8' 1-lamp T8, elec ballast <sup>2</sup>
8' to 2, 4' conversion w/T8, elec ballast <sup>2</sup>
8' 2-lamp T8, elec ballast <sup>2</sup>
8' 2-lamp, to 4, 4' T8, elec ballast <sup>2</sup>
Indoor Light Fixtures
Exterior Light Fixtures
Ceiling Fan
Low Flow Showerheads
Faucet Aerators
Pipe wrap
Water Heater Wrap
Weatherstripping – metal
Weatherstripping - foam tape
Pre-rinse spray valve