Final Report

EM&V STUDY OF THE ADM MOBILE ENERGY CLINIC 2004-2005 NON-UTILITY ENERGY EFFICIENCY PROGRAM IMPLEMENTATIONS

Program 1105-04 – SDG&E Service Territory
Program 1106-04 – SCE Service Territory
Program 1487-04 – SCG Service Territory

August 16, 2006

Submitted by

Sisson and Associates, Inc. (S&A)

Contact Information:

Mr. Phil Sisson, President
Sisson and Associates, Inc.
42 Moody Court
San Rafael, CA 94901
Voice 415-845-8820
Fax 415-454-6591
Email: philsisson1@comcast.net

Table of Contents

1. Executive Summary

This section briefly identifies "top level" EM&V findings regarding the 2004-2005 Mobile Energy Clinic (MEC) program implementations by ADM Associates (ADM) in the SDG&E, SCE, and SCG service territories. The program implementations were funded through the public goods charge (PGC) for energy efficiency. This study was conducted at the request of the California Public Utilities Commission (CPUC).

Study Linkages to CPUC Energy Efficiency Policy Manual (EEPM) EM&V Objectives

EEPM EM&V Objective	Conclusion	Report Reference
Measuring level of energy and peak demand savings achieved	SDG&E and SCE implementations both greatly exceeded goals for kW and annual kWh and fell far short of goal for annual therms. SCG implementation exceeded goals for kW, annual kWh, and annual therms.	Section 7.6
Measuring cost-effectiveness	Both implementations highly cost effective (with respect to a TRC Test).	Section 7.7
Providing up-front market assessments and baseline analysis, especially for new programs	Obtained realization rates indicate that there are significant numbers of "attractive" sites. Note, however, that ADM's characterizations of base annual energy usage by end use frequently required significant modification.	Sections 7.3 and 7.6
Providing ongoing feedback, and corrective and constructive guidance regarding the implementation of programs	While the program was largely functional and logically designed, major "big ticket" significant opportunities remained regarding service and process improvements.	Section 6.4
Measuring indicators of the effectiveness of specific programs, including testing of the assumptions that underlie the program theory / approach	Customers participated for reasons directly related to MEC program bundled attributes.	Section 5
Assessing the overall levels of performance and success of programs	Program successful – almost all energy savings goals exceeded, despite slightly below-goal activity levels [in the aggregate], and program extremely cost effective. Additionally, participants generally highly satisfied.	Sections 5, 6.1, 7.6, and 7.7
Informing decisions regarding compensation and final payments	SDG&E and SCE implementations both greatly exceeded goals for kW and annual kWh and fell far short of goal for annual therms. SCG implementation exceeded goals for kW, annual kWh, and annual therms.	Section 7.6
Helping to assess whether there is a continuing need for the program.	1) Attained program volumes, 2) high realization rates and 3) overall cost-effectiveness all imply a continuing need for this particular type of energy efficiency work.	Sections 6.1, 7.6, and 7.7

Primary Methodologies and Approaches Utilized – All Implementations

- Conducted reviews of program documents and tracking system databases, with follow-up program staff interviews; external data sources consulted/utilized as appropriate.

- Performed participant phone surveys and associated paperwork (and photo documentation) reviews for representative stratified samples of 71-73 data points for each of the three implementations.

- Conducted engineering reviews of measure data (subsequently adjusted when warranted by phone survey response data).

- Performed impact evaluation statistical analysis of program performance per CPUC <u>California Evaluation Framework</u> guidelines.

- Developed ex post cost-effectiveness assessment (i.e., TRC Test) using 1) EEGA workbook, 2) impact evaluation statistical analysis key findings, and 3) actually incurred program costs.

Key Survey Findings – All Implementations

- Customers were generally highly satisfied with the MEC program, particularly with its attributes related to 1) ease of program participation and 2) levels of disruption. Customer satisfaction with the overall program was slightly lower.

- Measure dissatisfaction was largely limited to programmable thermostats (p-stats), reprogrammed thermostats (r-stats), and CFL's. Concerns regarding p-stats and r-stats mainly pertained to settings / adjustments / comfort issues. Concerns regarding CFL's mainly pertained to units burning out prematurely. In a relatively limited number of instances, customers removed the p-stats altogether (and substituted different setback thermostat controls altogether).

- Free ridership appears to have been relatively limited, with overall program NTG rates above the 80% values utilized by ADM in its program proposal ex ante assumptions.

- A small but not insignificant number of respondents in all three implementations reported that HVAC system maintenance *does* happen regularly (i.e., at least annually) at their facility site.

- Customers typically don't implement energy efficiency measures because of 1) not having enough information/time to evaluate them properly and 2) excessively high up-front costs.

Key Process Evaluation Findings – All Implementations

- All three program implementations served their intended markets of small commercial businesses (particularly strip mall tenants and non-chain restaurants). Customers participated in the MEC program mainly because of the no-cost services and the measures' underlying good business economics.

- "Macro" environmental business factors had relatively little impact on any of the three program implementations.

- Many – if not most – of the EM&V recommendations identified by [program evaluator] Robert Mowris and Associates regarding the 2002-2003 MEC program were implemented either in whole or in part for the 2004-2005 MEC implementations.

- For the most part, the 2004-2005 MEC implementations were logically organized and functional. That said, however, key service and process improvement opportunities included the following:

    - Tailor HVAC system measure work based on whether or not 1) the customer indicated that the site has an HVAC maintenance contract / frequent HVAC system maintenance and 2) the customer in fact uses the HVAC system relatively frequently.

    - Overhaul energy savings calculations – both "pre" annual energy use assumptions and measure percentage savings values – per the impact evaluation research.

    - Augment p-stat/r-stat customer service levels – and MEC program customer service levels more generally – by adhering stickers listing the MEC 800 number on the p-stat/r-stat unit side (or other visually subtle location).

    - Do a better job of keeping CFL's in stock.

    - Expand measure photo documentation to reflect more fully "pre" conditions (since a disproportionate focus of photo documentation was on "post" conditions).

Key Impact Evaluation Findings – SDG&E Implementation

- Based on S&A's impact evaluation analysis (as summarized in the following table), the SDG&E MEC implementation greatly exceeded program goal savings for net peak kW and net annual kWh, and attained only a very small fraction of program goal savings for net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.379	1.662	0.110
Standard Error	0.091	0.137	0.042
Error Bound @ 90% confidence level	0.149	0.225	0.069
Upper Error Bound re Realization Rate	1.528	1.887	0.178
Lower Error Bound re Realization Rate	1.230	1.438	0.041
Relative Precision	10.8%	13.5%	62.6%
Tracking System Population Gross Savings	213	1,109,808	14,162
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	294	1,844,795	1,553
Program Goal Net Savings	169	880,800	11,240
S&A estimate of Net Ex Post Savings as % of Goal	173.7%	209.4%	13.8%

- Based on actual program costs and savings impacts, the SDG&E MEC implementation was indeed cost-effective – even more so than was assumed in the original proposal. TRC Test key metrics are summarized below.

Metric	SDG&E Proposed	SDG&E Actual
Net Peak kW	169	294
Net Annual kWh	880,800	1,844,795
Net Lifecycle kWh	7,046,400	9,223,975
Net Annual Therms	11,240	1,553
Net Lifecycle Therms	89,920	17,083
TRC Test Benefits	$404,189	$530,417
TRC Test Costs	$236,735	$271,084
TRC Test Net Benefits	$167,454	$259,333
TRC Test BCR	1.71	1.96

Key Impact Evaluation Findings –SDG&E Implementation (continued)

- Year-by-year gross and net load impacts are summarized below. Data are applicable to the SDG&E service territory only.

Program ID: 1105-04
Program Name: ADM Associates – Mobile Energy Clinic

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	1,011	1,680	0.19	0.27	12,898	1,419
2	2005	1,110	1,845	0.21	0.29	14,162	1,558
3	2006	1,110	1,845	0.21	0.29	14,162	1,558
4	2007	1,110	1,845	0.21	0.29	14,162	1,558
5	2008	1,110	1,845	0.21	0.29	14,162	1,558
6	2009	99	165	0.02	0.03	14,162	1,558
7	2010					14,162	1,558
8	2011					14,162	1,558
9	2012					14,162	1,558
10	2013					14,162	1,558
11	2014					14,162	1,558
12	2015					1,265	139
13	2016						
14	2017						
15	2018						
16	2019						
17	2020						
18	2021						
19	2022						
20	2023						
TOTAL	**2004-2023**	5,549	9,223	1.07	1.47	155,786	17,137

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings – SCE Implementation

- Based on S&A's impact evaluation analysis (as summarized in the following table), the SCE MEC implementation significantly exceeded program goal savings for net peak kW and net annual kWh, and attained only a very small fraction of program goal savings for net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.147	1.128	0.134
Standard Error	0.076	0.087	0.056
Error Bound @ 90% confidence level	0.125	0.142	0.092
Upper Error Bound re Realization Rate	1.273	1.270	0.225
Lower Error Bound re Realization Rate	1.022	0.986	0.042
Relative Precision	10.9%	12.6%	68.7%
Tracking System Population Gross Savings	486	2,527,896	32,259
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	557	2,851,056	4,310
Program Goal Net Savings	406	2,113,920	26,976
S&A estimate of Net Ex Post Savings as % of Goal	137.2%	134.9%	16.0%

- Based on actual program costs and savings impacts, the SCE MEC implementation was indeed cost-effective, just not quite as cost-effective as was assumed in original proposal assumptions. TRC Test key metrics are summarized below.

Metric	SCE Proposed	SCE Actual
Net Peak kW	406	557
Net Annual kWh	2,113,920	2,851,056
Net Lifecycle kWh	16,911,360	14,255,280
Net Annual Therms	26,976	4,310
Net Lifecycle Therms	215,808	47,410
TRC Test Benefits	$970,053	$826,967
TRC Test Costs	$568,164	$650,527
TRC Test Net Benefits	$401,889	$176,440
TRC Test BCR	1.71	1.27

Key Impact Evaluation Findings –SCE Implementation (continued)

- Year-by-year gross and net load impacts are summarized below. Data are applicable to the SCE service territory only.

Program ID: 1106-04
Program Name: ADM Associates – Mobile Energy Clinic

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	986	1,113	0.19	0.22	12,589	1,687
2	2005	2,528	2,851	0.49	0.56	32,259	4,323
3	2006	2,528	2,851	0.49	0.56	32,259	4,323
4	2007	2,528	2,851	0.49	0.56	32,259	4,323
5	2008	2,528	2,851	0.49	0.56	32,259	4,323
6	2009	1,541	1,739	0.30	0.34	32,259	4,323
7	2010					32,259	4,323
8	2011					32,259	4,323
9	2012					32,259	4,323
10	2013					32,259	4,323
11	2014					32,259	4,323
12	2015					19,670	2,636
13	2016						
14	2017						
15	2018						
16	2019						
17	2020						
18	2021						
19	2022						
20	2023						
TOTAL	**2004-2023**	12,639	14,257	2.43	2.78	354,847	47,549

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings – SCG Implementation

- Based on S&A's impact evaluation analysis (as summarized in the following table), the SCG MEC significantly exceeded program goal savings for net peak kW, net annual kWh, and net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.103	1.055	1.168
Standard Error	0.099	0.100	0.143
Error Bound @ 90% confidence level	0.162	0.165	0.235
Upper Error Bound re Realization Rate	1.265	1.219	1.403
Lower Error Bound re Realization Rate	0.940	0.890	0.933
Relative Precision	14.7%	15.6%	20.1%
Tracking System Population Gross Savings	507	2,637,996	292,490
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	559	2,782,406	341,751
Program Goal Net Savings	406	2,113,920	312,296
S&A estimate of Net Ex Post Savings as % of Goal	137.6%	131.6%	109.4%

- Based on actual program costs and savings impacts, the SCG MEC implementation was indeed cost-effective, just not quite as cost-effective as was assumed in original proposal assumptions. TRC Test key metrics are summarized below.

Metric	SCG Proposed	SCG Actual
Net Peak kW	406	559
Net Annual kWh	2,113,920	2,782,406
Net Lifecycle kWh	16,911,360	13,912,030
Net Annual Therms	312,296	341,751
Net Lifecycle Therms	3,069,008	2,050,506
TRC Test Benefits	$1,978,460	$1,596,653
TRC Test Costs	$805,159	$898,502
TRC Test Net Benefits	$1,173,301	$698,151
TRC Test BCR	2.46	1.78

Key Impact Evaluation Findings – SCG Implementation (continued)

- Year-by-year gross and net load impacts are summarized below. Data are applicable to the SCG service territory only.

Program ID: 1487-04
Program Name: ADM Associates – Mobile Energy Clinic

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	1,017	1,073	0.20	0.22	12,982	15,163
2	2005	2,623	2,767	0.50	0.56	259,685	303,312
3	2006	2,638	2,783	0.51	0.56	291,471	340,438
4	2007	2,638	2,783	0.51	0.56	291,471	340,438
5	2008	2,638	2,783	0.51	0.56	291,471	340,438
6	2009	1,621	1,710	0.31	0.34	291,471	340,438
7	2010	15	16	0.00	0.00	278,489	325,275
8	2011					31,786	37,126
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**	13,190	13,915	2.53	2.79	1,748,825	2,042,627

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings – Total SDG&E + SCE + SCG Service Territory

Program ID's: 1105-04, 1106-04, and 1487-04
Program Name: ADM Associates – Mobile Energy Clinic

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	3,015	3,866	0.58	0.70	38,469	18,269
2	2005	6,260	7,463	1.20	1.41	306,106	309,193
3	2006	6,276	7,479	1.21	1.41	337,892	346,318
4	2007	6,276	7,479	1.21	1.41	337,892	346,318
5	2008	6,276	7,479	1.21	1.41	337,892	346,318
6	2009	3,261	3,613	0.63	0.71	337,892	346,318
7	2010	15	16	0.00	0.00	324,910	331,155
8	2011	0	0	0.00	0.00	78,207	43,006
9	2012	0	0	0.00	0.00	46,421	5,881
10	2013	0	0	0.00	0.00	46,421	5,881
11	2014	0	0	0.00	0.00	46,421	5,881
12	2015	0	0	0.00	0.00	20,935	2,775
13	2016	0	0	0.00	0.00	0	0
14	2017	0	0	0.00	0.00	0	0
15	2018	0	0	0.00	0.00	0	0
16	2019	0	0	0.00	0.00	0	0
17	2020	0	0	0.00	0.00	0	0
18	2021	0	0	0.00	0.00	0	0
19	2022	0	0	0.00	0.00	0	0
20	2023	0	0	0.00	0.00	0	0
TOTAL	**2004-2023**	31,379	37,395	6.03	7.05	2,259,458	2,107,313

** Definition of Peak MW as used in this evaluation: on-peak

2. Introduction

This document is the formal EM&V report by Sisson and Associates Inc. (S&A) for the 2004-2005 Mobile Energy Clinic (MEC) programs implemented by ADM Associates in the San Diego Gas and Electric (SDG&E), Southern California Edison (SCE), and Southern California Gas (SCG) service territories. The program implementations were funded through the public goods charge (PGC) for energy efficiency. This study was conducted at the request of the California Public Utilities Commission (CPUC).

Its intended audiences and associated uses are as follows:

- CPUC: independent party findings and assessment regarding the programs; final payment evaluation

- ADM (and IOU program administrators): obtain information useful in modifying / improving various aspects of the 2006-2008 implementation of the same program (since the program is continuing in the SDG&E service territory)

This document assumes reader general familiarity with and/or access to the following:

- ADM program proposals from September 2003 and December 2004 (the latter for the boiler measure "add on" sub-program for the SCG service territory only)

- ADM monthly reports, including the EEGA program tracking workbooks

- S&A EM&V Research Plan

- The CPUC's California Evaluation Framework reference document dated June 2004

With respect to the S&A EM&V Research Plan, please note the following changes and amplifications:

- *Midstream feedback.* Initial feedback regarding the program implementations was provided mostly verbally and via informal email communications, rather than in the form of a distinct Interim Report. Impact evaluation work ended up being significantly more extensive than was budgeted for originally. S&A's non-development of a full-blown Interim Report allowed resources to remain largely focused on impact evaluation work. The key aspects of emerging findings *were* conveyed to ADM midstream.

- An initially recommended *near-census of extremely large program participants* was not employed, because it quickly became apparent during

program monitoring that energy savings were *not* ultra-concentrated in a very few number of sites as had been originally envisioned.

-       *Impact evaluation.* A detailed reverse engineering of ADM gross energy saving calculations was not conducted, so that resources could be re-deployed in a comprehensive development of S&A gross energy savings calculations.

By reference, this final EM&V report includes the following:

-       Full participant phone survey instrument (Appendix A)

-       Full participant survey response coded datasets (in Excel workbook format; Appendices B, C, and D for the SDG&E, SCE, and SCG service territories, respectively)

-       Impact evaluation workbooks (in Excel workbook format; Appendices E, F, and G for the SDG&E, SCE, and SCG service territories, respectively)

-       EEGA workbooks of actual program cost-effectiveness (in Excel workbook format; Appendices H, I, and J for the SDG&E, SCE, and SCG service territories, respectively)

-       Year-by-Year impact analysis (in Excel workbook format; Appendix K – one workbook covering all three MEC program implementations).

-       Draft report review comments and responses (Appendix L)

3. General Comments and Observations

For the SCE and SDG&E service territory implementations, program assessments are relatively straightforward. In the case of the SCG service territory implementation, however, the program has been assessed assuming one overall combined program implementation consisting of 1) the original program as proposed in September 2003 and 2) the boiler program supplement as proposed in December 2004. This approach has been taken since 1) no supplemental EM&V funding was provided as part of the boiler program supplement, and 2) 90/10 statistical performance is still desired with respect to the impact evaluation.

3.1. Methodologies and Approaches Utilized

The bulk of the EM&V research utilized in this particular study involved the following types of methodologies and approaches:

- Program document reviews and associated program staff interviews

- Program tracking system reviews

- Full participant phone surveying and associated application paperwork reviews

Each type of research is briefly summarized in turn.

Program document reviews and associated program staff interviews. This research mostly featured a front-loaded review of program documents and follow-up program staff discussions to familiarize S&A with program operational details. Subsequent research in this area happened as-needed periodically over the course of the program (e.g., when program participation characteristics changed significantly). The subsequent research was usually characterized by as-needed document reviews which in turn generated iterative question and answer sessions conducted by S&A staff via either email or phone with ADM program staff until adequate resolution was attained.

Program tracking system reviews. This research involved analyzing monthly updates to the ADM tracking system database files, and assessing the cumulative program population and sample in the context of the stratified sample's structural characteristics (see Section 4 discussion).

Full participant phone surveying and associated application paperwork reviews. This research built off of the monthly program tracking system reviews. All other things equal, the pragmatic intent of the sample design was to sample a relatively even number of participants completing the program in each relevant month so as to survey participants approximately 45 to 75 days after completing the program (hence attempting to hold reasonably constant time-related recollections regarding the program). For any given monthly sample bin, the then-current version of each program's tracking database would

be screened for records with program completion dates in the desired time frame. Participant data points were then sampled as needed to maintain general consistency between the program's cumulative population and the sample. Once successful participant phone surveys were obtained, paperwork application packets were then requested from ADM for those surveyed participants to conduct paperwork application verification audits, and to aid more generally in the impact evaluation quantification. As part of the impact evaluation, sampled application paperwork materials were cross checked with corresponding electronic records in the tracking database.

3.2. Actual Versus Originally Intended Program Implementation

For the most part, the ADM actual 2004-2005 program implementations resembled what was proposed: largely HVAC measure-intensive activity, as installed at strip mall and other small retail business locations.

The most significant modifications in program delivery during the 2004-2005 implementations (in S&A's opinion) consisted of the following:

- Significantly higher implementation/installation rates in all three implementations (relative to what was assumed in the September 2003 proposal) for 1) p-stats and 2) air damper adjustments.

- Significantly lower implementation/installation rates (relative to what was assumed in the September 2003 proposal) for 1) lowered hot water temperature, 2) replacement/installation of hot water line insulation, 3) combing of condenser fan coils, and 4) CFL replacement of incandescent lamps.

- For the SCG boiler measure sub-program, measure work for a number of sampled participants (i.e., 7 out of 26 surveyed sample respondents) involved out-of-pocket costs and system work not described in the ADM proposal. Such work involved replacement of valves and pipes, at cited costs ranging between $200 and $1000 per participant.

- The notion of telephoning regular program (i.e., non-boiler tune-up measure) participants approximately four weeks after the site work had been conducted to ascertain which if any recommended measures had been implemented was in fact not conducted. ADM noted to S&A that findings for the 2002-2003 program had been found to be not robust (e.g., different answers often would be reported in different calls to the same customer; disagreements often occurred between ADM calls and EM&V contractor calls). S&A notes that such work appears more appropriately a part of EM&V work, and perceives that this particular program delivery modification was highly appropriate.

Please refer to additional related discussion on this topic in Section 6.1.

3.3. Program Issues Not Explored

Based on S&A reviews of ADM monthly reports to the CPUC, it appears that the program implementations – with the exception of the SCG boiler sub-program - generally attained the total targeted number of site implementations. Given this state of affairs, relatively little effort was spent by S&A on program issues such as:

- How ADM identified and prioritized prospective customers

- What methods ADM used to "close" MEC program sales, or

- What an optimized measure mix might consist of (relative to what was implemented)

The broader intent of S&A's EM&V work efforts involved focusing efforts and resources on key "big ticket" areas of uncertainty (e.g., energy savings quantification; customer satisfaction with various aspects of program delivery).

4. Sample

4.1. Design

Core aspects of each of the three MEC program implementations' sample designs as articulated in the EM&V Research Plan were as follows:

-        A total of 68 data points

-        Use of a stratified sample, with 3 to 4 strata

-        A near-census of extremely large program participants (with respect to claimed gross energy savings)

Data collection for the sample was implemented generally consistent with the above design principles, and with the following additional key attributes:

-        Three strata were used for the stratified sample for the SDG&E and SCE implementations. Ex ante site-specific gross annual kWh savings values (as opposed to the generic site energy savings values utilized in ADM's September 2003 proposal cost-effectiveness analyses) were used as the strata definitional criteria[1], with the following strata definitions: >5,000 kWh (Band A); 2,501-5,000 kWh (Band B); and 0-2,500 kWh (Band C). For the SCG implementation, the same three kWh-based strata were used, plus a fourth stratum for boiler measure participants. Strata based on annual kWh savings were utilized for the non boiler program participants, since ex ante ADM proposal-based net electric side TRC Test benefits for the SDG&E and SCE implementations – and for the non boiler portion of the SCG implementation – represented 92% of total net TRC Test benefits (i.e., natural gas side TRC Test benefits represented the remaining 8%).

-        For the SDG&E and SCE implementations, the sample was allocated across strata based on the cumulative site-specific gross annual kWh savings represented in each stratum. For example, if sites in the SCE implementation with ADM-calculated site-specific gross electric savings of 5,000+ (band A) represented 20% of overall program implementation gross annual electric savings, 20% of the 68 data points would be allocated to that particular stratum.

-        For the SCG implementation, 1/3 of the 68 data points (i.e., 23 data points) were allocated to the boiler measure, while the remaining 46 data points were

---

[1] Ex ante gross annual kWh savings were selected for obvious linkages to impact evaluation statistics, as well as because of the likelihood that other stratification variables such as business type and language preference would be unlikely to correlate effectively with energy savings.

allocated to the regular program measures. The 46 remaining data points in turn were allocated across the three kWh-based strata using the same approaches used in the SDG&E and SCE implementations. Note that the SCG boiler program was not approved by the CPUC until early 2005, after the initial SCG implementation data collection efforts were well underway.

- Most sampled participants were to be surveyed within 90 days of the date of service.[2] "Older" participants for the most part were not considered, since recollections for this type of program – offered at no cost to the participant, and significantly focused on "out of sight" energy efficiency measures (e.g., rooftop HVAC system work) – are likely to fade significantly more rapidly than for an energy efficiency program requiring out-of-pocket customer expenditures (which "endear" the participant to the program implementation specifics and results more directly and intimately).

- In recognition of significant program participation by customers for whom English is a second language, a subset of the survey calls were conducted in Spanish (since S&A has English-Spanish bilingual surveyor capabilities in-house). More specifically, calls were conducted in Spanish in proportion to the general program population (e.g., if 10% of the SDG&E program population indicated that Spanish was the preferred language, 10% of the sample calls were to be conducted in Spanish). Calls to other ethnic language groups – most notably Chinese, Vietnamese, and Korean, in terms of sheer quantities – were conducted in English (where language barriers were not insurmountable).

- The EM&V Research Plan's articulated notion of conducting a near-census of extremely large program participants was not employed, simply because it quickly became apparent during program monitoring that energy savings were not ultra-concentrated in a very few number of sites (as if often the case with an industrial process energy efficiency program or a nonresidential lighting energy efficiency program).

Note that onsite verification work was not conducted for the MEC program implementations owing to 1) EM&V budget issues and 2) the fact that ADM MEC staff members photo documented site work conducted extensively.

With respect to the completeness and likely validity/accuracy of photo documentation, S&A makes the following observations (especially in light of the relatively high measure non-recollection rates experienced in the participant survey – as discussed in Section 5):

- Photo documentation was available for the vast majority of the indicated measures, and for all but a handful of sites. For measures/sites where photos

---

[2] The SDG&E implementation was somewhat of an exception, since its implementation ended in March 2005. As a result, most SDG&E sampled participants were to be surveyed within 180 days of the date of service.

were not provided, the customers interpretation of events [per phone survey-provided information] was almost always utilized (for those instances where there were disagreements).

- Each and every photo requested by S&A/provided by ADM was reviewed by S&A to ensure that "boilerplate" photos were not utilized, and to cross check measure photos against database lists of measures implemented. S&A made sure that site-specific photo documentation included the front of the participant's building (i.e., where the business name was prominently displayed), that the business name matched the database record, and that accompanying measure photos had date/time stamps within hours of date/time stamps for the building front picture(s). Photo documentation for sites/measures failing to meet these criteria – rare, but not completely non-existent – was greatly downplayed in importance (i.e., significantly greater weight was given to the customer's interpretation of events, in the event of disagreements).

4.2. Results

SDG&E implementation. High level attributes of the attained sample are summarized in tabular form below. These results indicate that both of the indicated design attributes were exceeded.

Attribute	Design	Results
Total sample size (n)	68	71
Spanish language (n)	5 (8% of 68)	6

The overall actual sample of 71 data points exceeded the design of 68 data points since 1) the program population evolved over time such that certain strata ended up being "overweight" and 2) S&A wanted to attain quantity targets in other strata bins.

Survey calls to sampled program participants were made between June 2005 and August 2005. These calls covered program participants reported by ADM for the program months of June 2004 through March 2005. The sample's range of program months compares with the overall program population's program months of March 2004 through March 2005.

Strata-specific results for the program population (per participant- and measure-specific detailed data in the final program tracking workbook) and sample are summarized in tabular form below.

Stratum	Population N ex ante site-specific gross annual kWh Savings	%	Target n	Actual n	Actual – Target n	Popu-lation N	Case Weight
Band A (gross annual kWh >5,000)	1,442,438	59%	40	37	-3	171	4.62
Band B (gross annual kWh 2,501-5,000)	832,827	34%	23	26	+3	227	8.73
Band C (gross annual kWh 0-2,500)	182,314	7%	5	8	+3	106	13.25
Total	2,457,580	100%	68	71	+3	504	NA

Key "oddities" associated with the sample and/or sample data collection are summarized in bullet form below.

- As was noted in Section 4.1, most SDG&E sampled participants were surveyed within 180 days of the date of service, rather than within 90 days for the SCE and SCG implementations. This situation arose from the SDG&E implementation's early completion in March 2005 (in contrast, the SCE and SCG implementations did not end until December 2005 and January 2006, respectively).

- Bands A and B ended up being slightly underrepresented and slightly overrepresented, respectively, relative to target quantities since all Band A data points from the program's 2004 Q4 and 2005 Q1 reporting months were contacted without attainment of the desired completed survey quantities. Band

A data points from prior to 2004 Q4 were deemed too "stale" to contact, and hence three data points were substituted within the sample from Band B.

SCE implementation. High level attributes of the attained sample are summarized in tabular form below. These results indicate that both of the indicated attributes were exceeded.

Attribute	Design	Results
Total sample size (n)	68	73
Spanish language (n)	13 (19% of 68)	14

The overall actual sample of 73 data points exceeded the design of 68 data points since 1) the program population evolved over time such that certain strata ended up being "overweight" and 2) S&A wanted to attain quantity targets in other strata bins.

Survey calls to sampled program participants were made between June 2005 and February 2006. These calls covered program participants reported by ADM for the program months of June 2004 through December 2005. The sample's range of program months compares with the overall program population's program months of March 2004 through December 2005. Survey calls featured a "burst" of activity in June 2005 (reflective of "catching up" with 2004 and early 2005 program activity), then shifted to a significantly lower average number of completed calls per month thereafter.

Strata-specific results for the program population (per participant- and measure-specific detailed data in the final program tracking workbook) and sample are summarized in tabular form below.

Stratum	Population N ex ante site-specific gross annual kWh Savings	%	Target n	Actual n	Actual – Target n	Popu-lation N	Case Weight
Band A (gross annual kWh >5,000)	834,056	28%	19	18	-1	120	6.67
Band B (gross annual kWh 2,501-5,000)	1,189,242	40%	27	27	0	342	12.67
Band C (gross annual kWh 0-2,500)	976,956	33%	22	28	+6	686	24.50
Total	3,000,254	100%	68	71	+5	1,148	NA

Key "oddities" associated with the sample and/or sample data collection are summarized in bullet form below.

-       Bands A and C ended up being slightly underrepresented and slightly overrepresented, respectively, relative to targets. These modest divergences resulted from QC-related adjustments made by ADM program staff to the

final version of the program tracking system; they are not considered sufficiently major to warrant additional data collection.

SCG implementation. High level attributes of the attained sample are summarized in tabular form below. These results indicate that both of the indicated attributes were met or exceeded.

Attribute	Design	Results
Total sample size (n)	68	73
Spanish language (n)	14 (21% of 68)	14

The overall actual sample of 73 data points exceeded the design of 68 data points since 1) the program population evolved over time such that certain strata ended up being "overweight" and 2) S&A wanted to attain quantity targets in other strata bins.

Survey calls to sampled program participants were made between June 2005 and March 2006. These calls covered program participants reported by ADM for the program months of August 2004 through January 2006. The sample's range of program months compares with the overall program population's program months of March 2004 through January 2006. Survey calls featured a "burst" of activity in June 2005 (reflective of "catching up" with 2004 and early 2005 program activity), then shifted to a significantly lower average number of completed calls per month thereafter.

Strata-specific results for the program population (per participant- and measure-specific detailed data in the final program tracking workbook) and sample are summarized in tabular form below. Note the delineation of the SCG implementation into non-boiler measure and boiler measure portions of the population and sample.

Stratum	Population N ex ante site-specific gross annual kWh Savings	%	Target n	Actual n	Actual – Target n	Popu-lation N	Case Weight
Band A (gross annual kWh >5,000)	600,583	22%	11	10	-1	86	8.6
Band B (gross annual kWh 2,501-5,000)	1,114,957	40%	18	19	+1	331	17.42
Band C (gross annual kWh 0-2,500)	1,056,556	38%	17	18	+1	781	43.39
Subtotal – Non-Boiler Measure Portion	2,772,096	100%	46	47	+1		NA
Subtotal – Boiler Measure Portion	--	--	22	26	+4		NA
Total	--	--	68	73	+5		NA

The boiler measure portion of the program was further delineated into three boiler size-based strata as indicated below, with sampling proportional to the population within the respective strata.

Stratum	Population N	%	Target n	Actual n	Actual – Target n	Case Weight
Boiler Band A (sites where HP >15)	11	4%	1	1	0	11.00
Boiler Band B (sites where HP 9.5-15)	65	26%	6	6	0	10.83
Boiler Band C (sites where HP 0-9.49)	178	70%	15	19	+4	9.37
Subtotal – Boiler Measure Portion	254	100%	22	26	+4	NA

The boiler measure sub-sample of 26 data points exceeded the design of 22 data points since 1) the program population evolved over time such that certain strata ended up being "overweight" and 2) S&A wanted to attain quantity targets in other strata bins.

Key "oddities" associated with the sample and/or sample data collection are summarized in bullet form below.

- The boiler measure portion of the program began in June 2005 (and was reported on in beginning in late July 2005), after the sampling / surveying for the non-boiler portion of the program was underway. Since the inclusion of the boiler measure effectively meant the addition of an extra sampling stratum midway through the data collection efforts, non-boiler measure sites were sampled somewhat more "lightly" for the reporting months in the second half of 2005 than for the reporting months in late 2004 and the first half of 2005.

5. Participant Survey

This section summarizes responses for SDG&E, SCE, and SoCalGas Mobile Energy Clinic program participants with respect to the phone survey instrument utilized. Survey questions 1-34 (and associated response findings) are listed in order, and have been grouped together where logically appropriate.

Key pragmatic findings associated with the survey results are provided in the Section 6 Process Evaluation.

Note that scores associated with survey questions 14-16, 18-19, 21b, and 22b utilize a 5-point scale (where 5 is best possible score and 1 is the worst possible score; additional possible responses are "don't remember" (DR) and "not applicable" (NA)).

Q1.) _____Verify name / name of business

Q2.) _____Verify business street address and city

Q3.) _____Verify business type

SDG&E respondents. Interviewees were promised that their names would remain confidential. 100% of the 71 respondents were verified with respect to program tracking system data regarding their name / business name, business location, and business type.

SCE respondents. Interviewees were promised that their names would remain confidential. 100% of the 73 respondents were verified with respect to program tracking system data regarding their name / business name, business location, and business type.

SoCalGas respondents. Interviewees were promised that their names would remain confidential. 100% of the 73 respondents were verified with respect to program tracking system data regarding their name / business name, business location, and business type.

Q4.) _____Do you recall participating in the Mobile Energy Clinic program implemented by a crew from ADM Associates back on _____?

SDG&E respondents. 100% of the 71 respondents verified participation in the program.

SCE respondents. 100% of the 73 respondents verified participation in the program.

SoCalGas respondents. 100% of the 73 respondents verified participation in the program.

Q5.) Did you *initially* learn about the Mobile Energy Clinic program through either 1) a marketing flyer or 2) a site visit from a program representative ?
    ____Yes
    ____No _____ (record)

SDG&E respondents. 64 of the 71 respondents (90%) indicated that they learned about the program through either a marketing flyer or a site visit from the program representative.

SCE respondents. 69 of the 73 respondents (95%) indicated that they learned about the program through either a marketing flyer or a site visit from the program representative.

SoCalGas respondents. 62 of the 73 respondents (55%) indicated that they learned about the program through either a marketing flyer or a site visit from the program representative.

Q6.) Our records indicate that you had the following energy efficiency work done at no cost to you (*read from data extract*):
____**Rooftop AC system work**
____**Hot Water system work**
____**Reprogrammed Thermostat**
____**Installed Programmable Thermostat**
____**Refrigerator system work**
____**Replaced Incandescent Light Bulbs with CFL's**
____**Boiler tune-up service work**
Does this scope of work sound correct? _____

SDG&E respondents. 46 of the 71 respondents verifying program participation (65%) confirmed the indicated scope of implemented measures.

In 24 of the remaining 25 instances, respondents either indicated that some of the listed work had not been done, or did not recall the full scope of indicated work. Most such instances pertained to rooftop AC work, CFL's (which frequently were installed in bathrooms and storage areas, and which evidently ran out of stock on a few occasions), and/or hot water system work; thermostat measures and refrigeration system work were only mentioned a few times in this respect. S&A notes that most disagreements pertained to measures that were "out of sight" (and hence which were less top-of-mind).

There was one instance were CFL's were not in the tracking system's indicated scope of work, but where the participant insisted that CFL's had been provided through the program.

SCE respondents. 59 of the 73 respondents verifying program participation (81%) confirmed the indicated scope of implemented measures.

In 10 of the remaining 14 instances, respondents either indicated that some of the listed work had not been done, or did not recall the full scope of indicated work. The most frequently cited measure in this respect was the CFL item (frequently installed in bathrooms and storage areas). S&A notes that most disagreements pertained to measures that were "out of sight" (and hence which were less top-of-mind).

There were 4 instances where respondents identified measure work had been done that was not reflected in the program tracking system. Two instances pertained to reprogrammed thermostats, and two instances pertained to CFL's.

SoCalGas respondents. 52 of the 73 respondents verifying program participation (71%) confirmed the indicated scope of implemented measures.

In 10 of the remaining 21 instances, respondents either indicated that some of the listed work had not been done, or did not recall the full scope of indicated work. The most frequently cited measure in this respect was the CFL item (frequently installed in bathrooms and storage areas). S&A notes that most disagreements pertained to measures that were "out of sight" (and hence which were less top-of-mind).

In another 10 of the remaining 21 instances, respondents identified measure work had been done that was not reflected in the program tracking system. The most frequently cited measure in this respect was work related to the boiler tune-up.

There was one instance where the respondent identified both work that had not been done, as well as work that had been done that was not reflected in the program tracking system.

Q7.) Is all of this work still fully installed? (*ask about each item verified in #6*) _____

Regarding any/each item where NOT all remains fully installed, ask:

Q8.) What was removed, and why?

Q7. Fully installed/operational (yes/no)?	**Q8. What was removed, and why?**
____**Rooftop AC system work**	_____
____**Hot Water system work**	_____
____**Reprogrammed Thermostat**	_____
____**Installed Programmable Thermostat**	_____
____**Refrigerator system work**	_____
____**Replaced Incandescent Light Bulbs with CFL's**	_____
____**Boiler tune-up service**	_____

SDG&E respondents. Measure-specific responses are summarized below in tabular form.

Measure	Instances Where Respondents Verified Work Definitely Was Done	Instances Confirmed as Still Fully Installed / Operational	Discussion Regarding Other Instances
Rooftop AC system work	61	59	One instance involved an HVAC system (including p-stat) replacement after the program participation, while the other instance involved replacement of a fuse that ADM had removed.

Hot Water system work	8	8	--
Reprogrammed Thermostat	7	7	--
Installed Programmable Thermostat	58	57	One instance involved an HVAC system (including p-stat) replacement after the program participation.
Refrigerator system work	8	8	--
Replaced Incandescents with CFL's	18	14	Three instances involving lamps burning out; one instance involved lamps not able to be used.
Boiler turn-up service	NA	NA	--

SCE respondents. Measure-specific responses are summarized below in tabular form.

Measure	Instances Where Respondents Verified Work Definitely Was Done	Instances Confirmed as Still Fully Installed / Operational	Discussion Regarding Other Instances
Rooftop AC system work	70	69	One instance involved HVAC technician repairs done to rooftop unit shortly after ADM site work performed (after which problems emerged).
Hot Water system work	16	16	--
Reprogrammed Thermostat	6	5	--
Installed Programmable Thermostat	61	58	Three instances involving units being swapped out (e.g., owing to bad sensors, incompatible wiring, or ultimately not being able to get unit to work to tenant satisfaction).
Refrigerator system work	7	7	--
Replaced Incandescents with CFL's	30	27	Three instances involving issues such as lamps being too dim or color being inappropriate.
Boiler turn-up service	NA	NA	--

SoCalGas respondents. Measure-specific responses are summarized below in tabular form.

Measure	Instances Where Respondents Verified Work	Instances Confirmed as Still Fully	Discussion Regarding Other Instances

	Definitely Was Done	Installed / Operational	
Rooftop AC system work	46	44	Two instances involved HVAC technician repairs done to the rooftop unit shortly after ADM site work performed (after which problems emerged).
Hot Water system work	14	14	--
Reprogrammed Thermostat	2	2	--
Installed Programmable Thermostat	41	40	One instance involved a unit being swapped out after the tenant unsuccessfully tried get the unit to work to his satisfaction.
Refrigerator system work	1	1	--
Replaced Incandescents with CFL's	24	24	--
Boiler turn-up service	26	26	--

Q9.) (*Ask if customer implemented any CFL's):*
How many hours per business day would you say that the CFL's typically are on (to nearest half-hour)? _____

SDG&E respondents. Among the 12 respondents who could confirm CFL measure participation and quantify typical business day usage, the average usage cited was 8.4 hours per business day of CFL usage.

SCE respondents. Among the 25 respondents who could confirm CFL measure participation and quantify typical business day usage, the average usage cited was 7.0 hours per business day of CFL usage.

SoCalGas respondents. Among the 18 respondents who could confirm CFL measure participation and quantify typical business day usage, the average usage cited was 5.3 hours per business day of CFL usage.

Q10.) (*Ask if customer had thermostat reprogrammed):*

Q10a.) How did you use the previous thermostat? Specifically: When did the system turn on and off? What were the temperature settings for heating and cooling?
(*record for weekdays, Saturdays, and Sundays, as applicable*) _____

Q10b.) Have you changed the settings on your thermostat since the Mobile Energy Clinic team reprogrammed it? ____

Q10c.) (*ask if Q10b is "yes"*) When does the system now turn on and off? What are the temperature settings for heating and cooling? (*record for heating and cooling settings for weekdays, Saturdays, and Sundays, as applicable*) _____

SDG&E respondents. Among the 7 respondents who confirmed Mobile Energy Clinic reprogramming of their p-stats and that the p-stat was still fully installed and operational, two respondents indicated that they previously had utilized the p-stat manually (but now relied on default/automatic settings), two respondents were unsure, and three respondents indicated no change in the settings relative to pre-Mobile Energy Clinic levels.

A total of 4 respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic measure work – such changes involved manual adjustments as needed for premise comfort. One respondent indicated that the premise HVAC system was rarely utilized for heating or cooling.

SCE respondents. Among the 5 respondents who confirmed Mobile Energy Clinic reprogramming of their p-stats and that the p-stat was still fully installed and operational, respondents mostly described various previous manual/as needed uses of the p-stat. In several instances, data were either [accidentally] not obtained, or the respondent was unable to provide specific information.

A total of 4 respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic measure work – either relating to hours of operation, or lowering the default temperature for cooling.

SoCalGas respondents. Among the 2 respondents who confirmed Mobile Energy Clinic reprogramming of their p-stats and that the p-stat was still fully installed and operational, one described a reduction in HVAC system usage of 2 hours per business day (relative to use prior to the p-stat reprogramming), while one was unable to provide previous settings information since he had recently bought the store.

No respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic measure work.

Q11.) (*Ask if customer had programmable thermostat installed*):

Q11a.) How did you use the previous thermostat? Specifically: When did the system turn on and off? What were the temperature settings for heating and cooling? (*record for weekdays, Saturdays, and Sundays, as applicable*) _____

Q11b.) _____ Have you changed the settings on your programmable thermostat since the Mobile Energy Clinic team installed it? _____

Q11c.) (*ask if Q11b is "yes"*) When does the system now turn on and off? What are the temperature settings for heating and cooling? (*record for heating and cooling settings for weekdays, Saturdays, and Sundays, as applicable*) _____

SDG&E respondents. Among the 57 respondents who confirmed Mobile Energy Clinic p-stats installation and that the p-stat was still fully installed and operational, 36 respondents described pre p-stat usage as manual/as needed, 8 respondents described pre p-stat usage as matching work hours, 1 respondent described a timer-based system, 8 respondents didn't know/recall specifics, 3 respondents stated that the old thermostat did not work well, and 1 respondents stated that the system was not used since the HVAC system and/or the thermostat was broken. Five respondents explicitly stated that they hardly ever used their HVAC systems prior to installation of the p-stat. One respondent indicated that the HVAC system often was left on at night.

A total of 22 respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic p-stat unit installation. These situations involved a wide variety of situations, including lowering cooling settings and/or raising heating settings (nominally load-building relative to the ADM settings), raising cooling settings and/or lowering heating settings (nominally energy conservation-intensive relative to the ADM settings), or a mix (e.g., lowering both cooling and heating settings).

A total of 10 respondents indicated that they had turned (or kept) the p-stat units off except for extreme weather conditions.

SCE respondents. Among the 58 respondents who confirmed Mobile Energy Clinic p-stats installation and that the p-stat was still fully installed and operational, 26 respondents described pre p-stat usage as manual/as needed, 16 respondents described pre p-stat usage as matching work hours, 1 respondent described a timer-based system, 14 respondents didn't know/recall specifics, 0 respondents stated that the old thermostat did not work well, and 1 respondent stated that the system was not used. Two respondents explicitly stated that they hardly ever used their HVAC systems prior to installation of the p-stat.

A total of 21 respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic p-stat unit installation. These situations involved a wide variety of situations, including lowering cooling settings and/or raising heating settings (nominally load-building relative to the ADM settings), raising cooling settings and/or lowering heating settings (nominally energy conservation-intensive relative to the ADM settings), or a mix (e.g., lowering both cooling and heating settings).

A total of 4 respondents indicated that they had turned (or kept) the p-stat units off except for extreme weather conditions.

SoCalGas respondents. Among the 40 respondents who confirmed Mobile Energy Clinic p-stats installation and that the p-stat was still fully installed and operational, 18 respondents described pre p-stat usage as manual/as needed, 10 respondents described pre p-stat usage as matching work hours, 8 respondents didn't know/recall specifics, 2 respondents stated that the old thermostat did not work well, and 2 respondents stated that the system was not used since the HVAC system and/or the thermostat was broken. Two

respondents explicitly stated that they hardly ever used their HVAC systems prior to installation of the p-stat.

A total of 19 respondents indicated that they had changed p-stat settings subsequent to the Mobile Energy Clinic p-stat unit installation. These situations involved a wide variety of situations, including lowering cooling settings and/or raising heating settings (nominally load-building relative to the ADM settings), raising cooling settings and/or lowering heating settings (nominally energy conservation-intensive relative to the ADM settings), or a mix (e.g., lowering both cooling and heating settings).

A total of 5 respondents indicated that they had turned (or kept) the p-stat units off except for extreme weather conditions.

Q12.) What made you decide to participate in the program? *(pre-coded list; multiple responses allowed; probe until reasonably exhausted)*
　　　____**Free services (i.e., doesn't cost anything to participate)**
　　　____**Good way to save [immediately] on monthly utility bill**
　　　____**Good way to learn about** *additional* **ways to save on monthly utility bill**
　　　____**Convincing/trustworthy program rep (including: rep speaks my language)**
　　　____**Turnkey service program made participating easy**
　　　____**Not disruptive to my business**
　　　____**Other** _____ **(record)**

SDG&E respondents. Among the 71 respondents who verified program participation, the leading responses were "free services" (47 respondents; 66%), "good way to save on monthly utility bill" (34 respondents; 48%), and "other" (30 respondents; 42%). All other responses were far behind.

Within the "other" category, the leading responses were 1) the need for/desirability of getting a new thermostat and 2) wanting to save energy.

SCE respondents. Among the 73 respondents who verified program participation, the leading responses were "good way to save on monthly utility bill" (48 respondents; 66%), "free services" (44 respondents; 60%), and "other" (28 respondents; 38%). All other responses were far behind.

Within the "other" category, the leading response by far was conservation / wanting to save energy.

SoCalGas respondents. Among the 73 respondents who verified program participation, the leading responses were "free services" (56 respondents; 77%), "good way to save on monthly utility bill" (548 respondents; 74%), and "other" (35 respondents; 48%). All other responses were far behind.

Within the "other" category, the leading responses were 1) endorsement by the Korean Drycleaners and Laundry Association (applicable to boiler measure participants only), 2) conservation / wanting to save energy, and 3) need for a new p-stat.

Q13.) What was the single most important reason for deciding to participate in the program?

SDG&E respondents. Responses generally resembled the responses for question 12. The most frequently cited most important reason was "free services" (34 respondents; 48%). "good way to save on monthly utility bill" (22 respondents; 31%) came in second place, and "other" (14 respondents; 20%) came in third place.

SCE respondents. Responses generally resembled the responses for question 12. The most frequently cited most important reason was "good way to save on monthly utility bill" (31 respondents; 42%), "other" (21 respondents; 290%) came in second place, and "free services" (18 respondents; 25%) came in third place.

SoCalGas respondents. Responses generally resembled the responses for question 12. The most frequently cited most important reason was "good way to save on monthly utility bill" (27 respondents; 37%), "free services" (22 respondents; 30%) came in second place, and "other" (21 respondents; 29%) came in third place.

Q14.) ____Overall, how satisfied are you with the Mobile Energy Clinic program?

Q15.) ____How easy was it to participate in the program?

Q16.) ____How satisfied were you with the performance of the technician(s) who did the work?

Q17.) (*ask if response to #Q16 was a 1, 2, or 3*) Were there any problems with the technician(s)? _____ (*record*)

Q18.) ____What was the level of disruption to your business during installation?

SDG&E respondents. Respondents scored these four elements of program satisfaction relatively favorably. Attributes are listed below in declining order of average score.

-	Easy to participate	4.9
-	Level of disruption	4.9
-	Performance of technician	4.7
-	Overall program satisfaction	4.4

The 3 stated occurrences of technician dissatisfaction pertained to p-stat technical proficiency (2 instances) and one instance of not showing up at the set appointment time.

SCE respondents. Respondents scored these four elements of program satisfaction relatively favorably. Attributes are listed below in declining order of average score.

-	Easy to participate	4.9

-     Level of disruption   4.9
-     Performance of technician   4.6
-     Overall program satisfaction   4.4

The 6 stated occurrences of technician dissatisfaction mainly pertained to p-stat technical issues. Other cited dissatisfaction included technicians not being in uniforms, and technicians providing but not being able to install certain measures.

SoCalGas respondents. Respondents scored these four elements of program satisfaction relatively favorably. Attributes are listed below in declining order of average score.

-     Easy to participate   4.8
-     Level of disruption   4.7
-     Performance of technician   4.5
-     Overall program satisfaction   4.3

There were 8 stated occurrences of technician dissatisfaction: 5 occurrences related to the boiler measure, and 3 occurrences related to other measures. Boiler measure technician dissatisfaction mainly related to the procedure taking longer than expected (thereby affecting business operations). Other measure technician dissatisfaction related to air filters, p-stat use with a heat pump, and additional work being promised but not completed.

Q19.) How satisfied are you with the performance of each implemented item? (*as applicable from item list per #Q6 above*)
    ____**Rooftop AC system work**
    ____**Hot Water system work**
    ____**Reprogrammed Thermostat**
    ____**Installed Programmable Thermostat**
    ____**Refrigerator system work**
    ____**Replaced Incandescent Light Bulbs with CFL's**
    ____**Boiler tune-up service work**

SDG&E respondents. Respondents generally scored measures quite favorably. Results are listed in listed below in tabular form in declining order of average score. The table also lists the number of sample data points associated with the average scores, since the degree of coverage "thickness" varies significantly across the measures.

Measure	Average Score	Sample Data Points
Hot Water system work	5.0	10
Replaced Incandescent Light Bulbs with CFL's	4.8	13
Rooftop AC system work	4.5	50
Installed Programmable Thermostat	4.3	55
Refrigerator system work	4.1	7
Reprogrammed Thermostat	3.9	7
Boiler tune-up service work	NA	0

SCE respondents. Respondents generally scored measures quite favorably. Results are listed in listed below in tabular form in declining order of average score. The table also lists the number of sample data points associated with the average scores, since the degree of coverage "thickness" varies significantly across the measures.

Measure	Average Score	Sample Data Points
Hot Water system work	5.0	15
Rooftop AC system work	4.8	68
Refrigerator system work	4.8	6
Replaced Incandescent Light Bulbs with CFL's	4.6	28
Installed Programmable Thermostat	4.3	63
Reprogrammed Thermostat	3.6	5
Boiler tune-up service work	NA	0

SoCalGas respondents. Respondents generally scored measures quite favorably. Results are listed in listed below in tabular form in declining order of average score. The table also lists the number of sample data points associated with the average scores, since the degree of coverage "thickness" varies significantly across the measures.

Measure	Average Score	Sample Data Points
Reprogrammed Thermostat	5.0	1
Refrigerator system work	5.0	2
Hot Water system work	4.7	12
Replaced Incandescent Light Bulbs with CFL's	4.6	23
Boiler tune-up service work	4.4	26
Rooftop AC system work	4.3	46
Installed Programmable Thermostat	4.3	40

Q20.) Record any articulated implemented item-specific satisfaction or dis-satisfaction. _____

SDG&E respondents. A total of 19 respondents articulated measure-specific comments. Three comments were positive, one comment was neutral, and fifteen comments were negative.

Positive comments pertained to 1) the p-stat being easier to use, 2) the p-stat being effective at turning the HVAC system off at the end of the day, and 3) the fact that the regular HVAC system maintenance person had not been changing the air filter (whereas the ADM technician did).

The one neutral comment pertained to the p-stat, since the customer had not yet tried using the p-stat and the HVAC system since the ADM site work was performed some months previously.

Illustrative negative comments mainly pertained to p-stats (e.g., too complicated/hard to adjust; incorrectly programmed; hard to maintain a temperature comfort zone), CFL's

(e.g., some units burning out quickly), and/or bill-based usage increasing since the site work had been done (purportedly after consideration of weather effects).

SCE respondents. A total of 22 respondents articulated measure-specific comments. Five comments were positive, five comments were neutral, and twelve comments were negative.

Positive comments pertained to issues such as 1) bill savings realized, 2) CFL's being better than expected, 3) technicians speaking Spanish, and 4) systems running generally well.

Neutral comments pertained to issues such as 1) the p-stat and the HVAC system not having been used yet, 2) no compatible p-stats being available, and 3) p-stat settings being acceptable for some people at the site, but not for others.

Illustrative negative comments mainly pertained to p-stats (e.g., battery replacement issues; incorrect setting); CFL's (e.g., units being too dim), and/or bill-based usage either remaining flat or even increasing since the site work had been done (purportedly after consideration of weather effects).

SoCalGas respondents. A total of 21 respondents articulated measure-specific comments. Three comments were positive, five comments were neutral, and thirteen comments were negative.

Positive comments pertained to 1) bill savings realized, and 2) being grateful to have new equipment installed.

Neutral comments pertained to issues such as 1) the boiler being so old that the tune-up would not be that effective, 2) the p-stat and the HVAC system not having been used yet, 3) some aspects of AC tune-up work perhaps not being needed, since an AC system maintenance contract was already in place.

Illustrative negative comments mainly pertained to boiler tune-ups (e.g., business disruptions; usage savings being significantly less than the "promised" amount); p-stats (e.g., systems cycling HVAC units on more frequently, hence causing increased usage; less effective than older units with respect to comfort); and AC systems (e.g., system failures shortly after the tune-up; wrong sized AC filters being used by technicians).

Q21a.) _____Do you recall getting a list of energy efficiency maintenance recommendations (e.g., change HVAC system air filters annually)?

Q21b) _____(*ask if Q21a is "yes"*) How satisfied were you with the list of maintenance recommendations?

Q22.)   Record any articulated recommended maintenance list satisfaction or dissatisfaction. _____

SDG&E respondents. A total of 32 respondents (45%) recalled getting the maintenance recommendations list. Of these 32 respondents, 10 respondents did not recall enough to assess list satisfy, while the remaining 22 respondents gave the list an average score of 4.4.

A total of 3 respondents articulated recommended maintenance list-specific comments. Two comments were positive (e.g., some measures in fact had been implemented), while one comment was neutral (i.e., measures were relatively complex, and not particularly applicable to the customer's site).

SCE respondents. A total of 36 respondents (49%) recalled getting the maintenance recommendations list. Of these 36 respondents, 6 respondents did not recall enough to assess list satisfy, while the remaining 30 respondents gave the list an average score of 4.1.

A total of 17 respondents articulated recommended maintenance list-specific comments. Seven comments were positive (e.g., many things implemented, and things are still running smoothly; has gotten an HVAC system maintenance contract), eight comments were neutral (e.g., haven't read the list, or only parts of the list; gave list to landlord; don't have time to deal with), and two comments were negative (e.g., list has routine items; list was not in his [non-English] native language.

SoCalGas respondents. A total of 29 respondents (49%) recalled getting the maintenance recommendations list. Of these 29 respondents, 2 respondents did not recall enough to assess list satisfy, while the remaining 27 respondents gave the list an average score of 4.5.

A total of 14 respondents articulated recommended maintenance list-specific comments. Seven comments were positive (e.g., many maintenance items being implemented; technician explained ways to improve efficiency going forward), seven comments were neutral (e.g., haven't read the list; don't have time to deal with; not considering the measure at present since it's winter), and zero comments were negative.

Q23a.) ____Do you recall getting a list of recommended energy conservation items (e.g., install T8 lamps, high efficiency spot lights, occupancy sensors, duct sealing, evaporative coolers) and associated likely installed costs and annual operating cost savings?

Q23b.) ____(*ask if Q23a is "yes"*) How satisfied were you with the list of recommended energy conservation items?

Q24.) Record any articulated recommended item list satisfaction or dissatisfaction.
_____

SDG&E respondents. A total of 23 respondents (32%) recalled getting the recommended measures list. Of these 23 respondents, 8 respondents did not recall enough to assess list satisfy, while the remaining 15 respondents gave the list an average score of 4.2.

A total of 6 respondents articulated recommended maintenance list specific comments. All six comments were neutral (e.g., many of the items already had been implemented; the list was similar to lists previously received from SDG&E; the respondent didn't time to implement the measures).

SCE respondents. A total of 29 respondents (40%) recalled getting the recommended measures list. Of these 29 respondents, 6 respondents did not recall enough to assess list satisfy, while the remaining 23 respondents gave the list an average score of 4.0.

A total of 13 respondents articulated recommended maintenance list-specific comments. Three comments were positive (e.g., wants to do some/all of the items), seven comments were neutral (e.g., haven't read the list; gave list to landlord), and three comments were negative (e.g., items were costly; list was not in his [non-English] native language.

SoCalGas respondents. A total of 17 respondents (23%) recalled getting the recommended measures list. Of these 17 respondents, 2 respondents did not recall enough to assess list satisfy, while the remaining 15 respondents gave the list an average score of 4.6.

A total of 4 respondents articulated recommended maintenance list-specific comments. One comment was positive (e.g., have already switched to CFL's), three comments were neutral (e.g., don't have time to deal with; not considering the measure at present since it's winter), and zero comments were negative.

Q25.) (*For each item verified by the participant in #Q6*) Assuming you had not been contacted by the Mobile Energy Clinic program in the first place, what is the likelihood (in percent) that you would have implemented or installed any of the items during 2004-05 in the absence of this program, where 0% = no chance and 100% = definitely would have had?

Q26.) (*For respondents answering any portion of Q25 as >0%*) How much sooner (in months) was the item implemented because of this program?

Q25. Implementation likelihood %?	Q26. Months sooner implemented?
____**Rooftop AC system work**	_____
____**Hot Water system work**	_____
____**Reprogrammed Thermostat**	_____
____**Installed Programmable Thermostat**	_____
____**Refrigerator system work**	_____
____**Replaced Incandescent Light Bulbs with CFL's**	_____
____**Boiler tune-up service**	_____

SDG&E respondents. Average implementation likelihood percentages and associated months sooner data are summarized in tabular format below. The data indicate very low free ridership across all measures. It should be noted that these data are arithmetic averages, and are different from the site-specific data used in the impact evaluation.

Measure	Average Implementation Likelihood %	Average Months Sooner Implemented
Rooftop AC system work	15	4
Hot Water system work	0	--
Reprogrammed Thermostat	7	18
Installed Programmable Thermostat	13	6
Refrigerator system work	11	2
Replaced Incandescent Light Bulbs with CFL's	5	24
Boiler tune-up service work	NA	NA

SCE respondents. Average implementation likelihood percentages and associated months sooner data are summarized in tabular format below. The data indicate low free ridership across most measures. It should be noted that these data are arithmetic averages, and are different from the site-specific data used in the impact evaluation.

Measure	Average Implementation Likelihood %	Average Months Sooner Implemented
Rooftop AC system work	15	7
Hot Water system work	16	11
Reprogrammed Thermostat	6	12
Installed Programmable Thermostat	16	7
Refrigerator system work	57	9
Replaced Incandescent Light Bulbs with CFL's	13	9
Boiler tune-up service work	NA	NA

SoCalGas respondents. Average implementation likelihood percentages and associated months sooner data are summarized in tabular format below. The data indicate low free ridership across all measures. It should be noted that these data are arithmetic averages, and are different from the site-specific data used in the impact evaluation.

Measure	Average Implementation Likelihood %	Average Months Sooner Implemented
Rooftop AC system work	22	4
Hot Water system work	19	5
Reprogrammed Thermostat	0	--
Installed Programmable Thermostat	13	5
Refrigerator system work	0	--
Replaced Incandescent Light Bulbs with CFL's	10	6
Boiler tune-up service work	23	16

Q27.) (*skip to #Q31 if customer only had boiler service done*) **Are you aware of any sort of periodic routine maintenance done to your building's HVAC system?**
    ____**Yes (record estimated typical service frequency)** _____
    ____**No / maintenance only happens when the system breaks down**
    ____**Don't Know**
    ____**Other** _____ **(record)**

SDG&E respondents. A total of 32 respondents (45%) were aware of HVAC system maintenance being done, 23 respondents (32%) did not know, 14 respondents (20%) said that maintenance only happens when the system breaks, and 2 respondents (3%) described other situations.

Among the 32 respondents aware of HVAC system maintenance being done, the following schedules were described:

Schedule	Respondents
Monthly	3
6x / year	1
3-4x / year	10
2x / year	7
Annually	5
Unsure	6

Among the 2 respondents describing other situations, there was one articulated comment (i.e., that the landlord never did maintenance related to the building HVAC system).

SCE respondents. A total of 29 respondents (40%) said that maintenance only happens when the system breaks, 24 respondents (33%) did not know about maintenance, 19 respondents (26%) were aware of HVAC system maintenance being done, and 1 respondent (1%) described other situations.

Among the 19 respondents aware of HVAC system maintenance being done, the following schedules were described:

Schedule	Respondents
Monthly	0
6x / year	1
3-4x / year	4
2x / year	4
Annually	7
Unsure	3

For the 1 respondent describing other situations, the situation involved the specific tenant having to pay for needed work when the HVAC system broke down.

SoCalGas respondents. Note that only 47 respondents had this question applicable, as the other 26 respondents participated only in the boiler measure. Of the 47 respondents, a

total of 23 respondents (49%) did not know about maintenance, 12 respondents (26%) were aware of HVAC system maintenance being done, and 12 respondents (26%) said that maintenance only happens when the system breaks; 0 respondents (0%) described other situations.

Among the 12 respondents aware of HVAC system maintenance being done, the following schedules were described:

Schedule	Respondents
Monthly	1
6x / year	4
3-4x / year	0
2x / year	1
Annually	3
Unsure	3

Q28.) Have you implemented any of the recommended energy conservation items (e.g., install T8 lamps, high efficiency spot lights, occupancy sensors, duct sealing, evaporative coolers)? If so, which ones? _____ (*record item type(s) and quantities, as applicable***)**

Q29.) *(if answered "yes" to #Q28 above)* **Did you use rebates available through other CPUC-authorized energy efficiency programs?**
        ____Yes _____ (record)
        ____No
        ____Some yes, some no _____ (record)
        ____Don't Know
        ____Other _____ (record)

SDG&E respondents. A total of 4 respondents (6%) had implemented at least some recommended measure work. Three sites involved lighting upgrades, while one site involved a new water heater.

Two of the respondents utilized CPUC-authorized energy efficiency program rebates (1 through SDG&E, 1 unspecified), and two respondents fell into the "other" category (since they either did not want to provide details, or were unable to do so).

SCE respondents. A total of 6 respondents (8%) had implemented at least some recommended measure work, and 2 respondents (3%) had implemented at least some recommended behavioral modifications. Measure work mainly pertained to lighting issues (e.g., CFL's), while behavioral modifications involved things like closing doors and lowering DHW temperature settings.

Three of the respondents utilized CPUC-authorized energy efficiency program rebates, three respondents were unsure about rebate specifics, and two respondents fell into the "other" category.

SoCalGas respondents. A total of 4 respondents (5%) had implemented at least some recommended measure work, and 0 respondents (0%) had implemented at least some recommended behavioral modifications. Measure work mainly pertained to lighting (e.g., CFL's).

Four of the respondents were unsure about rebate specifics.

Q30.) What are the main reasons you didn't implement some or all of the recommended energy conservation items? (*pre-coded list; multiple responses allowed; probe until reasonably exhausted*)
    ____**Don't own the building**
    ____**Landlord wouldn't allow it**
    ____**Up-front costs too high**
    ____**Rebates not available or not big enough**
    ____**Relatively poor return (compared with other business investment needs)**
    ____**Energy not a big enough portion of operating costs to worry about it**
    ____**Don't have other significant energy-using equipment**
    ____**Don't have enough information to evaluate**
    ____**Takes too much time to evaluate**
    ____**Don't trust the technology(s) regarding performance, reliability, etc.**
    ____**Other _____ (record)**

SDG&E respondents. The leading response by far was "other" (61 responses). The other leading responses – far behind – included "takes too much time to evaluate (8 responses), "up front costs too high" (4 responses), and "don't have enough information to evaluate" (4 responses).

Representative "other" reasons included "unhappy with landlord", "haven't really thought about it", "no opinion", "existing system still to new [to want to replace]", and "already done all s/he thought was necessary."

SCE respondents. The leading response by far was "other" (50 responses). The other leading responses – far behind – included "don't have enough information to evaluate" (14 responses), "up front costs too high" (9 responses), and "takes too much time to evaluate (8 responses).

Representative "other" reasons included "already done enough regarding energy efficiency", "didn't get lists/literature", "haven't read the material", and "no opinion."

SoCalGas respondents. Note that this question was posed only to non-boiler measure program participants (47 respondents). The leading response by far was "other" (32 responses). The other leading responses – far behind – included "don't have enough information to evaluate" (13 responses), and "takes too much time to evaluate (7 responses).

Representative "other" reasons included "didn't get lists/literature", "haven't read the material", and "no opinion."

Q31.)   Did you tell any other small businesses about the Mobile Energy Clinic program and/or the types of energy efficiency work it does?

Q32.)   *(if answered "yes" to #Q31 above)* **Approximately how many other small businesses did you inform?** _____

SDG&E respondents. A total of 16 respondents (23%) had told a total of approximately 37 other small businesses about the Mobile Energy Clinic program.

SCE respondents. A total of 19 respondents (26%) had told a total of approximately 53 other small businesses about the Mobile Energy Clinic program.

SoCalGas respondents. A total of 24 respondents (33%) had told a total of approximately 105 other small businesses about the Mobile Energy Clinic program.

Q33.)   Do you think the California Public Utilities Commission should continue to fund programs such as the Mobile Energy Clinic to operate energy efficiency programs?
  a.   **Definitely**
  b.   **Probably**
  c.   **Unsure**
  d.   **Probably not**
  e.   **Definitely not**
  f.   **Don't know / no opinion**

SDG&E respondents. Among the 71 respondents, the most common answer was "definitely" (49 responses; 69%), followed by "probably" (13 responses; 18%) and "unsure" (7 responses; 10%). Two respondents (3%) indicated "definitely not."

SCE respondents. Among the 73 respondents, the most common answer was "definitely" (60 responses; 82%), followed by "unsure" (6 responses; 8%), "probably" (4 responses; 5%) and "probably not" (3 responses; 4%).

SoCalGas respondents. Among the 73 respondents, the most common answer was "definitely" (53 responses; 73%), followed by "unsure" (8 responses; 11%), "probably" (7 responses; 10%), "definitely not" (2 responses; 3%), "don't know / no opinion" (2 responses; 3%) and "probably not" (1 response; 1%).

Q34.)   Do you have any other feedback or suggestions regarding the program that we have not covered?   _____

SDG&E respondents. General feedback and suggestions generally fell into one of three categories: 1) generally positive process improvement suggestions, 2) strong program praise, and 3) criticism of the program and/or technologies used. Illustrative quotes for each category are provided below.

Process improvement suggestions

- "This program is good because it helps save small businesses both time and money. You should track new businesses or remodels, and offer upgrade packages."

- "Announce more broadly [other than in the paper flyer handout] that small businesses can qualify for this program, even if they don't own their building."

- Follow up after a business participates to see if they are saving money."

Program praise

- "The level of the AC work was unexpectedly impressive. We'd like residential [program] offerings [too]."

- "We thank the program for their time and the work done, which has allowed me to save money on my monthly bill."

Program / technologies criticism

- "My [monthly utility] bill is generally higher now."

- "The technicians were not properly trained; there was poor presentation, poor communication. The reps weren't clear on what they were doing."

SCE respondents. General feedback and suggestions generally fell into one of four categories: 1) process improvement suggestions, 2) program praise related to direct experience, 3) general program praise, and 4) criticism of the program and/or technologies used. Illustrative quotes for each category are provided below.

Process improvement suggestions

- "It would be good if someone from the program would come back to check up on the work that's been done."

- "Help make it clearer that this program is a state-approved free program, not a scam. Have your technicians wear uniforms and have better ID."

- [paraphrased] "Have lists of maintenance recommendations and energy conservation items be translated into Spanish for Spanish-speaking businesses."

- "Have a better variety of t-stats for your technicians to work with."

- "Have your technicians wear uniforms and have better ID."

- "We would love to receive an analysis of our bills before participation and after participation."

- "The reps [should] explain more up front to the candidates why they are doing this program, so it is clear that there is no 'catch'."

- "I had a problem with the thermostat and didn't know who to contact about it, and wasn't given any contact information by ADM - a hotline number would be helpful."

Direct experience program praise

- "We thank the program for their time and the work done, which has allowed me to save money on my monthly bill."

- "[I] already have seen a 10-20% savings on my energy bill."

- [paraphrased] "The program was of great help for [my] new business, since [I] had no funds to have the work done [myself]."

General program praise

- "This is a good program since most small businesses can't afford to do these types of things!"

- "All businesses should participate, to help California save energy."

- "Continue with the program, especially in small businesses like his where a lot of energy is consumed and owners don't know how to go about conserving energy."

- "Conserving energy in California is very important, especially with the population growth, so this is a good program."

- "This program increases business' awareness of energy-saving practices and possibilities, and that otherwise probably wouldn't happen."

Program / technologies criticism

- "We are so upset that our bill is so high. We've been trying to contact someone to come out and fix the t-stat."

- "Our bill is higher since we had the work done. Can someone check out the p-stats?"

SoCalGas respondents. General feedback and suggestions generally fell into one of four categories: 1) process improvement suggestions, 2) program praise, 3) criticism of the program and/or technologies used, and 4) neutral "too soon to tell" observations regarding the program. Illustrative quotes for each category are provided below.

Process improvement suggestions

- "Please have the MEC technicians break down the costs of the additional work needed to be done, to understand what the materials cost." [boiler measure participant]

- "[I] suggest MEC keep records of the service work done, and remind companies every 2-3 years to repeat the service, because the owners are too busy or tired to keep records themselves." ." [boiler measure participant]

- "[I] had to ask too many questions and still didn't understand what the MEC was doing and where they got the money for the program … give more information to the public, so there is no confusion as to the nature of the program."

- "The CPUC should evaluate the participants before and after to determine whether this program is working, not just after the changes have been made."

Program praise

- "This is a great program that saves energy, improves efficiency, and supports the small business sector of industry." [boiler measure participant]

- "The program is very handy. [I] was so impressed with the thermostat here that I bought one for home. The CFL's last much longer than the regular bulbs; I have bought some for home as well."

- "We otherwise couldn't pay for the services that were provided, so [we] appreciated the visit of the MEC."

Program / technologies criticism

- "I am unhappy with [the] program because instead of conserving energy I am now using and paying for more."

- "The only winners are the contractors; I haven't saved any energy."

Neutral program observations

- "We can't tell if we'll save on our energy bill yet, but at least we know the boiler is clean and working." [boiler measure participant]

- "It's still too cold to evaluate the energy savings effect. That said, this program is a good orientation about energy efficiency to business owners."

6. Process Evaluation

Based on the EM&V Research Plan, four main topic areas have been investigated:

- Did the programs serve their intended markets (and for reasons originally hypothesized)?

- Did key "environmental" (i.e., marketplace and regulatory) factors significantly affect the program's performance?

- Have EM&V recommendations regarding the 2002-2003 programs been implemented?

- Is the program implementation consistent with and logical for the proposed design? Are there significant opportunities for program service and procedure improvements?

Each topic is approached in turn.

Note that no onsite verification work was conducted, owing to 1) EM&V budget constraints and 2) the fact that ADM provided extensive photo documentation of measure "post" work for most measures at most sampled sites. These issues were noted in the CPUC-approved EM&V Research Plan back in September 2004.

6.1. Serving of Intended Markets / Participation Reasons

Intended and actual markets – program volumes. The table below summarizes goal versus actual site implementations. In the aggregate, the MEC implementations came very close to or attained program goals regarding site volumes.

Service Territory	Goal Sites (per 9/2003 proposal)	Actual Sites (per ADM 5/2006 final report materials)	Actual Sites as % of Goal Sites
SDG&E	500	504	101
SCE	1,200	1,148	96
SCG – original program	1,200	1,198	100
SCG – boiler measure sub-program	350	254	73
SCG – total	1,550	1,452	94
Grand Total	3,250	3,104	96

Intended and actual markets – business types and locations. The original September 2003 ADM proposals regarding the 2004-2005 implementations identified that their intended markets/customers were small commercial businesses generally, and strip mall tenants, small convenience stores, Laundromats, and non-chain restaurants specifically. Additionally, the December 2004 ADM proposal regarding the boiler measure "add on"

sub-program for SCG identified its intended markets as independently-owned dry cleaners.

These specifically identified business types <u>do</u> indeed appear to have been the vast majority of participants served through MEC. In all three implementations, nearly all listed business types [per tracking system records] had at least one of these attributes. Moreover, reviews of address-sorted records indicate that most of the customer participants indeed appear to be located in strip mall/closely adjacent premises.

Intended and actual markets – other key attributes. The original September 2003 ADM proposals regarding the 2004-2005 implementations identified that all non-boiler measure customers served were to be less than 5,000 square feet <u>and</u> 50 kW in size (with most participants being less than 20 kW in size).

Reviews of specific program records indicate that all listed participants indeed had total <u>conditioned</u> floor space of 5,000 square feet or less. A handful of participants nominally violated program eligibility criteria, however; see discussion in the "Divergences" section immediately below. None of the program records failed a "sniff test" in terms of floor space-business type plausibility; examples of customer characteristics that would fail such an assessment include – for example – a 4,000 square foot barber shop or a 250 square foot furniture store.

Program record reviews also indicate that the vast majority of participants indeed had peak demands – as defined based on MEC field staff estimates – of <20 kW. The table below provides summary statistics regarding this aspect of the program population.

Service Territory	Actual Sites (per ADM 5/2006 final report materials)	Actual Sites <20 kW (per ADM 5/2006 final report materials)	< 20 kW Sites as % of Actual Sites
SDG&E	504	489	97
SCE	1,148	1,113	97
SCG – original program only	1,198	1,085	91
Total of Above	2,850	2,687	94

Moreover, sites $\geq$20 kW appeared generally "sniff test" plausible in terms of business types: such participants mostly consisted of restaurants and grocery stores.

Divergences. Four modest divergences from intended markets were observed for the program populations, although none appears to be serious in nature:

- The original September 2003 ADM proposals regarding the 2004-2005 implementations defined one of the customer eligibility criteria based on total square footage. In contrast, ADM utilized total <u>conditioned</u> square footage for this particular dimension. Reviews of program tracking system records indicate that a total of 4 participants (1 in the SCE service territory, 3 in the SCG service territory) nominally violated the original program design criteria by virtue of having total floor space of >5,000 sq ft. S&A does not view these

violations as serious, and thus has not "zero-ed out" any such sampled customers in the paperwork verification portion of the impact evaluation. S&A suggests that this aspect of program eligibility pro-actively be defined in the 2006-2008 SDG&E implementation to refer explicitly to conditioned square footage.

- Laundromats were not observed in any meaningful quantities in any of the implementations. Laundromats were not even listed as one of the tracking system's pre-coded business types, nor were "typical" Laundromat names (e.g., names including "laundr-" or "wash") observed with any degree of frequency.

- Small offices – presumably located in strip malls and/or in close proximity to small retail establishments –appear to represent approximately 10% of program participants (frequency counts ranged from 8% in the SDG&E implementation to 14% in the SCE implementation). Since MEC broadly targeted hard to reach small commercial businesses, such establishment appear "within scope", but are nonetheless slightly different from the core of the envisioned MEC customer base of strip mall tenants, small convenience stores, Laundromats, and non-chain restaurants.

- A handful of establishments classified as "process/industrial" were observed in the SDG&E and SCG implementations. Most of the encountered records appear to involve small-scale machining operations, and appear to be located in strip malls and/or small retail areas. S&A views such sites as allowable within the program implementation since they are broadly considered "non-residential" customers by the CPUC (as opposed to "residential" or "new construction", which are distinct/markedly different segments for purposes of energy efficiency resource program classification).

Participation reasons. The original September 2003 ADM proposals regarding the 2004-2005 implementations (and the December 2004 ADM proposal regarding the boiler measure "add on" sub-program for SCG) addressed specific reasons for customer participation implicitly rather than explicitly. Targeted customers were characterized "hard to reach" (i.e., burdened with significant market barriers) for the following four reasons:

- Energy costs are insufficiently large to warrant attention (applicable to the main MEC program only)

- Business owners are unaware of energy efficiency improvement options and associated benefits and costs (applicable to both the main MEC program and the boiler measure sub-program)

-        Many small business owners speak English as second language, or do not speak English at all (applicable to both the main MEC program and the boiler measure sub-program)

-        Small business owners must focus their attention on "big ticket" items affecting overall business profitability (applicable to the main MEC program only)

Regarding these points, S&A's observation – in large part based on the phone survey results and program database reviews – is that the last three of the above four points appear to be the most relevant.

With this background information in mind, specific reasons for customer participation in the MEC program implementations then can be discerned from the key aspects of the program design – most notably the no-cost nature of services, and the diagnostic-, maintenance-, and recommendations-intensive nature of onsite work conducted. These aspects are indeed largely corroborated through the survey findings regarding the leading reasons for program participation [see discussion in Section 5 regarding survey questions 12 and 13]: in *each* of the three implementations, the top two reasons for participation cited were "free services" and "good business economics/good investment".

6.2. Environmental Factor Impacts

Findings regarding the impact of "macro" environmental factors on the 2004-2005 program implementations are presented in tabular form below. None of these factors appear to have had *major* impacts on program performance.

Factor	Impact on 2004-2005 Prog. Impl.	Discussion
Measure incentive adjustments for 2004-2005 implementation (relative to 2002-2003 incentive structure)	Not applicable	Both the 2002-2003 and 2004-2005 various MEC program implementations featured no-cost [to the participant] direct installation of selected no-/low-cost energy savings measures, and energy audits and diagnostics work for other energy-using equipment.
Measure costs in 2004-2005 (relative to 2002-2003)	Not applicable	Both the 2002-2003 and 2004-2005 various MEC program implementations featured no-cost [to the participant] direct installation of selected no-/low-cost energy savings measures, and energy audits and diagnostics work for other energy-using equipment.
Utility energy prices (directly affect customer economics of implemented and recommended measures)	Minor (slightly helpful)	Annual adjustments to SDG&E, SCE, and SCG electric rates for small commercial customers were modest in 2004 and 2005. The most noteworthy 2004-2005 rates developments – significant procurement-related hikes for SDG&E and SCG in natural gas prices in 2005 Q4 – were minimally applicable, since the MEC program focuses mostly on electric side measures (with the exception of the SCG boiler sub-program).
Competition from other energy	Minor	Appears largely not applicable, as ADM for the most part

efficiency programs and/or ESCOs	(largely nonexistent)	had its intended market to itself.
Timeliness of CPUC/IOU program implementation approval	Moderate (significantly helpful, for the most part)	ADM was able to begin implementations in March 2004 (as opposed to having to wait until late summer 2002 in 2002-2003 program cycle). As a result, the relatively small SDG&E implementation (500 sites targeted) completed its work by March 2005, and the SCE and & SCG implementations (1200 sites targeted for each service territory) finished their implementations in December 2005 and January 2006, respectively. SCE and SCG implementation work went on as long as it did in significant part owing to crew-related constraints (e.g., injuries). The one exception pertains to the SCG boiler sub-program. ADM submitted its "add-on" proposal in December 2004, received CPUC approval in January 2005, but did not receive IOU approval until mid spring 2005, and hence did not begin field operations until June 2005.
Regulatory standards	Minor (largely nonexistent)	Not applicable to the retrofit- and maintenance-oriented measures representing the core of the MEC program implementations' ex ante energy savings.

6.3. Status of 2002-03 Program EM&V Recommendations

Findings regarding the status of 2002-2003 program EM&V recommendations[3] – sorted by applicable program functional area(s) – are presented in tabular form below. Many recommendations have been implemented either in part or completely.

Program Area(s) – Specific Issue [and 2002-2003 EM&V Report Reference]	Implementation Status and Assessment Basis	Comments
General – improve program tracking database and QC procedures. Conduct follow-up calls and site visits/spot checks. [section 3.2.3.1, item #1; also section 3.2.3.3]	Implemented (although specifics regarding number of follow-up calls, site visits, and data adjustments are unclear). Nonetheless, 28% of 217 total sampled respondents disagreed in some respect with the databases' records regarding the scope of measures implemented. *Assessment basis*: program staff interviews; program document reviews; phone surveys.	Useful 2004-2005 program addition. Not all issues universally solved, but significant improvement from 2002-2003 appears attained. Interestingly, reviews of sampled paperwork found that a small but substantial number of measures were implemented but not recorded in the program tracking system (such instances have been adjusted as part of the impact evaluation).

---

[3] Robert Mowris and Associates, <u>EM&V Report for the Mobile Energy Clinic Program</u>, Final Report, April 30, 2004.

General – verify proper operation of AC units before doing measure work. [section 3.2.3.1, item #2; also section 3.2.3.4]	Implemented. *Assessment basis*: reviews of site-specific paperwork; phone surveys.	Germane addition to 2004-2005 programs. That said, however, a more relevant issue for impact evaluation purposes may be querying participants up-front regarding the pragmatic usage frequency of their HVAC systems.
General – have technicians explain p-stats, provide user-friendly instructions, and 800 # to call. [section 3.2.3.1, item #3]	Implemented, although not always effectively. Manuals and/or 800 # information are left with participants, but many times are lost or forgotten. 800 # support does not appear to be significantly utilized. *Assessment basis*: program staff interviews; phone surveys.	Significant numbers of participants expressed frustration at not understanding how to change p-stat settings or not knowing how to contact ADM for technical support. This issue is a key improvement opportunity area for 2006-2008 program implementation.
General – label all measures. [section 3.2.3.1, item #4]	Implemented nearly universally, and nearly always accompanied by some degree of measure photo documentation. *Assessment basis*: photo documentation for sampled sites.	Useful "jump-starting" of site-specific verification activities. Recommend broadening to universal measure coverage for all sites, and for measure pre as well as post conditions.
General – consider adding AC diagnostic as a measure. [section 3.2.3.1, item #5]	Implemented (with respect to AC diagnostic <u>tests</u>). *Assessment basis*: program database reviews.	Refrigerant charge and airflow <u>adjustments</u> not implemented (as would affect significantly measure cost, and hence number of sites able to be addressed within program budget constraints). If implemented, would generate additional energy savings. If not implemented by ADM during 2006-2008, consider 1) providing lists of local HVAC contractors and/or 2) adding typical cost and energy savings data to the recommended measures list to help overcome customer inertia regarding this measure.
General – consider adding T8 lamps, CFL fixtures, and/or LED exit signs. [section 3.2.3.1, item #6]	Not implemented. *Assessment basis*: program database reviews; program staff interviews.	Would have significantly adverse impact on program budget and/or number of sites able to be addressed through the program implementations.
General – give *Use Energy Wisely* checklist to all participants. [section 3.2.3.1, item #7]	Implemented in somewhat different fashion, by providing participants with 1) site-specific recommended measure lists and calculations, and 2) literature rearding IOU Express Efficiency program rebates.	Useful addition to 2004-2005 implementation, but persistently low measure adoption rates indicate that more extensive "hand-holding" may be required to overcome customer inertia and/or landlord-tenant split incentives issue.

	Assessment basis: program document reviews; program staff interviews.	
General – participant suggestions, including advertising through landlord, offering after-hours services, and better worker photo IDs. [section 3.2.3.1, item #8]	Mostly not implemented. *Assessment basis*: phone surveys; program staff interviews.	A few phone survey respondents indicated finding out about program through landlord. No apparent after-hours services offered. Technician uniform issues mentioned more frequently than technician photo ID issues. The issue of marketing to landlords appears most relevant as an improvement opportunity area for 2006-2008 program implementation.
General – consider obtaining customer billing release forms for sample of customers, for ascertaining energy savings. [section 3.2.3.1, item #9]	Not implemented. *Assessment basis*: program document reviews.	More appropriately a part of EM&V work by external consultant, if EM&V budget allows it [not the case for 2004-2005].
Training – train technicians re AC diagnostic tune-ups, and provide associated equipment. [section 3.2.3.2]	Implemented (with respect to AC diagnostic <u>tests</u>). *Assessment basis*: program database reviews; program document reviews.	Refrigerant charge and airflow <u>adjustments</u> not implemented (as would affect significantly measure cost, and hence number of sites able to be addressed). If implemented, would generate additional energy savings.
Air Filter – give out 8 filters at time of measure installations. [section 3.2.3.5]	Not implemented. *Assessment basis*: program database reviews; program document reviews.	Customers unlikely to install in a timely manner, given that HVAC units typically are located on rooftop ["out of sight, out of mind"]. Reasonable that was not implemented by ADM.
Refrigerant Line Insulation – follow CEC requirements re thickness, amount and durability rating. [section 3.2.3.6]	Implemented. *Assessment basis*: photo documentation for sampled sites.	Appropriate addition in 2004-2005 relative to 2002-2003.
Lowered Hot Water Temperature – document pre and post temperatures in database. [section 3.2.3.7]	Not implemented. *Assessment basis*: program database reviews.	A "nice to do" item that adds slightly to database girth. Not essential to implement (especially given relatively low implementation rate in 2004-2005).
Hot Water Line Insulation – follow CEC requirements re thickness and length. [section 3.2.3.7a]	Implemented. *Assessment basis*: photo documentation for sampled sites.	Appropriate addition in 2004-2005 relative to 2002-2003.
Clean Condenser Coils – take pre and post photos. [section 3.2.3.8]	Partially implemented. *Assessment basis*: photo documentation for sampled sites.	Nearly all available photo documentation focuses on "post" conditions. Useful verification step, but should be expanded universally to include corresponding "pre" conditions.

Reprogrammed t-stats – document old and new settings in database. [section 3.2.3.9]	Not implemented, except for default boilerplate language that unit "new" settings turn system on 15 minutes before business opens and off 30 minutes before business closes. *Assessment basis*: program database reviews; sampled paperwork reviews; phone surveys.	Given importance of this measure to ex ante energy savings, would be very useful to document old hours of use and heating/cooling temperature settings, and new heating/cooling temperature settings.
P-stats - document old and new settings in database; use NiCad batteries to boost persistence. [section 3.2.3.10]	Not implemented, except for default boilerplate language that unit "new" settings turn system on 15 minutes before business opens and off 30 minutes before business closes. *Assessment basis*: program database reviews; sampled paperwork reviews; phone surveys.	Given importance of this measure to ex ante energy savings, would be very useful to document old hours of use and heating/cooling temperature settings, and new heating/cooling temperature settings. Also, battery technology/installation issues need addressing, given that a number of phone survey respondents mentioned p-stat battery failures.
Outdoor Air Dampers / Economizer – fully document adjustments in database. [section 3.2.3.11]	Not implemented. *Assessment basis*: program database reviews; sampled paperwork reviews.	A "nice to do" item that adds slightly to database girth. Not essential to implement.
Comb Condenser Coils – take pre and post photos. [section 3.2.3.12]	Partially implemented. *Assessment basis*: photo documentation for sampled sites.	No photo documentation provided for this measure as distinct from condenser coil cleaning photos. Should include "pre" and "post" condition conditions.
CFL's – screen customers who express dislike for CFL's; take pre and post photos. [section 3.2.3.13]	Partially implemented. *Assessment basis*: phone surveys; photo documentation for sampled sites.	Very few instances of surveyed customers removing CFL's for anything other than ballast failure. Nearly all available photo documentation focuses on "post" conditions; "post" photos are a useful verification step, but should be expanded universally to include corresponding "pre" conditions.
MEC checklist measures – consider sending *Use Energy Wisely* checklist to building owners. [section 3.2.3.14]	Not implemented. *Assessment basis*: program document reviews.	A "nice to do" item that would require adding landlord contact information to the tracking system. On balance, probably easier to give related materials to participating customers, and ask them to convey to landlord. On the other hand, landlords typically own multiple strip mall/retail area locations, so strategic utilization of landlord contact information – coupled with follow-up MEC contacts –

		could increase recommended measure installation rates for 2006-2008 from low levels observed in 2002-2003 and 2004-2005.

6.4. Service and Procedure Improvement Opportunities

This section provides a relatively short discussion regarding program improvement opportunities. In certain respects this particular analysis is a "Monday morning quarterbacking" academic exercise (since the program is only continuing in 2006-2008 in the SDG&E service territory, and with total implementation volumes significantly smaller than in the combined SDG&E, SCE, and SCG service territories during 2004-2005). S&A emphasizes that the program implementations were for the most part logical for and consistent (and functional) with their designs.

Improvement opportunities are classified in tabular form below into one of four program functional areas: 1) marketing and sales, 2) direct implementation, 3) tracking systems/data collection, and 4) general and administrative. Within each functional area, improvement opportunities are classified as "major" or "minor" importance in nature (depending on the perceived importance). Within a given functional area/importance level combination, there can be one, multiple, or no issues identified. For each identified issue, a brief discussion of the basis for the improvement opportunity is provided.

Functional Area / Relative Importance	Recommendation	Basis / Other Comments
Marketing and Sales – Major Importance	Focus implementation efforts on strip mall/small retail customers who in fact utilize their HVAC systems extensively. Except for targeted business types like restaurants, greatly downplay activities in coastal (mild climate) locations.	Phone survey findings (that significant numbers of program participants in coastal zone areas hardly ever use their HVAC systems -- almost certainly owing to climate mildness).
Marketing and Sales – Minor Importance	Explicitly ask participants (tenants) to forward recommended measure lists to landlords.	Phone survey findings (that recommended measure list items usually involves landlord-made improvements, and many times is simply set aside and forgotten).
Marketing and Sales – Minor Importance	For boiler measure: become more conservative regarding the stated amount of time needed to do all aspects of the work.	Phone survey findings that approximately 20% of sampled boiler measure participants went out of their way to make explicit [complaining] comments regarding the amount of time needed to do the work.
Direct Implementation – Major Importance	Measure list modifications: consider changing "check refrigerant" and "check airflow" to "check/correct refrigerant" and CA" to "check/correct airflow").	Per impact evaluation research/analyses.
Direct	At the onset of the site visit, query	Phone survey findings (that significant numbers

Implementation – Major Importance	the customer regarding 1) the approximate vintage of the building, 2) the frequency of HVAC system use, 3) HVAC temperature settings, and 4) whether building already has HVAC maintenance contract); tailor implemented measure work accordingly (e.g., significantly limit AC measure work, if system used only during heat waves and cold snaps).	of program participants in coastal zone areas hardly ever use their HVAC systems; that many customers already have HVAC system maintenance work done at least annually).
Direct Implementation – Major Importance	Update energy savings algorithms per impact evaluation research/analyses.	Per impact evaluation research/analyses.
Direct Implementation – Minor Importance	Augment leave-behind materials (e.g., p-stat manual) regarding who to call if technical problems arise by adhering stickers with MEC 800# on side/inside of p-stat unit (akin to typical practice by HVAC vendors with their furnaces and AC unit installations).	Phone survey findings regarding frequent customer frustration with p-stats (i.e., setting changes needed or settings inadvertently bungled).
Direct Implementation – Minor Importance	Ensure adequate stocks of all aspects of measure items are on hand at all times. Main improvement opportunity areas pertain to CFL's and appropriate batteries for p-stats.	Phone survey findings regarding measure scope verification and (dis)satisfaction; r-stats in particular had significantly lower satisfaction scores than all other measures in the SDGE and SCE service territories. Additionally, reviews of sampled paperwork found many instances of "none to offer" for the CFL measure.
Direct Implementation – Minor Importance	Update average electric and natural gas rates used in payback calculations. Revisit quarterly (owing to natural gas market volatility) and update as warranted.	Reviews of site-specific workbooks. For example, most SCE sampled site workbooks used $.18-.21/kWh and $.83/therm (some workbooks used rates as low as $.34/therm) for avoided rate structures. As of spring 2006, real electricity and natural gas rates were significantly lower and dramatically higher, respectively.
Tracking Systems/Data Collection – Major Importance	Modify energy savings algorithms per impact evaluation recommendations.	Measure research conducted by S&A.
Tracking Systems/Data Collection – Minor Importance	Include "pre" photos for all sites for all implemented measures, and provide for all sites.	Reviews of sampled site documentation; most sites had photo documentation for most or all measures (including significant measure photo duplication), but almost 100% of such documentation pertained to "post" photos).
Tracking Systems/Data	Ask customers who implement CFL's to estimate average daily	ADM default assumption of setting lamp use hours/day to business hours/day typically results

Collection – Minor Importance	usage for the incandescent lamps replaced by the CFL's. Also, describe CFL locations in the database.	in inaccurate (i.e., overstated) savings for situations involving bathrooms and storage areas.
Tracking Systems/Data Collection – Minor Importance	Add database logic checks and/or reporting month fields in tracking system to preclude situations such as duplicate customer IDs from being used, or a given customer ID from being reported in multiple reporting months.	Observations regarding database oddities seen during regular monthly updates provided during the course of the 2004-2005 program cycle (e.g., all SCE 11/2005 sites had previous appeared in SCE 9/2005 reports; customer ID's MU1180 in SCG 11/2004 and SCE0789 in SCE 6/2005 were used multiple times). Note that to ADM's credit, it should be emphasized that cited issues were fixed for the May 2006 final report by ADM.
Tracking Systems/Data Collection – Minor Importance	Augment measure data collected on a targeted basis. If p-stats continued to be utilized in 2006-2008, collect pre and post heating and cooling temperature settings, and obtain information regarding typical usage patterns (degree of intensity used; typical hours used). For refrigerant and airflow check/correction measures, report/tally the frequency of the time that corrections were needed.	Revews of paperwork packets; phone survey findings regarding p-stats and r-stats pragmatic pre and post usage patterns.
Tracking Systems/Data Collection – Minor Importance	Make sure that cameras used for photo verification utilize accurate date and time settings.	Photo dates and times for approximately 50% of the sampled sites were nonsensical (e.g., unchanged from default values), thereby ironically inadvertently hindering verification efforts.
General and Administrative – Major Importance	No distinct improvement opportunities were classified in this category.	--
General and Administrative – Minor Importance	No distinct improvement opportunities were classified in this category.	--

7. Impact Evaluation

The impact evaluation has been conducted utilizing A) database reviews, B) engineering reviews of measure data, C) participant phone survey data, and D) verification audits/reviews of application paperwork and accompanying photographic evidence. Based on the EM&V Research Plan, a five step approach has been utilized for sampled applications:

- Step 1: Reference Information – Ex Ante Values per September 2003 Proposal

- Step 2: Reference Information – ADM-calculated Site-specific Gross Savings per Program Database

- Step 3: Reverse Engineering of Gross Savings Data Using Primary Source Data Inputs Obtained by S&A

- Step 4: Participant Self-reported Verification-based Savings Adjustments

- Step 5: Application Paperwork Formal Verification Audit-based Savings Adjustments

The five-step approach is utilized (and visually presented) for each of the sampled MEC program applications in the respective SDG&E, SCE, and SCG service territory impact evaluation workbooks (Appendices E, F, and G, respectively). The impact evaluation workbooks also contain extensive methodology and source documentation information – **for these various reasons, the impact evaluation workbooks should be considered core pieces of the overall EM&V report.**

The five-step approach has been used to develop realization rates for each of the sampled applications that translate MEC gross savings estimates into "vetted" net savings data. In turn, the net savings data have been weighted by strata to yield weighted realization rates and associated statistics for the overall samples. The sample-wide statistics then have been extrapolated to the overall service territory-specific program populations regarding program performance relative to CPUC goals (refer to the "Stats" worksheet in the respective impact evaluation workbook).

Each of the five steps is discussed in turn. Step-specific issues and findings are discussed here in relatively general terms since 1) highly detailed sampled application-specific calculations are presented in the impact evaluation workbooks and 2) the impact evaluation's primary focus pertains to the Step 5 results relative to the corresponding Step 1 reference savings data. Overall impact evaluation and cost-effectiveness findings are then reported.

Note that this approach excludes savings associated with ADM-recommended low cost measures (e.g., T8 lamps and electronic ballasts, high efficiency water heaters) that were reported by surveyed respondents as having been implemented. These particular savings benefits have been excluded from the impact evaluation analysis since:

- They are not a formal part of the MEC program implementations' energy savings. Rather, they are more accurately characterized as spillover.

- Verification evidence is weaker than for core program savings (e.g., no photo documentation; information usually not available as to whether an identified recommended measure was implemented in whole or in part relative to ADM's measure characterization).

- In a significant of instances, implemented recommended measures were acquired using PGC-funded energy efficiency rebate programs (hence inclusion of their savings benefits would raise issues of double-counting).

- Such savings are small relative to formal MEC program savings (e.g., even assuming 100% NTG factors, annual kWh savings appear to be on the order of 1-4% of core program net annual kWh savings).

See additional related discussion in Section 5 (regarding survey Q's 28 and 29) and in chapter 5 of the May 2006 ADM MEC Final Report.

7.1. Step 1

Introduction. Step 1 involved obtaining September 2003 ADM proposal-based measure ex ante gross savings values based on assumed typical site characteristics. Step 1 savings data were used as the starting points for subsequent work in Steps 2 through 5, and function as the denominator values used in the realization rates derived at the conclusion of Step 5. Proposal-based ex ante measure data have been used since CPUC-approved goals are based on these gross savings values.

Step 1 Process Pragmatics. The same basic set of "blended measure" site gross energy savings values has been utilized for all sampled sites in all three service territories (with one additional set of values utilized for boiler tune-up measures in the SCG service territory). This approach has been used since the September 2003 proposal (and the December 2004 SCG boiler tune-up follow-up proposal) characterized all participant sites in terms of aggregated/blended program measure attributes (e.g., gross energy savings values of .42 kW, 2,202 annual kWh, and 28.1 annual therms for non-boiler measure sites).

Step 1 Observations and Conclusions. Since the same basic set of "blended measure" program assumptions was used by ADM in its September 2003 proposals for all three service territories, the only variation within and across the three samples for Step 1 involved different gross energy savings of 1,109 annual therms utilized for the SCG service territory boiler tune-up measure sites.

7.2. Step 2

Introduction. Step 2 involved obtaining, reviewing, and summarizing ADM-calculated site-specific gross savings data. Extracts of site-/measure-specific information from the program database were utilized.

Step 2 Process Pragmatics. Site-specific energy savings records were copied from the program database and reformatted within the impact evaluation workbooks. Although records were fully manipulated (i.e., extracted and reformatted) only for the sampled data points, additional calculations were run on the program populations to [successfully] verify agreement with the site-specific gross energy savings reported by ADM for each service territory in its MEC final report materials (i.e., adjusting for the default 80% NTG assumptions utilized by ADM).

Step 2 Observations and Conclusions. Typical site-specific Step 2 gross savings values were greater – sometimes considerably so – than corresponding Step 1 data in all three service territories (e.g., on a simple average basis, approximately 50-150% higher for annual kWh, and approximately 0-30% higher for annual therms). Key reasons for these positive variances include (but are not limited to) the following:

- Significantly higher than anticipated measure adoption rates for certain "big ticket" measures such as p-stats (all three service territories) and the repositioning of outside air dampers (SDG&E and SCE service territories)

- Significantly larger than anticipated typical business floor space square footages (particularly an issue for the SDG&E service territory)

- For the SCG boiler tune-up measure, significantly greater than anticipated changes in boiler load factor values.

Additional Comments Regarding Nature of Step 2 Work. Step 2 originally was envisioned to include the reverse engineering of ADM gross energy savings. Relatively early in the impact evaluation research, however, it became apparent that certain issues associated with the ADM site-specific data implied that Step 2 efforts instead should be redirected towards Step 3 work involving "from the ground up" re-engineering of gross savings data. Key reasons for this decision include (but are not limited to) the following:

- "Pre" measure end use-specific annual energy use data for air conditioning and electric space heating – expressed in terms of kWh/sq ft/year – were based on two independent statewide commercial sector forecasts of kWh consumption and square feet. Each forecast was relatively old, lacked building type vintage delineation, and was subject to building type, climate zone, and/or end use data allocation and data quality issues. The kWh forecast was from the CEC Energy Forecast Division, and pertained to 2003. The square footage forecast was derived from the CEC's June 2000 California Energy Outlook, and also pertained to 2003. Both forecasts utilized commercial sector building types that were rather aggregated (and large building-oriented)

relative to the MEC program's building type targets (e.g., "Retail", "Restaurant" and "Hospital" building types were used as opposed to "Small Retail"; "Fast Food Restaurant", and "Clinic", respectively).

- "Pre" gas space heating annual energy use data – expressed in terms of therms/sq ft/year – were undocumented [with respect to data source], had no building type or vintage delineation, and included only three relatively aggregated climate zones (i.e., "south coast", "south inland", and "desert").

- Many of the percentage energy savings values associated with specific measures were based on references that were old (e.g., from the 1980s and 1990s for many of the measures) or based on "apples versus oranges" assumptions (e.g., p-stat data based on non-California weather conditions; condenser coil data applied to evaporator coil applications). Additionally, kW savings percentage impacts were not distinguished from kWh savings impacts (i.e., the same percentage savings values were applied to both kWh and kW statistics for any given measure).

7.3. Step 3

Introduction. Step 3 involved developing measure savings data "from the ground up" (in most instances) for the reasons noted immediately above in the Step 2 discussion. For most end uses (and fuel types, as applicable), Step 3 work involved developing 1) "pre" annual energy usage estimates and 2) percentage savings factors. Each topic is discussed in turn. The Step 3 discussion is deliberately high-level in nature, since detailed measure data and data issues are extensively presented and commented in various measure worksheets in the impact evaluation workbooks.

"Pre" annual energy usage estimates. For the air conditioning, space heating, and water heating end uses, the 2005 DEER was utilized as the main "pre" data source. The 2005 DEER was utilized since:

- It is a relatively recently developed data source that utilizes calibratied energy usage simulation techniques.

- It includes a number of building types that map relatively well to the main building types targeted by the MEC program (e.g., small retail, fast food restaurants).

- It delineates building types by climate zone and vintage.

- While its primary focus is on energy savings measures, it also includes extensive data regarding typical "pre" annual energy use levels.

- It includes useful documentation of baseline (i.e., "pre") energy usage characteristics (e.g., equipment descriptions, utilization patterns, service levels).

For the air conditioning, space heating, and water heating end uses, 2005 DEER "pre" annual energy use data were 1) obtained (or synthesized) from measure data extracts, 2) converted to a per-square foot basis, 3) adjusted for typical cooling and heating set points found in MEC program sites, and then 4) adjusted by site-specific conditioned floor space data (as obtained from the sampled paperwork) to yield overall end use / fuel type / site-specific annual energy usage values. Additionally, adjustments were made regarding air conditioning and space heating system usage intensity for a subset of surveyed respondents who indicated that they used their systems for one or both end uses on a limited basis during the course of a full year.

Illustrative comparisons of ADM and S&A "pre" annual energy usage assumptions for air conditioning and space heating for the retail and small retail building types, respectively are presented in tabular form below. It should be noted that [small] retail stores were the most heavily represented building type in all three of the MEC program implementations.

End Use / Fuel Type	"Pre" Annual Energy Usage Units	CZ	ADM (geography[4])	S&A SDG&E, <78 bldg	S&A SDG&E, 78-92 bldg	S&A SCE/SCG, <78 bldg	S&A SCE/SCG, 78-92 bldg
AC (elec)	kWh/sq ft/yr	6	1.59 (DZ 11)	5.01	3.99	5.01	3.99
AC (elec)	kWh/sq ft/yr	7	1.27 (DZ 13)	5.37	4.30	5.37	4.30
AC (elec)	kWh/sq ft/yr	8	1.43 (DZ 8)	6.16	4.97	6.16	4.97
AC (elec)	kWh/sq ft/yr	9	1.29 (DZ 9)	6.56	5.32	6.56	5.32
AC (elec)	kWh/sq ft/yr	10	2.13 (DZ 10)	7.06	5.73	7.06	5.73
SpHt (gas)	Therm/sq ft/yr	6	0.68 (SC)	NA	NA	.025	.023
SpHt (gas)	Therm/sq ft/yr	7	0.68 (SC)	.018	.017	.018	.016
SpHt (gas)	Therm/sq ft/yr	8	0.68 (SC)	NA	NA	.025	.023
SpHt (gas)	Therm/sq ft/yr	9	0.35 (SI)	NA	NA	.024	.022
SpHt (gas)	Therm/sq ft/yr	10	0.35 (SI)	.030	.028	.029	.027
SpHt (ht pump)	kWh/sq ft/yr	6	3.23 (SC)	NA	NA	.696	.532
SpHt (ht pump)	kWh/sq ft/yr	7	3.23 (SC)	.505	.379	.495	.371
SpHt (ht pump)	kWh/sq ft/yr	8	3.23 (SC)	NA	NA	.694	.530
SpHt (ht pump)	kWh/sq ft/yr	9	1.69 (SI)	NA	NA	.656	.493
SpHt (ht pump)	kWh/sq ft/yr	10	1.69 (SI)	.828	.631	.812	.619

For the refrigeration end use, the ADM approach of utilizing equipment nameplate kW data and 8,760 hour/year operating assumptions was kept. Equipment load factors were developed based on S&A research to yield "pre" annual energy usage data.

For the lighting end use, "pre" annual energy usage data were developed based on 1) the number of CFL lamps involved, 2) an average assumed incandescent lamp wattage value of 75 watts (based on detailed site data reviews), 3) hour/day usage values based on survey data (or average business hours/day, if survey data were not available), and 4) business days/week and weeks/year data based on site paperwork data reviews.

---

[4] DZ = demand zone; SC = south coast, SI = south inland

For the boiler end use (for the SCG service territory boiler tune-up measure), "pre" annual energy usage data were developed based on boiler horsepower, and on operating hours/day and days/week characteristics.

Measure-specific savings assumptions. Savings assumptions for each measure were developed based on 1) reviews of ADM measure data sources, 2) S&A reviews of data sources such as DEER, the "Flex Your Power" web site, and PG&E and SMUD measure data, 3) ADM-provided photos of measure "pre" and "post" conditions, and 4) survey response information.

Measure savings equations and constants. Generalized measure savings equations are specified in the "AC EEM Eq", "SpHt EEM Eq", "WH EEM Eq", "Refrig EEM Eq", "Ltg EEM Eq", and "Boiler EEM Eq" worksheets of the impact evaluation workbooks[5]. Specific starting values for "pre" annual energy usage for air conditioning, space heating, and water heating measures are provided (and documented/described) in the "AC EEMs", "SpHt-Elec EEMs", "SpHt-Gas EEMs" and "WH EEMs" worksheets of the impact evaluation workbooks. As the previous table indicated, S&A "pre" values per square foot are typically significantly higher on the electric side and significantly lower on the natural gas side than corresponding ADM-developed "pre" data [particularly for the SDG&E-applicable climate zones]. For refrigeration and lighting end uses, "pre" annual energy usage data are based on the relevant equipment/lamp nameplate kW/lamp wattage involved, and more closely agree with ADM corresponding "pre" values.

Measure-specific percentage savings values applied to annual energy usage data are described and referenced in the "EEM % Savings Values" worksheet of the impact evaluation workbooks, and are summarized for the air conditioning and space heating end uses in tabular form below. Measure-specific percentage savings values have been developed based on a mix of 1) secondary source literature, 2) participant self-reported operating hours and settings, and 3) photo documentation-based observations regarding "pre" and "post" conditions[6]. Relative to corresponding ADM data, S&A utilized lower percentage savings values for most air conditioning and space heating measures[7]. S&A developed percentage savings values consciously mindful of EUL assumptions, so as to appropriately develop an average percentage savings value for the indicated life of the given measure.

AC or Space Heating Measure	ADM % Savings (kWh, Therms, and/or kW)	S&A % Savings (kWh or Therms)	S&A % Savings (kW)
Replaced air filter	7.5%	1.75% - 3.5% (depends	0.88% - 1.75% (depends

---

[5] Equations are provided for ADM-developed site-specific measure savings data, as well as S&A-developed site-specific measure savings data.

[6] The specific approach taken – a variation of IPMVP option A – was taken in light of EM&V budget constraints, and as approved by the Master Evaluation Contractor Team in the EM&V Research Plan.

[7] As a related comment, S&A notes that ADM photo documentation for most sampled air conditioning measure sites indicated light to moderately dirty condenser/evaporator coil and air filter "pre" conditions; the corresponding conditions depicted in photos in the ADM Final Report appear to have been "extreme" cases involving particularly exposed and/or neglected conditions.

		on "pre" maint.)	on "pre" maint.)
Replaced refrigeration line insulation	5%	3.5%	1.75%
Cleaned Condenser Coil	8%	6.5% - 13% (depends on "pre" maint.)	3.25% - 6.5% (depends on "pre" maint.)
Cleaned Evaporator Coil	12%	6.5%	3.25%
R-stat (Cooling)	10%	4 - 10% (varies by bldg type and svc terr.)	6%
P-stat (Cooling)	15%	4 - 10% (varies by bldg type and svc terr.)	6%
Re-positioned outside air dampers	6%	1-22% (varies by bldg type and CZ)	0%
Adjusted economizer	6%	1-22% (varies by bldg type and CZ)	0%
Combed condenser fan coil	3%	3%	1.5%
R-stat (Heating – either gas furnace or heat pump)	10%	6 - 8% (varies by bldg type and svc terr.)	NA
P-stat (Heating – either gas furnace or heat pump)	15%	6 - 8% (varies by bldg type and svc terr.)	NA

Note that S&A kW percentage savings values are generally based on – but often vary from – kWh percentage savings values; these values are identified and discussed in the "AC EEMs", "WH EEMs", "Refrig EEMs", and "Lighting EEM" worksheets of the impact evaluation workbooks.

Step 3 Process Pragmatics. Step 3 involved three main steps: 1) integration of paperwork-obtained data, 2) integration of survey-obtained data, and 3) calculation of gross savings impacts. Each step is discussed in turn.

Integration of paperwork-obtained data involved configuration/transformation/data entry of information such as measure applicability, end use/fuel type applicability, service city location, business type, business days/week (and hours/day for the boiler tune-up measure), conditioned square feet, and refrigeration equipment/lighting unit(s) characteristics. Note that MEC site business types included in the samples were mapped to 2005 DEER building types for air conditioning, space heating, and water heating end use measure purposes as follows:

Site Business Type	2005 DEER Building Type
Grocery; liquor store	Grocery
Clinic; dental office; health spa; medical office; optometrist office; yoga facility	Health/Medical – Clinic
Office; postal/mailing service	Office – Small
Bakery; bar; restaurant	Restaurant – Fast Food
Florist; hair salon; nail salon; retail; tattoo parlor; video store	Retail – Small
Dry cleaner (re boiler measures)	Not applicable

Building vintages were determined based on whether p-stats were installed by MEC personnel; p-stat installation was defined to imply a pre-1978 vintage building, while all

other buildings were classified as being of 1978-1992 vintage. Newer building vintage classifications were not utilized, since photo documentation provided by ADM confirmed a MEC program focus on relatively older buildings (i.e., typically from the late 1980s or earlier).

Integration of survey-obtained data involved manipulation of information pertaining to A) normal versus limited air conditioning/space heating system usage (survey Q's 10-11), B) whether HVAC systems were maintained relatively frequently prior to the MEC site visit (survey Q 27), and C) CFL hours/day utilization information (survey Q 9). These data were used to fine-tune gross energy usage and/or gross energy savings estimates.

Calculation of gross savings impacts involved integration of all previously-described data into site-specific annual kWh, annual therm, and peak kW values. The "Core Data" worksheets of the impact evaluation workbooks group step 3 data by end use, and by data inputs and savings outputs within each end use. Note that kW impacts are not derived for electric space heating measures (i.e., p-stats and r-stats), since space heating by definition involves relatively cool weather, while peak savings – per August 2003 CPUC <u>Energy Efficiency Policy Manual</u> and 2005 DEER definitions – pertain to summer weekday afternoons (June-September for the former data source, May-October for the latter data source).

Step 3 Observations and Conclusions. Expressed based on simple averages, site-specific Step 3 gross savings values relative to corresponding Step 2 data varied considerably by savings metric. Peak kW data typically were approximately 75% lower. Annual kWh data typically were within 5% (either direction) of corresponding Step 2 data. Annual therms data were approximately 80%+ lower in the SDG&E and SCE service territory samples, and approximately 35% higher in the SCG service territory sample. Primary reasons for these variations relative to Step 2 corresponding data are as follows:

- For kW data, Step 3 utilized significantly lowered S&A kW percentage savings assumptions for air conditioning measures (reflective of typical summer weekday afternoon conditions).

- For annual kWh, significantly higher S&A "pre" annual energy usage assumptions regarding air conditioning usage were offset (and then some) by significantly lower S&A measure percentage savings assumptions.

- For annual therms for the SDGE and SCE service territory samples, savings were lowered dramatically because of 1) significantly lower S&A "pre" annual energy usage assumptions regarding space heating and 2) significantly lowered S&A percentage savings assumptions for p-stats and r-stats.

- For annual therms for the SCG service territory sample, savings were significantly higher because of the boiler tune-up measure. Specifically, boilers typically had significantly higher annual operating hours than were assumed in Step 2 – enough to more than offset lower S&A percentage

savings assumptions (relative to ADM step 2 data). In the aggregate, boiler measure annual therm "windfalls" more than offset space heating-related annual therm "shortfalls".

7.4. Step 4

Introduction. Step 4 involved adjusting Step 3 savings data based on survey information (reconciled with ADM-provided photo verification evidence, where available). Certain survey data were treated as binary (e.g., basic customer name and service location verification), while other issues involved proportionately adjustments (e.g., fraction of measure remaining installed/operational; NTG information). Most notably, Step 4 involved translating savings data from a gross basis to a net basis using survey-based free ridership information.

Step 4 Process Pragmatics. The phone survey data component of Step 4 involved four distinct "chunks" of information:

- Basic customer / contact / service location / business type verification (survey Q's 1-4). This information was treated as a binary variable. Pragmatically, all of the sampled applications were successfully verified by survey respondents. Refer to Section 5 for additional discussion regarding this portion of the survey findings.

- Basic program participation, measure-specific implementation verification, and measure persistence verification (survey Q's 6 through 8). These data were treated as proportional variables. For instances where there were disagreements between the program database and the customer characterization of events, ADM photo verification evidence and paperwork materials were reviewed to reconcile disputes. In most instances involving customer survey-based outright denials of measure work being implemented, ADM photo verification evidence proved sufficiently compelling[8] such that ADM's interpretation of events was utilized (particularly for instances regarding [out of sight] rooftop AC work and/or CFL's). That said, however, there were a small but significant number of instances where customers either had removed measures (usually p-stats) or where measures had failed (usually CFL's) – in these situations, customer interpretations of the events were usually adopted. Note that for those measures/sites where photo documentation was not available and where disagreements between ADM and the participant existed, the participant's interpretation of events generally was utilized.

- Measure-specific free ridership and associated timeframe information (survey Q's 25 and 26). This information was treated as a proportional variable. It should be noted that S&A took an approach of resetting measure-specific NTG data to 100% if the indicated timeframe for measure adoption in the

---

[8] See related discussion in Section 4.1.

absence of the program would have been one year or greater. This approach was taken since 1) the EEGA workbook cannot accurately model the cost-effectiveness of early replacement situations involving multi-year time shifts between the no-program and with-program cases, 2) claims of measure investment rapidly become highly speculative when customer-asserted periods of years rather than months are involved, 3) it makes SBEA measure NTG data more consistent/comparable with NTG survey-based data for many other PGC-funded programs, and 4) it is consistent with time-indexed approaches to NTG energy efficiency program data taken by utilities such as SMUD. Refer to Section 5 (as well as the impact evaluation workbooks) for additional discussion regarding this portion of the survey findings.

Step 4 Observations and Conclusions. Site-specific Step 4 gross energy savings values were typically approximately 10-25% lower than corresponding Step 3 kW, kWh, and therm data in each of the three service territories. Primary reasons for these lowered values are as follows:

-       In all three service territory samples, there were a few instances of respondents who 1) had removed p-stat units altogether owing to measure dissatisfaction and/or 2) had CFL's burn out (usually prematurely).

-       In all three service territory samples, there were low to moderate numbers of free-riders (most significantly for the AC measure items, and often related to the presence of HVAC system maintenance agreements already in place at the sites).

7.5. Step 5

Introduction. Step 5 involved adjusting savings data based on evaluative reviews of paperwork with respect to certain specific customer, measure, and application attributes. All attribute data were treated as binary.

Step 5 Process Pragmatics. The following application paperwork attributes were evaluated:

-       Was the customer type acceptable (e.g., nonresidential, ≤ 50 kW service account)?

-       Was the service location address acceptable (i.e., in a CPUC-approved geography)?

-       Was the measure equipment scope acceptable? (i.e., approved by CPUC)?

-       Was the application completed in a timely manner with respect to the 2004-2005 program cycle (i.e., completed between January 1, 2004 and March 15, 2006)?

Step 5 Observations and Conclusions. Cumulative Step 5 savings data were unchanged from Step 4 corresponding data. Not a single sampled application had paperwork containing a "fatal flaw(s)" with respect to the evaluative criteria described above.

A brief comment is in order regarding the pipe insulation and valve replacement work conducted for some of the SCG boiler measure participants (see related discussion in Sections 3.2 and 5). Based on S&A reviews of ADM's December 2004 boiler measure add-on proposal and associated CPUC approval documents, such work does not appear to have been within-scope. However, since ADM ultimately decided to not count the impacts of such measure work in its claimed savings, there are no claimed energy savings benefits to "disallow".

7.6. Overall Impact Evaluation Findings

Overall results of the Impact Evaluation are presented in tabular form below (they also can be found in the "Stats" worksheets of the impact evaluation workbooks). These statistical analyses follow the approaches and steps described in pages 375-380 of the CPUC's June 2004 <u>California Evaluation Framework</u> reference document.

SDG&E implementation. The analyses indicate that the SDG&E MEC implementation greatly exceeded program goal savings for net peak kW and net annual kWh (e.g., over double program goals, in the case of net annual kWh), and attained only a very small fraction (i.e., approximately 14%) of program goal savings for net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.379	1.662	0.110
Standard Error	0.091	0.137	0.042
Error Bound @ 90% confidence level	0.149	0.225	0.069
Upper Error Bound re Realization Rate	1.528	1.887	0.178
Lower Error Bound re Realization Rate	1.230	1.438	0.041
Relative Precision	10.8%	13.5%	62.6%
Tracking System Population Gross Savings	213	1,109,808	14,162
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	294	1,844,795	1,553
Standard Error	19	151,497	591
Error Bound @ 90% confidence level	32	249,213	972
Upper Error Bound re Realization Rate	326	2,094,008	2,525
Lower Error Bound re Realization Rate	262	1,595,583	581
Program Goal Net Savings	169	880,800	11,240
S&A estimate of Net Ex Post Savings as % of Goal	173.7%	209.4%	13.8%
Upper Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	192.5%	237.7%	22.5%
Lower Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	155.0%	181.2%	5.2%

SCE implementation. The analyses indicate that the SCE MEC implementation significantly exceeded program goal savings for net peak kW and net annual kWh (e.g., over 130% program goals for both metrics), and attained only a very small fraction (i.e., approximately 16%) of program goal savings for net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.147	1.128	0.134
Standard Error	0.076	0.087	0.056
Error Bound @ 90% confidence level	0.125	0.142	0.092
Upper Error Bound re Realization Rate	1.273	1.270	0.225
Lower Error Bound re Realization Rate	1.022	0.986	0.042
Relative Precision	10.9%	12.6%	68.7%
Tracking System Population Gross Savings	486	2,527,896	32,259
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	557	2,851,056	4,310
Standard Error	37	218,694	1,801
Error Bound @ 90% confidence level	61	359,752	2,963
Upper Error Bound re Realization Rate	618	3,210,807	7,273
Lower Error Bound re Realization Rate	496	2,491,304	1,348
Program Goal Net Savings	406	2,113,920	26,976
S&A estimate of Net Ex Post Savings as % of Goal	137.2%	134.9%	16.0%
Upper Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	152.2%	151.9%	27.0%
Lower Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	122.2%	117.9%	5.0%

SCG implementation. The analyses indicate that the SCG MEC implementation significantly exceeded program goal savings for net peak kW, net annual kWh, and net annual therms.

	Peak kW	Annual kWh	Annual Therms
Realization Rate (RR)	1.103	1.055	1.168
Standard Error	0.099	0.100	0.143
Error Bound @ 90% confidence level	0.162	0.165	0.235
Upper Error Bound re Realization Rate	1.265	1.219	1.403
Lower Error Bound re Realization Rate	0.940	0.890	0.933
Relative Precision	14.7%	15.6%	20.1%
Tracking System Population Gross Savings	507	2,637,996	292,490
Total Net Ex Post Savings (= Tracking Savings Population Gross Savings * RR)	559	2,782,406	341,751
Standard Error	50	264,140	41,787
Error Bound @ 90% confidence level	82	434,511	68,740
Upper Error Bound re Realization Rate	641	3,216,917	410,491

Lower Error Bound re Realization Rate	477	2,347,896	273,011
Program Goal Net Savings	406	2,113,920	312,296
S&A estimate of Net Ex Post Savings as % of Goal	137.6%	131.6%	109.4%
Upper Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	157.9%	152.2%	131.4%
Lower Error Bound - S&A estimate of Net Ex Post Savings as % of Goal	117.3%	111.1%	87.4%

7.7. Cost-Effectiveness Evaluations

TRC Test cost-effectiveness evaluations have been conducted for each of the three MEC implementations using 1) the 2004-2005 EEGA workbook model's structure (and associated avoided costs and discount rate) and 2) 2004-2005 program "actual" data.

Each program implementation has been modeled using an aggregated measure. This approach has been utilized 1) in order to link program data to realization rate and EUL findings, and 2) since measure-specific measure costs (e.g., allocations of Direct Implementation costs to specific measures) are not available (owing to on the comprehensive (i.e., multiple end-use) nature of the onsite work conducted).

Data Inputs. Key TRC Test data inputs are listed and described in tabular format below. Data inputs have been finessed within the EEGA workbooks in order to address certain shortcomings of the EEGA workbook structure (e.g.,, the inability to model fuel type-specific NTG/realization rate factors and EUL's).

Input Variable	SDG&E Value	SCE Value	SCG Value	Comments
Administrative Costs	$39,543	$95,294	$130,484	Actual 2004-2005 costs, per ADM MEC Final Report, 5/2006.
Marketing Costs	$2,958	$7,125	$9,729	Actual 2004-2005 costs, per ADM MEC Final Report, 5/2006.
EM&V Costs	$11,696	$26,142	$26,852	Actual 2004-2005 costs, per ADM MEC Final Report, 5/2006.
Performance Award	$19,775	$47,460	$65,590	Included since EEGA workbook does not allow this value (7% of program budget, less financing costs) to be readily zeroed-out.
Measure Data: Units	1	1	1	Unitary values used (so as to be logically consistent with utilized energy savings and NTG data assumptions).
Measure Data: Incentive/Unit	$228,302	$549,438	$769,934	Values set to 100% of 2004-2005 Direct Implementation costs (since MEC measures were no-cost to participants).
Gross Peak kW Savings/Unit	294	557	559	Total program net peak kW per the impact evaluation statistical analysis have been used to be consistent with utilized units data and NTG data (since EEGA workbook cannot handle different NTG values (or realization rates) by fuel type).

Gross Annual kWh Savings/Unit	1,844,795	2,851,056	2,782,406	Total program net annual kWh per the impact evaluation statistical analysis have been used to be consistent with utilized units data and NTG data (since EEGA workbook cannot handle different NTG values (or realization rates) by fuel type).
Gross Annual Therms Savings/Unit	1,553	4,310	341,751	Total program net annual therms per the impact evaluation statistical analysis have been used to be consistent with utilized units data and NTG data (since EEGA workbook cannot handle different NTG values (or realization rates) by fuel type).
Gross Incremental Measure Cost/Unit	$216,887 = 95% of $228,302	$521,966 = 95% of $549,438	$731,437 = 95% of $769,934	95% of total actual 2004-2005 Direct Implementation costs used. 95% values reflect 5% allowances (S&A judgment-based) for items such as 1) HVAC/refrigeration/boiler system maintenance that would have been conducted anyway and 2) incremental costs of CFL's relative to incandescent lamps that otherwise would have been bought. Note that incentive costs nominally exceed incremental measure costs in the EEGA workbook because of the 5% allowance issue.
EUL – electric measures (years)	5	5	5	Weighted average of electric measure EUL's, as based on Step 3-developed annual kWh data. Per the CPUC Energy Efficiency Policy Manual v2 (whenever measure data available) and supplemental data sources such as 2005 DEER and the Flex Your Power web site, measure EUL's nominally range from 1 year (air filters) to 3 years (coil cleanings) to 8 years (CFL's[9]) to 11 years (p-stats). 5 years appears to be an appropriate EUL for air dampers/economizers (i.e., mechanical items that become "sticky" gradually over time). P-stat 11 year EUL perhaps somewhat optimistically assumes that 1) r-stats will last as long as p-stats, and 2) system operating hours and temperature settings will remain unchanged.
EUL – gas measures (years)	11	11	6	For SDGE and SCE: p-stat values per the CPUC Energy Efficiency Policy Manual v2 have been utilized. It should be noted, however, that these values perhaps somewhat optimistically assume that 1) r-stats will last as long as p-stats, and 2) system operating hours and temperature settings will remain

---

[9] The 8 year CFL EUL is per the CPUC Energy Efficiency Policy Manual v2. Note, however, that 3 years appears to be a more realistic EUL for CFL's, given typical MEC site use and the 2005 DEER assumption of an 8,000 hr unit life.

				unchanged. For SCG: 5 year boiler tune-up EUL has been combined with 11 year p-stat EUL to yield a 6 year weighted average EUL (assuming weights of approximately 90% and 10%, respectively).
NTG	1	1	1	Unitary values used (so as to be logically consistent with utilized units and energy savings data).

Model Outputs. Key TRC Test performance indicators are summarized for the three MEC implementations below. The data indicate that all three implementations were indeed cost-effective – even assuming that full performance awards are made. However, the implementations were less cost-effective for the SCE and SCG implementations relative to original proposal assumptions, in no small part because of significantly shorter S&A EUL assumptions [described in the previous table] relative to ADM ex ante EUL's of 8 years for the regular program measures and 10 years for the boiler tune-up measure[10].

Metric	SDG&E Proposed	SDG&E Actual	SCE Proposed	SCE Actual	SCG Proposed	SCG Actual
Net Peak kW	169	294	406	557	406	559
Net Annual kWh	880,800	1,844,795	2,113,920	2,851,056	2,113,920	2,782,406
Net Lifecycle kWh	7,046,400	9,223,975	16,911,360	14,255,280	16,911,360	13,912,030
Net Annual Therms	11,240	1,553	26,976	4,310	312,296	341,751
Net Lifecycle Therms	89,920	17,083	215,808	47,410	3,069,008	2,050,506
TRC Test Benefits	$404,189	$530,417	$970,053	$826,967	$1,978,460	$1,596,653
TRC Test Costs	$236,735	$271,084	$568,164	$650,527	$805,159	$898,502
TRC Test Net Benefits	$167,454	$259,333	$401,889	$176,440	$1,173,301	$698,151
TRC Test BCR	1.71	1.96	1.71	1.27	2.46	1.78

7.8. Year-by Year Impacts

Year-specific gross and net lifecycle savings impacts are summarized provided in tabular form below, and in Appendix K, consistent with reporting formats identified by CPUC Energy Division staff in January 17, 2006 materials communicated to program evaluators.

Key assumptions regarding these analyses include the following:

-      Gross savings are based on 1) site-specific ex ante savings values utilized in impact evaluation Step 1, 2) calendar year-specific site completions (per final report EEGA worksheet "2A – RecordedEEActivities" data), and 3) service territory-/fuel type-specific measure EUL's as noted in Section 7.7.

---

[10] ADM ex ante EUL values for the regular program measure reflected a heavy weighting of the 11-year p-stat measure. In contrast, S&A impact evaluation ex post research showed a heavy weighting [at least on the electric side] towards the 3-year coil cleaning measures. For the boiler measure, ADM's ex ante savings value utilized percentage energy savings assumptions [relative to "pre" annual energy use] associated with the initial year of measure life. However, ADM's approach then held constant these first year savings for the entire measure lifes, ignoring performance degradation associated with core scaling buildup.

-        Net savings are based on gross savings data and associated service territory-specific peak kW, annual kWh, and annual therms realization rates as developed in Section 7.6. Any minor differences in values between EEGA-based data and the Energy Division-developed workbook regarding net lifecycle savings for 2004-2023 cumulative values pertain to rounding errors associated with the realization rates.

Note that this methodology – consistent with 2004-2005 EEGA workbook general calculation approaches – assumes that all sites completed in a given calendar year have full annualized impacts beginning that year.

Key Impact Evaluation Findings –SDG&E Implementation

- Year-by-year gross and net load impacts are summarized below. Data are applicable to the SDG&E service territory only.

Program ID: 1105-04
Program Name: ADM Associates – Mobile Energy Clinic

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	1,011	1,680	0.19	0.27	12,898	1,419
2	2005	1,110	1,845	0.21	0.29	14,162	1,558
3	2006	1,110	1,845	0.21	0.29	14,162	1,558
4	2007	1,110	1,845	0.21	0.29	14,162	1,558
5	2008	1,110	1,845	0.21	0.29	14,162	1,558
6	2009	99	165	0.02	0.03	14,162	1,558
7	2010					14,162	1,558
8	2011					14,162	1,558
9	2012					14,162	1,558
10	2013					14,162	1,558
11	2014					14,162	1,558
12	2015					1,265	139
13	2016						
14	2017						
15	2018						
16	2019						
17	2020						
18	2021						
19	2022						
20	2023						
TOTAL	2004-2023	5,549	9,223	1.07	1.47	155,786	17,137

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings –SCE Implementation

- Year-by-year gross and net load impacts are summarized below. Data are applicable to the SCE service territory only.

Program ID: 1106-04
Program Name: ADM Associates – Mobile Energy Clinic

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	986	1,113	0.19	0.22	12,589	1,687
2	2005	2,528	2,851	0.49	0.56	32,259	4,323
3	2006	2,528	2,851	0.49	0.56	32,259	4,323
4	2007	2,528	2,851	0.49	0.56	32,259	4,323
5	2008	2,528	2,851	0.49	0.56	32,259	4,323
6	2009	1,541	1,739	0.30	0.34	32,259	4,323
7	2010					32,259	4,323
8	2011					32,259	4,323
9	2012					32,259	4,323
10	2013					32,259	4,323
11	2014					32,259	4,323
12	2015					19,670	2,636
13	2016						
14	2017						
15	2018						
16	2019						
17	2020						
18	2021						
19	2022						
20	2023						
TOTAL	**2004-2023**	12,639	14,257	2.43	2.78	354,847	47,549

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings –SCG Implementation

-       Year-by-year gross and net load impacts are summarized below. Data are applicable to the SCG service territory only.

Program ID: 1487-04
Program Name: ADM Associates – Mobile Energy Clinic

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	1,017	1,073	0.20	0.22	12,982	15,163
2	2005	2,623	2,767	0.50	0.56	259,685	303,312
3	2006	2,638	2,783	0.51	0.56	291,471	340,438
4	2007	2,638	2,783	0.51	0.56	291,471	340,438
5	2008	2,638	2,783	0.51	0.56	291,471	340,438
6	2009	1,621	1,710	0.31	0.34	291,471	340,438
7	2010	15	16	0.00	0.00	278,489	325,275
8	2011					31,786	37,126
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**	13,190	13,915	2.53	2.79	1,748,825	2,042,627

** Definition of Peak MW as used in this evaluation: on-peak

Key Impact Evaluation Findings – Total SDG&E + SCE + SCG Service Territory

Program ID's: 1105-04, 1106-04, and 1487-04
Program Name: ADM Associates – Mobile Energy Clinic

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	3,015	3,866	0.58	0.70	38,469	18,269
2	2005	6,260	7,463	1.20	1.41	306,106	309,193
3	2006	6,276	7,479	1.21	1.41	337,892	346,318
4	2007	6,276	7,479	1.21	1.41	337,892	346,318
5	2008	6,276	7,479	1.21	1.41	337,892	346,318
6	2009	3,261	3,613	0.63	0.71	337,892	346,318
7	2010	15	16	0.00	0.00	324,910	331,155
8	2011	0	0	0.00	0.00	78,207	43,006
9	2012	0	0	0.00	0.00	46,421	5,881
10	2013	0	0	0.00	0.00	46,421	5,881
11	2014	0	0	0.00	0.00	46,421	5,881
12	2015	0	0	0.00	0.00	20,935	2,775
13	2016	0	0	0.00	0.00	0	0
14	2017	0	0	0.00	0.00	0	0
15	2018	0	0	0.00	0.00	0	0
16	2019	0	0	0.00	0.00	0	0
17	2020	0	0	0.00	0.00	0	0
18	2021	0	0	0.00	0.00	0	0
19	2022	0	0	0.00	0.00	0	0
20	2023	0	0	0.00	0.00	0	0
TOTAL	2004-2023	31,379	37,395	6.03	7.05	2,259,458	2,107,313

** Definition of Peak MW as used in this evaluation: on-peak

Appendix A. Full Participant Phone Survey Instrument

Open with preamble about who is calling, why, and the fact that we want to talk with them for approximately five minutes. Mention respondent anonymity, and the fact that we are not trying to sell the customer anything. Sample script:

My name is _____, and I am not trying to sell you anything. I am calling from Sisson and Associates, an independent market research firm. We are doing some follow-up work required by the California Public Utilities Commission (CPUC) regarding the Mobile Energy Clinic no cost energy efficiency tune-up program administered by ADM Associates. Our records indicate your firm participated in this program back on _____ (*read from data extract*). I will only need 5 -7 minutes of your time – or I can call back at another time if that is more convenient.

(If get agreement to proceed) I want to assure you that your responses will be kept anonymous, and will be combined with many other program participants' answers to help verify, measure, and evaluate this program for the CPUC.

Verify respondent and business:

Q1.) _____Verify name / name of business (*read from data extract*)

Q2.) _____Verify business street address and city (*read from data extract*)

Q3.) _____Verify business type (*read from data extract*)

Verify program participation (and assess communication about program)

Q4.) _____Do you recall participating in the Mobile Energy Clinic program implemented by a crew from ADM Associates back on _____? (*read from data extract*)
If cannot recall, add more information such as: have you had NO COST energy efficiency work done on your HVAC, hot water, refrigeration, or lighting systems. Or ask for another person who might have had responsibility for the business' decision to participate in such a program.

    If still no recollection, END SURVEY, and thank the respondent for his/her time.

Q5.) Did you *initially* learn about the Mobile Energy Clinic program through either 1) a marketing flyer or 2) a site visit from a program representative ?
    ____Yes
    ____No _____ (record, e.g., friend/colleague, newspaper ad)

Q6.) Our records indicate that you had the following energy efficiency work done at no cost to you (*read from data extract*):

    ____Rooftop AC system work
    ____Hot Water system work
    ____Reprogrammed Thermostat
    ____Installed Programmable Thermostat
    ____Refrigerator system work
    ____Replaced Incandescent Light Bulbs with CFL's
    ____Boiler tune-up service work

Does this scope of work sound correct?

_____

(If answer is no, record their version of what happened.)

Q7.)   Is all of this work still fully installed? (*ask about each item verified in #6*) _____

(Treat situations where a piece of equipment promptly failed and was satisfactorily replaced as part of the Mobile Energy Clinic program as still installed/operational)

Regarding any/each item where NOT all remains fully installed, ask:
Q8) What was removed, and why?

Q7. Fully installed/operational (yes/no)?	Q8. What was removed, and why? (record)
____Rooftop AC system work	_____
____Hot Water system work	_____
____Reprogrammed Thermostat	_____
____Installed Programmable Thermostat	_____
____Refrigerator system work	_____
____Replaced Incandescent Light Bulbs with CFL's	_____
____Boiler tune-up service	_____

Q9.) (*Ask if customer implemented any CFL's):*
How many hours per business day would you say that the CFL's typically are on (to nearest half-hour)? _____

Q10.) (*Ask if customer had thermostat reprogrammed):*

Q10a.) How did you use the previous thermostat? Specifically: When did the system turn on and off? What were the temperature settings for heating and cooling? (*record for weekdays, Saturdays, and Sundays, as applicable*) _____

Q10b.) Have you changed the settings on your thermostat since the Mobile Energy Clinic team reprogrammed it? ____

Q10c.) (*ask if 10b is "yes"*) When does the system now turn on and off? What are the temperature settings for heating and cooling? (*record for heating and cooling settings for weekdays, Saturdays, and Sundays, as applicable*) _____

Q11.) (*Ask if customer had programmable thermostat installed*):

Q11a.) How did you use the previous thermostat? Specifically: When did the system turn on and off? What were the temperature settings for heating and cooling? (*record for weekdays, Saturdays, and Sundays, as applicable*) _____

Q11b.) Have you changed the settings on your programmable thermostat since the Mobile Energy Clinic team installed it? _____

Q11c.) (*ask if 11b is "yes"*) When does the system now turn on and off? What are the temperature settings for heating and cooling? (*record for heating and cooling settings for weekdays, Saturdays, and Sundays, as applicable*) _____

Q12.)   What made you decide to participate in the program? *(pre-coded list; multiple responses allowed; probe until reasonably exhausted)*
_____Free services (i.e., doesn't cost anything to participate)
_____Good way to save [immediately] on monthly utility bill
_____Good way to learn about *additional* ways to save on monthly utility bill
_____Convincing/trustworthy program rep (including: rep speaks my language)
_____Turnkey service program made participating easy
_____Not disruptive to my business
_____Other _____ (record)

Q13.)   What was the single most important reason for deciding to participate in the program? *(circle the answer from the prior pre-coded list)*

Program Satisfaction and Effectiveness

I am going to read you a short list of questions that I would like you to respond to using a 5-point scale (where 5 is best possible score and 1 is the worst possible score; additional possible responses are "don't remember" (DR) and "not applicable" (NA)).

Q14.)   _____Overall, how satisfied are you with the Mobile Energy Clinic program?
Q15.)   _____How easy was it to participate in the program?

Q16.)   _____How satisfied were you with the performance of the technician(s) who did the work?
Q17.)   (*ask if response to #16 was a 1, 2, or 3*) Were there any problems with the technician(s)? _____ (*record*)[11]
Q18.)   _____What was the level of disruption to your business during installation?

---

[11] As needed, probe regarding matters related to technician courtesy/demeanor, issues with measure installation, site cleanliness, and/or work schedule timeliness.

Q19.) How satisfied are you with the performance of each implemented item? (*as applicable from item list per #6 above*)

    ____Rooftop AC system work
    ____Hot Water system work
    ____Reprogrammed Thermostat
    ____Installed Programmable Thermostat
    ____Refrigerator system work
    ____Replaced Incandescent Light Bulbs with CFL's
    ____Boiler tune-up service work

Q20.) Record any articulated implemented item-specific satisfaction or dissatisfaction.

_____

Q21a.) ____Do you recall getting a list of energy efficiency maintenance recommendations (e.g., change HVAC system air filters annually)?

Q21b) ____(*ask if 21a is "yes"*) How satisfied were you with the list of maintenance recommendations?

Q22.) Record any articulated recommended maintenance list satisfaction or dissatisfaction. _____

Q23a.) ____Do you recall getting a list of recommended energy conservation items (e.g., install T8 lamps, high efficiency spot lights, occupancy sensors, duct sealing, evaporative coolers) and associated likely installed costs and annual operating cost savings?

Q23b.) ____(*ask if 23a is "yes"*) How satisfied were you with the list of recommended energy conservation items?

Q24.) Record any articulated recommended item list satisfaction or dissatisfaction.

_____

Q25.) (*For each item verified by the participant in #6*) Assuming you had not been contacted by the Mobile Energy Clinic program in the first place, what is the likelihood (in percent) that you would have implemented or installed any of the items during 2004-05 in the absence of this program, where 0% = no chance and 100% = definitely would have had?

Q26.) (*For respondents answering any portion of Q25 as >0%*) How much sooner (in months) was the item implemented because of this program?

Q25. Implementation likelihood %?	Q26. Months sooner implemented?
____Rooftop AC system work	_____
____Hot Water system work	_____
____Reprogrammed Thermostat	_____
____Installed Programmable Thermostat	_____
____Refrigerator system work	_____
____Replaced Incandescent Light Bulbs with CFL's	_____
____Boiler tune-up service	_____

Q27.)   (*skip to #31 if customer only had boiler service done*) Are you aware of any sort of periodic routine maintenance done to your building's HVAC system?
   ____Yes (record estimated typical service frequency) _____
   ____No / maintenance only happens when the system breaks down
   ____Don't Know
   ____Other _____ (record)

Q28.)   Have you implemented any of the recommended energy conservation items (e.g., install T8 lamps, high efficiency spot lights, occupancy sensors, duct sealing, evaporative coolers)? If so, which ones? _____ *(record item type(s) and quantities, as applicable)*

Q29.)   *(if answered "yes" to #28 above)* Did you use rebates available through other CPUC-authorized energy efficiency programs?
   ____Yes _____ (record)
   ____No
   ____Some yes, some no _____ (record)
   ____Don't Know
   ____Other _____ (record)

Q30.)   What are the main reasons you didn't implement some or all of the recommended energy conservation items? *(pre-coded list; multiple responses allowed; probe until reasonably exhausted*)
   ____Don't own the building
   ____Landlord wouldn't allow it
   ____Up-front costs too high
   ____Rebates not available or not big enough
   ____Relatively poor economic return (compared with other business investment
   needs)
   ____Energy not a big enough portion of operating costs to worry about it
   ____Don't have other significant energy-using equipment
   ____Don't have enough information to evaluate
   ____Takes too much time to evaluate
   ____Don't trust the technology(s) regarding performance, reliability, etc.
   ____Other _____ (record)

Q31.)   Did you tell any other small businesses about the Mobile Energy Clinic program and/or the types of energy efficiency work it does?

Q32.)   *(if answered "yes" to #31 above)* Approximately how many other small businesses did you inform? _____

Q33.)   Do you think the California Public Utilities Commission should continue to fund programs such as the Mobile Energy Clinic to operate energy efficiency programs?
- g.   Definitely
- h.   Probably
- i.   Unsure
- j.   Probably not
- k.   Definitely not
- l.   Don't know / no opinion

Q34.)   Do you have any other feedback or suggestions regarding the program that we have not covered?   _____

Thank you.

Appendix B. ADM MEC SDG&E Full Participant Phone Survey Coded Dataset

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length and viewing format considerations). Explicit customer identifiers have been removed.

Appendix C. ADM MEC SCE Full Participant Phone Survey Coded Dataset

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length and viewing format considerations). Explicit customer identifiers have been removed.

Appendix D. ADM MEC SoCalGas Full Participant Phone Survey Coded Dataset

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length and viewing format considerations). Explicit customer identifiers have been removed.

Appendix E. ADM MEC SDG&E Impact Evaluation Workbook

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix F. ADM MEC SCE Impact Evaluation Workbook

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix G. ADM MEC SoCalGas Impact Evaluation Workbook

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix H. ADM MEC SDG&E Cost-Effectiveness Assessment

The TRC Test cost-effectiveness analysis has been conducted using an updated version of the original September 2003 ADM MEC SDG&E EEGA workbook. Note that only the "Program Summary", "1 - Budget Worksheet", and "2 – MeasurableEEActivities" worksheets have been updated per the data inputs described in Section 7.7; all other worksheets have been left unchanged.

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix I. ADM MEC SDG&E Cost-Effectiveness Assessment

The TRC Test cost-effectiveness analysis has been conducted using an updated version of the original September 2003 ADM MEC SCE EEGA workbook. Note that only the "Program Summary", "1 - Budget Worksheet", and "2 – MeasurableEEActivities" worksheets have been updated per the data inputs described in Section 7.7; all other worksheets have been left unchanged.

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix J. ADM MEC SCG Cost-Effectiveness Assessment

The TRC Test cost-effectiveness analysis has been conducted using an updated version of the original September 2003 ADM MEC SCG EEGA workbook. Note that only the "Program Summary", "1 - Budget Worksheet", and "2 – MeasurableEEActivities" worksheets have been updated per the data inputs described in Section 7.7; all other worksheets have been left unchanged.

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix K. ADM MEC Year-by-Year Impacts

The year-by-year impact analysis has been conducted using 1) the Section 7.8-identified approaches and 2) the workbook format identified by CPUC Energy Division staff in January 17, 2006 materials communicated to program evaluators.

The dataset is an Excel workbook, and is provided in electronic format (owing to printing length considerations).

Appendix L. Draft Final Report Reviewer Comments and S&A Responses

The following table summarizes draft final report reviewer comments and associated S&A responses.

Reviewer	Draft Report Reviewer Comments (paraphrased)	S&A Response
ADM	Did the impact evaluation include savings from recommended measures that were implemented?	No. See discussion in Section 7 (just before Section 7.1).
Master Evaluation Contractor Team [MECT]	Provide listing of EM&V report linkages to CPUC <u>Energy Efficiency Policy Manual</u> EM&V Objectives.	Table provided in Section 1.
Master Evaluation Contractor Team [MECT]	EM&V Research Plan called for use of IPMVP Option A (partially measured isolated retrofit), but there does not appear to be any direct measurement of any energy variable.	The MECT-approved EM&V Research Plan allowed Option A-based development/customization of measure savings based on A) participant self-reported operating hours and thermostat settings and B) photo documentation regarding "pre" and "post" conditions. The specific approach taken was in part based on EM&V budget limitations.
Master Evaluation Contractor Team [MECT]	EM&V Research Plan called for a formal Interim Report, but midstream feedback was provided mostly verbally and via informal emails.	Impact evaluation work ended up being significantly more extensive than was budgeted for originally. S&A's non-development of a full-blown Interim Report allowed resources to remain focused on impact evaluation work. The key aspects of emerging findings *were* conveyed to ADM midstream.
Master Evaluation Contractor Team [MECT]	Need to add tables showing year-by-year program impacts in the EM&V report proper – not just in Appendix / separate file.	Tables provided in Sections 1 and 7.8.
Master Evaluation Contractor Team [MECT]	Need to expand on discussion of adequacy of ADM-provided photo documentation (in light of relatively high rates of measure non-recollection by survey respondents).	Photo documentation was indeed "vetted", and leading reasons for measure non-recollection have been described. See discussion provided in Section 4.1.
Master Evaluation Contractor Team [MECT]	Discuss reasons for likely respondent non-collection of measure installations.	Discussion regarding "out of sight" nature of many measures has been amplified in Section 5.
Master Evaluation Contractor Team [MECT]	Discuss approaches taken when no photo documentation was available for a given measure/site.	Customer interpretation of events utilized in such instances. See also discussion provided in Section 7.4.

Self [issue came up in MECT comments regarding other 2004-2005 energy efficiency program evaluations conducted by S&A]	Measure EUL's need to reflect CPUC Energy Efficiency Policy Manual v2 values whenever data are available.	Only one adjustment occurred – for CFL's. Values for most program measures either are not included in the Energy Efficiency Policy Manual (e.g., coil cleanings), or values obtained elsewhere (e.g., 2005 DEER) are same as in 8/03 Energy Efficiency Policy Manual (e.g., p-stats). Change reflected in data presented in Sections 1, 7.7, and 7.8. Pragmatically, adjustment only affected cost-effectiveness data and year-by-year impacts data in the SCG implementation (since weighted average values were used for program-aggregated measures, and since CFL's were a very small fraction of gross annual kWh savings).