

California Nonresidential Program Assessments Study

Third Party Commercial Resource Program Group Report

Final Report

Program Years 2010-2012

Prepared for the CPUC and the California IOUs

Submitted by:



Heschong Mahone Group, Inc.

11211 Gold Country Blvd. #103

Gold River, CA 95670

Phone: (916) 962-7001

Fax: (916) 962-0101

website: [www. h-m-g.com](http://www.h-m-g.com)

TABLE OF CONTENTS

1.	EXECUTIVE SUMMARY	11
1.1	Introduction	11
1.1.1	<i>Role of Third Party Commercial Programs in the Portfolio</i>	11
1.1.2	<i>Third-Party Management</i>	12
1.2	Summary of Best Practices	12
2.	PROGRAMS AND CONTEXT	19
2.1	History of Third Party Commercial Programs	19
2.2	Policy Environment	19
2.2.1	<i>Program Continuation</i>	19
2.2.2	<i>Workpaper Approval Process</i>	20
2.3	Equipment Standards.....	22
3.	PROGRAM CHARACTERIZATION	24
3.1	Program Design and Delivery Features Inventory	24
3.1.1	<i>Target markets</i>	24
3.1.2	<i>Program Characterization Sampling</i>	26
4.	THIRD PARTY NON-RESIDENTIAL PROGRAM PRACTICE ASSESSMENT BY PROGRAM COMPONENT	28
4.1	Program Theory and Design	28
4.1.1	<i>Program Ramp Up</i>	28
4.1.2	<i>Program Focus Flexibility</i>	29
4.1.3	<i>Single Point of Contact</i>	30
4.1.4	<i>Contract Changes</i>	30
4.1.5	<i>Comprehensive Measure Mix</i>	31
4.1.6	<i>Streamline the Program Management Structure</i>	32
4.1.7	<i>Program Qualification Changes</i>	33
4.1.8	<i>Hire Experienced Program Management</i>	33
4.1.9	<i>Maximize Net Program Savings</i>	33
4.2	Program Management: Project Management.....	34
4.2.1	<i>Use a Well-Qualified Engineering Staff</i>	34

4.2.2	<i>Use Electronic Project Management Tools</i>	35
4.2.3	<i>Maintain Consistency in Personnel Over Time with Both the IOU and Third Party Staff</i> 35	
4.2.4	<i>Facilitate IOU – Implementer Communication</i>	36
4.2.5	<i>Inform Product Development</i>	36
4.2.6	<i>Provide Education on Regulatory Process</i>	37
4.3	Program Management: Reporting and Tracking	37
4.3.1	<i>Integrate All Program Data into a Single Database</i>	38
4.3.2	<i>Minimize Documentation Requirements</i>	38
4.3.3	<i>Articulate the Data Requirements Needed to Measure Success</i>	39
4.4	Program Management: Quality Control and Verification	39
4.4.1	<i>Streamline Project Approval Process</i>	39
4.5	Program Implementation: Marketing and Outreach	42
4.5.1	<i>Leverage Utility Credibility</i>	42
4.5.2	<i>Leverage Industry Associations and Trade Groups</i>	42
4.5.3	<i>Utilize Case Studies</i>	43
4.6	Program Implementation: Participation Process and Customer Service	44
4.6.1	<i>Streamline Participation Process</i>	44
4.6.2	<i>Encourage Cross Promotion</i>	44
5.	HVAC PROGRAMS	46
5.1	Category Characterization/Description	46
5.1.1	<i>Technologies</i>	46
5.1.2	<i>Interventions</i>	47
5.1.3	<i>Marketing and Outreach</i>	47
5.1.4	<i>Long Term and Short Term Outcomes</i>	47
5.1.5	<i>Evolution of this Program Category</i>	48
5.1.6	<i>Program Savings Achievements</i>	48
5.2	HVAC Program Practice Assessment by Program Component	50
5.2.1	<i>Program Theory and Design</i>	51
5.2.2	<i>Program Implementation: Marketing and Outreach</i>	51
5.2.3	<i>Program Implementation: Participation Process and Customer Service</i>	51
6.	LIGHTING PROGRAMS	53

6.1 Category Characterization/Description	53
6.1.1 Technologies	53
6.1.2 Interventions.....	54
6.1.3 Marketing and Outreach	55
6.1.4 Long Term and Short Term Outcomes.....	55
6.1.5 Market Transformation	55
6.1.6 Cost Effectiveness	56
6.1.7 Evolution of this Program Category.....	56
6.1.8 Product Innovation	57
6.1.9 Program Savings Achievements	57
6.2 Lighting Program Practice Assessment by Program Component	58
6.2.1 Program Theory and Design	58
6.2.2 Program Management: Project Management.....	59
6.2.3 Program Management: Reporting and Tracking	60
6.2.4 Program Management: Quality Control and Verification	60
6.2.5 Program Implementation: Marketing and Outreach	61
6.2.6 Program Implementation: Participation Process and Customer Service.	61
6.2.7 Program Implementation: Installation and Delivery Mechanism	62
6.2.8 Program Evaluation and Adaptability	63
7. EMERGING TECHNOLOGY PROGRAMS.....	64
7.1 Category Characterization/Description	64
7.1.1 Technologies	64
7.1.2 Interventions.....	65
7.1.3 Marketing and Outreach	65
7.1.4 Long Term and Short Term Outcomes.....	66
7.1.5 Evolution of this Program Category.....	66
7.1.6 Program Savings Achievements	66
7.2 Emerging Technology Program Practice Assessment by Program Component	68
7.2.1 Program Theory and Design	69
7.2.2 Program Management: Project Management.....	69
7.2.3 Program Management: Reporting and Tracking.....	70
7.2.4 Program Management: Quality Control and Verification	71

7.2.5	<i>Program Implementation: Marketing and Outreach</i>	71
7.2.6	<i>Program Implementation: Participation Process and Customer Service</i>	72
7.2.7	<i>Program Implementation: Installation and Delivery Mechanism</i>	73
7.2.8	<i>Program Evaluation and Adaptability</i>	73
8.	SCHOOL PROGRAMS	75
8.1	Category Characterization/Description	75
8.1.1	<i>Interventions</i>	76
8.1.2	<i>Marketing and Outreach</i>	76
8.1.3	<i>Long Term and Short Term Outcomes</i>	76
8.1.4	<i>Role of Comprehensiveness: Deep Retrofit</i>	77
8.1.5	<i>Evolution of this Program Category</i>	78
8.1.6	<i>Program Savings Achievements</i>	78
8.2	Schools Program Practice Assessment by Program Component	81
8.2.1	<i>Program Theory and Design</i>	82
8.2.2	<i>Program Management: Project Management</i>	82
8.2.3	<i>Program Management: Reporting and Tracking</i>	82
8.2.4	<i>Program Implementation: Marketing and Outreach</i>	83
8.2.5	<i>Program Implementation: Participation Process and Customer Service</i>	83
8.2.6	<i>Program Implementation: Installation and Delivery Mechanism</i>	84
9.	RETAIL PROGRAMS	85
9.1	Category Characterization/Description	85
9.1.1	<i>Technologies</i>	85
9.1.2	<i>Interventions</i>	86
9.1.3	<i>Marketing and Outreach</i>	86
9.1.4	<i>Long Term and Short Term Outcomes</i>	86
9.1.5	<i>Role of Comprehensiveness: Deep Retrofit</i>	87
9.1.6	<i>Evolution of this Program Category</i>	88
9.1.7	<i>Program Savings Achievements</i>	88
9.2	Retail Program Practice Assessment by Program Component	90
9.2.1	<i>Program Theory and Design</i>	90
9.2.2	<i>Program Management: Project Management</i>	90
9.2.3	<i>Program Management: Quality Control and Verification</i>	91

9.2.4	<i>Program Implementation: Marketing and Outreach</i>	91
9.2.5	<i>Program Implementation: Participation Process and Customer Service</i>	91
10.	GROCERY PROGRAMS	93
10.1	Category Characterization/Description	93
10.1.1	<i>Technologies</i>	93
10.1.2	<i>Interventions</i>	93
10.1.3	<i>Marketing and Outreach</i>	94
10.1.4	<i>Long Term and Short Term Outcomes</i>	94
10.1.5	<i>Role of Comprehensiveness: Deep Retrofit</i>	95
10.1.6	<i>Cost Effectiveness</i>	96
10.1.7	<i>Evolution of this Program Category</i>	96
10.1.8	<i>Program Savings Achievements</i>	96
10.2	Grocery Program Practice Assessment by Program Component	99
10.2.1	<i>Program Theory and Design</i>	99
10.2.2	<i>Program Management: Project Management</i>	100
10.2.3	<i>Program Management: Reporting and Tracking</i>	100
10.2.4	<i>Program Management: Quality Control and Verification</i>	101
10.2.5	<i>Program Implementation: Marketing and Outreach</i>	101
10.2.6	<i>Program Implementation: Participation Process and Customer Service</i>	102
10.2.7	<i>Program Implementation: Installation and Delivery Mechanism</i>	102
11.	DATA CENTER PROGRAMS	103
11.1	Category Characterization/Description	103
11.1.1	<i>Technologies</i>	103
11.1.2	<i>Interventions</i>	104
11.1.3	<i>Marketing and Outreach</i>	104
11.1.4	<i>Long Term and Short Term Outcomes</i>	104
11.1.5	<i>Role of Comprehensiveness: Deep Retrofit</i>	105
11.1.6	<i>Cost Effectiveness</i>	105
11.1.7	<i>Evolution of this Program Category</i>	105
11.1.8	<i>Program Savings Achievements</i>	106
11.2	Data Center Program Practice Assessment by Program Component	107
11.2.1	<i>Program Management: Project Management</i>	108

11.2.2	<i>Program Management: Reporting and Tracking</i>	108
11.2.3	<i>Program Implementation: Marketing and Outreach</i>	109
11.2.4	<i>Program Implementation: Participation Process and Customer Service</i>	110
12.	HOSPITALITY PROGRAMS	111
12.1	Category Characterization/Description	111
12.1.1	<i>Technologies</i>	111
12.1.2	<i>Interventions</i>	112
12.1.3	<i>Marketing and Outreach</i>	112
12.1.4	<i>Long Term and Short Term Outcomes</i>	113
12.1.5	<i>Role of Comprehensiveness: Deep Retrofit</i>	113
12.1.6	<i>Cost Effectiveness</i>	114
12.1.7	<i>Evolution of this Program Category</i>	115
12.1.8	<i>Program Savings Achievements</i>	115
12.2	Hospitality Program Practice Assessment by Program Component	119
12.2.1	<i>Program Management: Project Management</i>	119
12.2.2	<i>Program Management: Reporting and Tracking</i>	120
12.2.3	<i>Program Management: Quality Control and Verification</i>	120
12.2.4	<i>Program Implementation: Marketing and Outreach</i>	120
12.2.5	<i>Program Implementation: Installation and Delivery Mechanism</i>	121
13.	HEALTHCARE PROGRAMS	122
13.1	Category Characterization/Description	122
13.1.1	<i>Technologies</i>	122
13.1.2	<i>Interventions</i>	123
13.1.3	<i>Marketing and Outreach</i>	123
13.1.4	<i>Long Term and Short Term Outcomes</i>	124
13.1.5	<i>Role of Comprehensive Deep Audit</i>	124
13.1.6	<i>Evolution of this Program Category</i>	124
13.1.7	<i>OSHPD Requirements</i>	124
13.1.8	<i>Program Savings Achievements</i>	125
13.2	Healthcare Program Practice Assessment by Program Component	127
13.2.1	<i>Program Theory and Design</i>	128
13.2.2	<i>Program Management: Project Management</i>	128

13.2.3	<i>Program Management: Reporting and Tracking</i>	129
13.2.4	<i>Program Management: Quality Control and Verification</i>	129
13.2.5	<i>Program Implementation: Marketing and Outreach</i>	130
13.2.6	<i>Program Implementation: Participation Process and Customer Service</i>	131
13.2.7	<i>Program Implementation: Installation and Delivery Mechanisms</i>	131
14.	VENDOR-IMPLEMENTED PROGRAMS	132
14.1	Category Characterization/Description	132
14.1.1	<i>Technologies</i>	132
14.1.2	<i>Interventions</i>	133
14.1.3	<i>Marketing and Outreach</i>	133
14.1.4	<i>Long Term and Short Term Outcomes</i>	133
14.1.5	<i>Role of Comprehensiveness, Deep Retrofit</i>	134
14.1.6	<i>Evolution of this Program Category</i>	135
14.1.7	<i>Savings Achievements</i>	135
14.2	Vendor Implemented Program Practice Assessment by Program Component	137
14.2.1	<i>Program Theory and Design</i>	137
14.2.2	<i>Program Management: Project Management</i>	139
14.2.3	<i>Program Implementation: Participation Process and Customer Service</i>	139

TABLE OF FIGURES

Figure 1: HVAC Program MWh Energy Savings	49
Figure 2: HVAC Program Demand Reduction	49
Figure 3: HVAC Program Therm Savings.....	50
Figure 4: Lighting Sector MWh Energy Savings	57
Figure 5: Lighting Sector Demand Reduction	58
Figure 6: Emerging Technology Programs MWh Energy Savings	67
Figure 7: Emerging Technology Programs Demand Reduction	67
Figure 8: Emerging Technology Programs Therm Savings.....	68
Figure 9: School Programs Energy Savings Analysis	77
Figure 10: SCE School Programs MWh Energy Savings.....	79
Figure 11: PG&E School Programs MWh Energy Savings	79
Figure 12: SCE School Programs Demand Reduction	80
Figure 13: PG&E School Programs Demand Reduction	80
Figure 14: School Programs Therm Savings.....	81
Figure 15: Retail Program Energy Savings Analysis	87
Figure 16: Retail Program MWh Energy Savings	89
Figure 17: Retail Program Demand Reduction	89
Figure 18: Grocery Program Energy Savings Analysis.....	95
Figure 19: Grocery Programs MWh Energy Savings	97
Figure 20: Grocery Programs Demand Reduction	98
Figure 21: Grocery Programs Therms Savings	98
Figure 22: Data Center Programs MWh Energy Savings.....	106
Figure 23: Data Center Programs Demand Reduction	107
Figure 24: Hospitality Programs Energy Savings Analysis.....	114
Figure 25: PG&E Hospitality Programs MWh Energy Savings.....	116
Figure 26: SCE Hospitality Programs MWh Energy Savings.....	117

Figure 27: PG&E Hospitality Programs Demand Reduction	117
Figure 28: SCE Hospitality Programs Demand Reduction.....	118
Figure 29: Hospitality Program Therms Savings	118
Figure 30: Healthcare Programs MWh Energy Savings	125
Figure 31: Healthcare Programs Demand Reduction	126
Figure 32: Healthcare Programs Therm Savings.....	127
Figure 33: Vendor Implemented Program Energy Savings Analysis.....	134
Figure 34: Vendor-Implemented Programs MWh Energy Savings.....	136
Figure 35: Vendor-Implemented Programs Demand Reduction.....	136
Figure 36: Vendor-Implemented Programs Therm Savings	137
Figure 37: Current Structure of Vendor Programs	138
Figure 38: Proposed Structure of Vendor Programs	138

Table of Tables

Table 1: List of Programs and Program Abbreviations	15
Table 2: Description of Best Practices	18
Table 3: Percent of Total Third Party Commercial Programs Savings Attributed to Measures Impacted by Title 24 and Federal Equipment Standards	23
Table 4: Program Characterization Groups	27
Table 5: Overall Program Management - Project Management Best Practices.....	34
Table 6: Overall Program Management - Reporting & Tracking Best Practices.....	37
Table 7: Overall Program Management - Marketing and Outreach Best Practices	42
Table 8: HVAC Program Best Practices	51
Table 9: Emerging Technology Program Best Practices.....	69
Table 10: Schools Sector Best Practices.....	82
Table 11: Grocery Sector Best Practices	99
Table 12: Hospitality Sector Best Practices.....	119
Table 13: Healthcare Sector Best Practice.....	128

1. EXECUTIVE SUMMARY

1.1 Introduction

The report contains the results from an analysis of the Third Party Commercial Resource Programs (3P Programs). This analysis looked at 46 of the 49 3Ps across the California IOU service territories. The objective of the study was to assess the 3P commercial sector programs to determine successful practices, update Best Practices, and identify opportunities for improvement in 3P Programs. The details on the methodology and the project scope are in a separate volume. The list of the programs studies are in Table 1 of this report.

1.1.1 Role of Third Party Commercial Programs in the Portfolio

The third parties (3Ps) consider their role in the portfolios to create energy savings in sectors that the IOUs have struggled to reach or to create comprehensive energy savings projects. The IOUs consider the 3Ps as providing a higher level of service to assist customers through the programs. The 3P Programs were described by an IOU Contract Manager (CM) as being valet parking and the Core Programs as being self-parking. In the Core Programs, customers navigate the programs by themselves. In the 3P Programs, customers are led through the process by the Implementer. The 3P Programs assist customers through the process with the following methods:

- ◆ Audits,
- ◆ Filling out the incentive/rebate applications,
- ◆ Project contracting assistance,
- ◆ “Floating”¹ incentive funds to help pay project cost,
- ◆ Education on EE measures,
- ◆ Recommending Contractors, and
- ◆ Product selection.

Not every program utilizes every method but each program will use at least one of the methods above.

In general, the value proposition of Third Party Programs is segment expertise and turnkey solutions. This facilitates the forging and maintaining of relationships with market actors within these niche sectors that may be difficult for core programs to match. Having this enhanced access built on credible segment expertise allows 3Ps to market EE opportunities more effectively.

There are cases where 3Ps do not have established relationships and the associated “access” to customers, and therefore have not been able to leverage their expertise to establish such

¹ Floating the incentives is providing a short term loan to customers in the amount of the incentives. The incentive check is issued to the entity floating the money.

relationships. In some of these cases, the IOU Account Executives (AEs) perform a large amount of the sales and marketing for the 3P Programs.

The additional customer assistance and other advantages noted above adds greater administrative costs to the programs which results in the 3P Commercial programs tending to cost more than the Commercial Core Programs. These increased costs are needed to procure savings in hard to reach niche markets and for achieving deep retrofits. These cost pressures tend to reduce the scope of the 3P Programs to comprehensive or harder-to-reach sectors. Simple projects do not warrant higher levels of service and costs and therefore are funneled through the Core Programs rather than the 3P Programs.

1.1.2 Third-Party Management

Given the administrative nature of 3P Programs, it is reasonable to expect them to be more flexible, innovative and a good testing ground for new technologies and marketing methods. During interviews conducted by the evaluation team, 3P Program implementers were asked questions examining how program design and implementation protocols such as incentive levels, program policies and customer eligibility were developed. Overwhelmingly the 3P Program implementers stated that these areas are addressed by the IOUs. While administrative reasons require consistency between core and 3P Programs to ensure conformance with the CPUC-policy framework and the IOU custom program portfolio, and deliver diversified measures to the customer, the downside of this process is that the 3Ps do not always have the flexibility they would like in order to respond quickly to the changing market conditions or have the ability to quickly adjust and adapt program procedures without approval from the IOUs.

One of the main findings of this research is that there is a need to better understand how to allow the 3Ps greater agility, autonomy and flexibility while maintaining a cohesive and comprehensive portfolio that minimizes gaps and redundancy.

Overall the 3Ps are striving to overcome market barriers through additional customer service. There are some very innovative programs, products and processes in the portfolios, but the largest difference between the 3P and the Core Programs is the level of customer service provided by the 3P Programs. Higher levels of service add to the implementation cost, but result in greater marginal benefit of savings in hard-to-reach markets. Achieving truly deep savings requires more risk and planning which also makes the 3P Programs more expensive than the Core Programs.

1.2 Summary of Best Practices

This study has defined and updated best practices for the following program components:

- ◆ Program Design and Theory,
- ◆ Program Management: Project Management,
- ◆ Program Management: Reporting & Tracking,
- ◆ Program Management: Quality Control & Verification,
- ◆ Program Implementation: Participation Process,
- ◆ Program Implementation: Marketing and Outreach, and
- ◆ Program Evaluation.

The Best Practices were developed through researching the programs through a study of program filings, program evaluations, The National Energy Efficiency Best Practices Study (EEBP) (Quantum Consulting, 2004), monthly reports, interviews with program and IOU staff and through an examination of program participation data. The EEBP was conducted in 2004 and was based upon IOU programs across the nation. Three volumes of the report have some applicability to the 3P Programs: the Large Commercial, HVAC, and Lighting. There are three reasons for the differences between the current listed best practices for 3P Programs and the EEBP, which are the type of management of the programs, the timing of the study and the scope of this project.

The 3P Programs are different from the IOU run programs because the third party implementers are overseen by both the IOUs and the CPUC. This adds a layer of complexity for managing the programs that manifests itself in the marketing, quality control, rebate processing and reporting. In the EEBP, there were only three non-IOU programs included in the study. This additional level of oversight was not a focus of the EEBP research, thereby changing the applicability of some of the best practices and requiring a revision of others.

In the last eight years since the EEBP was released, energy efficient technologies have rapidly advanced and the regulatory environment in California has changed. The rapidly changing technologies change how some of the best practices should be applied. There were also best practices identified in the EEBP that were technology specific and those best practices are no longer relevant. The regulatory environment has also changed. In 2004, savings attribution and IOU earnings were handled through different methods. Currently, IOU earnings and savings attribution are large issues and are being addressed through strict regulatory policies. This changes the designs of the programs.

This scope of this study is different than the original EEBP completed. The EEBP researched a small subset of homogeneous programs that studied all aspects of the programs in depth. This study researched a large number of heterogeneous programs and focused on many issues in less depth. As a result, some of the best practices that were identified originally do not appear in this research but could still be considered best practices. Also there are best practices listed in the EEBP that are outdated and are no longer helpful to the programs. These best practices were left out of the study because there was not the research to support them.

The best practices that were supported by the current research are included in the report. Some of the original best practices have been modified to better describe the current regulatory conditions and the management of 3P Programs, as found in the current research. In addition to these best practices there are also best practices that have been added to the report. The new best practices are current practices that are being implemented by several programs and are universally successful. The findings behind all of these best practices are detailed in the body of the report.

There is a list of program abbreviations and the implementer in Table 1. Table 2 is a list of the best practices developed through this analysis. Further detail on the best practices is given in subsequent sections of this report.

Sector	IOU Service Territory	Program Name	Program Abbreviation	Program Implementer
Data Centers	PG&E	Data Center Cooling Control Program	DCCCP	Quantum Energy Services Technology (Quest)
Data Centers	SCE	Data Center Energy Efficiency	DCEEP	Willdan Energy Solutions
Emerging Technology	PG&E	Ozone Laundry Energy Efficiency	Ozone Laundry	Willdan Energy Solutions
Emerging Technology	SCE	Management Affiliates Program	MAP	Energy Innovation Group
Emerging Technology	SDG&E and SoCal Gas	Non-Residential	BID	SDG&E and SoCal Gas
Grocery	PG&E	EnergySmart Grocer		PECI
Grocery	PG&E	Small Commercial Comprehensive Refrigeration Program	Cool Biz	KEMA
Healthcare	PG&E	Medical Building Tune-Up		Quantum Energy Services Technology (Quest)
Healthcare	PG&E and SCE	Healthcare Energy Efficiency Program	HEEP	Willdan Energy Solutions
Hospitality	PG&E and SCE	Energy Efficiency for Entertainment Centers	EE4EC	Matrix Energy Services, Inc.
Hospitality	PG&E	LodgingSavers		Ecology Action
Hospitality	PG&E	Casino Green		Ecology Action
Hospitality	SDG&E and SCE	Lodging Energy Efficiency Program	LEEP	Willdan Energy Solutions
HVAC	PG&E	Air Care Plus		PECI
HVAC	PG&E	Enhanced Automation Initiative	EA	KEMA
HVAC	SDG&E	Non-Res HVAC Tune-up/Quality Installation	Premium Efficiency Cooling	Conservation Services Group
HVAC	SDG&E	Retro Commissioning	RCx	PECI
HVAC	SoCal Gas	Gas Cooling Retrofit		Cypress
Lighting	PG&E	RightLights		Ecology Action
Lighting	PG&E	High Performance Office Lighting Program		Sylvania
Lighting	PG&E	Energy-Efficient Parking Garage	EEPG	EFM Solutions
Lighting	PG&E	LED Accelerator	LEDA	Energy Solutions

Sector	IOU Service Territory	Program Name	Program Abbreviation	Program Implementer
Retail	PG&E	Comprehensive Retail Energy Management	CREMP	Quantum Energy Services Technology (Quest)
Retail	PG&E	Furniture Store Energy Efficiency	FREE	Matrix Energy Services, Inc.
Schools	PG&E	School Energy Efficiency	SEEP	Resource Solutions Group
Schools	PG&E and SCE	California Preschool Energy Efficiency Program	CPEEP	Low Income Investment Fund
Schools	PG&E	K-12 Private Schools and Colleges Audit Retro		Matrix Energy Services, Inc.
Schools	SCE	Public Pre-Schools, Elementary Schools and High Schools		Matrix Energy Services, Inc.
Schools	SCE	Automatic Energy Review for Schools		Benningfield Group
Schools	SCE	Private Schools and Colleges Program		Matrix Energy Services, Inc.
Schools	SoCal Gas	Program for Resource Efficiency in Private Schools	PREPS	Resource Solutions Group
Vendor Implemented	PG&E	Cool Controls Plus		Honeywell International
Vendor Implemented	PG&E	GreenVent for Energy-Efficient Kitchens	GreenVent	Honeywell International
Vendor Implemented	PG&E and SCE	Cool Schools		Trane Company
Vendor Implemented	PG&E	Cool Cash		Trane Company
Vendor Implemented	SDG&E and SoCal Gas	Save Gas		EDC Technologies
Vendor Implemented	SCE	Retail Energy Action Program	REAP	Trane Company
Vendor Implemented	SCE	Commercial Utility Building Efficiency	CUBE	Trane Company

Table 1: List of Programs and Program Abbreviations

Best Practices	Rationale
Program Management: Project Management	
Use well-qualified engineering staff	Engineering staff should be experienced with the measures in the programs. They should understand the inputs that are important to calculate the energy savings.
Use electronic project management tools	All programs should use some form of electronic project management tools to manage the programs but the size and complexity tools should be commensurate with the number projects and complexity of the participation process.
Maintain consistency in personnel over time with both the IOU and 3rd Party Staff	Maintaining IOU and 3rd Party staff helps maintain institutional knowledge and reduce program interruptions.
Develop and maintain clear lines of responsibility and communication with the IOUs	Good communication between the IOUs and the 3rd Party Program staff is very helpful in solving program issues during the program cycle.
Work with manufacturers to drive product improvement & advancement	An awareness of the market and the key players in that market are required to successfully interface with product manufacturers and program customers to produce a higher quality product. Coordination with manufacturers, and customers where possible, can help bring new high quality products to the market sooner than otherwise would have been possible.
Keep 3rd Party Implementers well informed about program features and changes through seminars, training sessions and annual meetings of key groups	Regular meetings to discuss regulatory changes, disseminate program best practices and other changes help keep the 3rd Party Implementers up to date on changes and help train staff. It is helpful for the 3rd Parties to get regular training on regulatory terms and processes.
Program Management: Reporting and Tracking	
Integrate all program data, including measure-level data, into a single database	Program tracking tools should house all necessary information for reporting, evaluation and program management. Program tracking tools should be simple to use and to pull reports to manage the programs.
Minimize documentation requirements	All parties mentioned the need to minimize documentation requirements to ensure that staff spends the majority of their time promoting the programs and moving projects along the sales cycle.
Articulate the data requirements needed to measure success	All program requirements should be negotiated up front to avoid confusion and additional costs to the programs. Issues such as acceptable engineering calculations methods, necessary documentation, target markets and quality control methods should be determined before contracts are signed and the program begins.

Best Practices	Rationale
Program Implementation: Marketing & Outreach	
Leverage utility credibility to help vendors 3rd Party Implementers to sell the program	The utilities can help 3rd Party Programs obtain market credibility in the beginning of the program cycle. The IOU field staff should be aware of the 3rd Party Programs. The IOU websites should have information available on the 3rd Party Programs.
Leverage partnerships with community-based organizations, trade groups and Industry Associations	Marketing to associations and trade groups, is more time-effective than targeting individual customers. It is also effective for gaining customer trust. 3P implementers can develop a network, if they are not already connected, fairly easily by attending conferences, liaising with industry associations, and other trade groups. The exception to this recommendation is the private school segment.
Develop and disseminate case studies of key technologies and segment applications	Case studies are very helpful in marketing key technologies. Customers appreciate seeing how the technologies have worked for other and it helps increase market adoption.
HVAC	
Provide AC contractors training on selling and proper installation practices	The programs should adhere to nationally recognized standards, ASHRAE/ACCA 180 Standards, or a higher CA standard. All collateral should only have information on products that adhere to the standards to avoid confusion in the marketplace.
Schools	
Link free, direct install programs to installing other measures as well.	To create more comprehensive projects the programs should install more capital intensive measure along with free or low cost measures. Programs should facilitate performance contracting to assist schools in completing comprehensive retrofits with deep energy savings.
Hospitality	
Foster ongoing relationships with larger lodging chains and collaborate on their equipment replacement plans.	By taking a longer-term, multi-cycle approach to implementation, programs can find savings by working in conjunction with the customer's equipment lifecycles and achieve the deep retrofit that would not necessarily be feasible to undertake in one shot.
Take a long-term approach to identification and installation of measures at large hospitality chains to achieve the deep retrofit in a staged approach that would not necessarily be feasible to undertake in one shot.	As customers across the board install more energy efficient measures, the "low-hanging fruit" is thinning out, and programs need to look for different ways to achieve their savings goals. By taking a longer-term, multi-cycle approach to implementation, programs can find savings by working in conjunction with the customer's equipment lifecycles.

Best Practices	Rationale
Emerging Technology	
Establish program credibility through public outreach .	Vendor and trade ally relations can be a fruitful manner in which to recruit projects to program implementing new technologies. New Technologies are many times not widely known or implemented; therefore, educating trade alley groups in the appropriate sectors has the potential to increase the awareness of these programs. In addition, it can also inform the IOU and 3P of new technologies not currently on the market, but show energy savings potential.
Healthcare	
Ensure implementers are aware of OSHPD regulations.	Programs should be aware of OSHPD requirements and works with engineers and sub-contractors (who are also generally informed on the requirements) to ensure they are met.
Grocery	
Tailor market and outreach efforts to organizational structure and decision makers.	Decision makers are the gatekeepers of participant commitment and resources. Energy saving results can only be achieved with tailored approached that convey qualitative and quantitative message to decision makers.
Make customer eligibility easy for customers to determine	Customers want to have a consistent program that they can work with. Changing customer qualifications makes it difficult for customers to find the appropriate program for them to participate in.
Provide assurance on measure reliability.	Program should take on the responsibility of demonstrating measure/equipment reliability by mandating program-level contractor warranty.

Table 2: Description of Best Practices

2. PROGRAMS AND CONTEXT

2.1 History of Third Party Commercial Programs

Energy Efficiency programs in California have been around since the early 1980s. Until 2005 the EE programs were run by the IOUs and occasionally the IOUs subcontracted a program or a component of a program to a third party. In 2005 the CPUC approved (A.05-06-004) IOUs plans for bidding out 20% of the PY 2006-08 energy efficiency (EE) funds to third party implementers. Each IOU selected commercial sectors to be targeted by the 3P Programs that had typically not been participating in the IOU programs or were considered to be hard-to-reach. The IOUs issued targeted solicitations to reach the sectors identified as hard-to-reach as well as general solicitations that allowed 3P implementers to design innovative programs. The IOUs selected the Third Party Programs in their portfolios.

Beginning in late 2008 the IOUs released additional solicitations for Third Party Programs. Most of the solicitations were targeted at selected technologies or sectors with a few general solicitations. The IOUs selected 3P Programs from the successful PY2006-08 3P Programs and new programs from the solicitation to implement in the 2010-12 program cycle.

2.2 Policy Environment

The 3P Programs are considered an integral part of the program portfolios in the last few years, and many programs have produced considerable energy savings. There are some policy issues that are affecting the programs that could be worked through to better facilitate program performance. Two issues affecting the programs most are the timing of the program continuation decisions and the workpaper approval process.

2.2.1 Program Continuation

Funding and program continuation decisions should be conveyed to the 3Ps at least six months to a year before the new funding cycle to ensure that 3Ps are able to continue marketing the programs and building the sales pipeline. For the 3Ps to be able to receive program continuation decisions on a timely basis, the following items must be completed:

- ◆ The CPUC will have to make a decision on the program cycle policies;
- ◆ The IOUs will have to create their portfolio plans and communicate those decisions to the 3Ps; and
- ◆ The CPUC must approve the IOUs' portfolio plans.

These items are time intensive and must be started more than a year in advance of the next program cycle for the 3Ps to be able to receive a program continuation decision. This requires the efforts of both the CPUC and the IOUs.

Many large customers make funding decisions six months to a year and a half in advance. This is considered especially important in the lodging, healthcare, and retail sectors. Currently, 3P Program implementers are unsure as to whether their programs will continue into the next

program cycle, therefore they cannot commit to projects with long implementation (12-18 months) schedules. Implementers of two other programs noted that by the end of the summer (2012), they would be ramping down if they do not receive approval to continue into the next program cycle. Any projects starting the process after that point would not be incented before the next program cycle, and the implementers could not guarantee the incentive levels or that funds would be available.

Third Party Programs are not guaranteed funding in the next program cycle, unlike the IOU Core Programs. The majority of the Core Programs will be operating in the next program cycle, although there may be changes to the incentive levels or measures offered. As a result, the Core Programs can continue marketing their programs and customers can plan their participation. This is not the case for the 3P Programs; they cannot continue marketing their programs to participants since they are unsure about the program status. The customers could potentially participate through the core programs in later years, but the participation process and the level of customer assistance would be reduced.

Providing 3P Program implementers with sufficient notice prior to program funding decisions facilitates steady program enrollment and savings and encourages customer confidence in the program. The Commission has worked diligently to increase the timeliness of the Decisions over the last few cycles. The IOUs and CPUC should continue to work towards providing sufficient notice to 3Ps.

2.2.2 Workpaper Approval Process

Regulatory policy requires the IOUs to submit workpapers for all non-DEER measures for which ex ante savings are intended to be claimed.² Energy Division typically reviews workpapers for measures that are expected to make up 1% or more of ex ante claims. The IOUs can claim savings for a non-DEER measure only if a workpaper was submitted and ED disposition was provided.

Interviewees reported their understanding of the mechanism to be that regulatory policy requires energy saving measures that make up 1% or more of ex-ante claims or having a favorable measure distribution outlook in the current cycle to have an approved workpaper, the function of which is to determine the ex ante savings associated with the measure. This interpretation is understandable, as regulatory policy requires the IOUs to submit workpapers for all non-DEER measures for which ex ante savings are intended to be claimed. Energy Division typically reviews workpapers for measures that are expected to make up 1% or more of ex ante claims.

² 3P Programs are intended to introduce innovative approaches and ideas to achieve greater energy savings. The workpaper review process requires time and resources to complete. This can hinder the 3Ps from making some changes or adaptations in their measure offerings as fast as they would like to make them. Historically non-DEER workpapers were submitted with quarterly claims, but in that environment final savings values were determined post-cycle. Since the utilities are measuring their accomplishments ex-ante, rather than ex-post, savings associated with new measure offerings must be determined with a reasonable degree of accuracy at the time of introduction. The IOUs often recommend or require workpapers to be approved before the measures can be implemented.

In any event, the approval process is designed to lower the uncertainty and risk to the portfolio of substantial ex-post adjustments to claimed savings. Risk reduction, of course, comes at a cost; in this case the cost includes a built-in waiting period for new measures. In any case, verification of ex-post savings takes time which can create contractual and financial challenges for the 3Ps – another cost. Fast, careful, and judicious approval of submissions is, of course, the best of all worlds; supporting accurate savings figures and an agile, evolving suite of offerings. However, there is no magic bullet and judicious, accurate approvals take time.

The workpaper approval process is new in the 2010-12 cycle and the parties involved are learning as they accumulate experience. The implementers commented that there has been substantial improvement in expedience of the approval process since the advent of the cycle, but there is still a desire for greater expedience and a backlog remains. In order to better control the queue and achieve a more even distribution of submissions through time, the IOUs will occasionally ask the 3P Program implementers to hold off submissions until a particularly large backlog is reduced. Many of the 3P Programs are serving rapidly evolving sectors and would like to be able to respond quickly to new technologies, federal equipment standards, and Title 24. Consequently, 3Ps would like the ability to propose new measures and, if accepted, add them to the program offerings quickly. However, the approval process is necessary and does take time.

From the perspective of third party participants and implementers, workpaper submissions are not necessarily evenly spaced over time. This may be due to the fact that Energy Division may receive a great number of requests in a short period (or even all at once), followed by a long period of no submissions. Once submitted, 3P Program implementers believe that ED alone determines whether the submissions lack sufficient documentation (and/or require additional documentation) to support a review.³ If ED's Ex Ante Review Team or the IOUs are not satisfied with a submitted workpaper, they may grant provisional approval contingent on certain specified changes in savings claims or calculations methods, which is required by Energy Division policy. . They also may not approve the savings value and place the risk on the project's savings claims on the utilities during the ex post review. At this writing, only SCE and PG&E have received approval for workpapers.

This all matters to implementers because the comparative advantage of 3P Program offerings is their ability to serve rapidly evolving sectors. They depend on processes from ED and the IOUs that enable them to respond quickly to new technologies, federal equipment standards, and Title 24 requirements. Consequently, 3Ps would like to have the ability to propose new measures and, if accepted, add them to the program offerings quickly in a timely manner. Burdensome review processes associated with approvable savings values and consequent measure offerings conflict with the Third Party Program business model and expressed desires for speed and flexibility to a considerable extent. The review process on both the IOU and ED sides conflict with interviewees' desire to both implement projects and make independent decisions about what measures to offer

³ The IOUs review these projects and contribute to project delays. For SCE, this internal review runs in parallel with ED selected projects.

without undue hesitation about final savings values.⁴ As a result of this conundrum, it is the opinion of those interviewed that the programs are unable to implement some prospective projects, resulting in lost savings opportunities.

In response to these administrative challenges, at the time of this writing, modifications are being developed to streamline the process and make it easier for all involved parties. The ED plans to create a uniform workpaper template in the hopes of avoiding or reducing the number of incomplete submissions or submissions with insufficient documentation. In addition, ED is developing a guidance document that will detail the review methods, processes, and requirements, as well as a document outlining approved methods for workpaper approval. The IOUs have also proposed alternative methods of improving net savings. Despite these challenges, implementers noted substantial improvement in expedience of the approval process since the advent of the cycle. However, there is still a desire for greater expedience to address the substantial backlog and future proposed workpapers.

The 3Ps feel that a reasonable goal would be to reduce the approval process to an average of 30 to 60 days, contingent on sufficient measure documentation and allowing some deviations related to ebbs and flows in the frequency/quantity of submissions. This will allow the 3P Programs and other programs in the portfolio to keep up with changing technologies and respond to market conditions. It is also important to note that 3Ps are paid based on their ex-ante savings, and therefore do not bear the longer term risks that may arise from a rushed/inaccurate approval.

2.3 Equipment Standards

Currently there are federal equipment standards and Title 24 building energy efficiency standard changes that are affecting or will affect the portfolio energy savings. One of the largest impacts to the portfolio will be the updated lighting standards enacted through the Energy Policy Act (EPACT) of 2005 and the Energy Independence and Security Act (EISA) of 2007. This legislation is significantly increasing the lighting efficiency standards in the US. The legislation is technology neutral, which means that any type of lamp can be sold as long as it meets the efficiency requirements. This legislation will eliminate higher wattage lamps (standards increase beginning in 2011 and projected to end in 2018) and magnetic ballasts (effective November 2014). The increase in lighting efficiency standards will reduce the savings from the lighting measures across the portfolio.

The 2013 Title 24 Building Energy Efficiency Standards that will take effect on January 1, 2014, will require that all new HVAC equipment (greater than 54,000 Btu/hr.) installed on commercial facilities include an economizer. New economizers will no longer be eligible to receive incentives or rebates on new HVAC equipment if the equipment was installed when the code already required economizers. The programs will be able to incent or rebate the addition of economizers to existing

⁴ The expressed desire for 3P speed and flexibility as a program model would only make sense if they also bear the burden for the eventuality of ex-post savings and verification of ex-post savings, which would create contractual and financial challenges to 3Ps.

equipment. Programs that fix or optimize existing economizers will be eligible to provide rebates or incentives.

In 2007, ASHRAE Standard 90.1 adopted increased boiler efficiency standards. In July 2009, the DOE adopted the ASHRAE 90.1-2007 Standard that increases the efficiency metric from combustion efficiency to thermal efficiency, requiring 80% thermal efficiency for gas-fired boilers and 82% thermal efficiency for oil-fired boilers. This will increase the standard efficiency for space heating boilers. Any program providing rebates or incentives for boilers must revise their efficiency requirements and/or rebate/incentive levels.

Table 3 shows the percent of installed savings achieved by measures impacted by Title 24 and Federal Equipment Standards in the third party commercial programs. The measures included in the Other Lighting column include T8 to T8 retrofits, HID retrofits, and lighting controls. The data were taken from the program databases as of December 31, 2011.

		CFLs	T12 to T8 Conversions	Other Lighting	Space Heating Boilers
PG&E	kWh	5%	1%	32%	
	kW	3%	0%	28%	
	Therms				1%
SCE	kWh	4%	18%	54%	
	kW	3%	14%	41%	
	Therms				0%
SDG&E	kWh	5%	0%	0%	
	kW	3%	0%	0%	
	Therms				0%
SoCal Gas	Therms				0%

Table 3: Percent of Total Third Party Commercial Programs Savings Attributed to Measures Impacted by Title 24 and Federal Equipment Standards

3. PROGRAM CHARACTERIZATION

3.1 Program Design and Delivery Features Inventory

The Commercial 3P Programs in the 2010-12 program cycle reach a diverse group of sectors and measures. The IOUs' portfolios include 49 Third Party Programs; these programs were targeted by technology or by sector. HMG segmented the commercial 3Ps into the following characterization groups.

- ◆ Measure Based Programs
 - HVAC
 - Lighting
 - Emerging Tech
- ◆ Sector Based Programs
 - Schools
 - Retail
 - Grocery
 - Data Center
 - Hospitality
 - Healthcare
- ◆ Vendor Implemented Programs

The characterization groups were created to categorize recommendations regarding the marketing of programs designed to address individual sectors or measure types. HMG along with the PCG determined the programs to interview in each program characterization group. HMG provides overarching findings that cross program characterization groups and findings for the characterization groups.

3.1.1 Target markets

A brief description of each of the program characterization groups is below.

HVAC Programs

The market penetration of the HVAC market is difficult for a number of reasons, the first being the high first cost of the equipment. It is also difficult because of the many different market actors (manufacturers, equipment dealers, installers, maintenance providers and facility staff) that need to be reached to increase market penetration. There are several types of third party HVAC programs in the statewide portfolio. These programs target RCx/control optimization and HVAC maintenance/tune ups.

Lighting Programs

Lighting has been a significant part of IOU incentive programs, but those programs have focused exclusively on lamp and ballast change-outs. The 3P Programs are going beyond the typical lamp and ballast retrofits to encourage advanced technologies and designs. By harnessing new technologies in the quickly changing lighting industry, such as advanced controls and LEDs, the 3P Programs are targeting specific market sectors with high energy savings potential.

Emerging Tech Programs

Several 3Ps responded to the IOUs' open solicitation with proposals to implement programs that focus on a measure or a small list of measures that were new to the market or struggling to gain market acceptance. These programs are working to gain market acceptance for these newer technologies. There are also two programs being run by SDG&E and SoCal Gas that incentivizes customers or vendors to implement newer technologies or large scale projects. These two programs were also included in the scope for this study.

School Programs

K-12 Schools can be hard to reach because they require assistance to participate in the programs. Schools focus on educating students and often have limited resources, both financially and manpower, to conduct energy efficient retrofits. The 3Ps overcome the financial barriers to participation by providing higher incentives or financing for the projects. The 3P Programs also provide design/engineering assistance to overcome the manpower constraints.

Retail Programs

The retail sector has unique needs. Since the turnover rate for retail establishments is much higher than for other business types within the commercial sector, programs must prove a relatively short payback time for building efficiency upgrades. The most effective measures, for both small local shops and large retail chains, are lighting and HVAC upgrades. Programs aim to educate retail clients about their energy savings potential and help them move forward on efficiency projects.

Grocery Programs

Grocery stores have the highest electric energy use intensity of all commercial buildings types with an average of 50 kWh per square footage area per year⁵. Refrigeration and lighting each represent about half and a quarter of the electric use intensity. In the grocery industry, the primary concern is not energy efficiency, but instead on refrigeration reliability. Programs targeting the grocery store sector are dominated by the latest in efficient refrigeration measures.

⁵ Energy Star® Building Manual, Facility Type: Supermarkets and Grocery Stores. Energy Star®. January 2008.

Data Center Programs

Data Centers are high energy intensive users. The equipment is very technical and has very specific requirements. In order to serve these customers the 3P Programs must have very technical engineering staff that is experienced with HVAC and data centers. The implementers have highly skilled staff that understand the needs of data centers and have strong ties to the industry trade groups.

Hospitality Programs

The needs of the hospitality sector differ largely between the large scale operators and the small mom-and-pop establishments. The large chains are looking for the greatest energy savings and the newest, latest technologies, while smaller establishments do not have the ability to fund large projects. They are instead looking for free or low-cost programs. By tailoring programs to niche, underserved segments of the hospitality sector, maximum energy savings can be attained.

Healthcare Programs

The healthcare sector is the second largest commercial energy consumer in California, yet energy costs only comprise about 1-3% of the total budget of hospitals. As a result, hospital administrators are reluctant to act on energy efficiency upgrades. Additionally, large scale building upgrades in the healthcare industry can be challenging because of strict OSHPD regulations. Programs are able to provide tailored industry specialization to encourage these kinds of enhancements.

Vendor-Implemented Programs

Vendor-Implemented programs are new to the portfolio in the 2010-12 program cycle. The programs are based on HVAC and domestic hot water measures. These programs are attempting to take advantage of the existing relationships between the vendors and their customers. The vendors bring financing assistance, technical skills and strong sales experience to the program. Historically the programs have been run by vendor-neutral implementers. This report is the first to look at this type of program implementer.

3.1.2 Program Characterization Sampling

Of the 49 3P Commercial programs, 46 were included in the results of this study. There are 3 programs that were studied in the SDG&E⁶ or SoCal Gas⁷ Nonresidential Process Evaluation (Sempra Studies) and not included in this project. If a program had been studied as part of the

⁶ SDG&E Non-Residential Process Evaluation Study. Heschong Mahone Group. March 29, 2012. This study was managed by San Diego Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission.

⁷ SoCal Gas Non-Residential Process Evaluation Study. Heschong Mahone Group. March 29, 2012. This study was managed by SoCal Gas under the auspices of the California Public Utility Commission in association with the California Energy Commission.

Sempra Studies and could be used included in one of the program characterization groups, HMG used the information collected during the Sempra Studies in this project. The information in the Sempra Studies was used to enhance the analysis of the study. For each program, HMG spoke with the Program Manager. If appropriate, HMG also interviewed other staff member such as engineers, directors, marketing staff or reporting staff. An interview guide was created for the 3Ps at the beginning of the project and was revised after a few interviews were completed. The interview guide was created to gain an overview of the 3P Programs. The interview guide focused the questions on the program components listed in Section 1.2 above. Table 4 shows the total number of programs in each characterization group and the number of programs interviewed under this study and under the Sempra Studies. A detailed list of the 3Ps that are included in the report is in Table 1 earlier in the report.

Program Characterization Group	Total Programs	Programs Interviewed for the 3rd Party Needs Assessment	Programs Assessed in the Sempra Process Evaluations
Lighting	4	4	
HVAC	5	2	3
Emerging Tech	4	2	2
Schools	8	7	1
Data Centers	2	2	
Retail	2	2	
Grocery	2	2	
Hospitality	6	6	
Vendor-Implemented	9	7	2
Healthcare	4	4	

Table 4: Program Characterization Groups

HMG also interviewed Third Party Program managers from SCE and PG&E that oversee the Third Party Programs. A separate interview guide was created for the IOU Third Party Program managers. The interview guide focused on the management of the 3P Programs and their perspective on the 3P Programs. HMG interviewed 14 IOU Third Party Managers from SCE and PG&E. Interviews from SDG&E and SoCalGas conducted under the Sempra Process Evaluations were reviewed and used to strengthen the findings from the other interviews.

4. THIRD PARTY NON-RESIDENTIAL PROGRAM PRACTICE ASSESSMENT BY PROGRAM COMPONENT

The evaluation team assessed the 3P Programs against EE Best Practices (EEBP) detailed in The National Best Practices Study⁸ and reviewed each of the programs to look for additional best practices. The EE Best Practices were created based upon administrator-run program and not 3P Programs. Some of the new findings and best practices will be unique to the 3P Programs as a result of their role in the portfolio. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each finding and how it applies to EEBP.

4.1 Program Theory and Design

4.1.1 Program Ramp Up

Most of the Third Party Implementers for new programs noted that the first year of their program was primarily spent creating relationships with their customers and building their sales pipelines. This approach has paid off during the remaining years of the program cycle, and the program managers (PMs) attribute much of their success to the time spent reaching out to customers in the first year.

Eleven other 3P Programs noted that they rolled out their programs on a more limited basis, because they did not have the funding to fully staff their sales and marketing departments. The companies were not willing to take the financial risk to market the programs without a commitment from the IOUs of being reimbursed for expenses. They noted that had there been payments for sales milestones during the first year, it would have helped them more quickly ramp up the programs.

Efficiency Vermont gives all new programs a two-year program cycle to ramp up their programs before they are expected to produce energy savings. The implementers focus on marketing their programs and developing their sales pipelines during that time. During the second program cycle, the programs are actually producing energy savings and will continue to market their programs to add to their sales pipeline.

⁸ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company

It can take at least a year for a 3P Program to gain traction in the industry. Paying 3P Programs to ramp up their sales process could allow the programs to obtain strong savings in the remaining program years. However, HMG recommends the 3P contract payment structure be more weighted towards ultimate program goals (energy savings, audits and/or conversion rate) after a designated ramp-up period, to ensure the 3Ps use the Time & Materials (T&M) budget appropriately, and to reduce spending for programs with little demand, despite good faith efforts at sales building by the 3Ps. The IOUs and the 3Ps should work together to determine the appropriate amount of funding necessary to fully ramp up the programs.

4.1.2 Program Focus Flexibility

Several of the sectors in the 3P Program portfolio are struggling due to the economic downturn which caused some of the programs to have difficulty selling their programs. Some 3Ps have programs in multiple sectors that are struggling economically (for example commercial offices, schools and restaurants). During the RFP process in 2008, these sectors were financially better off than they currently are. As a result, 3Ps have shifted their focus on other sectors that are not struggling as much economically to allow them to achieve savings.

There are also programs that have extremely narrow target markets, such as casinos or entertainment centers that can sometimes find it difficult to generate a backlog of opportunities. One hospitality program was initially designed to serve casinos on Indian reservations, which required long project lead times for several reasons. The IOU expanded the program scope to include any commercial buildings on reservation land; this took advantage of the relationships the program was building on the reservations to increase the savings that could be generated by the program.

The IOU contract managers (CMs) noted that several of the niched programs have almost completely saturated their market segments. The IOU Third Party Program Managers were unsure if there would be enough customers in the current segments to continue running a program in the next program cycle.

Overly niched programs have a difficult time meeting their goals if they do not have several sectors to target. Since economic conditions cannot always be accurately forecasted, broadening the scope to include several sectors can help mitigate the effect of unanticipated economic downturns on the programs and continue to generate savings, after the sector originally targeted is saturated (i.e., most customers in the sector have installed the measure or refused the program). For example, once the staff of the above referenced hospitality program had reached the majority of Indian casinos they were able to use their established connections to expand their focus to include other buildings on the Indian reservations as well. While flexibility is helpful for the 3Ps, it could pose some difficulties with the contracting process with the IOUs. SCE has recommended that a systematic approach be created to deal with the economic cycles to deal with all the programs in the portfolios. Further research should be conducted to determine the best method of dealing with economic cycles.

4.1.3 Single Point of Contact

Customers prefer to have a single point of contact. Chain customers with facilities across the state, such as retail stores, lodging or large grocery stores, prefer a single point of contact for all their facilities in California when they participate in programs. Other customers prefer having one point of contact to help understand the program opportunities available to them.

The IOU account executives (AEs) have mentioned that their chain accounts would prefer a single program for all of their facilities in the state. Understanding the different requirements for the programs across the state is difficult. Chain accounts would prefer to work with one set of requirements and a single point of contact. The 3Ps did not mention the need for a special chain account program.

Participants in the grocery sector are struggling to navigate the multiple program offerings and implementation types (core, third-party, local government partnership). The customers have to contact several programs to determine which ones they are eligible for. The 3Ps have noted that the grocery customers are resource constrained and the multiple points of contact cause confusion and added work. An IOU Account Executive (AE) that serves large retail chains noted that the large chain retail customers also expressed interest in having a single point of contact for the programs. The large chain retail stores are struggling to find the program contacts and understand the different program requirements.

There are many HVAC programs in the portfolios, run by various entities (some 3P and some Core). Learning about the various programs can cause confusion for customers, increase their participation burden or cause them to not participate. The 3Ps have noted that it has been difficult for some of their customers to find the appropriate program to participate in and those customers prefer a single point of contact for cross-program participation.

A single point of contact with comprehensive program offerings can guide customers through the various retrofit options and/or programs offered for their sector. For chain accounts, a statewide chain account program could be created. This would allow chain customer to have a single point of contact for all their facilities in California. For large customers, the AEs could serve this role if they are kept informed of program offerings and 3P contacts, and financially incented for savings earned through 3P Programs. For small customers, IOUs could explore the idea of assigning a 3P to a specific subcategory of customers, and providing a small T&M payment for acting as their single point of contact. If this is not possible, 3Ps should be given up-to-date information on other 3P contacts, and could be given spiffs for referring customers to other programs that ultimately install a project.

4.1.4 Contract Changes

During the program cycle, 3Ps are being asked to make contract changes without being compensated for the additional cost necessary to comply with these changes. The causes of these changes can be grouped into three categories:

- ◆ IOU mandated database changes,
- ◆ CPUC mandated regulatory changes, and
- ◆ IOU requested customer communications (outside of EE issues).

While many of the changes are required to keep the portfolios of programs operating effectively and complying with the regulatory requirements mandated by the CPUC, there are costs associated with these changes. When the changes occur, contracts are not renegotiated and the 3rd parties are just given added requirements without additional funding to cover the costs. When the 3Ps ask to renegotiate the terms of the contracts the request is categorically denied and the 3P often felt like the IOUs had the belief that this is the contract and you can take it or leave it.

The IOUs are trying to run their portfolios as effectively as possible. As technology changes, the IOUs need to update their databases. Some of the IOUs are also trying to integrate the EE program databases to their Customer Relationship Management (CRM) systems. These efforts are important to be to increase service for their customers.

In response to changing regulatory conditions, the CPUC will increase data requirements or change processes. These changes are in response to increasing the certainty of the energy savings to ensure that the ratepayers are receiving value for their investment.

The IOUs are looking to communicate with their customers in as many methods as possible to communicate changes in tariffs or other issues. Since many of the 3Ps are having conversations with their customers, it can be an effective time to ask the 3Ps to talk to the customers about these issues without adding a separate customer visit. Since the IOUs AEs are marketing the 3Ps without receiving additional monetary compensation, it does not seem to be a burdensome request to ask the 3Ps to assist the IOUs.

Several of the well-respected companies implementing 3P Programs in California discussed the struggle they are having with the administration of the programs. There are large changes to the process that are adding costs to administer the programs. They stated that if they did not have as much at stake to continue running the programs they would likely quit running the programs. They would like to come to the negotiating table with the IOUs and to approach the contract as equals working towards a mutually beneficial result. The 3Ps would like to be considered important players in the market and to be treated as equals.

It is important for the CPUC, IOUs and the 3Ps to understand the costs associated with additional requirements. If the programs will no longer be cost effective because of new requirements, this should be communicated across all parties and an informed decision should then be made to move ahead with the additional regulatory requirements or to hold off. Currently there is no mechanism to discuss the financial cost to the programs for new requirements.

When there are large changes necessary to the contract, the IOUs and the 3P should be renegotiate the contract to come up with terms that are mutually beneficial. If there is an impasse in contract terms, the IOUs and 3P should be able to work with an impartial mediator to work out the contract dispute.

4.1.5 Comprehensive Measure Mix

Eleven percent of all the applications paid by the commercial 3Ps included 3 or more measures. Most applications included only one measure. There appears to be two different issues contributing to less comprehensive projects.

Currently, there are 8 programs with single end use programs, such as ozone laundry or kitchen range hoods, that do not offer a comprehensive approach to retrofits. Staff members of one of the single measure programs noted that they tried to refer customers to other programs. The 3P was unsure how many of the customers took advantage of the other 3Ps. In the interviews with the 3Ps, it was stated that very few had program participation that resulted from a customer being referred by another 3P.

Eight of the 12 comprehensive programs have discussed the difficulty of implementing comprehensive projects when there are completing Direct Install (DI) programs. When a customer is working with a comprehensive program and a DI program, the customer will move ahead with the DI project (often a lighting only project), and the comprehensive project will not move forward. Customers appreciate getting the free measures and will take the savings associated with the DI program and lose motivation to install a comprehensive and more capital intensive project. The other struggle for the more comprehensive programs is that funding a comprehensive project without the lower payback measures is difficult because the project payback will not meet the customer's financial threshold.

The portfolio may benefit by establishing a more comprehensive approach to projects through comprehensive programs. This streamlines the participation process for customers, as they do not have to determine and balance the requirements and timelines for several programs. Creating a comprehensive program could be difficult since some of the measures being implemented by the 3Ps are unique and may require specialized knowledge or skills to implement those measures.

4.1.6 Streamline the Program Management Structure

One 3P reported that they initially contracted with a firm to do the reporting and tracking for their programs. After a year, they determined that it was not cost-effective to hire out these responsibilities. Now the 3P internal staff is responsible for marketing, reporting, and engineering for the programs. The program staff noted that the administrative costs to run the program decreased substantially when they moved the reporting in-house.

A different 3P reported that although they serve as the liaison with the IOU, they have a company doing outreach, another doing the installations, a third doing reporting, and the IOU AEs are also doing considerable marketing for the program. The prime contractor for the program was very aware of the marketing and outreach for the program but was not very aware of the field work and the reporting. The IOU contract manager (CM) noted that this 3P is one of the most costly (\$/kWh) in the portfolios.

A couple of the IOU CMs stated that the programs in the commercial portfolio that do not cover at least two of the three tasks – marketing, reporting and engineering – were less cost effective than those that did. It was also noted that less direct work by implementers with many subcontractors on the program may also reduce the 3P implementers' understanding of customers' needs or concerns, program operations, or other important aspects.

4.1.7 Program Qualification Changes

Changes to program market sectors or policies and procedures during the program cycle should be avoided wherever possible. Some of the 3Ps have struggled with changes in customer qualifications during the program cycle, such as the change in the definition of “small and medium commercial customers”. These changes cause confusion and frustration. There were customers who participated in the programs in the beginning of the program cycle and attempted to participate again at additional sites. The 3Ps were forced to turn away the customers because the customers no longer qualified for the program. The customers were frustrated and forced to find another program to participate with different participation processes. Some changes to program policies mid-cycle may be unavoidable but in general should be avoided whenever possible. When it is unavoidable to make these changes, the 3Ps and the IOUs might want to allow a grace period for customers to participate in the original program for a period of months to minimize the impact on returning customers.

4.1.8 Hire Experienced Program Management

A PG&E Contract Manager mentioned that the success of the 3P Program was directly a result of the 3P PM running the program. A bad PM could hinder a successful program and a great PM could make a bad program design successful. For several of the 3P Programs, when the PM changed mid-cycle, the programs began producing considerably more energy savings.

In the interviews, some of the PMs discussed making changes to the incentive levels, marketing strategies and field staff. These PMs also mentioned reviewing the program processes to find ways to streamline the process. Though HMG could not corroborate the effects of these changes, it appears that changing the PM for these programs was integral to the savings achievement.

A productive PM can take a less effective program theory and make it succeed. A less effective PM can keep a program from succeeding. In the program monthly reports, in 5 or 6 programs after a program manager was changed the programs saw an uptick the energy savings achieved after a short period of time. These upticks match up with the changes in the programs’ marketing and management practices after the program manager was changed. While this is not conclusive, there is evidence that changing the PM did make a difference in the savings achieved by the programs.

4.1.9 Maximize Net Program Savings

In a few programs, we noted that energy savings projects may not have been installed because of attribution or industry standard concerns. These cases should be communicated to the IOUs and addressed to promote the overall goal of programs—maximizing program net savings. In other cases, there are projects that are not being implemented because of confusion over which programs should be serving the customer.

In the SCE data center program, the PM noted that server virtualization projects are considered standard practice by the IOU and the CPUC. In the PM’s program experience, there are a sizeable number of customers that are not implementing server virtualization because of upfront cost. The retrofits are not occurring, because the customers are not receiving rebates due to free ridership concerns. As a result, savings are not being achieved.

The Energy Efficient Parking Garage (EEPG) program implementers suggested that barring their program from government properties, due to conflicts with local government programs (LGPs) regardless of if the LGPs plan to work in the parking garages, have resulted in lost opportunities for savings from parking garages. The EEGP program also suggested that there were lost opportunities in the healthcare sector due to lack of cooperation with healthcare-specific 3P Programs. The EEGP program implementer stated that they had referred the interested customers to the other programs but believed that those programs did not incentivize the projects and the customers did not install the projects.

In the Enhanced Automation Program, the PM stated that he did not think that controls optimization was being implemented in the government accounts, but that these accounts could benefit from the measure.

The CPUC, IOUs, and 3Ps should work together to identify missed cost effective (CE) net savings opportunities, and develop strategies to minimize them. Any missed CE net savings opportunities should be reviewed to ensure that the portfolios are capturing any savings opportunities to help meet the goals. To be able to claim these savings there are program rules, CPUC policies, and IOUs rules that would need to be potentially revised. This is a complex and time consuming process for all involved.

4.2 Program Management: Project Management

Best Practices
Program Management: Project Management
Use well-qualified engineering staff
Use electronic project management tools
Maintain consistency in personnel over time with both the IOU and 3rd Party Staff
Develop and maintain clear lines of responsibility and communication with the IOUs
Work with manufacturers to drive product improvement & advancement
Keep 3rd Party Implementers well informed about program features and changes through seminars, training sessions and annual meetings of key groups

Table 5: Overall Program Management - Project Management Best Practices

4.2.1 Use a Well-Qualified Engineering Staff

Before a 3P Program can implement a custom project the IOUs will have an IOU-funded engineer review and approve the project. The IOU engineering review should focus on reviewing the measures being addressed in a project, rather than an open ended review. In addition, the engineering reviewers should be experienced in the technologies they are reviewing. This should result in a thorough engineering review on the relevant equipment and calculations. This is consistent with a best practice from the EE Best Practices Study on Non-Residential Large Comprehensive Incentive Programs (EEBPLC).

Nine of the 3P Programs that implement custom projects noted that the engineers reviewing their projects sometimes got caught up on obtaining very detailed information, like the thickness of the internal walls and exact window type, that did not have a significant impact on the installed measures. The 3Ps also mentioned that the engineering review focused on determining if the project selected was the most efficient option available rather than if the project savings were accurate.

Several of the 3Ps reported that it was not unusual for junior engineers to complete the site visit. They mentioned that it added significant time, which impacted the customer and the 3P staff that were accompanying the reviewer. The 3Ps were also having to educate the reviewers on common technologies installed and the savings calculations.

The IOUs are asking for more detailed engineering review in response to recommendations from past impact evaluations and the early ex ante review (EAR) process. As the commission and evaluators increase the need for increased accuracy and rigor to the energy savings calculations, the IOUs will respond to meet the requirements. HMG recommends that at the beginning of the program cycle the IOUs and the CPUC work together to determine the appropriate level of rigor for custom projects. The discussion should include the implications that the increased rigor will have on the projects in terms of time and cost.

3Ps should spend time moving customers through the sales process rather than educating the reviewers. If engineering staff are not familiar with the technology, IOUs could provide additional budget for 3P to educate the engineers about the technologies in the program.

4.2.2 Use Electronic Project Management Tools

All of the 3Ps are using some form of electronic program management tools, which is a best practice identified in the EEBP report. These tools assist the implementers in managing the programs. The complexity and functionality of the tools depends upon the complexity of the program management process. These tools overall appear to be helpful in managing the programs.

4.2.3 Maintain Consistency in Personnel Over Time with Both the IOU and Third Party Staff

Maintaining consistency in personnel over time with both the IOU and 3P staff allows the programs to maintain institutional knowledge and reduce program disruption. The majority of staff appears to have been in place over the program cycle. There are only a few cases where staff at the IOU level or 3P level changed mid-cycle. Maintaining consistency in personnel is consistent with the best practices noted in the EE Best Practices Study on Non-Residential Large Comprehensive Incentive Programs (EEBPLC).

Over two program cycles the Comprehensive Retail Energy Management Program (CREMP) experienced two switches of IOU PMs and this was reported to be very disruptive. Both times the IOU institutional knowledge as well as verbal agreements were lost in the transition and the 3P PM had to take non-budgeted time to re-build a new relationship with the IOU PM.

While not recommended, in the case of a mid-cycle staff change, the existing staff should transfer their institutional knowledge to the new staff before leaving.

4.2.4 Facilitate IOU – Implementer Communication

Close communication between the IOU Third Party Program staff and 3P Program implementers is helpful to ensure that the programs are meeting targets and to discuss best practices that are being gleaned from other programs. This should include both frequent communication to resolve day-to-day issues, and occasional meetings to discuss larger, long term issues and goals. Agreements between the IOUs and the 3Ps should be documented in writing to avoid misunderstandings later on. This is consistent with a best practice from the EEBPLC, develop and maintain clear lines of communication.

Over half of the 3Ps interviewed indicated that the IOU Third Party Program staff has shared ideas and best practices that helped them refine their processes. SCE also puts out a quarterly newsletter that shares ideas and best practices with all the 3Ps. The 3Ps have been able to successfully adapt their program process with SCE's help. The IOUs also stated that keeping in close contact with the 3P staff allowed them to understand how the programs were running and to help the 3P find solutions to issues.

Overall, communications among IOU Third Party Program staff and 3P staff for all programs appears to meet the needs and expectations of each. Both the IOU and 3P staff members were flexible with meeting schedules and check-ins so that communications worked fluidly to meet the needs of the programs. However, it appears that the quarterly meetings are functioning as simply another monthly meeting, instead of addressing larger over-arching issues, as intended.

Especially for new 3Ps, having timely IOU feedback on program performance is vital to program success. Making the structure of the communication flexible allows the programs to receive the level of attention needed, as it varies throughout the program cycle.

4.2.5 Inform Product Development

3Ps should work with manufacturers to drive product improvements and advancements. Targeted programs can craft performance requirements in coordination with customers and manufacturers to deliver products that meet customer needs and deliver deep savings.

One of the lighting programs worked directly with both customers and manufacturers to develop performance standards for products to be qualified in the program. By taking customer needs into consideration, the program was able to make high performance LED products more cost effective than lower quality products, and helped spur customers to change to higher efficiency LED technology earlier than they otherwise would have.

In the healthcare sector, there must be special care and sometimes special equipment to meet OSHPD regulations. Educating vendors and contractors on specific requirements and driving vendors to produce products that both fulfill the requirements of OSHPD and bring greater energy savings yields many advantages. Investing time to educate vendors and contractors on technologies the programs currently support could increase participation levels and capture more hard to reach market sectors. This is not currently a focus of the program's marketing but could benefit greatly by investing time and materials in educating individuals in the field performing installations.

An awareness of the market and the key players in that market is required to successfully interface with product manufacturers and program customers to produce a higher quality product. Coordination with manufacturers, and customers where possible, can help bring new high quality products to the market sooner than otherwise would have been possible.

4.2.6 Provide Education on Regulatory Process

By including non-traditional implementers in the process, the IOUs are harnessing large sales organizations who possess different customer relationships. This can provide greater market penetration. However, many of these 3Ps are unfamiliar with the regulatory structure or requirements. There are some 3Ps that already have a pretty good understanding but it needs to be consistent across the portfolio. It is important that all 3Ps have a clear understanding of the regulatory process, terminology, best practices and resources available to them. This will help make the programs more effective and avoid duplicative efforts.

Some 3P Program implementers also have an inconsistent or incomplete understanding of some of the regulatory concepts, such as free-ridership, cost effectiveness and the dual baseline.

New 3Ps should be educated on the regulatory process, terminology, best practices and resources available for their sectors. There should be a clear process for how 3Ps are updated on regulatory requirements, such as specifying which IOU staff member will notify them of new reporting requirements, updates to DEER, and more. Though the implementers are familiar with the measures they are implementing and with the energy efficiency sector in general, working with the CPUC and the IOUs adds a level of complexity to the process that implementers do not always anticipate. Seminars that educate new 3Ps on acronyms, regulatory terminology, and the vast resources available in California would reduce the time required for program ramp up. The same education materials could also be made available through webinars or seminar presentations. Thus, once this material is developed, it should be easy to administer and update as needed.

Several of the new 3Ps have struggled to understand the process and the resources available to them. One 3P noted that they spent considerable time getting up to speed on the regulatory process and they struggled to find the up-to-date measure codes. For the first year of the program, they were using an outdated list of measure codes, which made reporting difficult since their measures were continuously rejected.

4.3 Program Management: Reporting and Tracking

Best Practices
Program Management: Reporting and Tracking
Integrate all program data, including measure-level data, into a single database
Minimize documentation requirements
Articulate the data requirements needed for measure success

Table 6: Overall Program Management - Reporting & Tracking Best Practices

4.3.1 Integrate All Program Data into a Single Database

The EEBPLC lists using a single database to track all program data and to integrate or link all systems that are used to manage the programs.⁹ From our interviews, we learned that 18 of the 3Ps have built program tracking and management tools that were designed to include all aspects of program management and tracking. Innovative solutions to tracking include the use of drop-down menus so no spelling errors occur and data can be reliably computer analyzed, and programmable reminder emails that are automatically sent according to different program activities and deadlines.

Other 3Ps are using the tracking system that has been determined by the utility to manage their programs (for example, SMART or CRM). For 3Ps that are working with a smaller number of large projects, they are usually using a spreadsheet to track program participation. The 3Ps for these programs found this to be easy since it allowed for a lot of customization without a lot of development cost.

The use of a well-designed program tracking tool is a key component of successful and accurate program management. The exact type of system is not that important as long as it contains the appropriate information. Tracking systems should house data on projects from initial contact through to verification. Sales data, e.g., potential customers and market actor contacts are currently tracked very informally, and could be tracked more effectively using a system similar to (ideally integrated with) the wider project tracking system. This data would allow both the 3P contractor and the utility to gain a better understanding of which sales strategies are successful.

4.3.2 Minimize Documentation Requirements

Seven of the 3Ps have reported that the current one-size-fits all reporting requirements are overly cumbersome for simple retrofits like lighting. The reporting process requires a large amount of time to comply with the requirements. Sixteen of the 3Ps stated that the streamlined requirements from the IOUs (PG&E) have eased their reporting burden, but some elements such as the Bulk Load tool are still cumbersome and could benefit from more automation or simplification.

One of the IOU CMs stated that they were moving to the IOU CRM tool and that it will be less intuitive than the current tool, SMART. They suggested that the change to CRM will increase the reporting burden to the 3P. While there are likely great benefits to the IOU to use their CRM system for reporting, the burden it will place on the 3Ps should be considered and steps should be taken to reduce it. Some of the steps could be education or IT assistance if necessary.

Reporting processes and requirements should be streamlined as much as possible. The data requirements should be reviewed for the different types of programs to ensure that the requirements are commensurate with the program type. Changes that can be easily made mid-

⁹ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company

program cycle without complication for implementers should proceed, but major systematic changes should be made at logical transition points.

4.3.3 Articulate the Data Requirements Needed to Measure Success

A best practice in the HVAC Programs is to clarify the implementation requirements through the contracting period. This was only discussed by three of the 3Ps but was identified in the previous EEBP. The IOU and the 3P should discuss the requirements of the engineering review and the 3P's approach to meeting it. Acceptable calculation methods and appropriate documentation should be established in the beginning. When measures are added to the program, there should be an agreement on the approved calculation methods and documentation for the added measures.

One of the 3Ps planned to use proprietary engineering software to determine the energy savings for their projects. The original budget and compensation estimates were based upon using the software. One of the IOUs disallowed the software because they said that they could not verify the accuracy of the energy savings calculations, but the same software is being used in a different service territory. Changing the acceptable calculation tools increased the cost to the 3P to run the programs. The program performance payments did not increase to account for the increased costs. This also created inconsistency in how the program is implemented at the two utilities.

The contracting process should be detailed to ensure that all important process-related issues are established before the contract is signed and the program begins. This ensures that the 3P and the IOUs are on the same page when it comes to program requirements.

4.4 Program Management: Quality Control and Verification

4.4.1 Streamline Project Approval Process

One of the biggest issues that the 3P custom programs are facing is the project approval process. Ten of the 12 3Ps that implement custom projects discussed this issue in the interviews. Prior to 2011, the 3P custom project approval process consisted of preliminary engineering analysis included in a report that was submitted to the customer. If the customer approved the report and agreed to the proposed measures, they submitted an application and the energy savings were "trued up" in the M&V process. The process changed to accommodate the new environment where savings are finalized at their ex-ante values. Due diligence in this environment demands there be a process to complete reasonable independent verification of submitted ex-ante savings claims for custom projects. Without such a process, custom project savings would be finalized without any controls, i.e., no review or verification by an independent entity. To fill this important gap, the Ex-Ante Review (EAR) process for custom projects was introduced in 2011. The EAR is a process where the CPUC (or its evaluators) selects a few custom projects, and then reviews these projects closely at each stage, including reviewing ex-ante savings claims, and accompanying inspections. The EAR process not only provides needed verification of custom project savings in a world of frozen ex-ante savings, but also involves early in the project a specification and savings determination process. Early communication and collaboration in determining savings offers an opportunity to create timely feedback and a more unified process to reduce the misunderstandings

that may have contributed to wide discrepancies between ex-ante and ex-post savings experienced in previous cycles. The EAR process was intended to work in parallel with the existing internal IOU review processes.

As a result of the EAR process the IOUs are requiring that the 3Ps provide more detailed upfront engineering calculations to receive application approval for all projects. The IOUs requirement and reasoning is explained in detail in the Core Calculated Program Assessment Report, being conducted by the CPUC.

The 3Ps cannot give their customers an estimate of the project incentives until the application has been approved. To gain the approval, the 3Ps are required to perform rigorous engineering calculations. Customers will not make the decision to move forward with a project until they know the incentive amount. Thus, rigorous calculations must be completed before the customer commits to a project. Only after project approval and incentives are set, the customer will decide if they want to install the project. Customers will often make modifications to the project after receiving project approval, which changes the incentive amount, savings and costs. The revised project then needs to be re-engineered by the 3P and re-approved by both the customer, the IOU and –if the project is among those selected for the EAR process - the CPUC.

The original process allowed the 3Ps to initially spend much less time on each project before the customer agreed to the project. The lower rigor approach was sufficient to meet the requirements of ex-post savings verification. In the current process, the 3Ps spend more engineering resources on projects and at a point in the project cycle where there is a risk of rejection by the customer. While some 3Ps have time and materials components in their contracts – others are paid only for installed savings – and thus, the investment in a project that is ultimately rejected represents losses to the 3Ps.

The EAR process was intended to work in parallel with the current review process and it was intended to not change how the process worked or increase the amount of time required to review projects. However, the process has changed. There are many factors that contributed to the change – there is a learning and feedback loop between evaluators and project sponsors inherent in EAR that is new and demanding of both parties; there is also an added weight to the process due to the importance and finality of the EAR outcomes. One of the changes observed in the project approval process is that the IOUs are requiring a more rigorous engineering review before providing a preliminary incentive estimate. Although not all custom projects are selected for EAR, when a project is selected the IOUs are reticent to finalize payment of project incentives until the outcome of the review process is known. While no 3P Program project was reviewed when the report was written, interviewees were concerned because they expected 3P Program projects to mirror what had occurred with core projects. That is, although the process is intended to run in parallel, since the EAR process is the final determination of the viability of the project, it is in the critical path of the project. In order to minimize risk, 3Ps choose to hold EAR reviewed projects until savings estimates are finalized. For this reason, there was respondent concern that projects may be delayed while the EAR process is completed. Delays can cause problems and costs to customers and this complicates the project procurement process.

At the time of the interviews completed for this study, none of the 3P projects had been selected for the EAR review. Despite this, the 3Ps experienced and were frustrated by the challenges

associated with the more rigorous engineering and documentation requirements from the ED and IOU sides, which were both related to the new EAR process. The 3Ps report that the additional analysis and documentation can double the application review and approval processing time, and that some customers have become impatient and dropped out of the program. While the program drop outs were reported by the 3Ps, HMG could not independently verify the program drop outs.

The ESCO industry has successfully used the preliminary engineering analysis approach for many years. The ESCO model relies on ex-post verification, as the projects are paid for when energy savings are realized. Thus, while it may be useful to revisit the ESCO model, the model does not readily translate to an environment where savings are frozen at their ex-ante claim value. In the ESCO and retrofit industry, vendors approach a customer with a preliminary design and savings estimate. The customer will review the preliminary engineering estimate and make the decision to go ahead with the project and move to the next step of a detailed and refined engineering analysis. Customers are usually informed that the energy savings and any associated incentives are estimates and may change based upon as-built conditions. Typically this is an iterative process where the ESCO and the customer work together to create a project that meets the needs of the customer. The energy savings and the incentives can change throughout the process as the design changes, which the customer fully understands. An iterative process will decrease costs to the 3Ps because it will reduce the amount of up-front engineering work done on projects where the incentive is not enough to motivate the customer.

One of the major reasons for successful 3P Programs is that the program implementers are knowledgeable about the measures that are in their programs and able to create accurate savings estimates for the customers and build in schedules that meet business requirements. Their engineering calculations and models have been refined for years to ensure that they provide an accurate estimate of savings. In addition, the programs are collecting the necessary inputs to the engineering calculations or models to ensure accuracy of the estimates, which in turn are firmed up as the projects move into the final approval stage.

Retrofit projects are often changed during construction due to changes in technology availability, operational changes, or financial concerns. These changes usually make only a minimal difference in the savings. When these construction changes make a substantial difference in the savings or incentive, the customer is informed and approves these changes.

HMG recommends that custom projects should receive an initial incentive estimate based upon preliminary engineering calculations. This could happen during the preliminary design and analysis stage. The program representative could communicate to the customer that the incentive approval is preliminary and the amount and final approval would come later. The customer would make the decision about moving forward with the project at this stage. If the customer decided to move forward then the customer and the program representative would work together to finalize the project scope and energy savings, though final approved savings might still change due to EAR or IOU engineering review. This “finalized” project could then begin the IOU engineering review and the EAR review, if the project was selected. The 3P could subsume the risk associate with a lower incentive payment ultimately approved by the IOU review and/or EAR processes. This process would more closely mirror the typical ESCO sales process and reduce the time delay

burden on the programs, but maintain a high degree of quality control through the need to manage risk of review outcomes.

4.5 Program Implementation: Marketing and Outreach

Best Practices
Program Implementation: Marketing & Outreach
Leverage utility credibility to help vendors 3rd Party Implementers to sell the program
Leverage partnerships with community-based organizations, trade groups and Industry Associations
Develop and disseminate case studies of key technologies and segment applications

Table 7: Overall Program Management - Marketing and Outreach Best Practices

4.5.1 Leverage Utility Credibility

Approximately half of all the 3Ps mentioned the importance of leveraging the IOUs’ credibility as vital to operating the programs. This appears to be necessary in the beginning of a new program. In the EE Best Practices for Non-Residential Lighting Programs (EEBPL) it states that the programs should leverage the IOUs’ credibility to help sell the programs. HMG believes that this Best Practice can be applicable to all types of 3P with a little refinement.

The IOUs have cultivated strong relationships in their service territories that can be used by the 3Ps. This has helped the 3Ps gain credibility in their respective markets. While they can be helpful, the AEs should not be entirely responsible for marketing the 3Ps. The 3Ps should have customer relationship or industry contacts that help market the program.

4.5.2 Leverage Industry Associations and Trade Groups

In the EE Best Practices for Non-Residential Lighting Programs (EEBPL), it states that the programs should leverage partnerships with other organizations. Based upon this research, HMG believes that this recommendation should be refined to be applicable to all types of 3Ps. Fifteen of the 3Ps mentioned that leveraging participation in industry trade groups and associations was helpful to promoting their programs and bringing in projects. Attendance at trade shows can help gain program credibility and visibility with industry decision makers.

According to the interviews conducted, both lodging programs noted that their involvement in a number of industry associations, such as the California Hotel and Lodging Association, helped the programs gain credibility and customer contacts.

One vendor-implemented program has found success working with the Golden Gate Restaurant Association. It has been an effective method of marketing the program. One of the officers in the Association has participated in the program and is communicating the project to the Association members. This has been very helpful to increase participation in the program.

In the healthcare sector, 3Ps can participate in organizations and trade groups serving the healthcare community (e.g., California Society for Healthcare Engineering, etc.), and/or they could conduct targeted marketing toward hospital executives.

One 3P school program is working through the Child Care Resource Network. Another potential organization in the school sector is the California Association of School Business Officials (CASBO).

The private school programs have encountered difficulty in working with the private school associations such as the Roman Catholic Diocese or California Association of Private School Organization (CAPSO) to help disseminate information about the program. Those groups are more narrowly focused on education or do not have enough influence with the school business officials. The private schools are not as active in CASBO as the public schools are. The private school programs have found better success creating relationships with the individual private schools.

Marketing to associations and trade groups, is more time-effective than targeting individual customers. It is also effective for gaining customer trust. 3P implementers can develop a network, if they are not already connected, fairly easily by attending conferences, liaising with industry associations, and other trade groups. The exception to this recommendation is the private school segment because the private school associations are not focused on facility issues or are not attended by decision makers.

4.5.3 Utilize Case Studies

Approximately nine of the 3Ps are utilizing case studies to help promote their programs. Utilizing case studies was also determined to be effective in marketing the program in the original Best Practices study.

Two data center programs have produced a small number of case studies on successful projects. The case studies are considered by the 3P to be helpful in selling projects. Case studies have not been produced more often because of cost. In the next program cycle, it would be helpful to structure program funding to allow for the production of case studies.

For a school program that has used case studies it has been helpful to show savings achieved and benefits of the program. Often school officials have close relationships with other districts and share best practices and potential savings methods. Success stories from energy efficiency projects can be shared to give districts confidence in the program and gives them a reference they can call to get further unbiased information on the program. The program considers this to be a successful marketing approach.

Using case studies is a helpful method of educating customers on the benefits of the energy efficient technologies and demonstrate the potential savings.

4.6 Program Implementation: Participation Process and Customer Service

4.6.1 Streamline Participation Process

All of the 3Ps have found success in streamlining or simplifying the participation process. 3Ps cited a variety of strategies for streamlining the customer experience, tailored to the specific market and customer base for each program. These strategies include:

- ◆ Completing and processing incentive applications for the customer;
- ◆ Floating the incentive costs so that the customer only pays the difference between the project cost and the incentive;
- ◆ Assuming the administrative tasks of the program process for the customer;
- ◆ Creating a single decision point for customers;
- ◆ Reducing the time necessary to complete the participation process by shortening the customer forms (as was done for Energy Efficiency for Entertainment Centers); and
- ◆ Connecting customers with contractors who continue to work at lower rates even after the program has moved on.

3P Program implementers maintain customer relationships by assisting customers throughout the entire project process and offering continued support for efficiency. Additional assistance for customer participation creates greater customer satisfaction and can lead to more referrals and a higher level of overall success. Assisting customers through the participation process is already common throughout the 3P.

4.6.2 Encourage Cross Promotion

Currently, 3Ps are unlikely to coordinate because they see each other as competition and have no incentive to cooperate with one another. There is a lack of coordination among 3Ps even if their respective programs should not be competing. For example, a lighting program has found other programs uncooperative, even if the other programs do not address the same sectors or measures. The programs are not incentivized to work together, and unless the same implementer operates multiple programs, there is no cooperation. However, HMG has found two PG&E grocery programs that target different sectors of the market (one targets large, the other small grocers) that do cross-promote their programs.

A healthcare program reported that they included the rebates from other programs in their customer recommendations and attempted to refer customers to other programs when possible. The PM stated that it was occasionally difficult to determine the contact for some of the other programs. The PM thought that cross-promotion would be more likely to occur if there were an incentive for programs to make these connections.

Another 3P has created an informal database/navigation tool with current program contacts and eligibility requirements. Information about each 3P Program would facilitate greater cross-promotion. This database does not necessarily contain the most up-to-date contact information

since that information is changed without updating all the 3Ps. This implementer has stated that having an IOU-developed database with the contact and program information for all the 3Ps would facilitate greater cross promotion.

5. HVAC PROGRAMS

5.1 Category Characterization/Description

Third Party Commercial HVAC Programs have two major focuses, quality maintenance (QM) and RCx/control optimization. The California Long Term Energy Efficiency Strategic Plan has identified HVAC quality maintenance and installation as an area for improvement. The majority of the HVAC inventory in the state is inefficient and poorly maintained which increases the energy usage and peak demand. Most service providers are not properly educated on energy management. Third Party QM programs are being deployed to increase the efficiency of the existing equipment through tune-up and optimization. These programs are also educating equipment service providers on optimizing equipment performance and efficiency. The RCx and Control Optimization programs are working to improve the efficiency of existing equipment.

To meet the efficiency needs of the HVAC sector, three 3P commercial programs were given implementation approval for PY2010-12:

1. Air Care Plus (PGE2181) - Implemented by Portland Energy Conversation, Inc. (PECI), this program provides performance optimizing maintenance for commercial HVAC systems with a capacity of three to 60 tons.
2. Non-Res HVAC Tune-up/Quality Installation (a.k.a. Premium Efficiency Cooling) (SDGE3161) - Implemented by Conservation Services Group, this program provides assistance with installation and maintenance of medium and large commercial spaces, and incents the market at various points (up, mid, and downstream).
3. Enhanced Automation Initiative (EA) (PGE2186) - Implemented by KEMA Services, this program provides incentives to 100,000 square foot or larger spaces to improve building automation systems.
4. Retro Commissioning (RCx)(SDGE3170) - Implemented by Portland Energy Conversation, Inc. (PECI), this program provides incentives to facilities 100,000 square foot or larger spaces to improve existing systems and equipment.
5. Gas Cooling Retrofit (SCG3672) - Implemented by Cypress, this program provides incentives for efficient gas cooling units up to 100 tons. The program targets small and medium businesses.

5.1.1 Technologies

Most HVAC programs focus on the following types of HVAC equipment:

- ◆ Air Conditioning units,
- ◆ Heat Pumps,
- ◆ Evaporative Coolers,
- ◆ Packaged Terminal AC units,
- ◆ Packaged Terminal Heat Pumps,
- ◆ Packaged Economizer units,

- ◆ Refrigerant Charge testing,
- ◆ Refrigerant Charge and Airflow,
- ◆ Programmable Thermostat Adjustment or Replacement,
- ◆ Economizer Control Installation,
- ◆ Condenser Coil Cleaning,
- ◆ Evaporator Coil Cleaning,
- ◆ Economizer Adjustment and/or Repair; and
- ◆ Split System Quality Installation (charge optimization on installation).

The HVAC programs are designed to perform comprehensive HVAC retrofits or to properly tune and maintain the equipment.

5.1.2 Interventions

The HVAC programs offered interventions to help facilitate projects to participate in their program, and they are as follows:

- ◆ Facility Audits,
- ◆ Rebate and Incentives, and
- ◆ Technical Assistance.

Each program offered at least one of the interventions above to overcome market barriers. There are many HVAC market actors that need to be brought together. Emerging technologies are new to the market and have not been widely promoted. Therefore, when one of the above mentioned interventions is used to facilitate a customer to participate in the program, the result can be broader acceptance of the technology.

5.1.3 Marketing and Outreach

The HVAC programs are using a variety of marketing methods based upon their target markets. The Enhanced Automation program is using the PG&E Business Customer Division (BCD) representatives and vendor referrals to reach the appropriate customers. The program also received billing information for customers in their target markets and is using that information to market to customers that would be a good fit for their program. The RCx Program and the Air Care Plus Program are using existing relationships with industry trade groups, service providers, and individual customers to market their program. The Premium Efficiency Cooling Program is using the Non-Res HVAC Tune-up website and brochures to market their program. They are assisted by the SDG&E AEs that will pass along program collateral to their customers.

5.1.4 Long Term and Short Term Outcomes

The short term goals of the programs are to meet or exceed the program energy savings goals. The quality maintenance programs, Premium Efficiency Cooling Program, and Air Care Plus Program, provide technical assistance to facilities, and then provide a list of potential measures that could be installed at those facilities. The RCx Program has RCx providers that provide a facility overview for customers that details the potential measures that each customer could implement. The Enhanced Automation Program provides audit and engineering assistance to customers to create a project

that will optimize the building control systems. The long term goals of the program are to educate customers and vendors on maintaining and optimizing equipment in commercial buildings.

5.1.5 Evolution of this Program Category

The Enhanced Automation program began in the 2006-08 program cycle and was successful at targeting medium and large customers and creating energy savings by optimizing their control systems. The program continued into the 2009 bridge funding period and the 2010-12 program cycle. In the beginning of the current program cycle the IOU modified the program's target markets and limited the program to serve companies defined by certain NAICS codes. During the program cycle the program could target other customers if they received IOU approval. The list of measures for the program was also initially limited during this program cycle. After discussions with the IOU the implementer was able to implement the comprehensive list of control measure that was included in the 2006-08 program cycle.

The Premium Efficiency Cooling Program began in the 2006-08 program cycle. The program has experienced changes including modifications to equipment provided, mix of upstream versus midstream vendors engaged, market served, and services provided. In 2011 the CPUC required that the programs offer measures that are consistent with the ASHRAE/ACCA 180 standard under the Statewide QM.

The RCx Program began in PY2006-08 and in the current program cycle the program made changes to better identify potential facilities. The changes include a modified participation process and the customer payback changed from a one year payback before incentive to a two year payback after incentives.

The Air Care Plus program is a continuing program from PY2006-08.

5.1.6 Program Savings Achievements

The HVAC programs are all expected to meet or exceed their current program goals. The Air Care Plus Program has exceeded their savings targets. The Enhanced Automation program has exceeded their therm savings targets and the program staff expects to meet their electricity goals. The RCx Program is fully subscribed and expected to meet their goals. The Premium Cooling Program has received a change order that reduced their goals. The program is meeting their revised goals.

Figure 1, Figure 2, and Figure 3 below show the installed savings for the programs throughout the program cycle. At the time of the report HMG did not receive a confirmation of the new goals for the PG&E programs so the goals reflected in the table for 3Ps in the PG&E service territory are the original goals filed in the PIPs.

Energy Savings (Gross Annual MWh)

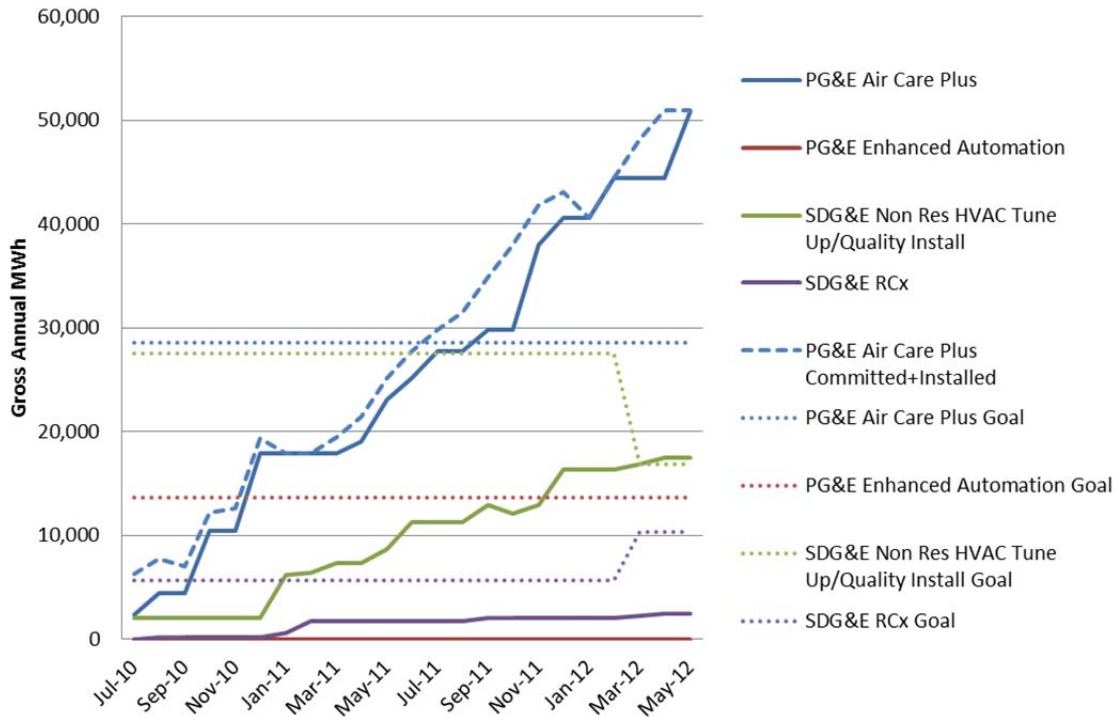


Figure 1: HVAC Program MWh Energy Savings

Demand Reduction (Gross Peak kW)

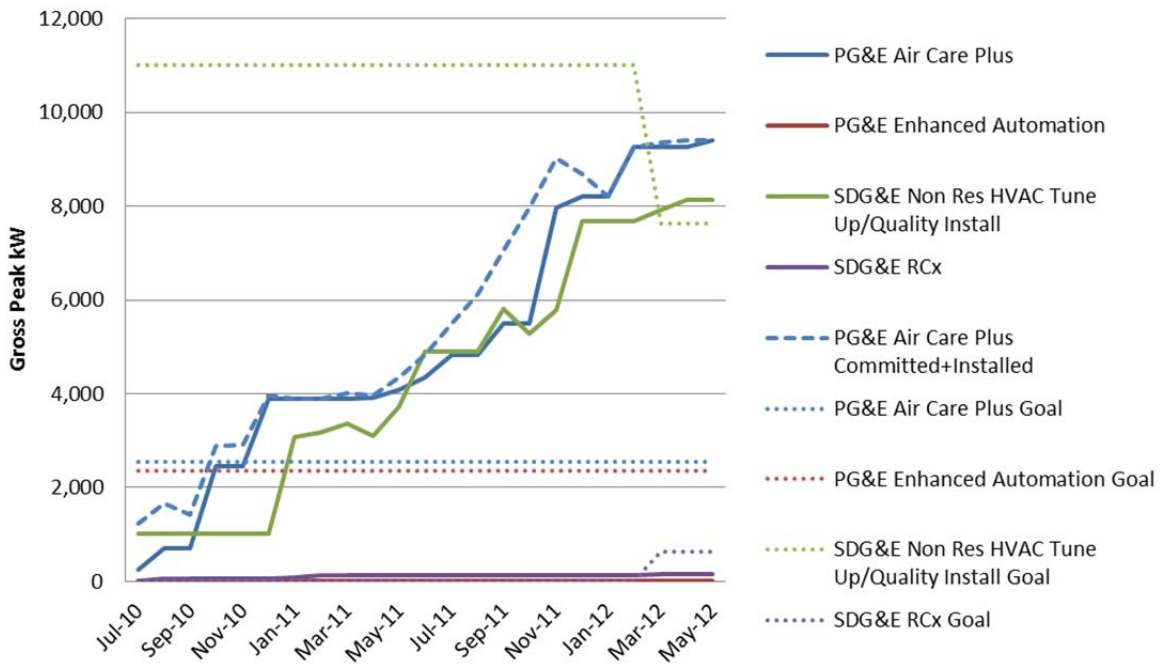


Figure 2: HVAC Program Demand Reduction

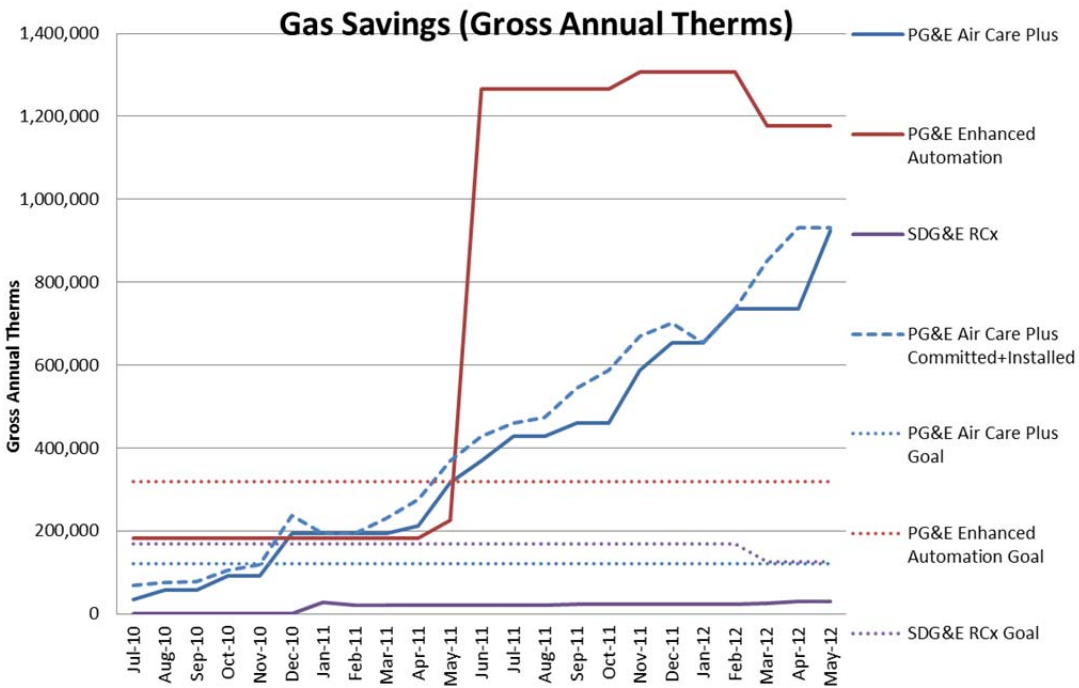


Figure 3: HVAC Program Therm Savings

5.2 HVAC Program Practice Assessment by Program Component

The evaluation team assessed the HVAC Programs against industry-defined best practices, as defined in The National Best Practices Study¹⁰ and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each finding and how it applies to industry defined best practices. In addition to the best practice, there are other notable practices that are detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 8 presents a summary of best practices for the HVAC sector.

¹⁰ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

HVAC Best Practice
Provide AC contractors training on selling and proper installation practices

Table 8: HVAC Program Best Practices

5.2.1 Program Theory and Design

Program collateral reviewed by HMG does not completely adhere to nationally recognized standards; instead the program implemented practices and protocols based on local sub-contractor best practices and ACCA 180 standards. HMG recommends that these protocols should be aligned to the nationally recognized standards. While the IOUs are not rebating the other services, lessor services are being offered on the program website. This was sufficient for the program to start, but further alignment across the state and country is vital, as any deviations will confuse customers. Education on the terminology and standards for those terms is necessary. Hands-on training will ensure that the contractors are appropriately trained to administer the service to the nationally recognized standards.

3Ps and the IOUs should work together to review the services offered by the 3P to ensure that program materials (on the web and hardcopy pamphlets) are clear about what is being offered and that it is ACCA-180 compliant. These standards are currently being developed by a statewide Program Coordination Group

5.2.2 Program Implementation: Marketing and Outreach

Many of the control optimization strategies must be accepted by all the participants to maximize the savings. Control strategy savings are dependent upon the facility staff and occupants to maintain the strategies. Education is often the best method to obtain building occupant acceptance of control strategies. Occupants, owners and facility staff need to understand what changes are being implemented, why they are important and how the changes will affect them. There needs to be an understanding that without their involvement the project will not achieve the energy savings. Programs should have education strategies reaching the facility managers, occupants, and business owners built into the program design.

In the Enhanced Automation Program, there is a customer with two similar buildings being run by two different facility managers. One facility is exceeding the savings from the control strategies; the other building was not meeting their expected energy savings. The facility manager who was exceeding the energy savings understood the energy cost with the strategies and educated his occupants on the importance of optimizing the control strategies. The other facility manager is more focused on immediate occupant comfort despite the energy cost. The program has worked with both facility managers. This illustrated the importance of obtaining buy-in on the control strategies from the facility managers, occupants, and business owners.

5.2.3 Program Implementation: Participation Process and Customer Service

The Enhanced Automation Initiative works intensively with facility staff to understand their HVAC system, the facility issues, and business needs. To best inform a control optimization project, the

implementer must complete an in-depth building assessment to fully understand the building, its occupants and the business needs. The building specific knowledge is necessary for creating control strategies that will work for the building occupants and increase occupant satisfaction. The current program has highly skilled engineers that are completing the facility audits.

6. LIGHTING PROGRAMS

6.1 Category Characterization/Description

Commercial buildings account for about 30 percent of California's electricity, and lighting in California is estimated to account for about one-third of total commercial end use. However it is estimated that nationwide, only about two percent of commercial buildings have dimmable ballasts, or the latest, most efficient fixtures and lamps. Recently, about one-third of all US commercial lighting purchases annually are T12 lamps. As existing T12 lamps are phased out, upgrading these soon-to-be outdated fixtures will become increasingly important. LED technology is becoming an increasingly affordable and viable option in commercial spaces. One program focuses specifically on LED upgrades and other programs have mentioned that as the technology becomes more cost effective, they would be interested in introducing LEDs into their measure mix.

To reduce the commercial lighting energy usage, the state of California has established four programs to meet the needs of various environments. These programs target commercial spaces including small to medium commercial spaces, warehouses, offices, above ground parking garages and large, chain retailers.

Lighting accounts for about 25% of all electricity across all sectors in California. To reduce the commercial lighting energy usage, four 3P commercial programs were given implementation approval for PY2010-12:

1. RightLights (PGE2196) - Implemented by Ecology Action, this program provides rebates and incentives to small and medium commercial customers (as defined by electricity consumption), such as retail stores, offices, restaurants, convenience and grocery stores, manufacturing, medical facilities and other business types if approved by PG&E.
2. Energy Efficient Parking Garages (PGE2199) - Implemented by EFM Solutions, this program provides incentives for above ground parking garages in PG&E service territory.
3. LED Accelerator (PGE2202) - Implemented by Energy Solutions, this program provides incentives to large multisite commercial businesses receiving electric service from PG&E, primarily in the retail and grocery sectors.
4. High Performance Office Lighting (PGE2201) - Implemented by Sylvania, this program provides incentives to business and lighting needs of single or multi-tenant office buildings and warehouses within the PG&E service territory.

6.1.1 Technologies

In the beginning of this program cycle, the above listed programs applied to implement the following measures:

- ◆ High-Kelvin, high-lumen fluorescent lamps,
- ◆ Bi-level occupancy controls,
- ◆ Induction lighting systems,

- ◆ Daylight harvesting systems,
- ◆ Comprehensive lighting T8,
- ◆ Comprehensive lighting CFL,
- ◆ Comprehensive lighting LED,
- ◆ Refrigeration comprehensive controls,
- ◆ Refrigeration doors, and
- ◆ Vend miser.

The programs strive to create comprehensive lighting solutions to reduce energy consumption. Though some programs experienced shifts in their target markets, the measures have remained fairly constant throughout the program cycle. T8 lamps are becoming the new industry standard baseline for lighting upgrades which affected the programs' energy savings. One program included induction lighting systems in their measure mix, though they admitted that it would likely never be installed by customers. They include the measure to provide a solution to customers who have problems with frequent bulb burn out. Cost, however, is a barrier to installation of induction lighting. In order to meet the needs of their customers, one program has expanded to include several refrigeration measures in addition to their lighting components.

The national phase out of T12s has created a sense of urgency for facilities wishing to receive incentives for the conversion to more efficient lighting systems. Higher wattage lamps will no longer be able to be used as a baseline for projects, so the calculated savings will be fewer. In order to achieve the highest possible incentive levels, customers are trying to complete projects during this program cycle.

Cost of installation for these programs can be a barrier for the customer. Programs that target small to medium size commercial customers provide a varied measure mix to facilitate participation. They are able to provide a balance that is both within each customer's budget and provides significant energy savings to the customers. Programs targeting large chain retailers provide projects with the latest technologies with the greatest potential energy savings. Tailoring measures to each segment facilitates customer adoption of the program.

6.1.2 Interventions

When customers enter a program, they are educated about the specific technologies that the program provides. Customers often are not knowledgeable about the technologies so their perception of the savings potential is skewed, either on the high or the low end of the spectrum. Educating the customer about their savings potential has been a significant contributor to program success. Through education, some programs have been able to bridge the gap between customers and manufacturers and drive markets to create cost-effective, efficient products.

Some customers have financial barriers to implementation as well. If education alone cannot bridge that gap, programs that offer custom measures are able to design a project that still achieves significant energy savings, while staying within the customer's budget.

6.1.3 Marketing and Outreach

Programs in this sector have found that direct customer contact is an effective way to reach target markets. Most programs relied initially on existing contacts who had expressed interest in energy efficient lighting upgrades. After those contacts were exhausted, programs began marketing directly to the customers through flyers, phone calls, or door-to-door sales. Programs also worked through industry trade organizations such as California Lighting Technology Center (CLTC) and trade shows like Lightfair to connect with manufacturers and learn of potential opportunities for the program to expand. Particularly for programs that aim to serve as market drivers, trade shows are critical, not only to see the technologies that are currently on the market, but also to connect with manufacturers and vendors and to encourage them to provide products that can fit within the scope of the program.

Another successful method for marketing was the use of program reputation and case studies. Programs that have had previous program cycles are able to point to their past accomplishments to show measure reliability and high levels of satisfaction. This is particularly important when promoting a technology that the customer might otherwise be unfamiliar with, like LEDs. Programs with a proven track record also can acquire customers from customer referrals.

One program relied solely on a subcontractor to reach their target market. The subcontractor had extensive industry connections and was able to reach market segments through contacts and a proven track record of reliability.

6.1.4 Long Term and Short Term Outcomes

The short term goals of the program are to create deep energy savings and to exceed the program savings goals. The programs perform full audits of the lighting options for each facility, and then provide lighting solutions which can include daylighting sensors and energy-efficient fixtures. Some of the programs serve as direct install programs providing a set list of measures and standard practices. They provide the audit, the equipment, and the installation. This streamlines the process for the customer and facilitates the process. Other programs allow for customization of the lighting upgrades. These programs can target specific upgrades needed for each building and provide flexible options that suit the customers' needs.

The long term goals of the program are encouraging the adoption of emerging technologies and educating customers about the potential for these types of technologies. One program also works with manufacturers and vendors to drive the creation of high quality, cost-effective technologies that can then be integrated in to the programs. Until recently, LEDs were not cost effective for retrofit programs. One program has been working to drive the technology forward so that it can be adapted to commercial spaces. Other programs have mentioned that they track customers who may be interested in upgrading to LEDs at a later date, so when the technology enters the programs' measure mixes, they can return to those customers and encourage them to upgrade.

6.1.5 Market Transformation

The LED Accelerator (LEDA) program aims to facilitate the adoption of LED technology into the market. Currently, LEDs have only achieved substantial market penetration in exit signs and stop

lights. The LEDA program recognizes that the potential for LEDs extends beyond this. They focus primarily on refrigeration lighting and retail display lighting. These are market segments with the greatest savings potential. Unlike florescent lighting, LEDs function at their greatest efficiency when they are cold. This makes them perfectly suited for use in refrigeration units, which are currently lit by fluorescents. Most retail displays still use incandescent bulbs since the 'punch' and beam spread required cannot be achieved by fluorescents. LEDs, however, can provide the necessary light qualities for the displays without the energy costs of incandescent.

The cost of LEDs is still too high for large scale adoption, so this program aims to work with manufacturers to create products that are high quality but also cost-effective for the consumer. LEDA brought the manufacturers and retailers together so that LED manufacturers could better understand what the retailers needed. The program hopes that the combination of incentives and the other market drivers will make LEDs a viable option for large commercial retail establishments.

The EEBPL noted that it is a best practice to define product specifications in program requirements and guidelines. This is especially important with LEDs since LEDs are so new to large scale use. Having minimum performance metrics for all products, in all of the programs incentivizing LEDs, receiving incentives or rebates would ensure the maximum energy savings in the long run. Though the LED EnergyStar list has helped make quality LED products more visible, further education of implementers and consumers about LED products would help drive higher quality products in to the market.

6.1.6 Cost Effectiveness

Lighting programs are, in general, very cost effective. The Energy Efficient Parking Garage program boasts an impressive 2.6 month average simple payback time for their program. This program also mentioned that they often have to reject garages where lighting is already actively controlled, or that have too many burnt out fixtures because they will not be able to achieve the desired energy savings.

Lighting programs that offer a variety of measures have a cost effectiveness balance. For example, one program noted that their T12 to T8 conversion compensates for the more costly CFL upgrades. For that program, 20% of their total savings were from CFLs.

Another program mentioned that, to increase cost effectiveness and maximize savings, they began focusing on large warehouse projects instead of smaller commercial office space projects. With the federal standards on T12s changing, it can be assumed that the cost effectiveness of the lighting programs will decrease in the next program cycle.

6.1.7 Evolution of this Program Category

The Right Lights program was continued from the previous program cycle, with an increased program goal. The other three programs are new in this program cycle and began through a response to an RFP.

6.1.8 Product Innovation

Driving the introduction of new products and technologies involves promoting products without a long-term proven track record. As a result, programs that aim to accomplish that goal must first do rigorous product testing. The LEDA program vets every product they use in the program before it is introduced to consumers. This allows LEDA to encourage manufacturers to produce quality products and to influence the products available on the market. However, this process is costly for the implementer, and they currently do not receive any budget for this kind of testing.

6.1.9 Program Savings Achievements

The programs promoting LEDs are not currently meeting the original goals set in the PIPs. Figure 4 and Figure 5 below show the installed savings for the programs throughout the program cycle. At the time of the report HMG did not receive a confirmation of the new goals for the programs in the PG&E service territory so the goals reflected in the table are based on the original goals filed in the PIPs.

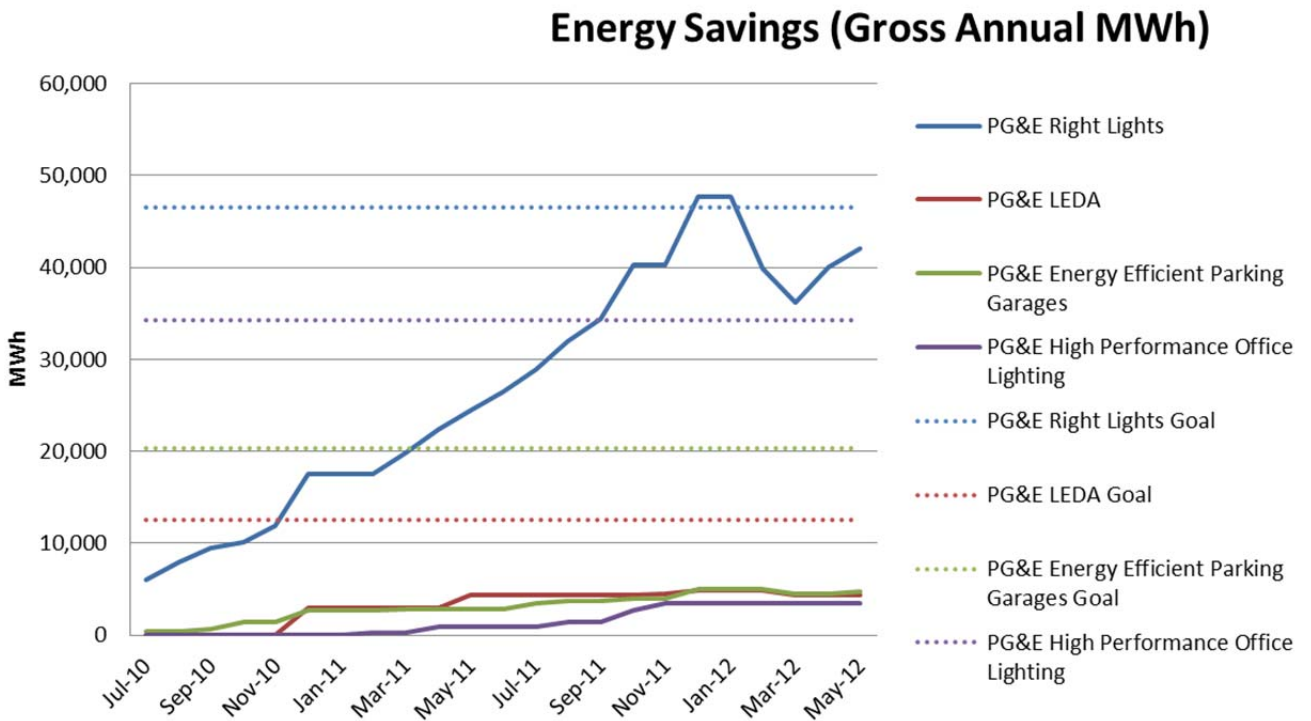


Figure 4: Lighting Sector MWh Energy Savings

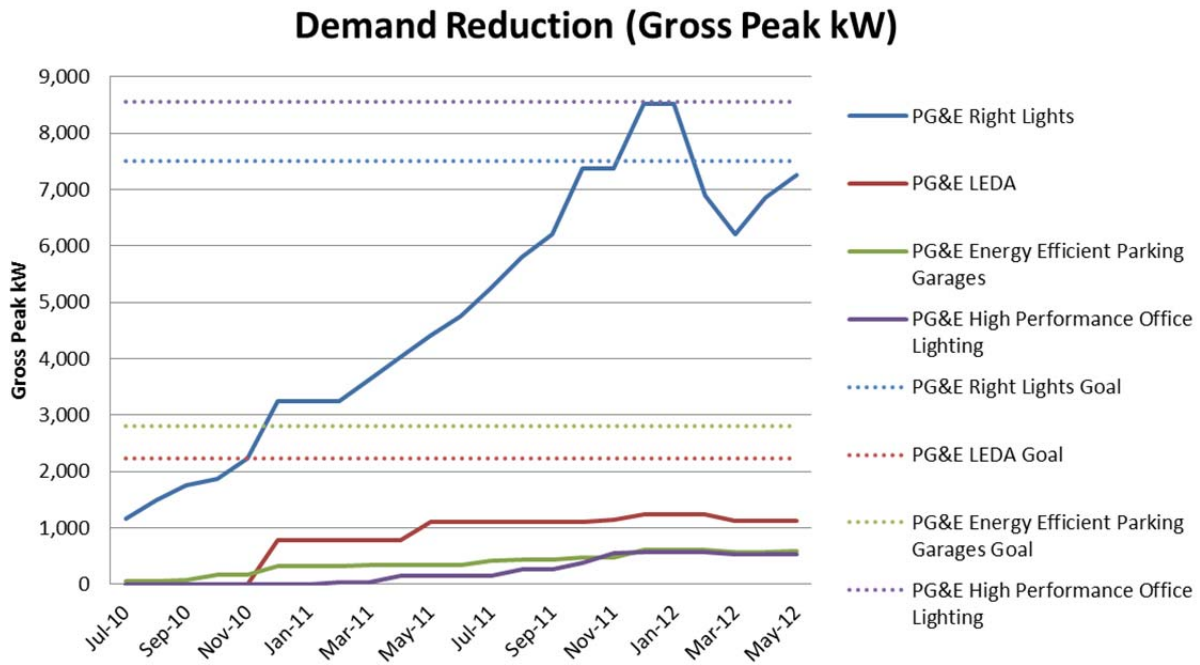


Figure 5: Lighting Sector Demand Reduction

6.2 Lighting Program Practice Assessment by Program Component

The evaluation team assessed the Lighting Programs against industry defined best practices, as described in The National Best Practices Study¹¹ and also reviewed the programs to look for new best practices. While the team did not find true best practices there were many successful practices that are listed below. These successful practices are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each practice.

6.2.1 Program Theory and Design

The programs use a customer-centric model to deliver optimized lighting strategies to the customer. To initially market the programs, implementers are given time and materials (T&M) budgets for the first stages of the initial program cycle. After that, contracts are strictly written as paid-for-performance. In order to provide the best possible service to the customers, program design is tailored to meet the specific needs of each type of project.

¹¹ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

Programs wishing to drive emerging technologies must provide extensive education to the customers about the products in the program. They also aim to stay up-to-date on all market innovations and policy changes regarding the new products to insure that the customer receives the best possible product. These programs also help customers locate reliable contractors to install products and achieve energy savings.

In order to encourage program participation, some programs offered a direct install plan, where all equipment was installed through a subcontractor. Streamlining the installation process simplifies the customer experience, easing the burden of facilities changes.

Currently, 3Ps are unlikely to coordinate because they see each other as competition. Implementers have no incentive to cooperate with one another. The EEPG program has found other programs uncooperative, even if the other programs do not address parking garages. Conflicts between 3P Program scopes also result in customer confusion. The programs are not incentivized to work together and unless programs are being run by the same implementer, there is no cooperation. 3Ps spend their time doing what they are incentivized to do by the IOUs. 3Ps should be incentivized to work together, and utilize synergies between programs to deliver deeper savings.

While IOUs should continue to develop 3P Programs that reach previously untapped savings opportunities, it is important to avoid undercutting existing programs. 3P representatives from RightLights, LEDA, and EEPG all reported that the RFP process for 3P Programs worked well in at least some regards by allowing implementers to identify and target underserved market sectors and help pave the way for more products and measures to be added to the portfolio. 3P Programs should be carefully designed and chosen to avoid conflicts with existing programs, and to avoid limiting savings potential by creating overly compartmentalized programs that are too limited in scope.

Excessively limiting or restricting program market sectors can limit program effectiveness. Third Party Programs are sometimes 3P limited to specific space types or end uses are restricted from certain market sectors that other programs may not fully address. This creates gaps in the portfolio and lost opportunities for savings. For example, the EEPG program implementers suggested that barring their program from government properties, due to conflicts with LGPs, resulted in lost opportunities for savings from parking garages that are not being captured. The EEPG program also suggested that there were lost opportunities in the healthcare sector due to lack of cooperation with 3P Programs in the healthcare sector. Despite the apparent conflicts, parking garages were either beyond the scope, or not being addressed by these other programs.

6.2.2 Program Management: Project Management

All programs have internal PMs that handle interactions with the IOU, but half of the programs also have subcontractors that handle aspects of the program, such as marketing and installation.

Some of the programs serve as direct install programs providing a set list of measures and standard practices. They provide the audit, the equipment and the installation. This streamlines the process for the customer and facilitates the process. Other programs allow for customization of the

lighting upgrades. These programs can target specific upgrades needed for each building and provide flexible options that suit the customers' needs.

Changes to program market sectors or policies and procedures during the program cycle should also be avoided wherever possible. Changes in customer qualifications during program cycles, such as the change in the definition of "small and medium commercial" in the RightLights program, can cause confusion and frustration. Some customers participated in the program and attempted to participate again at additional sites and had to be turned away because the customer qualifications changed and they were no longer eligible.

IOUs should allow more autonomy for proven programs and implementers. RightLights implementers suggested that progress with their program is held back by a constant need for sign-off from the IOUs, despite the long term success of the program. Approvals processes take time by delaying implementation of new measures and hindering the 3Ps' ability to provide the most comprehensive efficiency solutions possible. 3Ps are eager to innovate and update their programs to keep up with the rapidly changing lighting market, but are stifled by cumbersome and time-consuming approval processes.

6.2.3 Program Management: Reporting and Tracking

Communication with the IOUs occurs informally on an almost daily basis. Programs have weekly or bi-weekly formal phone calls with PMs at the IOUs, depending on the program needs. Each program submits a monthly report to the IOU as well. Program managers say that reporting requirements are time consuming but not overly burdensome.

IOUs and the CPUC should continue to streamline processes and reporting requirements for 3P and make these requirements commensurate with measure complexity. Program managers for the LEDA program reported that streamlined requirements from the IOUs (PG&E) have eased their reporting burden, but that some elements such as the Bulk Load tool are still cumbersome, and would benefit from more automation or simplification.

6.2.4 Program Management: Quality Control and Verification

Two 3P Programs provide 100% post-installation inspection. Programs deliver several other QC measures depending on the nature of the projects including more intensive inspections on larger projects, and HOBO loggers for at the examination of light levels. For projects that have a subcontractor doing implementation, the program implementer provides third-party verification of installation.

IOU incentive applications should reflect measure complexity. 3P implementers for the LEDA program reported that the current one-size-fits-all application process is overly cumbersome for more basic retrofits like lighting, creating a barrier for potential customers. Simple retrofit measures, such as 1-for-1 equipment replacement, should have a less cumbersome application process than more complicated measures to ease customer burden and make incentives more accessible.

6.2.5 Program Implementation: Marketing and Outreach

Marketing is done through a variety of channels for the programs, including door-to-door solicitation, outreach to industry trade groups and marketing at conferences. Some programs had success working with IOU AEs to make contact with customers. Direct contact with customers was essential for all programs in finding the appropriate customers for their programs.

Programs in this sector have found that direct customer contact is an effective way to reach target markets. Most programs relied initially on existing contacts who had expressed interest in energy efficient lighting upgrades. After those resources ran out, programs began marketing directly to the customers through flyers, phone calls, or door-to-door sales. Programs also worked through industry trade organizations such as California Lighting Technology Center (CLTC) and trade shows like Lightfair to connect with manufacturers and learn of potential opportunities for the program to expand. Particularly for programs that aim to serve as market drivers, trade shows are critical, not only to see the technologies that are currently on the market, but also to connect with manufacturers and vendors and to encourage them to provide products that can fit within the scope of the program.

Another successful method for marketing has been the use of 3P reputation and case studies. Programs that have had previous program cycles are able to point to their past accomplishments to show measure reliability and high levels of satisfaction. This is particularly important when promoting a technology that the customer might otherwise be unfamiliar with, like LEDs. Programs with a proven track record also can acquire customers from customer referrals.

One program relied solely on a subcontractor to reach their target market. The subcontractor had extensive industry connections and was able to reach market segments through contacts and a proven track record of reliability.

6.2.6 Program Implementation: Participation Process and Customer Service

Simplifying the customer experience reduces the number of customers who drop out of the program process. 3Ps have found success in streamlining or simplifying the customer experience. 3Ps cited a variety of strategies for streamlining the customer experience, tailored to the specific market and customer base for each program. These strategies include:

- ◆ Completing and processing incentive applications for the customer (EEPG, RightLights);
- ◆ Assuming the incentive costs so that the customer only pays the difference between the project cost and the incentive (EEPG);
- ◆ Assuming the administrative tasks of the program process for the customer (EEPG, RightLights); and
- ◆ Providing a single decision point for customers (EEPG, RightLights, LEDA).

Customers are more likely to participate in the programs if the process is simple.

3Ps should work with manufacturers to drive product improvements and advancements. Targeted programs can craft performance requirements in coordination with customers and manufacturers to deliver products that meet customer needs and deliver deep savings. For example, the LEDA program worked directly with both customers and manufacturers to develop performance standards for products to be qualified in the program. By taking customer needs into

consideration, the program was able to make high performance LED products more cost effective than lower quality products, and helped spur customers to change to higher efficiency LED technology earlier than they otherwise would have. Coordination with manufacturers helped bring new high quality products to the market sooner than otherwise would have been possible.

IOUs should actively interface with 3Ps to make sure that they are up-to-date on any relevant policy changes. Current programs tend to have slow adoption of new policies and initiatives such as the dual baseline, etc. Some 3P Program implementers have an inconsistent or incomplete understanding of some of the regulatory concepts, such as free-ridership, and the dual baseline. This has the potential to result in ineffective strategies to address these issues on the part of the 3Ps, at the expense of energy savings. These concepts can be difficult to understand for new 3P Program implementers, and continuing education or other informational resources on the regulatory environment would be helpful.

IOUs should follow up (or require that 3Ps follow up) with a subset of participants to evaluate customer satisfaction and estimate persistence of measures (i.e., how many measures remain). These visits would serve to address customer concerns (e.g., light color) and enhance persistence, as well as adjust measures installed if needed. The LEDA program, for example, worked with large multi-site retail customers to determine light color and performance requirements for LED products to best meet customer needs. As a result, the LEDA program was able to make higher quality products more cost-effective than lower quality LED products that some customers were considering.

6.2.7 Program Implementation: Installation and Delivery Mechanism

As previously mentioned each program either uses a subcontractor to perform installations or assists the customer in finding the appropriate contractor to do the work. Facilitating the installation process for the customer is crucial to program participation.

Integrating demand response (DR) into the Energy Efficiency Portfolio is a desire of the IOUs. DR enabled lighting controls are being considered, though some implementers noted that the current incentive levels for DR are not high enough to drive customers to install the technology.

Currently the lighting programs are not integrating demand response controls into the programs. The IOUs are interested in adding DR technologies into the portfolio. The lighting programs are willing to add the measures to their programs.

Any potential demand response programs must be carefully considered to ensure that the technology is implemented effectively and in appropriate spaces and applications. Potential examples of space types or applications that would be a good fit for demand response lighting technology include daylight areas of commercial buildings, and common areas (non-task oriented areas) in office buildings.

Once contact is made with a potential client, a site visit is set up. During the site visit, the implementer meets with the client and discusses what the program offers and provides education on the products that the program implements.

Cost of installation for these programs can be a barrier for the customer. Programs that target small to medium size commercial customers provide a varied measure mix to facilitate participation. They are able to provide a balance that is both within each customer's budget and provides significant energy savings to the customers. Programs targeting large chain retailers provide projects with the latest technologies with the greatest potential energy savings. Tailoring measures to each segment facilitates customer adoption of the program.

Long approval processes, as long as 6 months but averaging around 3-4 months, delay implementation and limit program effectiveness. Both LEDA and RightLights reported challenges with updating or adding measures due to approval delays of as long as 6 months. Improving approval times will require both a streamlined IOU process; and working with the CPUC to speed up faster workpaper approval, to develop an alternative approval procedure for these measures, or to develop an interim procedure before approval is granted by the CPUC. Both LEDA and RightLights reported challenges with updating or adding measures due to delays of as long as 6 months from the IOUs and the CPUC. The lighting market is changing quickly with new products and with changing code requirements. This will require that the programs be nimble to respond to these changes. To keep up with the quickly evolving lighting market, the process should be more responsive to changes in program specifications and measures.

6.2.8 Program Evaluation and Adaptability

The Right Lights program was evaluated in the previous program cycle, but no other program has been through an evaluation. Between program cycles, this program added in several additional refrigeration measures to fit customer needs. One program shifted its focus from commercial offices spaces to warehouses to achieve greater energy savings mid cycle.

The cost of LEDs is still too high for large scale adoption, so LEDA aims to work with manufacturers to create products that are high quality but also cost-effective for the consumer. LEDA is collaborating with manufacturers to ensure that products that fit within the scope of the project are readily available on the market for consumer use. LEDA brought the manufacturers and the retailers together to discuss their needs and gain a better perspective on the industry and manufacturer needs. The program hopes, that the combination of incentives and the other market drivers, LEDs will be a viable option for large commercial retail establishments.

Program evaluators should also have a strong understanding of the program process and reporting requirements in order to provide an accurate and informed evaluation. Implementers for the Right Lights program suggested that past evaluators did not fully understand the complexity of the reporting requirements for 3P Programs. The lack of understanding created recommendations that did not reflect the situation and were unhelpful. Evaluation results are given credence because they are completed by an independent professional, but it is important that the recommendations are well-informed and practical.

7. EMERGING TECHNOLOGY PROGRAMS

7.1 Category Characterization/Description

Emerging Technologies promoting energy efficiency in the commercial sector are continually entering and evolving in the market place. These technologies span a wide variety of commercial segments: hospitals, institutional, medical facilities, hospitality, retail, manufacturing and processing, and a variety of commercial office building types. The primary goal of emerging technology programs is to promote greater energy efficiency through new and developing technologies. The nature of these programs ranges from a single technology to a comprehensive list of technologies. By offering audits, retrofits, and alternatives to demand side management (e.g., demand response, renewable/distributed self-generation, etc.) the portfolio programs as a whole are able to cover a broad spectrum of building types and technologies. Individually, the programs may be limited in building type/size and able to offer one or a few types of technologies.

The existing emerging technologies programs range in size and are offered by different program administrators. To meet the efficiency needs of the emerging technologies sector and the potential savings, three 3P commercial programs were given implementation approval for PY2010-12:

1. Ozone Laundry Energy Efficiency (PGE2209) - Implemented by Willdan Energy Solutions, Inc., this program provides support and assistance for the ozone laundry installation process by facilitating audits of facilities, performing engineering assessment, and assisting with contractor selection.
2. Management Affiliates Program (MAP) (SCE-TP-031) - Implemented by Energy Innovation Group, this program provides incentives for energy retrofits retail spaces for a comprehensive array of upgrades including lighting, HVAC, and CO2 sensing, emphasizing the adoption of proven emerging technologies and upgrades on existing technology.
3. Non-Residential (SDGE3117, SCG3601) - Implemented by the local utility, this program provides incentives for non-residential retrofits.

Detailed manager interviews were conducted for each program. This memorandum provides preliminary findings to inform the portfolio planning process.

7.1.1 Technologies

In the beginning of the program cycle the programs applied to implement the following measures:

- ◆ Laundry Ozone Systems (OLEEP),
- ◆ Daylighting harvesting and dimming lighting ballast system (MAP),
- ◆ HVAC cycle manager for packaged HVACR (MAP),
- ◆ CO sensing system for garage exhaust fans (MAP),
- ◆ CO2 sensing system for demand control ventilation (MAP),
- ◆ Turbocor oil-free compressor (MAP),

- ◆ Hotel key card energy control system (MAP),
- ◆ Pressure independent water flow control valve system (MAP),
- ◆ Fan wall technology (MAP),
- ◆ Combustion and combustion control systems (BID),
- ◆ Steam systems (BID),
- ◆ Process control systems (BID),
- ◆ Central plant facilities (BID),
- ◆ Adiabatic pre-reformers (BID),
- ◆ Hydrogen recovery systems (BID),
- ◆ Progressive Crude distillation systems (BID),
- ◆ Upgrades to distillation columns (BID),
- ◆ Heat exchanger improvements and heat recovery systems (BID), and
- ◆ Any large scale process that consumes resources (natural gas, water, power) with emissions (waste water, NOx, GHG) on orders of magnitude (BID).

The technologies making up the current Emerging Technologies portfolio started with a comprehensive list of measures. However, the MAP program measures were significantly trimmed mid-program cycle. This change resulted in only two measures, dimming lighting ballast system and vending machine lighting controls, being available for implementation in qualifying projects.

7.1.2 Interventions

Each of the programs offered interventions to help facilitate projects to participate in their program and they are as follows:

- ◆ Facility Audits,
- ◆ Installation Support Services, and
- ◆ Low to no cost measures.

Each of the above interventions proved to be a valuable program detail when recruiting and implementing each program. Emerging technologies are new to the market and have not been widely promoted. Therefore, when one of the above mentioned interventions is used to facilitate a customer to participate in the program, the result can be broader acceptance of the technology.

7.1.3 Marketing and Outreach

Each program has a different approach to marketing and recruitment of their projects. The Third Party implementing the OLEEP program marketed directly to vendors and customer contacts. MAP was restricted in its marketing efforts due to SCE using account representatives to bring in the customer base. Lastly, in the utility-run BID programs, marketing was done solely by utility staff looking for large scale energy savings projects. Marketing for the BID program is done in conjunction with the IOU Calculated programs.

7.1.4 Long Term and Short Term Outcomes

The short term goals of the programs are to reach savings goals. The programs are all currently on track to achieve their savings goal, with the exception of the OLEEP program. This is due to the program being temporarily stopped while the gas funds were redirected. The program is back up and running, but it is uncertain if they will meet their goals during this program cycle. The programs on track to meet their goals have done so through a few large scale savings projects and good customer and contractor relationships.

The long term goal of the programs is to transform the marketplace by implementing new and emerging technologies which result in greater energy savings than current energy efficient products and technologies on the market. Currently, the portfolio's Emerging Technology programs are limited in many regards from successfully achieving early adoption of new technologies. This is due to the most comprehensive program, BID, reaching its energy savings goals through less than ten projects, and the Ozone laundry and MAP consisting of only one and two technologies, respectively.

7.1.5 Evolution of this Program Category

The Management Affiliates program is an expansion of a 2007-2008 Innovative Designs for Energy Efficiency Activities Program (IDEEA)¹². The program was designed to service commercial buildings operated by property management companies. The program started out by offering a comprehensive approach through retrofits and demand side management. However, midway through the program cycle, the program was reduced to only serving mid-market building customers (200-500 annual kWh), and the list of measures went from eight to only two.

OLEEP is a new 3P Program in the PG&E service territory. The program has had some setbacks due to the technology not meeting OSHPD regulations and was discontinued while the CA gas funds were temporarily redirected during the fall of 2011. Upon the reinstatement of gas funds, the program has struggled to regain legitimacy and customer retention.

The BID began in PY2004-05 for both SoCal Gas and SDG&E. Both programs have remained the same since the start because their program energy savings goals have been met by a limited number of projects. The program is very similar to the Calculated Statewide Program, and is also thought of and referred to as "Calculated Plus."

7.1.6 Program Savings Achievements

Based upon the information on EEGA (March 2012) the BID programs are expected to meet and exceed their energy savings goals. They have met their goals through less than 10 projects with higher than expected energy savings. The Management Affiliates program is on track to meet its

¹² The SCE IDEEA Program was a competitive bidding solicitation for innovative and cost-effective energy efficiency program proposals.

goals. At the time of the interviews, the 3Ps indicated all projects were installed, but not reported as complete until the check is issued from the utility. Figure 6 and Figure 7 depict MAP and the BID programs' energy savings and demand savings goals.

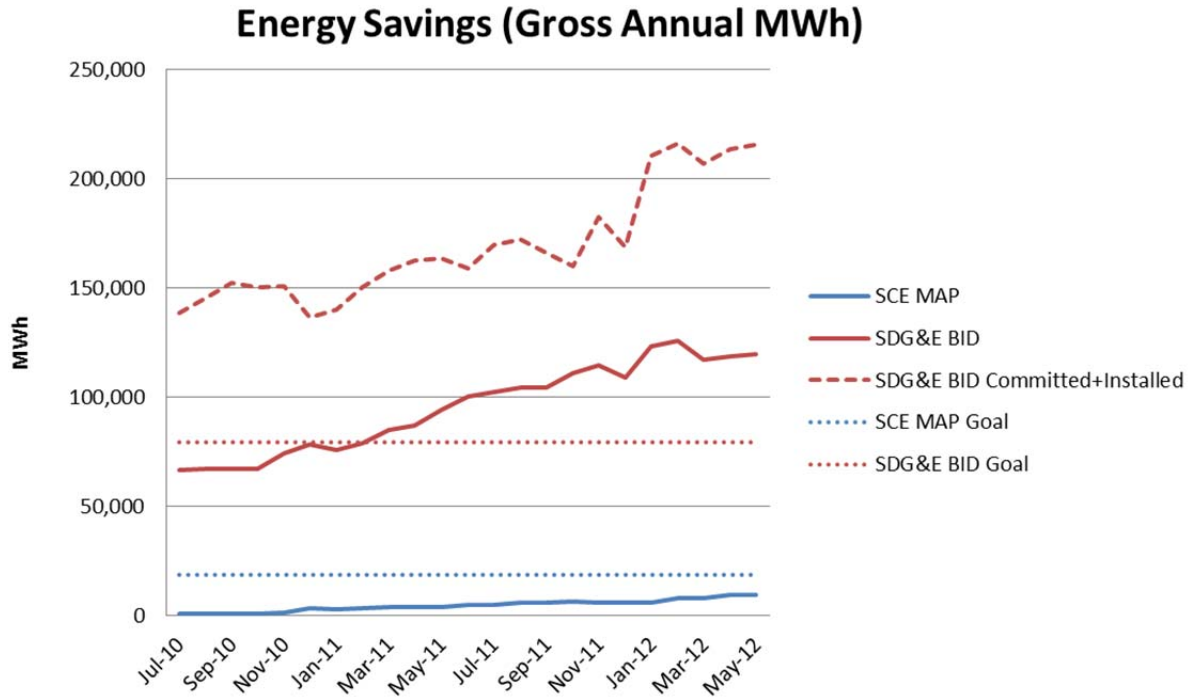


Figure 6: Emerging Technology Programs MWh Energy Savings

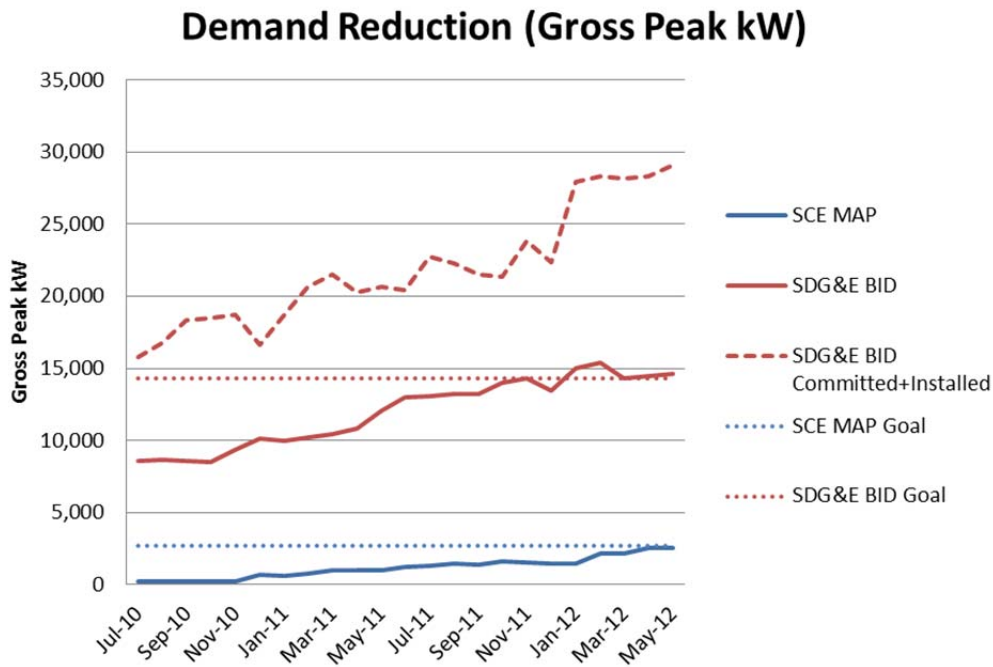


Figure 7: Emerging Technology Programs Demand Reduction

Due to the Ozone Laundry Program being discontinued for three months because of the gas fund redirection, the program is not currently meeting their expected gas savings as shown in Figure 8. After the program was reinstated it took another three months to build a customer base again. The SoCal Gas BID program is meeting and exceeding their program gas saving goals. However, the SDG&E BID program has struggled to meet their gas energy savings goals.

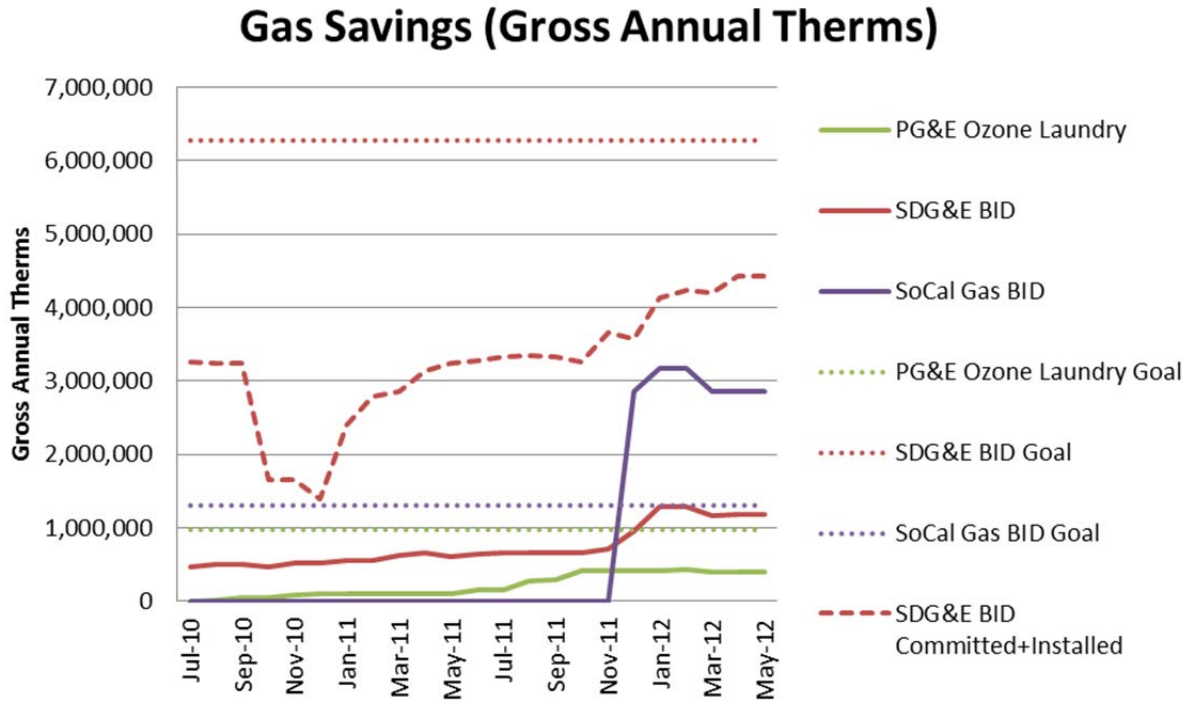


Figure 8: Emerging Technology Programs Therm Savings

7.2 Emerging Technology Program Practice Assessment by Program Component

The evaluation team assessed the Emerging Technology Programs against industry defined best practices, as defined in The National Best Practices Study¹³ and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each finding and how it applies to industry defined best practices. In addition to the best practice, there are other notable practices that are

¹³ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 9 presents a best practice from the needs assessment for the ET sector.

Emerging Technology Best Practice
Establish program credibility through public outreach

Table 9: Emerging Technology Program Best Practices

7.2.1 Program Theory and Design

Each Emerging Technology program in the IOU portfolio was started on the basis of a specific technology or to meet the needs of a particular market sector. The nature of emerging technologies is that they are continually evolving and new technologies are constantly entering the market place. Therefore, strong well-implemented programs that are able to adapt to new technologies is beneficial to the overall portfolio.

PG&E OLEEP was developed to target energy savings in laundry facilities and currently only supports one technology. Since program inception there have not been many changes over the course of its existence. Due to the specific nature of the technology supported by this program, the overall design has not been changed, thus allowing the programs day-to-day operations to remain consistent. If the program were to take on additional technologies for laundry facilities it would require some reworking of the current program design. The third party does not see the program being very adaptable to other technologies, since this program was designed specifically for the technology it currently promotes.

The BID programs were developed from the same design and theory as the statewide calculated programs. The difference being, the BID programs were vendor driven programs and created a case-by-case package of measures for each project. The projects were allowed to span across multiple sectors, sites, and customers to reach their goals. This amount of flexibility in the technologies implemented and use of vendor relationships benefited the programs greatly.

Currently, the portfolios only comprehensive programs are the SoCal Gas and SDG&E BID programs. The other two programs, OLEEP and MAP, target a specific audience and could benefit by revising the program design to be more adaptable to other technologies. Overall, the program designs should be straightforward and encourage strong vendor relationships as this assists in the marketing of each program. Vendors and contractors have played a large part in each program; therefore, developing strong vendor and contractor relationships in the program design will act as a marketing mechanism for the 3P implementing the program. Changing program design midway through the program cycle should be avoided unless, the program has not been meeting their program energy goals due to the technology not meeting energy savings expectations or the market sector not accepting the technology.

7.2.2 Program Management: Project Management

Open and frequent communication between the IOU and 3Ps has been essential in each program operating effectively. The two Third Party-Implemented Programs in the portfolio indicated good

working relationships with their IOU program managers. If issues arose the 3Ps and IOU program managers worked together to solve the problem. In some instances, where a measure was changed or dollar amount for savings was revised, it was out of the hands of the IOU program manager to resolve the situation and left to the 3P to remedy. This occurred in MAP; and while it was an inconvenience to the project flow and put an additional cost burden on the project, the 3P was able to keep the project moving and not affect the customer.

Project management style and method are generally left up to the 3Ps implementing a particular program unless the IOU has a specific project management structure that must be followed. In the case of MAP, the IOU had a project management tool in place in which projects could only move from one phase to the next with the utilities approval. While this was a good tool to keep both parties on the same page, it did prove to slow some projects down if the IOU was unable to approve the particular stage in a timely manner. The 3P indicated it would be useful to set time limits or reminders in the system to ensure the projects move through the system in a timely manner. This would ensure both the 3P and IOU program manager are making sure projects move towards completion on a reasonable schedule. In the IOU run BID programs the projects are overseen by IOU staff, but much of the daily work and coordination is done through vendors, contractors, and customers themselves receiving the incentive. This method has worked due to the program structure being more flexible and projects are done on a case-by-case situation, with a custom package of technologies put together for each project.

Overall, the project management of the Emerging Technology programs in the IOU portfolio has worked effectively. Areas for improvement on both the 3P and IOU have been identified and could enhance the flow of projects through each program.

7.2.3 Program Management: Reporting and Tracking

The reporting and tracking for the IOU BID programs were run in-house by SDG&E and SoCal Gas and no outstanding findings for these programs have been identified in terms of reporting and tracking. However, the reporting and tracking for both MAP and OLEEP have gone through some growing pains. It was indicated by both programs the reporting and tracking systems they used proved to be challenging at times and take more time than anticipated.

Both programs have tools set in place by the utilities to track program and project metrics. Both use an in-house tool to track additional information not captured by the utility tracking tool. The Management Affiliates program started using the SMART tracking system and transitioned to the CRM software midway through the program, at the direction of the utility. This transition occurred when the program down sized to only mid-market commercial buildings. This transition took three months longer than expected, which delayed projects from starting, because the Third Party was instructed to wait until projects could be tracked in CRM. In addition, the metrics in CRM did not encompass all of the metrics the 3P thought useful for project management. Therefore, they used an in-house Excel spreadsheet to do their own tracking; thus, creating redundant work for the 3P Program implementer. While this created redundant work, it also assisted the 3P in its reporting to the IOU. While CRM tracked only certain metrics, the IOU required other metrics not tracked in CRM to be reported. Furthermore, CRM was not set up for the 3P to run reports, which would have created more work for the 3P if they had not designed their own tracking and reporting tool.

The reporting for each program was done formally on a monthly and quarterly basis. It reported progress in relation to meeting savings goals and gave a status update on where projects were in the pipeline. Both MAP and OLEEP indicated the reporting requirements were reasonable and frequent enough. However, MAP did experience several unexpected ad hoc reports requests, which added some extra burden on the 3P because of a short turnaround time requested by the IOU.

The tracking tool is an area the 3Ps and IOU should work on together to meet the needs of both parties to track and report necessary project information before the program starts. Creating a tracking system able to capture all program metrics including project progress, savings, technologies, marketing contacts, is essential for the programs running efficiently and projects being completed in a timely fashion. It is expected that systems may go through some reworking throughout the course of the program cycle; however, switching tracking systems during the program cycle should be avoided, if possible. This has slowed the reporting process and added undue burden on the 3P Program implementer. Similarly, reporting metrics and frequency for each program proved to be effective and not onerous due to the clear expectations established at the start of the program.

7.2.4 Program Management: Quality Control and Verification

In the Emerging Technology sector quality control and verification is important to ensure the equipment or technology is installed and functioning properly. The two 3P-Implemented Programs have different QC and verification protocols. The IOU set up the MAP verification protocols; they include onsite visits after implementation by the utility, contractor, owner, and 3P at the time of verification, and each measure is counted and checked to be functioning properly. All measures must be working properly. If they are not, they must be fixed before the incentive on that measure is paid. It is essential to have consistent utility auditors from the pre-installation to verification stage to reduce time spent on-site and keep consistency within the project. OLEEP has a less stringent quality control and verification process in comparison. The program only performs on-site verifications on an as needed basis. The 3P staff also conducts phone verifications and education as needed. This method of verification is not sufficient in certain situations and has resulted in some issues with the installed technology. This could have potentially been avoided if each project was verified on site.

Because the technologies are new to the market place, it is essential to have a QC and verification protocol in place. This would ensure the equipment is installed and functioning properly, help to educate the customer further, and decrease the number of customer complaints from improperly functioning equipment.

7.2.5 Program Implementation: Marketing and Outreach

Marketing and outreach are extremely important in program implementation of Emerging Technology programs. This is due to the technologies being new and not widely known or accepted in the market. Outreach efforts should not only be directed to the customer, as engaging vendors and contractors in customer recruitment and education have also proven valuable

marketing techniques. The utility-run BID programs were successful in using vendors and contractors to market the program. While their programs met their energy savings goals with very few projects, this allowed the utility to focus program efforts elsewhere. In addition, OLEEP relies heavily on direct marketing to customers and vendors. Establishing more of a presence in the market place could benefit the program. Better coordination of other utility programs entering into the healthcare, lodging and other related sectors could increase participation levels. This would have been greatly beneficial to restoring the program after it was temporarily discontinued while the gas funds were redirected.

Marketing efforts for MAP were carried out through the IOU; projects were brought to the program and 3Ps through the IOU account representative. The 3P implementer considered this a barrier to recruiting projects that were not very well suited for the program, lacked energy savings potential, and did not utilize the implementer's past and current relationships with customers and contractors serving the mid-market audience. The 3P implementer should be allowed to market and use other avenues (i.e., contractors) to promote and market the program.

Vendor and trade ally relations can be a fruitful manner in which to recruit projects under the emerging technology sector. Educating trade ally groups in the appropriate sectors has the potential to increase the awareness of these programs and can inform the IOU and 3Ps of new emerging technologies not currently on the market. This would expand the range [or scope] of emerging technologies the IOU portfolio has to offer and cover a broader range of market sectors.

The programs could also benefit from more detailed program information on the 3Ps and IOU websites. Currently, the websites supply very little information about the program and are not widely promoted. Creating a wide variety of marketing collateral (i.e., websites, print materials, etc.) and marketing channels (i.e., direct marketing, contractors, vendors, etc.) would promote the programs and educate potential projects more effectively.

7.2.6 Program Implementation: Participation Process and Customer Service

There can be a negative image of emerging technologies in certain markets and sectors. This barrier along with industry regulations such as the Office of Statewide Health Planning & Development regulations (OSHDP) in the healthcare sector are consistently preventing customers from participating in the programs due to the extra red tape and associated costs. If and when building codes or standards conflict with emerging technologies, the utility should work with industry experts (e.g., manufacturers, vendors) to identify alternatives that meet code. Currently, OLEEP has to receive an exception for each project completed in a hospital or assisted living facility under OSHDP. This increases the project implementation time by at least three months. In addition, 3P Programs could greatly benefit from cross-promotion with other IOU programs by attracting participants that already have experience with utility programs. This is especially the case for hospitals and lodging. Due to the regulations both sectors have to adhere to, combining programs such as OLEEP with another (e.g., healthcare) could see an increase in participation. IOUs Codes & Standards efforts could encourage changes in building codes to facilitate new technologies.

Having a streamlined participation process in regards to program resources (i.e., forms, references, etc.) helps program participation become more visible and intuitive. This can be achieved by providing online resources to facilitate the application process, house program forms, and documents online for participants' use and reference. Making program documents more easily accessible can ease the participation process. While the current Emerging Technology programs do not have such online resources, the 3Ps have made other efforts to ease participation in the program. For example, the MAP program walks the customer through the program at the start, assists in filling out paper work, and facilitates arranging contractors to complete installation.

Overall, the 3P Program implementers have made every effort to facilitate the participation process; however, there are areas both the IOU and 3P could improve upon to further ease the participation process. The largest barriers to participation are additional costs from meeting industry regulations (i.e., OSHPD) and adhering to building codes when the technology being installed conflicts with code.

7.2.7 Program Implementation: Installation and Delivery Mechanism

Installation of the emerging technologies has currently not presented any issues to date. However, the biggest barrier to installation has been industry regulations such as OSPHD (healthcare), which prevent customers from pursuing such programs as OLEEP in the first place. In those instances OLEEP has made efforts to focus outreach efforts on customers currently enrolled in other portfolio programs before going through the OSPHD requirements. This allows the customer to add on additional energy savings and only go through the extra steps of OSHPD and fees once.

The other programs in the portfolio are not experiencing the same degree of difficulty with industry regulations as the OLEEP program has. This helps their projects run more successfully. As in any program, when installing new equipment there may be issues with existing building features (i.e., wiring) that may need to be worked out before a specific technology can be installed. However, this is typically not a large barrier and can be worked out by the installing contractor, and in most cases does not affect the customer.

All of the 3Ps indicated that having a network of well-experienced contractors is essential to the program running effectively. MAP has worked in the mid-market commercial buildings sector for 30+ years and was able to take advantage of good contractor relationships to successfully implement their program. Finding reliable contractors that can work with new technologies is highly important in programs implementing emerging technologies.

7.2.8 Program Evaluation and Adaptability

Neither of the 3P-Implemented Programs has been evaluated under their current design. OLEEP has never been evaluated, as it is a new program. MAP was evaluated during the last program cycle (2006-08). It offered a more comprehensive set of measures and was not restricted to mid-market buildings. Thus, the results of that evaluation are not entirely relevant to the implementation of the current program.

The adaptability of the current 3P implemented programs is difficult to measure due to the specific target market and technologies being offered. OLEEP offers a very specific technology to reduce

hot water demand of laundry facilities. This is a technology that has a small market with some barriers to implementation due to healthcare regulations. However, the program may benefit by being rolled into another more comprehensive emerging technology program, or the technology can be included as a list measure in the healthcare sector programs. Similarly, the MAP program is restricted to only mid-market buildings and two list measures after the IOU restructured the program mid-cycle. The program started out comprehensive and was offered to all commercial building sizes and was proved to be widely successful. However, the IOU recognized the mid-market buildings were not being targeted and wanted to make the program more exclusive to that hard-to-reach sector. This shows that the program is adaptable to expanding back to the original audience and comprehensiveness. In general, emerging technology programs should demonstrate an ability to be adaptable not only to new technologies, but different market sectors.

8. SCHOOL PROGRAMS

8.1 Category Characterization/Description

Schools can be hard to reach because they require assistance to participate in the programs. Schools focus on educating students and often have limited labor and financial resources to conduct energy efficient retrofits. The programs in this sector focus on different types of schools based upon school size or source of funding (private versus public). The programs target different types of schools in order for the programs to tailor design, marketing, and delivery approaches based upon the type and size of the school.

The programs are implementing the following measures:

- ◆ Lighting,
- ◆ HVAC optimization,
- ◆ Vending machine controls,
- ◆ Refrigeration (strip curtains),
- ◆ Window film,
- ◆ Building envelope,
- ◆ Plug load controls,
- ◆ HVAC Demand Response,
- ◆ Pool boiler replacement,
- ◆ Pool covers,
- ◆ Solar thermal hot water heating,
- ◆ Space heating boiler replacement,
- ◆ Instantaneous water heaters,
- ◆ Tank insulation,
- ◆ Pipe insulation,
- ◆ Boiler tune-ups, and
- ◆ Low flow showerheads.

Some programs that began with a comprehensive measure mix are now focusing mainly on T12 to T8 conversions and occupancy sensors to assist the schools in retrofitting the T12 lamps before the federal lighting standards change.

To meet the efficiency needs of the education sector and the potential savings, seven 3P commercial programs were given implementation approval for PY2010-12:

1. School Energy Efficiency Program (SEEP) (PGE2193) - Implemented by Resource Solutions Group (RSG), this program provides site evaluations and rebates to K-12 schools and college dormitories.
2. Cool Schools (PGE2210 and SCE-TP-023) - Implemented by Trane Company, this program provides incentives schools with a peak usage of at least 200 kW for the installation of a broad spectrum of energy efficient upgrades.

3. California Preschool Energy Efficiency Program (CPEEP) (PGE2212 and SCE-TP-038) - Implemented by the Low Income Investment Fund, this direct install program provides energy efficient equipment upgrades to preschools.
4. K-12 Private Schools and Colleges Audit Retro (PGE2213) - Implemented by Matrix Energy Services, Inc., this direct install program provides low cost HVAC tune-ups and lighting installations to K-12 schools.
5. Public Pre-Schools, Elementary Schools and High Schools (SCE-TP-024) - Implemented by Collaborative for High Performance Schools programs, this direct install program provides low-cost energy efficiency measures to public pre-K-12 schools.
6. Private Schools and Colleges Program (SCE-TP-037) - this program provides financial and installation assistance for energy efficiency upgrades for private schools and colleges.
7. Program for Resource Efficiency in Private Schools (PREPS) (SCG3663) - Implemented by Resource Solutions Group, this program provides rebates to preschools, K-12 schools, colleges, universities and trade schools for energy efficient upgrades, and was implemented partially based on RSG's experience implementing PGE2193.

8.1.1 Interventions

Three out of seven programs in the school sector are direct install (DI) programs that are focused on lighting and HVAC control optimization. All three DI programs have an energy audit component followed by low or no cost measure installations. Two of the programs, SEEP and the PREPS, provide technical assistance and education to assist the decision makers through the process of understanding project financing guidance, assisting the bid selection process and providing comprehensive audits. Both programs also have a financial incentive component. Cool Schools is an incentive program for schools with over 200kW peak usage that incentivizes energy efficiency upgrades on select measures.

8.1.2 Marketing and Outreach

The programs are utilizing several different marketing methods depending on the target market of the program. Most of the programs report that one of the best forms of marketing is through word of mouth. Schools generally have strong relationships with other schools and project successes are easily spread throughout the state. Larger schools are being targeted through outreach to the school boards and district management and through IOU AE referrals. The CPEEP is approaching schools through cold calls, conferences, referrals by AEs, or by utilizing child-care networks. The programs targeting private schools are finding the most success working with IOU AEs.

8.1.3 Long Term and Short Term Outcomes

The short term goals of the programs are to meet their energy savings targets and educate schools on energy efficient technologies and behaviors. School staff requires education on the technologies, the behaviors and the necessary maintenance. Market transformation and customer education are also part of the long term goals of the programs.

8.1.4 Role of Comprehensiveness: Deep Retrofit

The Cool School Programs were intended to create comprehensive retrofits for schools. These programs planned on working with performance contracts (PC), which are defined as comprehensive energy projects that achieve energy savings sufficient to pay for the full cost of the project and are often guaranteed by the energy service provider (ESCO). PCs work very well in schools because it allows them to create comprehensive retrofits that can be paid back over the term of the loans using their current operations and maintenance budget. This allows them to use their capital budgets for other expenditures. With the DI programs running in the same service territory it has been difficult to coordinate the timing of the retrofits. Once schools have received free lighting, they are less likely to complete the capital intensive measures.

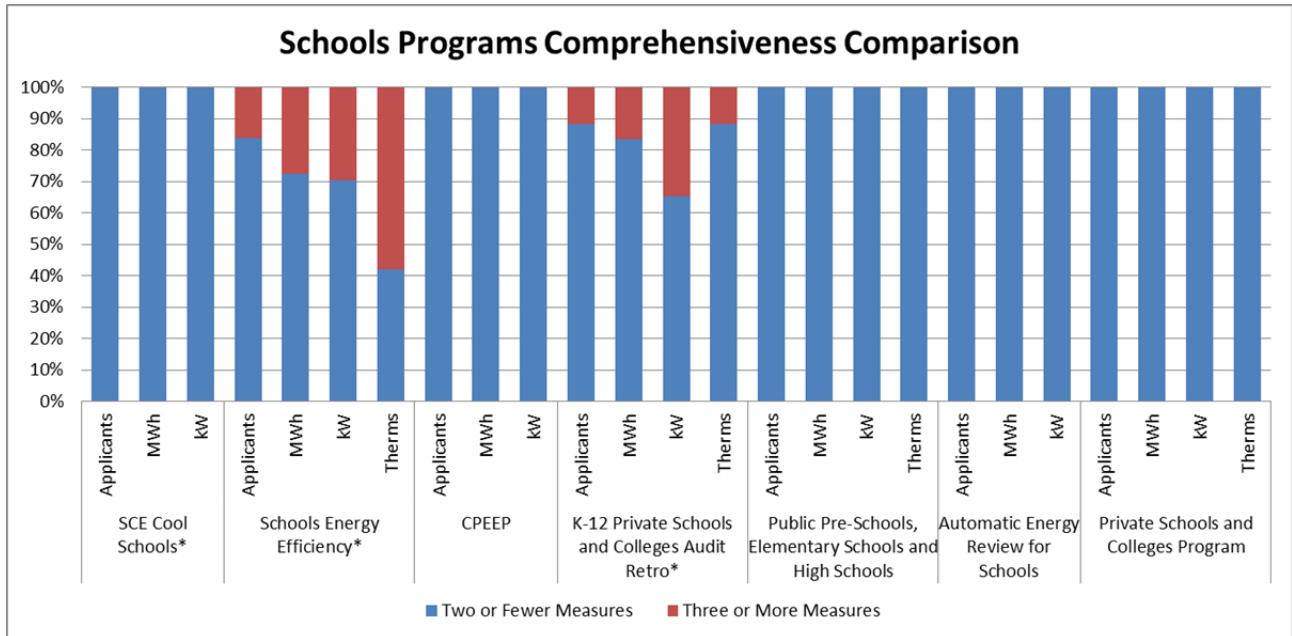


Figure 9: School Programs Energy Savings Analysis

Figure 9: School Programs Energy Savings Analysis shows a comparison of savings achieved by projects with two or less and three or more measures. Programs designed to be comprehensive are designated with an asterisk. Though comprehensive projects with three or more measures installed only account for 16% of the applicants for SEEP, those projects account for 58% of the Therm savings. In order to achieve a more comprehensive approach, SEEP combines widget upgrades, like LED exit signs, CFLs and occupancy sensors with lighting system upgrades, HVAC improvements and mechanical controls optimization. Similarly, 12% of the K-12 Private Schools and Colleges program applicants install comprehensive project, but those projects account for 35% of the kW savings. This program aims to combine low- or no-cost measures with large capital investments like HVAC, refrigeration and controls upgrades. Though the SCE Cool Schools program was designed as a comprehensive program, it has not installed any projects with more than two measures. Though Cool Schools intended to install a comprehensive mix of HVAC, lighting, evaporative pre-coolers and energy management systems, they have yet to install any lighting or HVAC measures. Comprehensive projects allow implementers to take advantage of interactive effects of measures and enhance energy savings.

8.1.5 Evolution of this Program Category

In the 2004-05 program cycle, SEEP was a non-resource program dedicated to education and training. In the 2006-08 program cycle, SEEP became a resource program and exceeded its energy savings targets. For the 2010-12 program cycle the energy savings targets increased dramatically. The program has been able to ramp up the marketing and outreach but not yet to the level expected in the PIP. The program target market and measures have remained the same. SEEP has evolved into a technical assistance and education program that also provides hand-holding services to the customer through the bid selection and installation process.

CPEEP started across the state in the 2006-08 program cycle. The program was dropped in the SDG&E service territory in the 2010-12 program cycle. The program measures and target markets have remained the same.

In the 2010-12 program cycle, some of the programs eliminated or lowered the co-pay to increase the participation rate. Other changes to this sector include elimination of the Automatic Energy Review for Schools program to avoid confusion and coordination issues with the Savings by Design program. Additionally, the Cool Schools Programs were added.

8.1.6 Program Savings Achievements

SEEP is exceeding its gas savings goals, but it has not yet achieved its projected electricity savings goals. The school programs have not yet meet their electricity savings goals.

The figures below show the installed savings for the programs throughout the program cycle. At the time of the report, HMG did not receive a confirmation of the new goals for the programs, so the goals reflected in the table are the original goals filed in the PIPs.

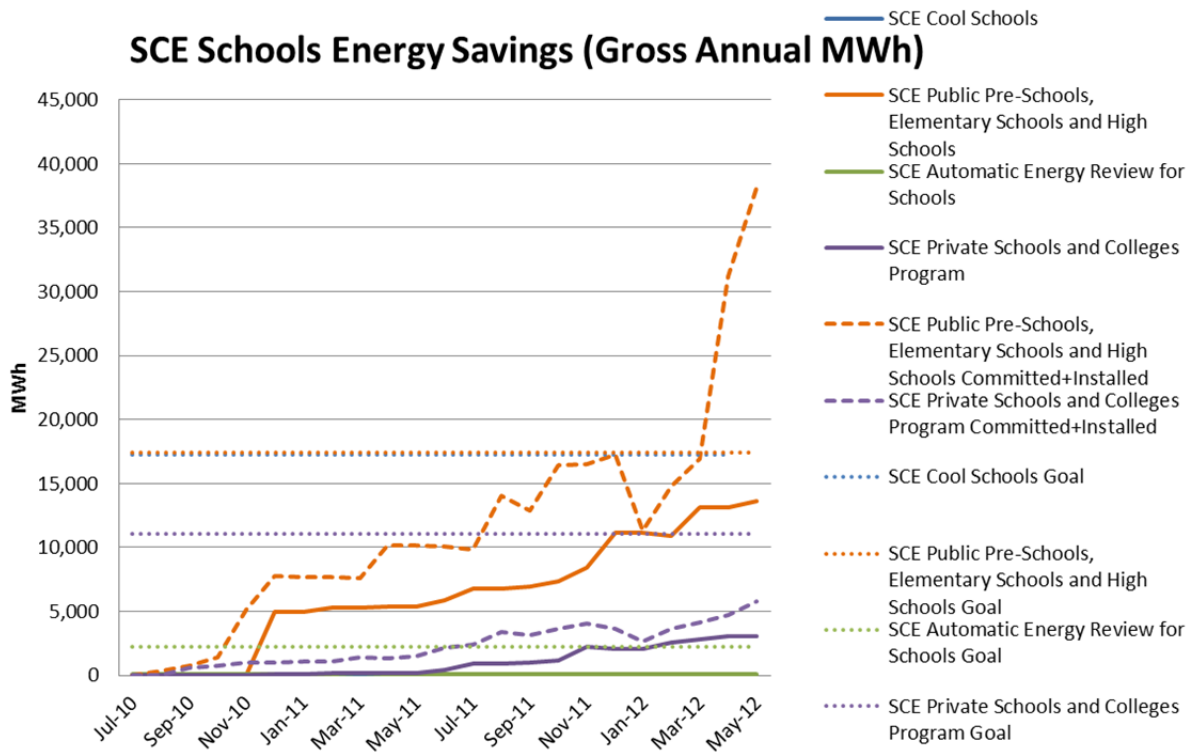


Figure 10: SCE School Programs MWh Energy Savings

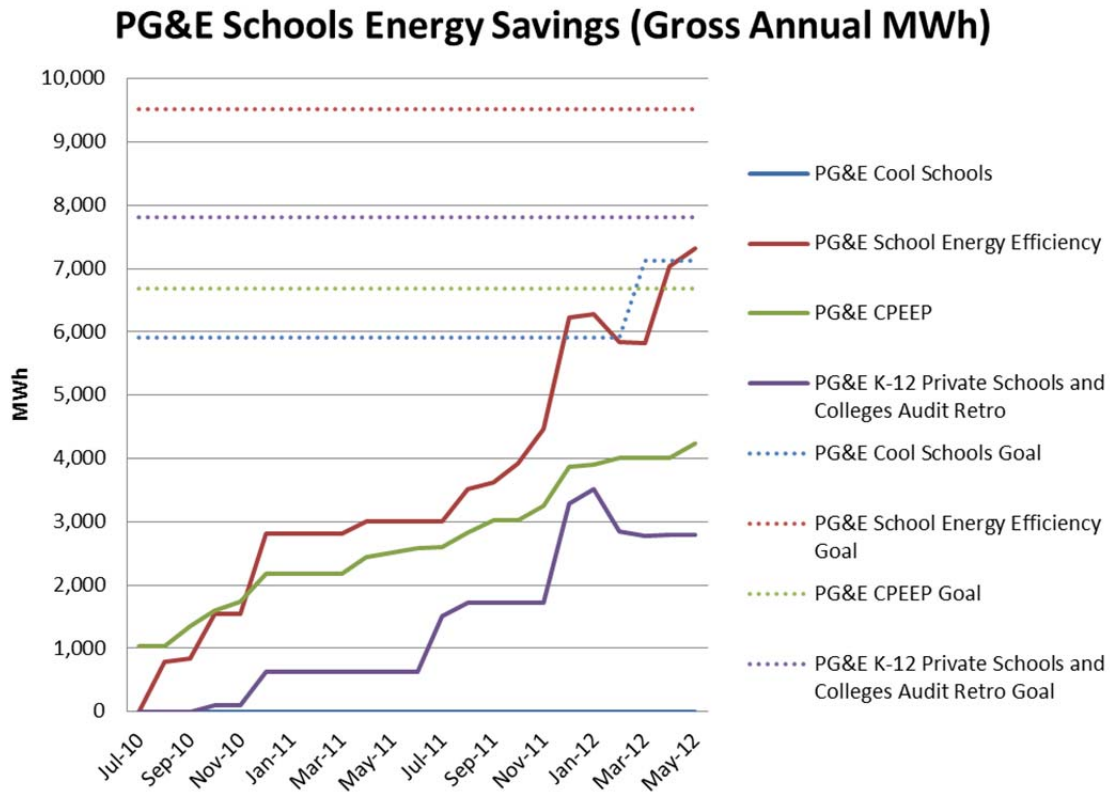


Figure 11: PG&E School Programs MWh Energy Savings

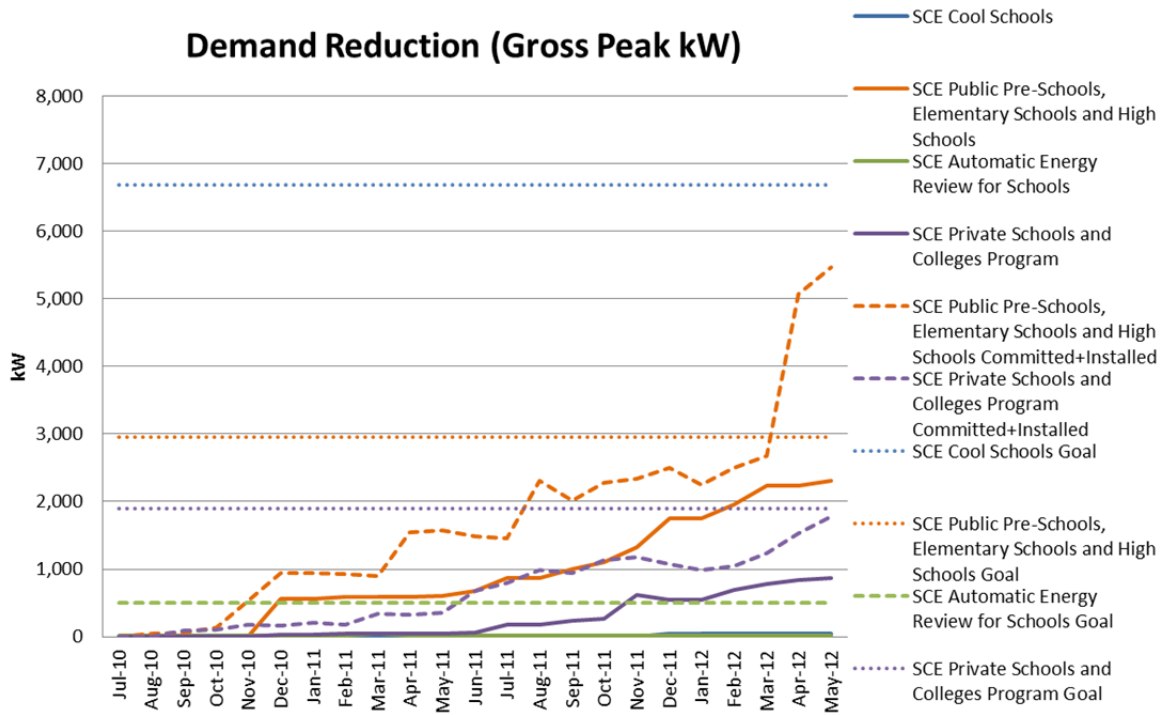


Figure 12: SCE School Programs Demand Reduction

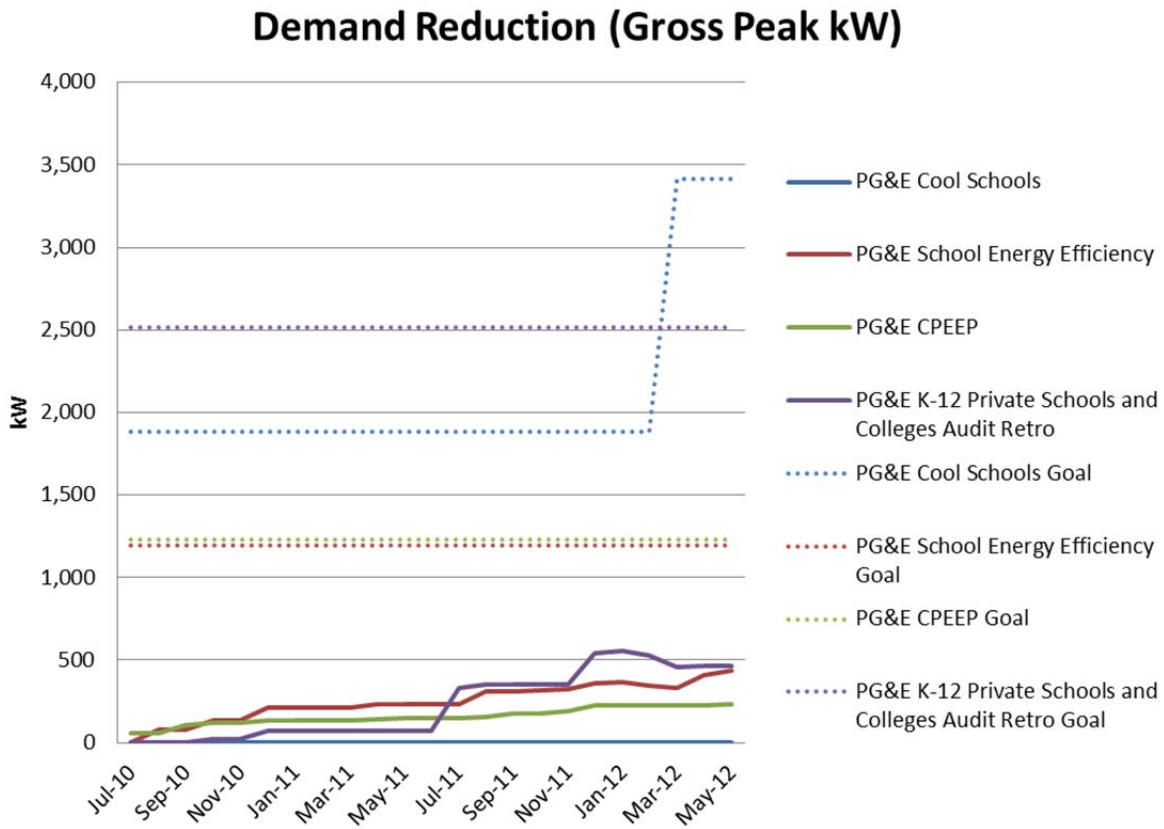


Figure 13: PG&E School Programs Demand Reduction

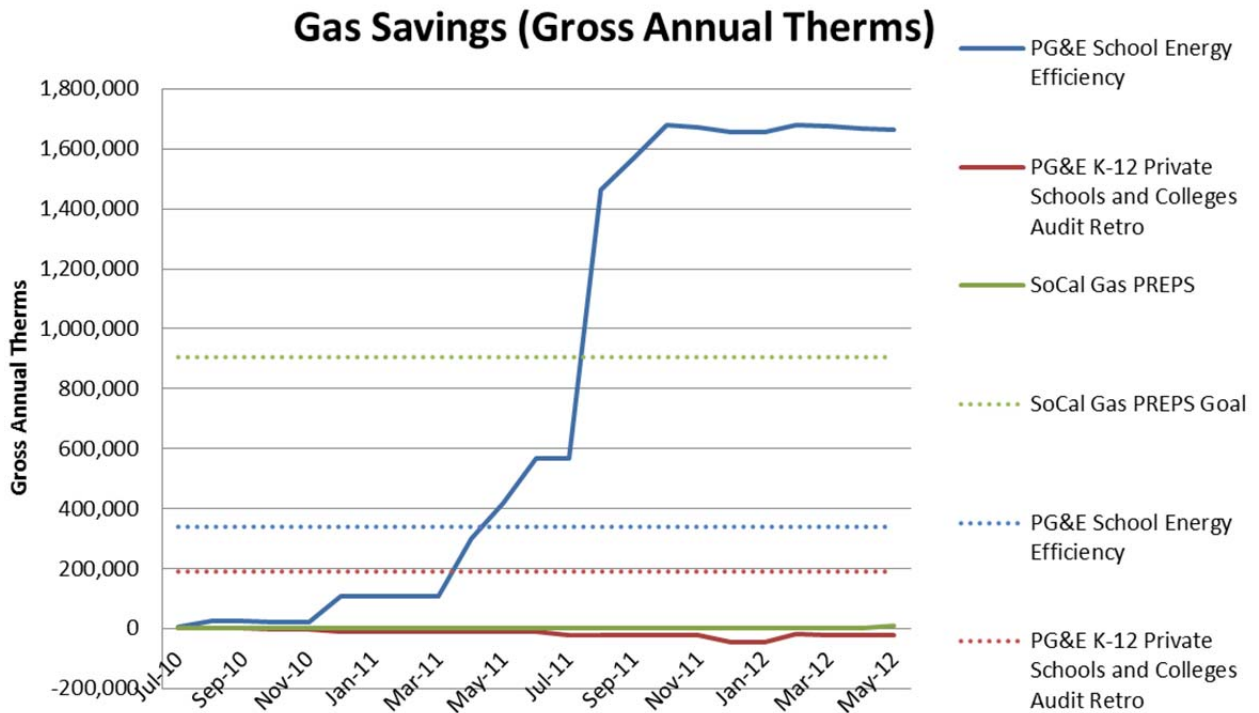


Figure 14: School Programs Therm Savings

8.2 Schools Program Practice Assessment by Program Component

The evaluation team assessed the School Programs against industry defined best practices, as defined in The National Best Practices Study¹⁴ and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing), and program evaluation. Under each area, the evaluation team briefly describes each finding and how they apply to industry defined best practices. In addition to the best practice, there are other notable practices that are detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 10 shows a best practice for the schools sector.

¹⁴ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

Schools Best Practice

Link free, direct install programs to installing other measures as well

Table 10: Schools Sector Best Practices

8.2.1 Program Theory and Design

Cool Schools reported that comprehensive projects with more capital intensive measures struggled to leverage the savings from the DI programs because of timing issues. DI projects take a few months to implement from the time of the first sales call to installation. More complex or capital intensive projects can take from 9 months to 2 years to install. Bridging the installation gap is difficult. Once a school has installed free measures, they can lose interest in installing the capital intensive projects. To receive free measure installations, customers should be required to install other measures that require a capital contribution to the project.

As another challenge, schools are ideal candidates for performance contracting; but with competing programs it is difficult for performance contracting to gain footing with customers. Cool Schools was set up to facilitate performance contracting, but only one school is working with a performance contract. The largest challenge is finding customers who have not already installed an EE lighting project; without the lighting savings, the payback on the other measures (e.g., HVAC) is too long for most customers to want to move forward.

The programs can still do a free direct install or cover the cost of the retrofit for low cost measures, but it should be linked to installing other measures as well. Finally, programs could require participants to install (or have a signed contract to install) a more comprehensive project before receiving free measures. This sector can achieve deeper energy savings if the measure mix is comprehensive; otherwise that opportunity is lost for the future. However, working with the schools' budget constraints and bringing in other programs to assist with funding can be complex and time-intensive, requiring coordination with school funding cycles and financial institution's timelines. Financing programs also have their own qualifying measures criteria, which may not always align with program measures.

8.2.2 Program Management: Project Management

For DI projects, the audit phase of the project is very time intensive and 3Ps do not get paid until the installed measures are verified (1-2 month lag time from when the audit is conducted to when the implementer is paid). If a school completes an audit, and then drops out of the program, the 3P does not get paid for the audit. This encourages the implementers to qualify the customer before they start the audit.

8.2.3 Program Management: Reporting and Tracking

Most programs found program tracking requirements to be adequate. The majority of the programs found it much easier to have an internal tracking database and upload to CRM as required. However, some programs use CRM to track customers and auto-generate some emails during the process. There are some programs that are also supplementing their tracking with common tools such as Google Docs. The Public School Program reported that they are using iPads

and tablets to do on-site data entry into their tracking database. Their system also was used to generate automated emails to customers with reminders and thank yous.

The reporting requirements are considered acceptable with the exception of the quarterly reports. It was reported that the quarterly reports are redundant, and are essentially a roll up of monthly reports.

8.2.4 Program Implementation: Marketing and Outreach

Involvement from facility maintenance managers, faculty and students is as critical to program success as from higher-up decision makers, like school boards and districts.

In terms of marketability of technologies, requirements of private schools were found to be vastly different than public schools. The Private Schools and Universities Program reported that a completely free program can carry a negative connotation. Some private schools advertise the programs as being state-of-the-art and look for more advanced technology options. Private schools appear to be more willing to bear higher out-of-pocket expenses. In public schools, because of budget cuts and funding restrictions, decision makers are less inclined to pursue measures with longer payback periods.

Including education as part of the program also increases savings persistence and helps to build relationships with the customers. Recommending and/or providing stipends for facility managers to participate in training opportunities, such as Building Operators Certification programs, and providing education to students, such as a short seminar or green-up kits, can promote long-term conservation and efficiency practices. When students are educated about energy efficiency, they take this knowledge home and help drive many of their parents' decisions outside of the Schools sector. Children, especially elementary school and middle school aged, will also police their teachers and administrators to ensure they are practicing energy efficient behaviors. This helps maintain energy savings persistence, and also encourages energy conservation, not just efficiency.

The Matrix Public School Program reported that District case studies are presented to other school districts to show savings achieved and benefits of the program. Often school officials have close relationships with other districts and share best practices and potential savings methods. Success stories from energy efficiency projects can be shared to give districts confidence in the program and gives them a reference they can call to get further unbiased information on the program. The program considers this to be a successful marketing approach. Case studies were not mentioned in the programs targeting private schools but might be an effective marketing tool since many private schools are interested in having a competitive edge, such as being 'green', or providing greater comfort or healthy environments for students. As the programs mature, implementers realize the importance of presenting past success stories to potential customers. However, the implementer may not have these available, if the program is new or if the case studies have not been documented in previous cycles.

8.2.5 Program Implementation: Participation Process and Customer Service

An overly complicated program can be a barrier. Matrix reported that providing too many measure choices to the customer resulted in the customer getting confused and delayed decision-making, so

it streamlined the process by offering only one set of measures. Customers have responded positively to the streamlined process and measure mix. Schools are most likely to install projects when the customer-specific presentations explain the process early on with clear indication of when customer decisions will be required. Customers can have pre-conceived ideas of onerous paperwork, feel overwhelmed with information, or have the wrong idea of the time input that would be required from them. As a result they can decline to go forward with the project. PREPS and SEEP offer technical assistance that includes helping schools find appropriate energy efficient solutions for their facilities. While there is not yet enough participation in the PREPS program to assess the success of this technical assistance, this service should reduce customer time in participation.

8.2.6 Program Implementation: Installation and Delivery Mechanism

The DI programs are providing free or low cost retrofits. The programs are struggling with school customers wanting a more comprehensive retrofit, lamp and fixture replacement rather than a lamp only replacement, for the same cost. The programs have become more aggressive about proposing a standard retrofit to avoid additional costs that will not be reimbursed by the program. The schools are concerned about light quality in the classroom. The schools are paying closer attention to the products being installed.

For the incentive programs the incentive mirrors those provided by IOU core programs. There is some discussion of creating bonuses or other methods to increase a customer's desire to move forward with projects. The implementers are looking in to this for the next program cycle.

9. RETAIL PROGRAMS

9.1 Category Characterization/Description

Retail properties require targeted support, as they have unique needs compared to other commercial sectors. Turnover rate is generally higher for retail establishments than other sectors, therefore a short term ROI is generally required for any investment in assets such as building efficiency to be realistically considered. There is a lot of variety within the retail sector as to the management and focus of the establishments. However the leading end-uses are invariably lighting and HVAC whether at a small mom and pop retail shop or a large franchise chain anchor store. Thus, there are significant savings opportunities in this sector in lighting and HVAC.

To meet the efficiency needs of the retail sector and the potential savings, two 3P commercial programs were given implementation approval for PY2010-2012:

1. Comprehensive Retail Energy Management Program (CREMP) (PGE2183) - Implemented by Quantum Energy Services Technology (QuEST), this program provides incentives to multi-site retailers that implement energy efficient measures on at least two sites; and
2. Furniture Store Energy Efficiency (Referred to in this report as FREE) (PGE2200) - Implemented by Matrix Energy Services, Inc., this program provides direct installation of upgrades and no cost for HVAC and lighting in retail furniture stores.

9.1.1 Technologies

In the beginning of the 2010-12 program cycle the programs applied to implement the following measures:

- ◆ Lighting,
- ◆ HVAC Equipment, and
- ◆ Retro-commissioning.

The programs work to integrate these measures for comprehensive solutions to reduce overall energy usage.

New technologies are changing the market and the programs need to respond quickly in order to meet the needs of the customers. Adding new measures has been a struggle because of the cost to create the workpapers and the timing to get the workpapers approved. There has also been a struggle between the desire for these programs to provide comprehensive services to their customers and maintaining specific measures for which only single-end-use programs can install and claim savings. For example, CREMP has referred some projects to the Advanced LED lighting program to install advanced measures beyond the scope of their measure mix. Demand response technologies are not currently included in the measure mix. Providing incentives for demand response capable technologies at the time of an energy efficiency upgrade could be advantageous.

9.1.2 Interventions

The two programs in the retail sector begin by having the customer sign a site access agreement. The FREE program conducts a site audit, whereas CREMP asks the customer to release utility data before conducting a site audit. The programs utilize interventions specifically tailored to the niche sector each program is designed to address.

The FREE program performs an audit to determine which lighting or HVAC measures would be best for direct installation at the furniture stores in PG&E territory. These installations are free to the customers, and are scheduled as soon as the manager or owner gives approval, commonly within a few weeks of initial contact.

CREMP has worked with Macy's upper management to identify stores within PG&E territory for potential energy efficiency upgrade opportunities. After site access and utility data release agreements are signed, CREMP works with program participants to educate them on energy savings opportunities and available rebates, and helps plan their equipment replacement. This strategy of top-down referral enabled CREMP to effectively coordinate EEM opportunities offered by the program with each store's established equipment upgrade schedule, leveraging the stores' operations, and maintenance budgets to increase the energy savings that could be realized during the upgrade. The program works with Macy's preferred vendors and contractors to ensure quality installation of the identified measure opportunities.

9.1.3 Marketing and Outreach

The FREE program relied primarily on door-to-door recruitment, supported by letters and fliers in coordination with the PG&E account executive (AE). Upon initiation of the program, support from the AE was crucial in providing the program with needed credibility. Many customers were skeptical of the program's offer to install measures for free, so integration with PG&E branded materials helped to reassure customers of their validity.

CREMP had been in existence in previous cycles as a comprehensive program specifically targeting Macy's, so marketing in this program cycle was reduced to an extremely streamlined process. Occasionally they have been asked to present their findings from site audits at board meetings to convince management to proceed with the EE retrofits. There was also an attempt to expand the scope of the program to include other larger retailers like JC Penny and Sears, which included meetings with upper management at those companies. However, language in the site access agreements was found to be problematic by the customers' attorneys, which prevented those efforts from continuing or leading to any energy savings opportunities.

9.1.4 Long Term and Short Term Outcomes

The short term goals of the programs are to reach and exceed the savings goals for the programs. The programs are working to reach their energy savings goals by building relationships with retail customers to educate them on the energy efficient technologies and to help design projects to fit their budget. Customers then work with their own vendors or the programs will refer customers to vendors, generally dependent on the size of the customer. The incentives allow customers to include the projects within their budgets. The FREE program performs direct installations at no

cost to the customer. This requires a slightly different approach to engaging customer interest, but maintains similar goals of reaching and exceeding energy savings targets.

The long-term goals of the programs are to educate customers on the energy efficient technologies and their reliability and non-energy benefits. Opportunities for energy savings are often missed by building owners due to a lack of information. CREMP has made a point to try and educate customers at the beginning of the process so that additional EE opportunities can be integrated into part of the customers' equipment upgrade planning.

9.1.5 Role of Comprehensiveness: Deep Retrofit

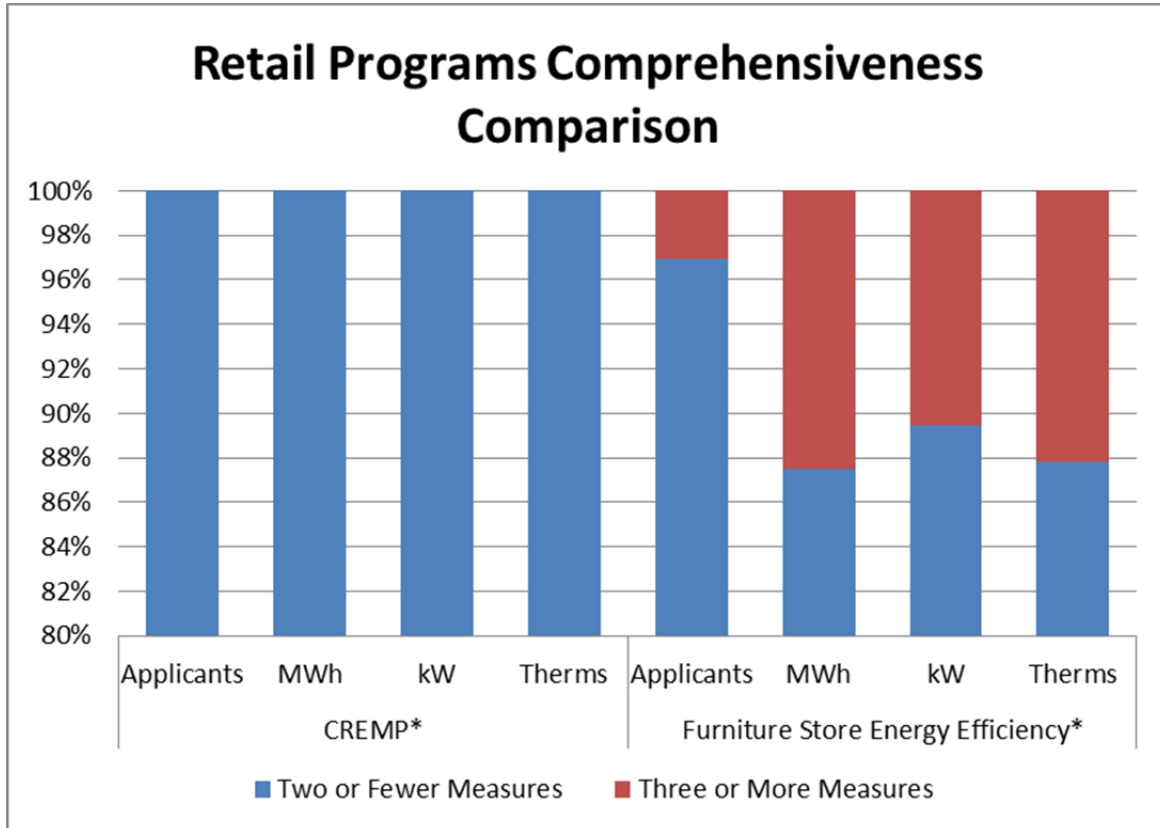


Figure 15: Retail Program Energy Savings Analysis

CREMP claims it has been operating for so long, and identifying comprehensive upgrade opportunities so effectively, that there are no Macy's stores remaining in PG&E territory that have not already been touched. Integration with the in-house schedule for retrofits has been crucial to their success. Figure 15: Retail Program Energy Savings Analysis shows the percent of savings attained from projects with two or fewer and three or more measures. Though CREMP planned to include RCx as well as lighting and HVAC upgrades, they have not had any projects that included three or more measures.

The FREE program is a direct install program for which all of the savings are deemed and there is no cost to the customer. Their goal has been to provide energy efficient upgrades for customers that do not have the time, capital, or interest in performing these upgrades for themselves. In order to

maintain their classification as a comprehensive program, the FREE program occasionally recommends installation of an HVAC measure in addition to the more commonly installed lighting measures, even though it can be less cost-effective. Implementers have expressed a desire to add LEDs and other emerging technologies into the retail programs. As Figure 15 demonstrates, the FREE program has one project out of 33 total projects that included comprehensive energy upgrades. This one project accounts for 13% of the total MWh energy savings for the program.

Overall the programs are cost effective, with a TRC greater than one (1.2 or 1.3 were examples given by CREMP). A balancing act is employed by the FREE program to ensure that sufficient “comprehensive” measures are installed to maintain that designation, while also keeping costs down by focusing on the most cost-effective measures (commonly lighting). In the long term, as low-hanging fruit is identified and implemented, the savings opportunities for future measures will become more expensive.

9.1.6 Evolution of this Program Category

CREMP in the 2010-12 program cycle was an extension of the retail program that began during the 2006-08 program cycle. The program previously targeted Macy’s only, until this program cycle when the scope was extended to allow recruitment of two other large retail chains. As a comprehensive program, CREMP was required to provide incentives only to customers that were going to install measures in at least two different end-use categories, one of which was required to be retro commissioning.

The FREE program began as an IDEEA program bid in 2007 and was added by PG&E as a stand-alone program in the 2010-12 program cycle. The program’s scope was narrowed by PG&E to include only retail stores exclusively selling furniture items (including bedding), excluding big box stores. This prevented any overlap or competition between the two programs.

9.1.7 Program Savings Achievements

The retail sector has been greatly affected by the downturn in the economy over the last several years. This has made it more difficult to convince retailers to take a long-term approach to budgeting for energy measures, and reduced the market size that were the basis for the initial savings goals. As shown in Figure 16 and Figure 17, the goal for the FREE program was revised to reflect this change in available market. Meanwhile CREMP has savings that reflect the diminishing returns that accompany a targeted program with such a long history. The inability to add customers other than Macy’s has limited their savings because they have already worked with most of the Macy’s stores in PG&E territory to install the low payback measures. The inability to add measures that other programs have received authorization to work on has limited their ability to increase program savings as well.

Energy Savings (Gross Annual MWh)

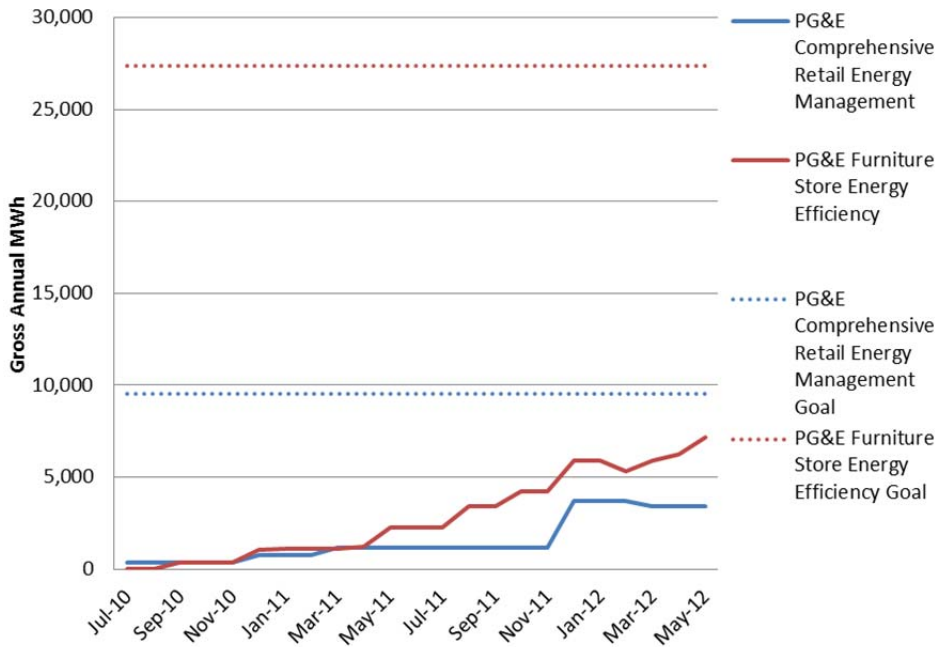


Figure 16: Retail Program MWh Energy Savings

Demand Reduction (Gross Peak kW)

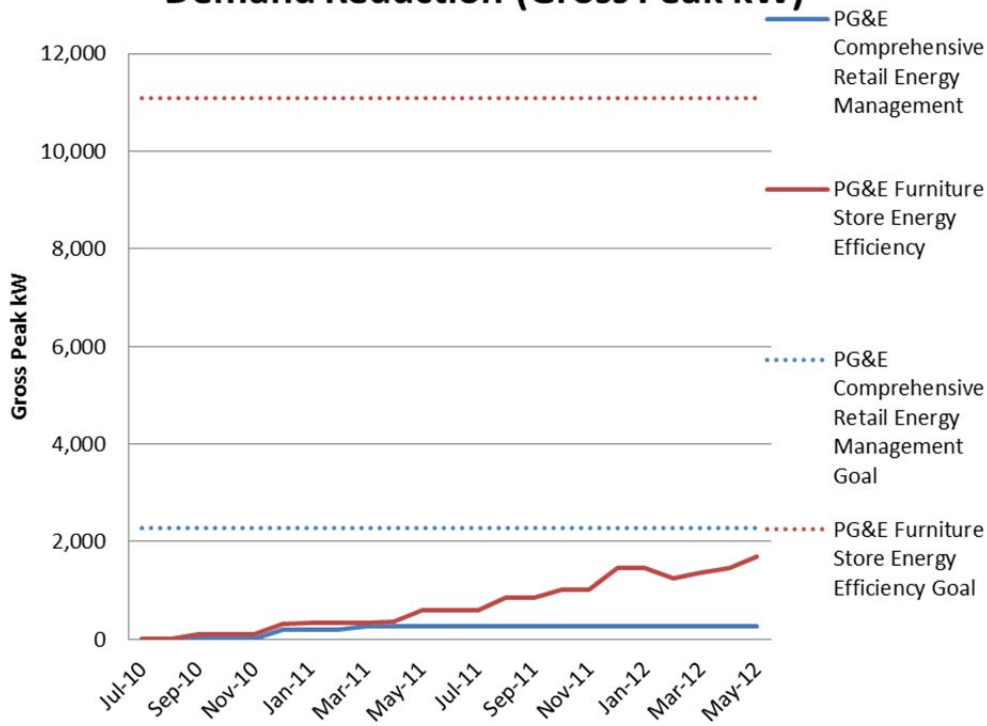


Figure 17: Retail Program Demand Reduction

9.2 Retail Program Practice Assessment by Program Component

The evaluation team assessed the Retail Programs against industry defined best practices, as defined in The National Best Practices Study¹⁵ and also reviewed the programs to look for new best practices. While the team did not find true best practices, there were many successful practices that are listed below. These successful practices are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area the evaluation team briefly describes each practice.

9.2.1 Program Theory and Design

IOU staff recommended a statewide program for chain retailers. They have stated that their chain customers would prefer one point of contact for their energy efficient retrofits in California. The third-party implementers did not voice that opinion, but did mention that retail programs work best when customers had a single point of contact. It seems reasonable that, particularly in cases where at least one key decision maker is at a corporate headquarters and influences multiple sites, a statewide program operated by the same third-party implementer could be advantageous. However, we do not have enough evidence to confirm this.

The CPUC and/or IOUs should explore the idea of a statewide program for multi-site retailers with other stakeholders, including a few multi-site customers, IOU account representatives for multi-site customers, and third-party implementers. It should also consider conducting a literature review and/or web search to understand if this type of program has been tried in other parts of the US. It should also be considered whether this type of program would offer significant advantages to current program offerings (including what barriers a statewide program could overcome) and what types of multi-site retailers (e.g., franchises, chain retailers, small and/or large facilities, different facility types, etc.) should be included.

Each program has a clear target, with CREMP focusing on the larger chain stores, and the FREE program clearly targeting a separate niche within the retail sector including only retail stores exclusively selling furniture items (including bedding). This excluded big box stores that also sold furniture items. Eligible customers were identified by NAICS code.

9.2.2 Program Management: Project Management

Both programs began with weekly calls scheduled between PG&E and 3P Program managers to check on the progress of the programs. These calls are supplemented by an additional phone call and emails between the program managers several times a week, on an as-needed basis. The FREE

¹⁵ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

program shifted to a bi-weekly standing phone call in the third year of their program cycle, as weekly calls were no longer necessary.

The flexibility with respect to communication type (emails, phone calls) and frequency practiced by program managers in both retail programs has contributed to these programs' success. Successful 3P Programs were able to communicate frequently with the PG&E PMs, and both the PG&E PMs and 3P PMs were flexible with meeting schedules and check-ins so that communications worked fluidly on an as-needed basis rather than on a strict timeline.

CREMP manages, tracks, and reports on its projects via a proprietary online database that the implementer, QuEST, internally designed and built specifically for third-party program work. This database is accessible by PG&E as well.

9.2.3 Program Management: Quality Control and Verification

Both retail programs perform an on-site inspection to verify installation of the appropriate equipment. After that, the process changes slightly depending on whether the measures being verified are using deemed or calculated savings. Deemed savings projects are randomly sampled for additional verification of installation and measure counts by an in-house technician, followed by an inspection by PG&E. One program uploads pictures to document that the measures were properly installed, coupled with a signature from the person providing the tour of the facility and a copy of the invoice indicating an appropriate time frame for installation to the program database.

For calculated savings measures, the programs follow guidelines dictated by PG&E, such as data logging for equipment of a certain size. Calculation of ex ante savings estimates require a baseline measurement of two weeks of trend data, which is made easier if the customer has an EMS installed; otherwise data loggers are installed and the data are recorded.

9.2.4 Program Implementation: Marketing and Outreach

Both programs are taking advantage of the PG&E Account Executives (AEs) to develop name recognition and credibility in the beginning of their program cycle. This practice can be particularly helpful for programs that are in their first program cycle. Neither CREMP nor the FREE program has a need for a complex marketing structure because their target markets are very niche. CREMP, because it has been in existence for two program cycles, has already established the necessary contacts within Macy's during its first program cycle, and has worked within that channel for the remainder of the program's existence.

The FREE program is able to work down a list of furniture stores in PG&E territory from a NAICS print-out provided by PG&E, and contact the PG&E AEs of individual properties that are applicable for the program.

9.2.5 Program Implementation: Participation Process and Customer Service

Interviews with the 3P Program managers discovered that PG&E site access agreements can be overly burdensome for customers in the retail sector, which can prevent a program from offering any energy savings services at all. Unfortunately, CREMP was ramping up in the 2010-12 cycle to

work with two other large retailers outside of Macy's, but both Sears and JC Penney refused access because of the language in the site agreements, which CREMP was unable to change.

The complexity of the site agreements can be a non-starter for program participation. If a future 3P statewide multi-site retailer program is adopted, this practice will be especially important to realizing the savings that are currently locked in that part of the sector.

10. GROCERY PROGRAMS

10.1 Category Characterization/Description

Grocery stores have the highest electric energy use intensity of all commercial buildings types with 41 kWh/SF annually; refrigeration and lighting represent about half and a quarter of the electric use, respectively.

There are currently two 3P Programs targeting the grocery sector in PG&E service territory. One of them targets medium to large stores with 70 kW or higher peak demand, and the other targets on smaller stores with less than 70 kW peak demand.

1. EnergySmart Grocer (PGE2185) - Implemented by Portland Energy Conversation, Inc. (PECI), this program provides lighting, refrigeration and HVAC incentives to medium and large sized (70 kW and above) refrigeration-related businesses including grocery and big box stores.
2. Cool Biz (PGE2197) - Implemented by KEMA Services, this program provides lighting, refrigeration and custom incentives to small and medium businesses (electric demand of <70 kW) with refrigeration loads.

10.1.1 Technologies

Both programs focus on refrigeration-related measures to reduce store energy usage. In addition, the program offered a relatively comprehensive list of measures. A list of the technologies offered is as follows.

- ◆ Refrigeration
 - Refrigeration system control
 - Equipment/component retrofit: anti-sweat door heater controllers, evaporator fan motors and cooler control systems
- ◆ Lighting
- ◆ HVAC maintenance and tune-ups
- ◆ Grocery-specific RCx and controls
- ◆ Food service technologies

10.1.2 Interventions

In addition to the measures listed above, the program targeting medium to large stores also provides extensive in-depth facility audits and estimated energy savings reports as part of the store recruitment and engagement process. Furthermore, this program provides technical assistance as well as contractor referrals throughout the service procurement and bidding process. For the program targeting smaller stores, comprehensive facility assessments are also provided (though by the contractors). To overcome the language barrier typical for smaller, owner-operated stores, the program also offers multilingual information and customer support.

10.1.3 Marketing and Outreach

The two programs have different approaches in terms of program market and outreach. Since many of the potential participants for the medium to large grocery stores program are chain stores, market and outreach efforts are focused on the corporate decision making level. Further, the program periodically utilizes the potential customer list generated by PG&E to identify and engage new qualifying customers (in terms of kW). Once a new potential customer is identified, the field energy analyst (the program's field rep) starts the conversation by offering an on-site audit.

In contrast, because smaller stores are often operated by owners themselves, the program targeting smaller stores rely on participating contractors to be their marketing arms. In this case, the participating and program certified contractors are going door-to-door and neighborhood-by-neighborhood to identify and recruit potential participants.

10.1.4 Long Term and Short Term Outcomes

The short-term goals of the programs are to reach and exceed the energy savings goals. For larger grocery stores, the program achieves these energy savings goals, first and foremost, by building relationship with corporate level decision-makers of chain stores and facility managers for individual stores. For smaller grocery stores, energy savings goals are accomplished by deploying efficient technologies through the help of contractors.

The long-term goals of the programs are to keep the customers informed and updated on efficient and available technologies, especially refrigeration-related, and to encourage behavioral changes through better understanding and awareness of how to control and maintain equipment to ensure optimal energy performance. Larger stores likely have in-house or preferred services contractors. For them, this educational component of the program is achieved by continuous conversations with both corporate and facility staff. For smaller stores, contractors take on the responsibility of educating store owners by explaining the technologies, their operational requirements, in addition to the financial benefits.

Another longer term goal of the program that targets larger grocery stores is to ensure savings persistence. This program achieves this goal by encouraging long-term maintenance and service agreements between the customer and the installer for equipment/technologies installed through the program, especially if the store does not already have a preferred contractor.

10.1.5 Role of Comprehensiveness: Deep Retrofit

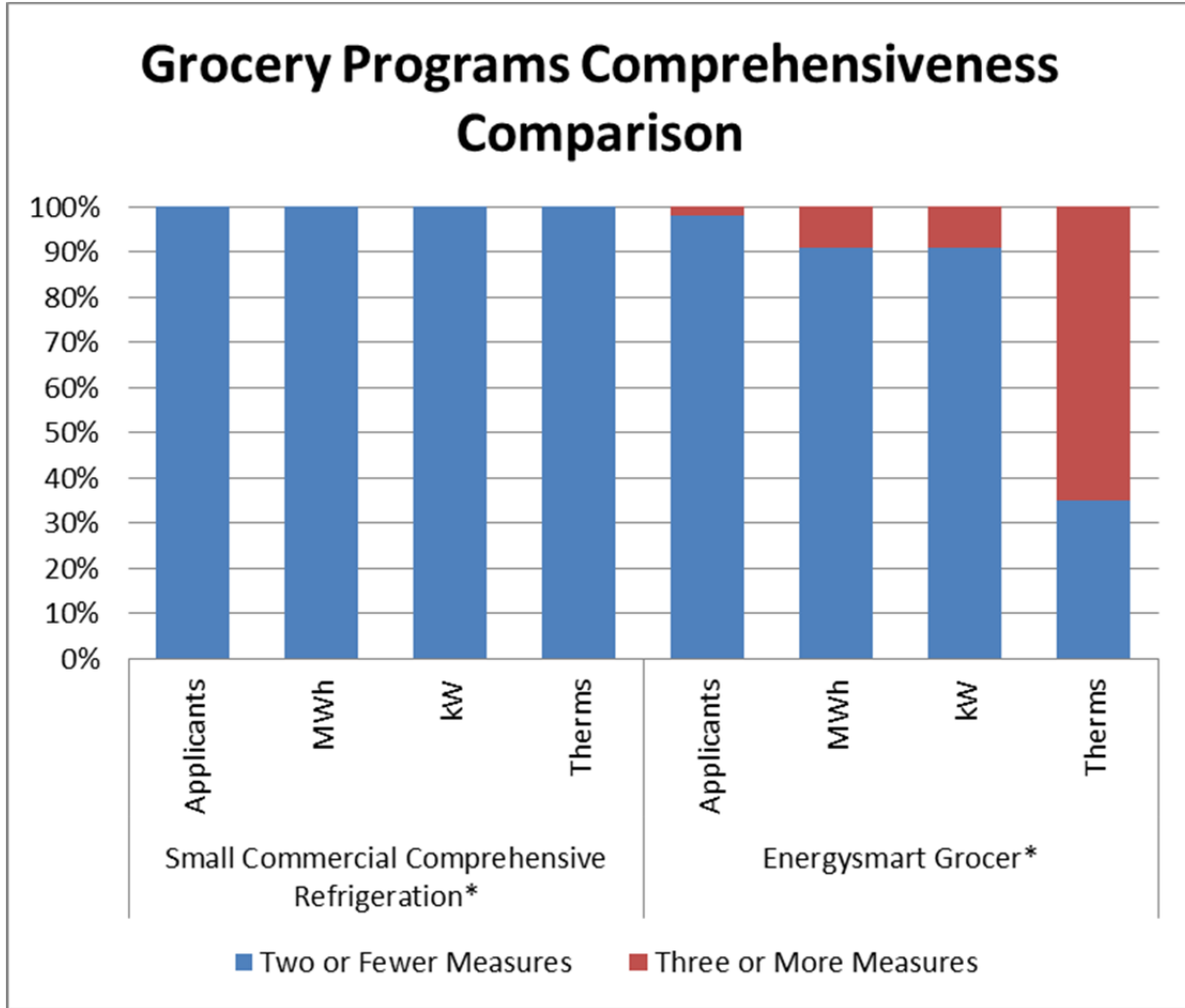


Figure 18: Grocery Program Energy Savings Analysis

Both programs offer comprehensive retrofits as one of the primary program objectives. Given that both programs are sector specific as opposed to end-use or equipment specific, this emphasis on measure comprehensiveness is expected.

The program targeting medium to large stores has a better engagement model for facilitating long-term, deeper retrofit. More emphasis and resources are dedicated to the initial audit and estimated energy savings report because the implementer believes it to be the key for identifying and prioritizing the list of retrofit opportunities and establishing on-going mutually beneficial relationships. Programs must have applicable retrofit opportunities and an established working relationship to implement retrofits throughout the program cycle. As Figure 18 demonstrates, though less than 5% of the EnergySmart Grocer projects involved 3 or more measures, those projects accounted for greater than 50% of the Therm savings for the program.

While the program targeting smaller stores also offers a comprehensive list of measures, the mechanism of engagement and interaction appears less inductive to deeper retrofits. The 3P

implementer stated that smaller store owners have limited access to the capital necessary for more substantial energy savings associated with deep retrofit. This limitation directly affects the store owner's ability to commit to larger-scale or multiple installations that may require further financing.

10.1.6 Cost Effectiveness

Both of the programs are cost effective. 3P implementers commented during the interviews that total TRC may not be the best cost effectiveness indicator as the DEER database is not updated frequently enough to reflect actual measure costs and energy savings. The implementer suggested levelized cost as an appropriate cost effective metric.

10.1.7 Evolution of this Program Category

The program targeting medium to large grocery stores had been in place for a number of program cycles. According to the program implementer, the program in the previous (06-08) cycle had a big uptake from relatively inexpensive measures with large savings, strong relationship with corporate accounts, and higher participation rates of contractors and customers. Thus, to meet the demand of the market, the program introduced more refrigeration controls measures during the 2010-12 cycle. The 3P implementer elaborated on this "stepped" approach by initially focusing more resources on marketing to first-time customers and contractors and later on rolling out more measures with deeper savings.

The program targeting smaller grocery stores is also run by an incumbent 3P implementer. Similar observations were made by the implementer in terms of measure offering. Measures have changed from simple "widgets" (for example door gaskets) to more complex measures yielding deeper savings. For the 2010-12 program cycle, the program had to match incentive levels with the IOU incentive rates for uniformity. As a result the incentive rates were lowered.

Both programs noted the drastic increase in competition with other LGP and other end use based 3P Programs as the programs evolve through the cycles.

10.1.8 Program Savings Achievements

Based on the information available from EEGA (see Figure 19, Figure 20, and Figure 21), both programs have achieved more than 50% of their kWh savings goals and slightly more than 50% of their kW reduction goals as established by their PIPs.

Staff of the program targeting medium to large grocery stores, EnergySmart Grocer, commented during the interview that their performance outcomes are in line with the original budget. Further, the program was expected to potentially achieve better cost effectiveness by end of the cycle. The Therms savings for EnergySmart Grocer declined sharply into negative savings in January and February of 2012, but returned to positive savings in March. The program contact indicated that the program had anticipated negative Therms savings goals, likely due to the interactive effects between refrigeration and lighting measures (electric savings) and the heating system (increased Therms). This interpretation is supported by the corresponding sharp increase in electric savings in January and February, as shown in Figure 21.

The program targeting small grocery stores, Commercial Comprehensive Refrigeration, “CoolBiz,” is currently going through a second change order of the cycle to obtain more budget funds. The original budget was reduced initially; however, more funds became available now since they are being re-routed from lower-performing programs. The implementer noted that the same change order situation occurred in the 2006-08 cycle.

Energy Savings (Gross Annual MWh)

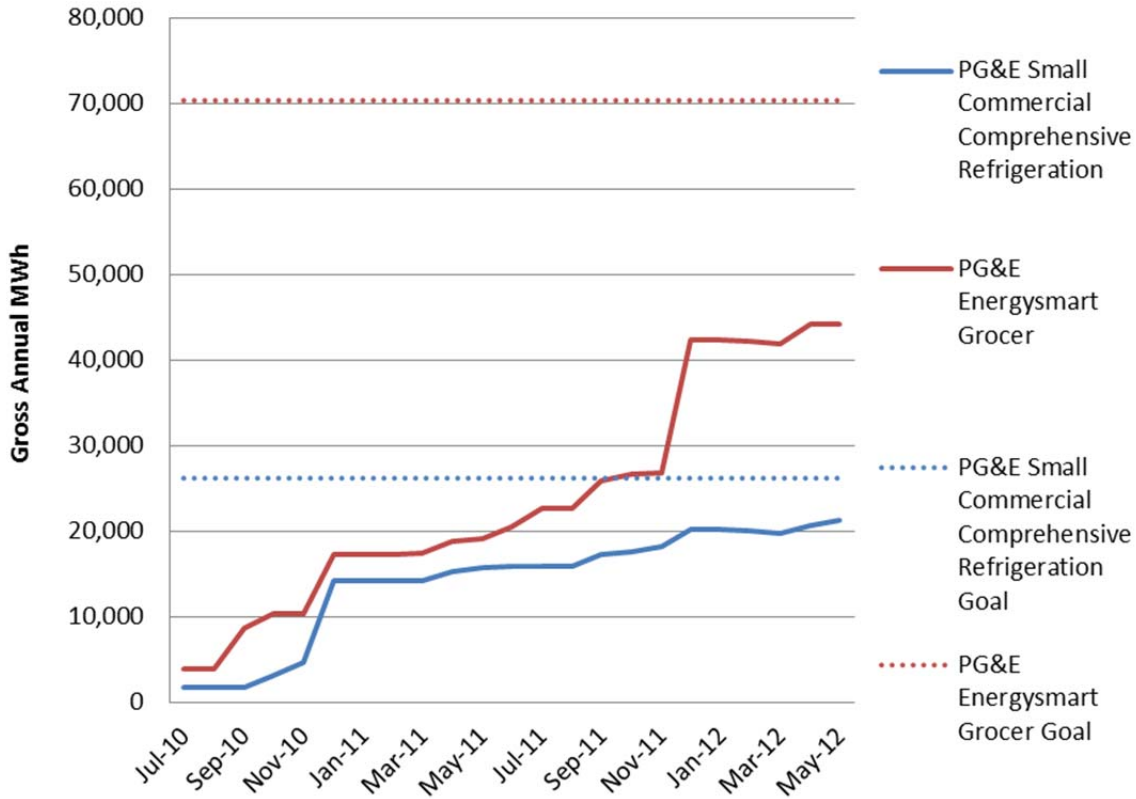


Figure 19: Grocery Programs MWh Energy Savings

Demand Reduction (Gross Peak kW)

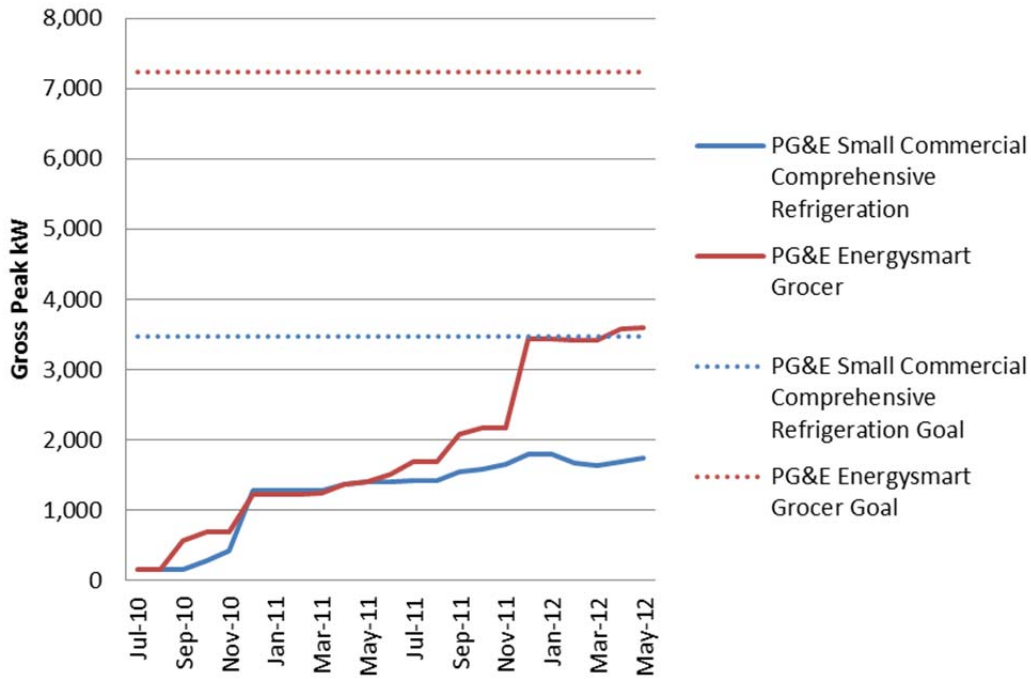


Figure 20: Grocery Programs Demand Reduction

Gas Savings (Gross Annual Therms)

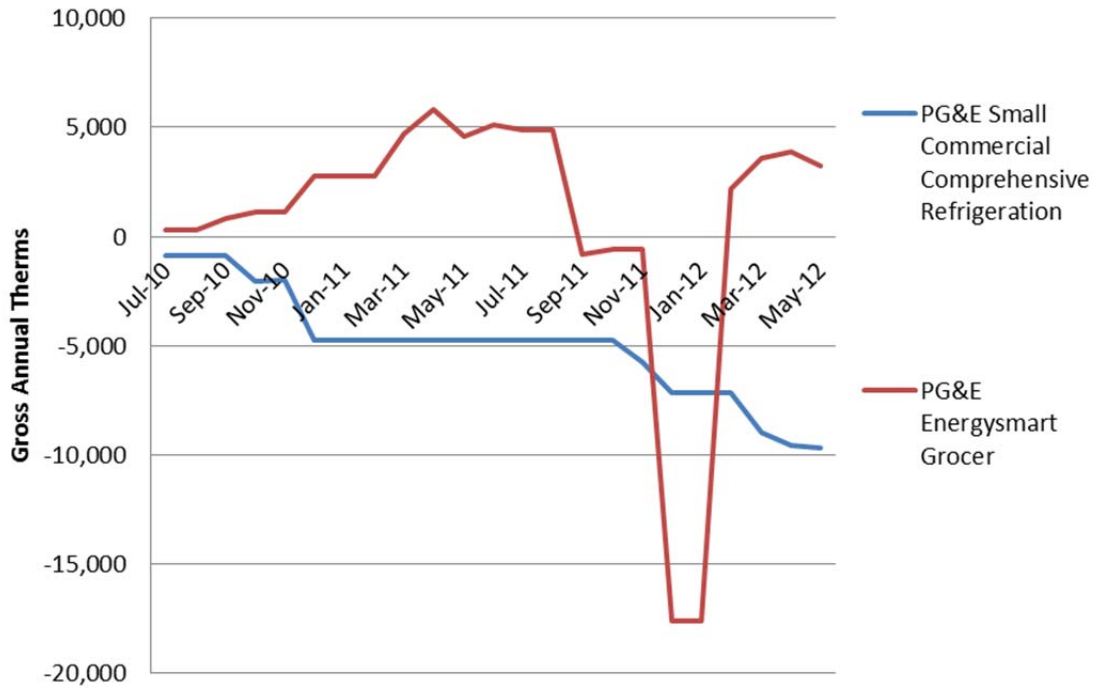


Figure 21: Grocery Programs Therms Savings

10.2 Grocery Program Practice Assessment by Program Component

The evaluation team assessed the grocery programs against industry defined best practices, as defined in The National Best Practices Study¹⁶ and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control) and program implementation (including the participation process and marketing). Under each area, the evaluation team briefly describes each finding and how it applies to industry defined best practices. In addition to the best practices, there are other notable practices that are detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 11 shows a summary of the best practices for the grocery sector. More detailed descriptions of these practices can be found in the following section.

Grocery Best Practices
Tailor Market and Outreach Efforts to Organizational Structure and Decision Makers
Provide Assurance on Measure Reliability

Table 11: Grocery Sector Best Practices

10.2.1 Program Theory and Design

Both grocery-sector programs included in this study were designed to address market needs. EnergySmart Grocer expressed that it was important to be aware of market segmentation. This meant looking at the program from the perspective of the customers and how their specific business models work. For example, the key decision maker differs by whether the store is part of a national chain or is operated independently. This awareness of the natural market segmentation does not necessarily align with PG&E’s peak demand differentiation; peak demand threshold currently determines the program for which they are eligible.

CoolBiz was an offshoot from the BEST small commercial programs (which had both retrofit and direct installed component). The implementer directly responded to PG&E’s request and designed the niche program to serve stores with refrigeration systems.

Neither of the programs reported utilizing a program theory during program design. One program responded that a program theory is perhaps more useful for evaluators than implementers, while the other program reported that the logic model was only used to inform the design process to make sure that the program offerings are reasonable and deliverable.

¹⁶ Volume NR5 – Non-Residential Large Comprehensive Incentive Programs Best Practices Report. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

10.2.2 Program Management: Project Management

Both grocery programs have extensively defined organizational roles and responsibilities, as well as established lines of communication. This was evident during the two interviews conducted by the evaluation team as well as through the supporting documents provided by both programs. This has also been identified as a best practice in the Best Practices report. Both programs maintain frequent and regular communications with their respective utility managers.

In terms of ensuring sound technical capability and experience in the area of refrigeration systems, EnergySmart Grocer relies on expertise from an in-house engineering team to provide support, while CoolBiz was set up to leverage their partnership with program-approved contractors. The major difference between the two program management models is how the programs approach customers and provide assistance throughout the project installation process. With medium to large grocery stores, especially ones belonging to a chain, stores often have preferred vendors and are mainly looking for help identifying and prioritizing available efficient retrofits. The program targeting smaller grocery and convenience stores, CoolBiz, partners with contractors to marketing the program and perform the project installation. This serves as a direct motivator for the contractors; the more projects they are able to solicit and complete for the program, the more work they secure for themselves, and at the same time they help achieve the program's energy savings goals. Through program coordination staff, the program manager keeps track of progress in the field and focuses on overall program management. These two tailored models of task division seem to serve the needs of the two programs' respective customers.

Judging from the abundance of operational and institutional knowledge available during the interview process, both grocery programs appear to maintain program personnel over multiple cycles. This is extremely helpful to having a successful program. Consistency in program personnel helps in the short-term by ensuring smooth daily operations and in the long-term by retaining the lessons learned from previous experience and maintaining continuity in customer relationships.

10.2.3 Program Management: Reporting and Tracking

EnergySmart Grocer and CoolBiz both reported using web-based databases for tracking and reporting purposes. EnergySmart Grocer uses Salesforce software, and CoolBiz uses a custom-made in-house program. In addition to tracking project process, the programs use these databases to generate reports for reporting to the IOU managers. Even though both programs use database tools to track projects and major indicators for management purposes, they differ in how they utilize the data collected based on the differences in implementation approaches.

EnergySmart Grocer uses Salesforce to store information on measures recommended, energy savings and project costs. The field analysts are responsible for data collection and entry. The implementer also reported the practice of assigning "stages" to projects, such as "opportunity identified," "active pursuit," and "installation completed". This information is valuable for identifying potential future opportunities that could be re-visited or recommended by program staff later. This is a good example of best practice of "tracking program prospect and driving intervention around major equipment-related events."

On the other hand, CoolBiz's web-based data tracking system is utilized for project as well as contractor management. During the interview conducted about this program, the implementer stated that each participating contractor has access to the projects on which they are working. The contractors who conducted the store visit and recruited the store are responsible for entering the project data. The project data entered into the system by contractors are used directly as an internal tracking system for invoices. As suggested by the best practices summary, having a real-time, web-based system enables quick and effective communication between program staff and contractors and eliminates separate efforts needed to keep track of project progress and contractors. CoolBiz's use of such a database is a clear demonstration of the best practice.

10.2.4 Program Management: Quality Control and Verification

Both grocery programs recognized the importance of quality control and verification through program practices. On-site energy audits are precursors to all following steps for stores participating in EnergySmart Grocer. The program stressed that post-installation inspections are performed by trained field technicians for all projects with costs over \$2,500 and selected projects for those under the threshold. This coincides with the practice of requiring pre- and post-inspections for large projects given by the best practice summary.

For CoolBiz, the implementer performs selected pre-inspections and 100% of post verifications. To further enhance the quality of the contractors and installations, contractors are required to satisfy established program requirements and agree to program-established warranty on installation work to participate in program activities.

10.2.5 Program Implementation: Marketing and Outreach

Both programs have websites which host information on program descriptions, measures, contacts and associated documents. As alluded to in previous sections, the key program element that sets the grocery programs apart from the rest of the programs is the tailored marketing and outreach efforts based on decision makers. Larger grocery chains have higher management decision-makers while owners of small grocery stores determine their program participation. EnergySmart Grocer has a customized approach for targeting independent store owners compared to larger, chain grocery corporate managers. The program implementer has a "national account" team whose purpose is to engage chain stores at the corporate level. This is aligned with the best practice of "market energy efficiency options directly to large end users at the earliest decision-making stages."

CoolBiz targets smaller stores and utilizes contractors as their marketing arm. The success and longevity of these programs are closely related to these tailored engagement models. This is an example of the practice of using personal marketing to identify and address barriers that are prevalent to smaller grocery store customers.

Grocery stores heavily rely on their refrigeration systems for storing saleable products that provide the financial means for the businesses. Both programs thus incorporate and market strategies to demonstrate their commitment to quality to customers. EnergySmart Grocer indicated that the program recognized the importance of equipment reliability and emphasize this point as marketing

approach. During the interview, the CoolBiz PM stressed that participating contractors were required to provide the standardized warranty documents to customers.

10.2.6 Program Implementation: Participation Process and Customer Service

The practice of providing technical assistance to customers to facilitate program participation was in the best practice summary, and both programs provide assistance to help guide the participants through the process. EnergySmart Grocer relies on their field energy analysts to serve as the face of the program at the store level. They are the bridge between the customer and program staff. They strive to understand and alleviate any barriers to participation and leverage the program house as necessary.

To make customer service available, CoolBiz has a dedicated “hotline” for contractors as well as customers to phone in with questions. The implementer noted that many answers and guidelines are provided through the “hotline” and they see this as a feature that greatly enhances contractor and program experiences.

10.2.7 Program Implementation: Installation and Delivery Mechanism

Both programs follow the same generic delivery model of first establishing eligibility and then performing a pre-inspection, measure installation, post-verification, issuing payment, (selected utility inspection and customer survey) and invoicing utilities, but included additional steps. As mentioned previously, EnergySmart Grocer’s energy assessment reports (as part of the store engagement) provide actual documentation for potential future project opportunities. CoolBiz web-based database enables direct submission of necessary paperwork to move projects forward. Use of the web-based database also reduces back-and-forth communication between the implementer and contractors and reduces the time for submissions.

11. DATA CENTER PROGRAMS

11.1 Category Characterization/Description

One of the growing end-uses for the commercial sector is HVAC loads from data centers or server farms. Data centers and server farms have an increasing need for more power applications, which require more powerful computing systems. These powerful systems produce more heat than the older, less powerful equipment. This additional heat load can tax the ability of the HVAC systems to maintain the environment thereby providing opportunities for the programs to provide strategies to reduce the heating load. It is common for the cost to run the equipment and cool the area to be greater than the cost of the hardware. There are often two different types of staff that work within the data centers - the IT staff and the facilities staff.

The data center programs (DCPs) are directed towards major corporations and large business in the SCE and PG&E service territories. The programs must work with both the IT and facilities staff to engineer energy efficiency projects.

To meet the efficiency needs of the data center sector and the potential savings, two 3P commercial programs were given implementation approval for PY2010-12:

1. Data Center Cooling Control Program (DCCP) (PGE2198) - Implemented by Quantum Energy Services Technology (Quest), this program provides incentives for data centers, approximately 5,000 square feet or larger, that perform HVAC retrofits and Air Side Economizer retrofits
2. Data Center Energy Efficiency (DCEEP)(SCE-TP-010) - Implemented by Willdan Energy Solutions, this program provides incentives for data centers with a peak demand greater than 200 kW to upgrade lighting, air conditioning, refrigeration, building controls and server equipment.

11.1.1 Technologies

In the beginning of the 2010-12 program cycle, the programs applied to implement the following measures:

- ◆ Lighting,
- ◆ Spray Cool technology,
- ◆ Wireless Sensors,
- ◆ HVAC Equipment,
- ◆ Retro-commissioning/System Optimization, and
- ◆ Virtualization.

The programs strive to create comprehensive solutions to reduce energy usage. Lighting only projects are not allowed through DCPs but data center customers can receive lighting rebates through the IOU core programs. The programs create custom solutions to achieve a low Power

Usage Efficiency (PUE)¹⁷. Note that during the current program cycle the IOUs determined that server virtualization and computer room air conditioning units (CRAC units) had become industry standard practice and the measures were removed from the programs.

11.1.2 Interventions

The programs provide audits, engineering assistance, incentives, and technology education to customers to assist them in the retrofit process.

11.1.3 Marketing and Outreach

The programs have somewhat similar approaches to marketing. Both programs have had good success from IOU AE relationships. Both 3P Programs reported that the customers referred by AE usually qualified for the programs and were interested in implementing projects. The SCE program began marketing its program through existing contacts in large technology companies and by attending conferences. The programs are also working closely with the Green Grid¹⁸ and other industry trade groups. The exposure through the trade groups has been very effective at marketing the program to potential participants. Since the high tech field is very closely connected the success of the projects spreads and other companies become interested in the programs.

11.1.4 Long Term and Short Term Outcomes

The short term goals of the programs are to reach and exceed the savings goals. The programs are working to reaching their energy savings goals by building relationships with customers who have large data centers or server farms by educating them on the energy efficient technologies and helping them to design projects that incorporate energy efficient technologies. Customers can either work with their own vendors or can have one referred to them by program staff. Although the paybacks tend to be low, many customers are not willing to retrofit their facilities without the incentive. According to the 3P Programs, if the customer is unwilling to move forward with a retrofit without the incentive, the measures should not be considered industry standard. Data center operators are focused on reliability; since it is critical to keep equipment running, O&M costs and energy usage are secondary priorities.

The long term goal of the programs is to educate customers on the energy efficient technologies and their reliability and non-energy benefits. In the field there is a lot of concern about making changes to the HVAC equipment. Some of the concerns are based upon outdated information and

¹⁷ PUE is the metric used to determine the energy efficiency of a data center. PUE is ratio calculated by dividing the amount of total power used by a data center by the power used to run the computer infrastructure.

¹⁸ The Green Grid is a non-profit, open industry alliance that seeks to improve the efficiency of data centers and business computing ecosystems. The Green Grid is comprised of end-users, policy-makers, technology providers, facility architects, and utility companies.

the programs are trying to re-educate IT and facility personnel. This education is happening through individual customer meetings, industry trade groups and publications.

11.1.5 Role of Comprehensiveness: Deep Retrofit

The programs are structured to create comprehensive retrofit projects for data centers. Project payback is estimated in the beginning of the participation process. Most of the installed projects have very low payback, usually 1.5 years. The programs are working with customers to create comprehensive projects whenever possible. Program engineering staff is experienced with the data center technologies and understand the energy and the technology side of the projects. The baseline for the savings calculations are the 12 months of previous billing data, but the baseline can change significantly depending on the type of HVAC unit they are using. Data centers cannot wait until burnout since they need to be reliable so all projects are for early replacement.

11.1.6 Cost Effectiveness

Overall, the programs are cost effective. Both programs stated that the programs are less cost effective than they were forecasted to be in their Program Implementation Plans (PIPs). The reason the total resource cost (TRC) has been reduced is because some of the more cost-effective measures in the programs are now considered industry standard and are no longer in the program. Both programs are using a standard net-to-gross ratio that the 3rd parties now think are not accurate for data centers. Both 3Ps suggested that further research should be completed to determine the appropriate net-to-gross ratio for data centers.

11.1.7 Evolution of this Program Category

The SCE program began as an Innovative Designs for Energy Efficiency Activities Program (IDEAA)¹⁹ program in 2008 and was added as a stand-alone program in the 2010-12 program cycle. In 2011 SCE determined that server virtualization measures are now industry standard and the program could not incentivize the measures. The PIP had relied heavily on server virtualization to achieve the energy savings goals. The Implementer has added several new measures to the program to take the place of the server virtualization measure. Most of the savings for the program this program cycle are from technologies that were not introduced into the market until after the program filing. The program created and received approval for these new measures to be added to the program mid-program cycle. Without the new measures the programs would not have been able to meet or exceed their current goals.

The PG&E program began in the 2006-08 program cycle. The Implementer responded to a sector specific RFP. Initially the program started incentivizing CRAC units, variable frequency drives on the CRAC units, and advanced controls. The program has evolved and currently incentivizes heat

¹⁹ The SCE IDEAA Program was a competitive bidding solicitation for innovative and cost-effective energy efficiency program proposals.

sequestration projects only. Heat sequestration projects involve removing heat from the data centers or server farms, which can be achieved through measures such controls on CRAC units or air side economizers. The incentives levels have changed between program cycles to match the incentives in the Core IOU programs.

11.1.8 Program Savings Achievements

In 2012 SCE increased the 2010-12 goals and budget for the program to allow the program to continue enrolling customers. Based upon the information in EEGA, the SCE program is expected to exceed their 2010-12 goals. The program installed project savings and commitments, which are in the installation phase, exceed the 2010-12 goals of the program. There is a sharp increase in commitments in March of 2012 as a result of projects that were in the pipeline that finally reached the installation phase.

The PG&E program is expected to meet their goals for the program cycle. Their goals and budget were reduced as a result of lower than expected program participation.

The Figure 22 and Figure 23 below show the installed and committed savings for the programs throughout the program cycle. At the time of the report HMG did not receive a confirmation of the new PG&E goals for the program so the goals reflected in the table for the Data Center Cooling Program are the original goals filed in the PIP.

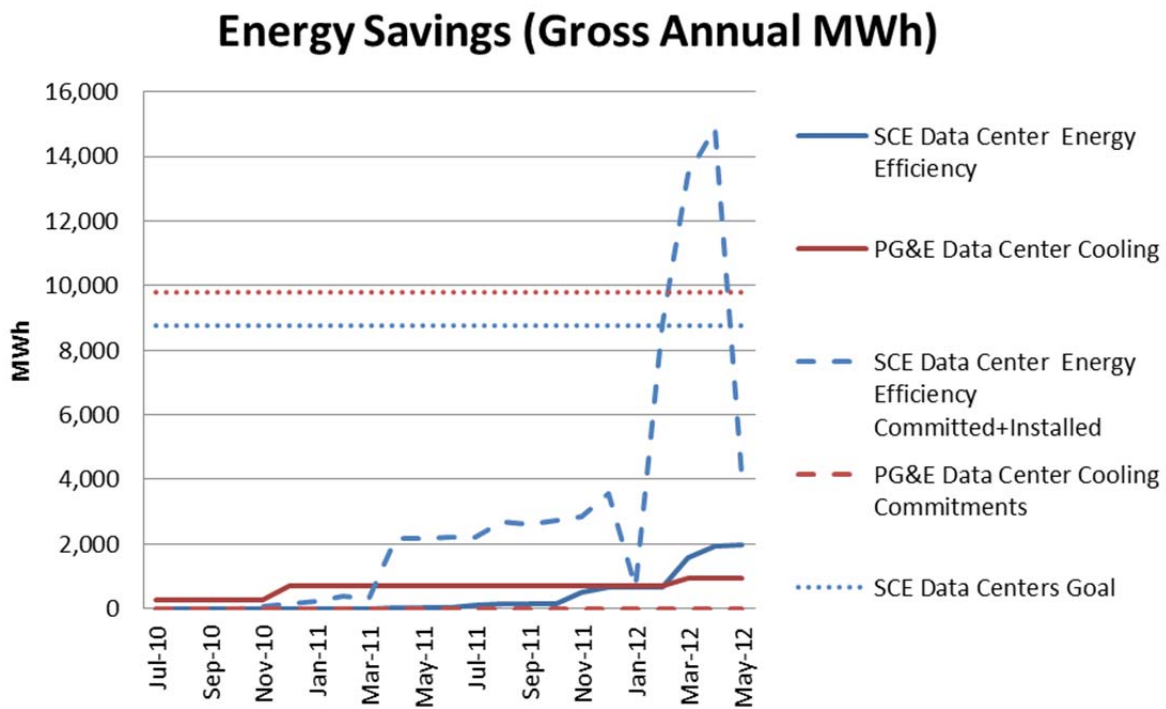


Figure 22: Data Center Programs MWh Energy Savings

Demand Reduction (Gross Peak kW)

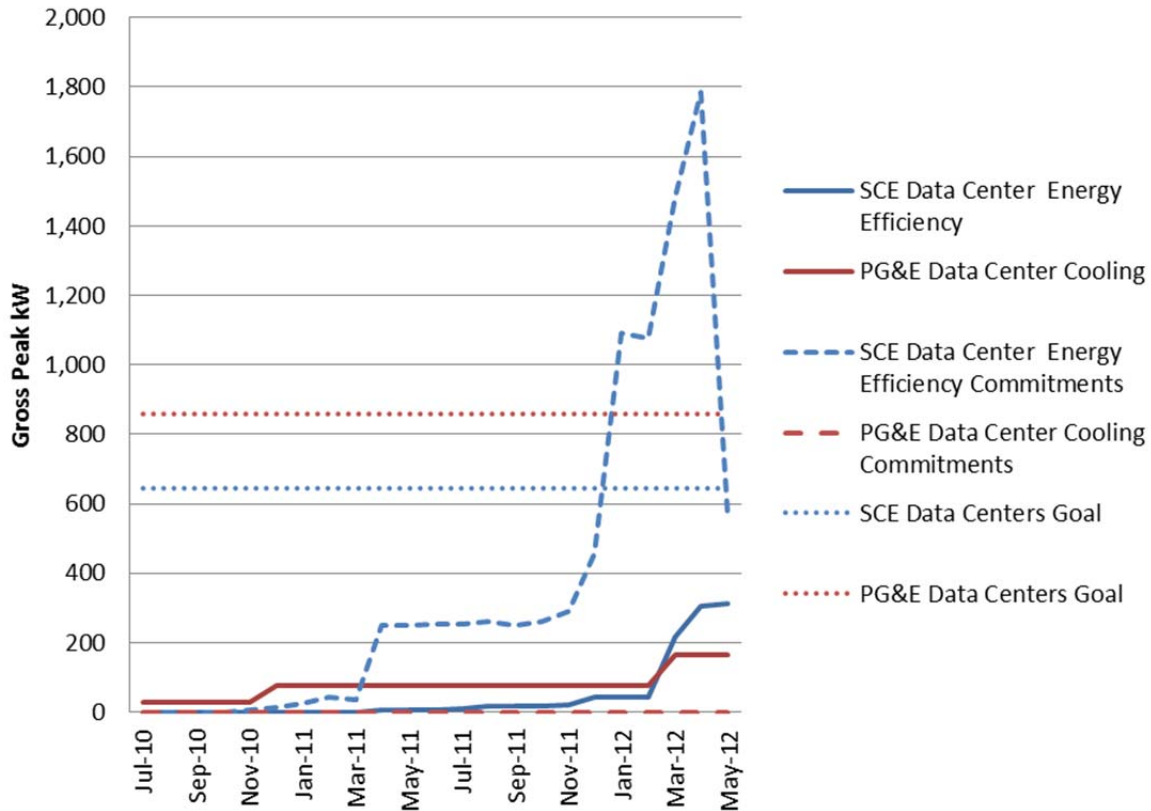


Figure 23: Data Center Programs Demand Reduction

11.2 Data Center Program Practice Assessment by Program Component

The evaluation team assessed the DCPs against industry defined best practices, as defined in The National Best Practices Study²⁰ and also reviewed the programs to look for new best practices. While the team did not find true best practices there were many successful practices listed below. These successful practices are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each practice.

²⁰ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

11.2.1 Program Management: Project Management

New technologies are changing the market and the programs need to respond quickly in order to meet the needs of the customers. New measures need to be added regularly. For the SCE program two of the large projects are using a technology that did not exist at the beginning of the program cycle. Program staff has worked to stay on top of the industry trends. The programs are keeping up on the new technologies by keeping in contact with product manufacturers, attending conferences and doing independent research. Staff also stated that they would like to have enough time to meet with companies on the leading edge of the new technologies to gain a better understanding of the new technologies entering the market.

Adding new deemed measures has been a struggle because of the cost to create the workpapers and the time required to get the workpapers approved. The 3Ps estimated that it cost between \$2,000 and \$40,000 to produce a workpaper depending upon the complexity of the measures being studied and the amount of engineering analysis necessary. This task is not included in the contract and therefore the implementers do not get reimbursed for the added cost. Staff from both programs noted that in the beginning it took approximately 9 months for workpaper approval. The process is taking less time (now 3-4 months) but optimally would take 30 to 45 days. The program staff did not comment on the approval process or ascertain the cause of the delay.

A generally accepted best practice for non-residential (NR) HVAC programs is that the program management staff should be skilled and have the program infrastructure to work with all the market actors in the HVAC market. Data Center programs are similar to the HVAC programs and also need program management staff that understands the technology and the energy issues of the data centers.

The DCCP implementer mentioned that they were looking for a new PM. They have struggled to find a PM that was able to run the program and that it would be helpful for the PM to have proven IT sales experience. They mentioned that next PM's compensation package could be tied to program performance. This is a departure from the current practice for Quest. This is consistent with a best practice in the EEBPLC that states that staff performance should be tied to independently verified results.

The SCE PM has good data center experience that helps him gain credibility with the customers. He has practical experience that helps him guide the projects so that they work for each customer's individual circumstance. The PG&E program has struggled to find the right PM. This has hurt their ability to produce energy savings despite having a good program design, since the program lacks the guidance it needs to reach key market players.

11.2.2 Program Management: Reporting and Tracking

One of the program's tracking databases sends reminders when an application has stalled in the process as defined by the program procedure manual. Program documents such as the site agreements, signed rebates forms, utility data requests, measurements and photos are also housed in the database. The software can also directly upload reporting data into the IOU SMART or BCD. This program's software is considered very helpful in managing the programs. Note however, that the IOU's database has changed several times during the program cycle and the changes have

made it time consuming and costly to maintain the links to the IOU database. These capabilities relate to one of the best practices for large comprehensive programs which states that the tracking database should integrate or link with other appropriate systems.

During the contracting phase, the 3Ps committed to an ex-post verification of project energy savings for all projects. Since the projects are primarily custom projects, the implementer planned on completing project level measurement and verification (M&V) and used the ex-post energy saving estimates to reduce the uncertainty of the project results. At the beginning of the 2010-12 program cycle the method of measuring the energy savings changed from ex-post to ex-ante, in order to reduce the uncertainty for the IOUs and the 3Ps. The process for the ex-ante review increased the rigor of the engineering analysis on the front end of the project. The 3Ps are required to complete the more rigorous engineering review before the application is accepted and before the ex-post analysis stage. The rigorous engineering review and the ex-post analysis add considerable time to the process and add additional work for the 3Ps. The 3Ps have not been compensated for the additional work necessary to complete both the ex-ante review and the ex-post analysis.

Capturing energy savings can also be challenging for data centers because often while optimizing data center performance, the implementers will open up a lot of space. The mentality in data centers generally is to fill empty space with new equipment. Even if the retrofit is very successful, a lot of the savings are lost 6 months to a year down the road when they are measured, since new equipment has been introduced. To be able to determine the actual energy savings, the projects should document the base case conditions (amount of computing power and the data center traffic).

11.2.3 Program Implementation: Marketing and Outreach

The SCE program is marketing the program to the customer's entire leadership team – the CEO, CFO and CIO. Often CIOs are responsible for the reliability of the data center but not the utility bills, therefore energy efficiency is a lower priority. The CEO and CFO are concerned about costs and are more interested in reducing their utility bills. The SCE program has had great success selling the program to the CEO, CFO and the CIO as a group. They have been able to get project buy-in at the top level and the leadership team then educates the IT staff on the importance of the project. The program credits this strategy with helping them exceed their goal for the program cycle. The big three in the company are, however, not always accessible to the programs so the implementers must understand how to speak with both top level executives and with facilities managers and IT groups to be successful.

The PG&E program is marketing to the IT department. This has been difficult since the IT group does not normally pay for the energy usage of their facilities out of the IT budget. If the data centers save money, the IT staff does not benefit from the reduced cost. The IT staff is tasked with increasing the reliability of the data center not the energy efficiency. It has been difficult to sell the program.

Both Data Center programs are working with Green Grid. Green Grid works with customers to help them establish their baseline energy usage. They have also established industry standard methods

of measuring the impact of data center retrofits. There are two calculations, the power usage effectiveness (PUE) and the data center infrastructure efficiency (DCiE), that are used to measure the efficiency of the data center.

For HVAC programs it is considered a best practice to develop and disseminate case studies of key technologies. Both data center programs have produced a small number of case studies on successful projects. The case studies are considered by the 3Ps to be helpful in selling projects. Case studies have not been produced more often because of cost. In the next program cycle, it would be helpful to structure program funding to allow for the production of case studies.

An HVAC program best practice is to market the program to large end users at the early stages of the decision making process. This holds true for the data center programs with the caveat that the programs should market to the CEO, CFO and CIO of the company. Meeting with the operations and financial leaders of the company (in addition to the IT department) ensures that the program focuses on reliability and financial needs as well as energy efficiency. A multi-pronged approach can overcome the market barrier of other company priorities taking precedent over energy efficiency.

11.2.4 Program Implementation: Participation Process and Customer Service

The programs report that they start working with customers in the beginning of the project planning process and provide education and technical support to help scope out the projects. One of the big contributors to program success has been educating qualified customers on the potential of the energy efficient technologies. The programs are helping customers and product vendors engineer projects that will produce deep energy savings.

A known best practice for large comprehensive programs is to provide technical assistance to customers to facilitate program participation. For the data center programs the customer expresses interest to participate in the program and the 3P perform an audit of the facility. In the audit the 3P creates a list of measures that could be installed at the facility. The 3Ps work with the customers to determine which measures to include in the projects. The program staff members assist customers in filling out program applications and paperwork and assisting them through the projects.

12. HOSPITALITY PROGRAMS

12.1 Category Characterization/Description

The hospitality sector includes a diverse set of programs covering lodging and entertainment centers. The programs are different enough to require specific support and an understanding of their separate needs. Large lodging chains have explicit equipment replacement budgets and schedules, often requiring staged participation in any utility retrofit program. Smaller “mom and pop” lodging establishments rarely have the capital available for large investments, and as a result they generally are better served by low and no-cost direct install measures. Casinos, considered part of the lodging sector, are different from traditional hotel chains, and are often run by Native-American tribes. This makes casinos unique from traditional lodging establishments and commands a separate kind of management and measure evaluation as well. Entertainment centers, defined as movie theaters, concert halls, and bowling alleys, comprise a very niche market within the sector, with highly individualized building systems at the property level. Regardless, there are significant savings opportunities in this sector in lighting and HVAC overall. Five hospitality programs are included in this evaluation and include the following:

1. LodgingSavers (PGE2190) - Implemented by Ecology Action, this program provides retro-commissioning and rebate assistance for hotels.
2. Casino Green (PGE2205) - Implemented by Ecology Action, this program provides energy efficient retrofits for casinos and commercial buildings on Native-American Reservations.
3. Lodging Energy Efficiency Program (LEEP) (SCE-TP-012 and SDGE3166) - Implemented by Willdan Energy Solutions, the SCE LEEP program provides evaluations and incentives to casinos, hotels, and resorts for energy efficient retrofits and upgrades. The SDG&E LEEP program is a non-resource program that provides audits and application assistance (for rebate or incentive programs) to lodging and health care facilities.
4. EE Entertainment Centers (Referred to as EE4EC – PG&E in this report) (PGE2214) - Implemented by Matrix Energy Services, Inc., this program provides assistance specifically to movie theaters by replacing lights, upgrading ventilation, and performing maintenance on HVAC systems.
5. Energy Efficiency for Entertainment Centers (Referred to as EE4EC – SCE in this report) (SCE-TP-036) - Implemented by Matrix Energy Services, Inc., this program provides assessments of and technical assistance with HVAC, ventilation and lighting for all types of entertainment centers.

12.1.1 Technologies

In the beginning of the 2010-12 program cycles the programs applied to implement the following measures:

- ◆ Audits,
- ◆ Lighting,
- ◆ HVAC Equipment, and
- ◆ Retro-commissioning.

By using a combination of these measures, hospitality programs work to create comprehensive solutions to reduce energy usage.

12.1.2 Interventions

The lodging-focused programs foster ongoing relationships with larger lodging chains on their equipment replacement plans to promote ongoing, long-term measure installations.

According to the interview conducted with staff of SDG&E's LEEP program, it has been in contact with customers over multiple program cycles, and returns to customers several years after an audit was performed to work on measures that were previously identified for implementation as part of the customer's long term budget. Budgets for larger/franchise hotels are strictly structured, requiring participation to be staged differently than smaller customers. The budgets for these types of establishments are generally for proportionately larger expenses. The measure recommendations are more comprehensive and support the large chains in their planning for future years. In contrast, the smaller "mom and pop" customers are better served by direct install programs offering low or no cost measures. By tailoring programs to the specific need of each group, the implementers are able to effectively reach the markets.

CasinoGreen spent its first program year building relationships with the Native-American tribes, and in doing so was able to learn about project upgrade schedules for the different casinos. The program then planned over the next two years of the program cycle how to best install measures with the tribes' permission.

The two EE4EC programs approach potential properties, perform on-site audits for no upfront cost, and if a customer is interested will continue from there. Both EE4EC programs learned that interventions in the entertainment center niche has to be planned for times when the buildings were not in use, and would otherwise be closed and locked.

12.1.3 Marketing and Outreach

Both EE4EC programs rely on simple NAICS code print-outs of the specific property types that fit their program scope to define their potential customers. The program team then works in coordination with the IOU account executives (AEs) to get in touch with individual properties in order to approach them for a free initial walk-through audit. Upon initiation of the program, support from the AEs is crucial in providing the programs with needed credibility. If an IOU AE was not responsive, the programs would sometimes have trouble reaching a customer or getting initial interest.

CasinoGreen, LodgingSavers, and LEEP all participated in related industry trade groups and associations in order to stay up to date with industry news and maintain a recognizable presence to advertise and bring customers in. LodgingSavers and LEEP both agreed that in addition to industry memberships, plain word-of-mouth from contractors and past customers helped them reach more properties as well.

12.1.4 Long Term and Short Term Outcomes

The short-term goals of the hospitality programs are to reach and exceed the individual programs' savings goals in a cost-effective manner. The programs are working to reaching their energy savings goals by building relationships with hospitality customers to educate them on the energy efficient technologies and to help design projects to fit into their budget. Large lodging chain customers then work with their own vendors, while smaller customers are referred to vendors by the program. The incentives allow customers to expand the scope of their retrofit projects without breaking their budgets.

The long-term goals of the hospitality programs are to shift the markets around HVAC, lighting, and retro commissioning measures in lodging, entertainment centers, and casinos toward more energy efficient technologies.

12.1.5 Role of Comprehensiveness: Deep Retrofit

This program sector was very focused on providing comprehensive retrofits to hospitality customers. Comprehensive programs with a full measure mix are better able to meet the needs of the portfolio and their customers. It can be difficult to create a comprehensive project when a customer has to balance the different requirements and timelines for several different projects run through separate programs.

The SDG&E LEEP noted that their customers appreciated having a single point of contact for assistance in submitting rebates. Their program is designed to assist customers with identifying potential upgrades for facilities, identifying rebate or incentive programs that could be used for these upgrades, and assisting them with the applications for these programs. The program is unique in that it is a non-resource program, but the lessons can apply to both resource and non-resource programs. A single point of contact with comprehensive program offerings can guide customers through the various retrofit options and/or programs offered for their sector.

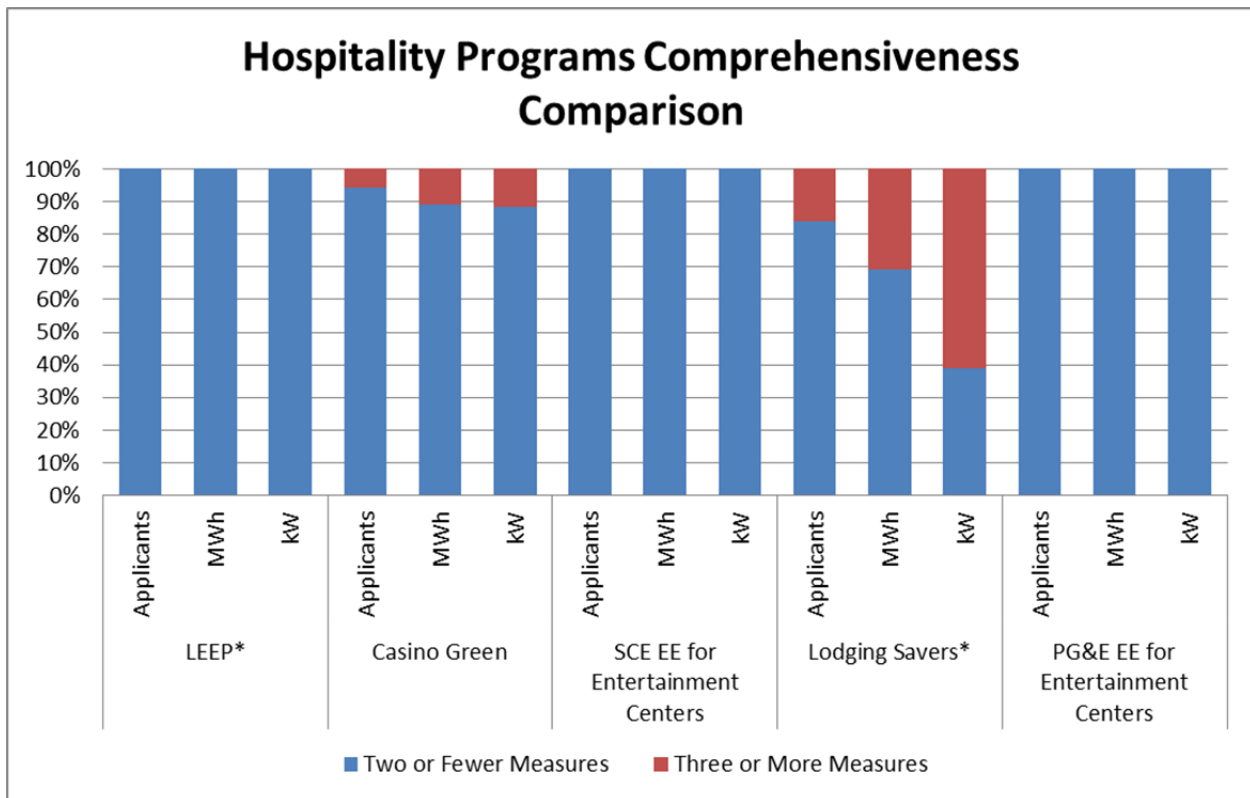


Figure 24: Hospitality Programs Energy Savings Analysis

CasinoGreen has been able to offer comprehensive energy solutions to all commercial buildings on Native American reservations in PG&E territory and has been highly successful within that jurisdiction. Roughly 6% of their projects have included 3 or more measures. These projects have yielded almost 11% of the programs MWh and kW savings.

Lodging Savers has also has a great deal of success with comprehensive projects. Well over half of the programs kW savings came from comprehensive projects. The Lodging Savers program integrates RCx measures with HVAC and lighting upgrades.

The EE4EC programs differ in that the SCE program has access to all entertainment center building types, whereas the PG&E program has been limited to only movie theaters.

12.1.6 Cost Effectiveness

Overall the hospitality sector programs are cost effective, with a TRC greater than 1. Programs in their first program cycle may be able to increase cost-effectiveness moving forward as marketing and outreach efforts continue to reap rewards into the future. However, for programs in their subsequent program cycles, the savings opportunities will most likely become more expensive as the low-hanging fruit has been identified and installed.

One program pointed out that the TRC model is skewed because of the 2-month delay in savings data being uploaded; the quarterly analysis only reflects the efforts from the first month of that quarter. Another program raised the point that the E3 calculator ignores spillover effects and other benefits of energy efficiency program, essentially undervaluing EE programs.

According to the interview conducted, both EE4EC programs stress that their top focus is to maintain a high level of cost-effectiveness.

12.1.7 Evolution of this Program Category

The SDG&E LEEP program came into effect during the 2008-09 program cycle as a resource program. It was changed to a non-resource program for this program cycle, which has turned out to be a positive change according to the staff member interviewed. The previous cycle focused on performing audits, which helped create a backlog of projects to follow up with during the current cycle to recommend measures to be installed.

The SCE LEEP program is in its first program cycle and is being run by the same implementer as the SDG&E LEEP program.

LodgingSavers began during the 2006-08 program cycle. It continues to offer primarily the same measure mix, although RCx has been redefined since it started offering it during the first program cycle. In addition, individual measures have been teased out of the general category of “custom” measures. Restrictions began in 2010 requiring increased coordination with local government partnerships, particularly San Francisco and Humboldt Counties. There are also additional requirements the program must meet when dealing with larger customers (>500kW) regarding rebates. The program must offer rebates to larger customers and the incentive levels offered must match those offered by non-residential retrofit programs. The program is also required to perform RCx at any customer site or it cannot offer any non-residential retrofit measures.

CasinoGreen began in the current 2010-12 program cycle. In addition to working with casinos’ lodging type buildings, the program has gained access to all commercial building types on casino campuses. The program is designed to offer a comprehensive EE measure mix, thereby making the program highly effective.

Both EE4EC programs began as pilot programs in the 2006-08 program cycle and were offering HVAC measures to movie theaters. In the 2010-12 cycle, EE4EC – SCE is offering HVAC and lighting measures to all types of entertainment centers. The EE4ED – PG&E started out the same way, but was cut back to only offer HVAC and lighting measures to movie theaters.

12.1.8 Program Savings Achievements

The economic downturn has adversely affected all of the hospitality sector programs. Hospitality building owners have all experienced major revenue shortfalls over the course of the 2010-12 program cycle and during this time, have not always been amicable to larger-scale EE efforts.

The figures below show the installed savings for the programs throughout the program cycle; at the time of the report HMG did not receive a confirmation of the new goals for the programs so the goals reflected in the table are the original goals filed in the PIPs. The overall analysis shows that most programs, with the exception of LodgingSavers, spent the first program year marketing, building a profile, and gaining customers in the industry. During the subsequent two years the programs have shown a marked increase in achieved savings, with most programs noting that they are working through the low-hanging fruit in their available markets and will naturally be faced

with less cost-effective savings solutions as they continue. It should be noted that due to recent installed sites being smaller in scope (less tons) than previous projects performed, projects being installed in milder climate zones (claiming less kWh/ton), and the budget being mostly exhausted, the EE4EC – PG&E program is not claiming as much savings as it has in the past.

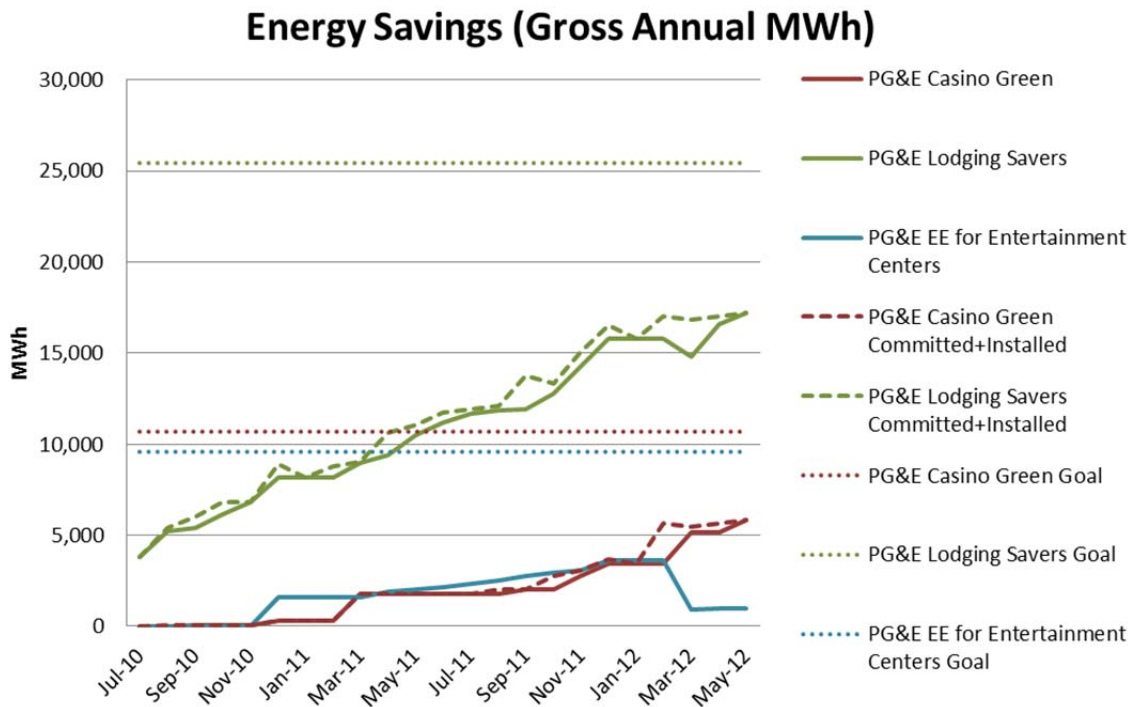


Figure 25: PG&E Hospitality Programs MWh Energy Savings

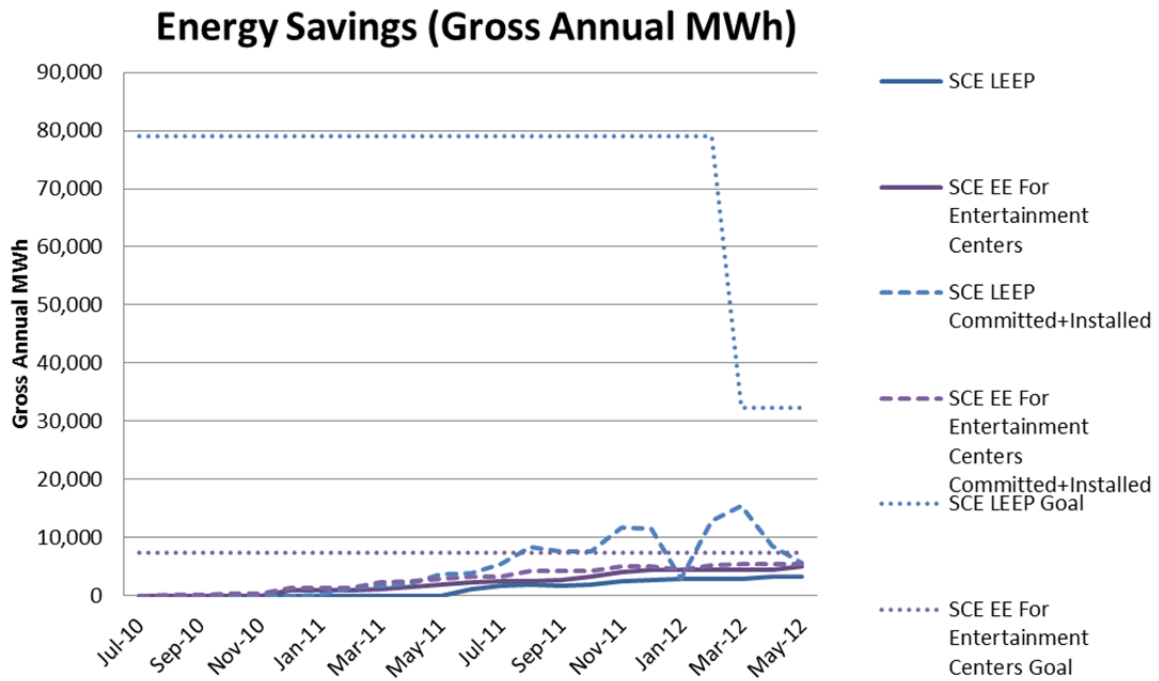


Figure 26: SCE Hospitality Programs MWh Energy Savings

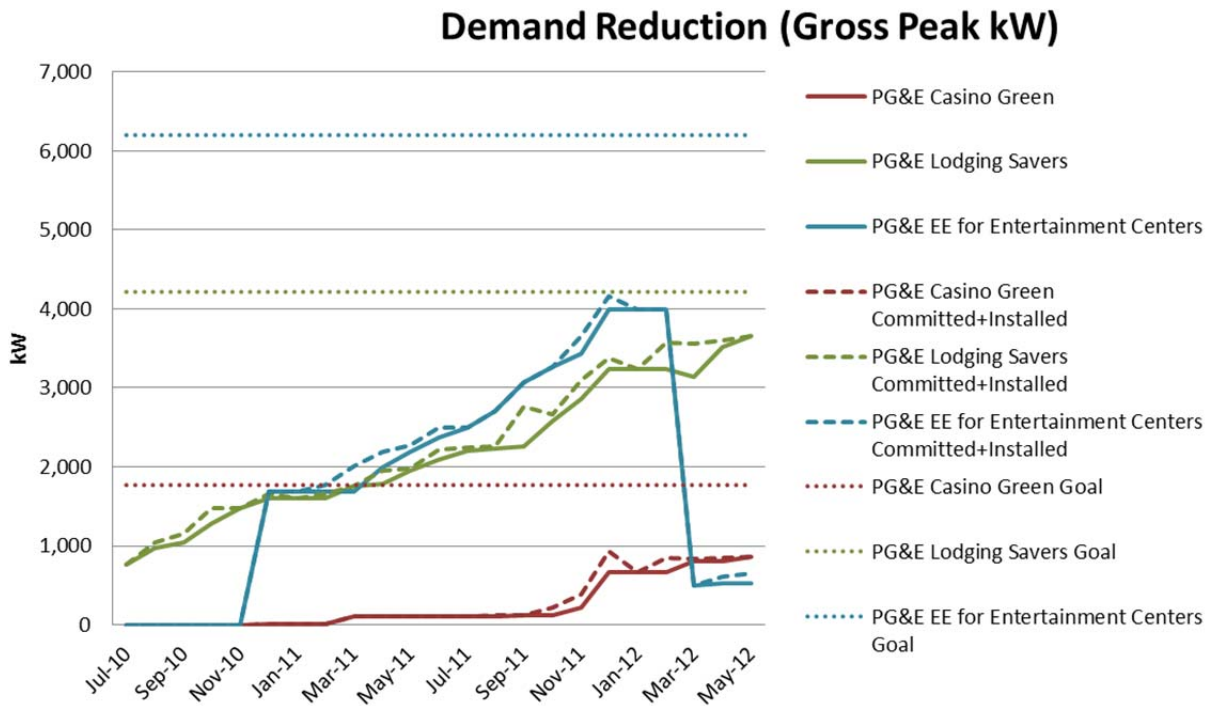


Figure 27: PG&E Hospitality Programs Demand Reduction

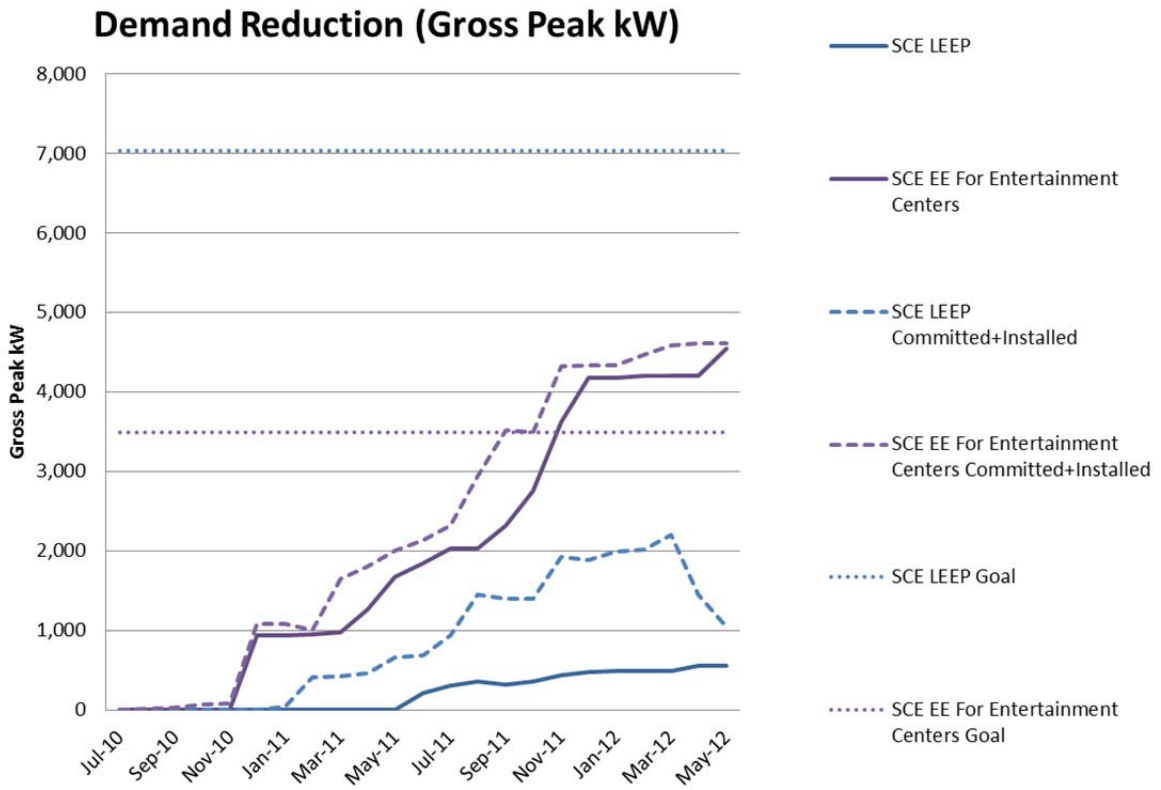


Figure 28: SCE Hospitality Programs Demand Reduction

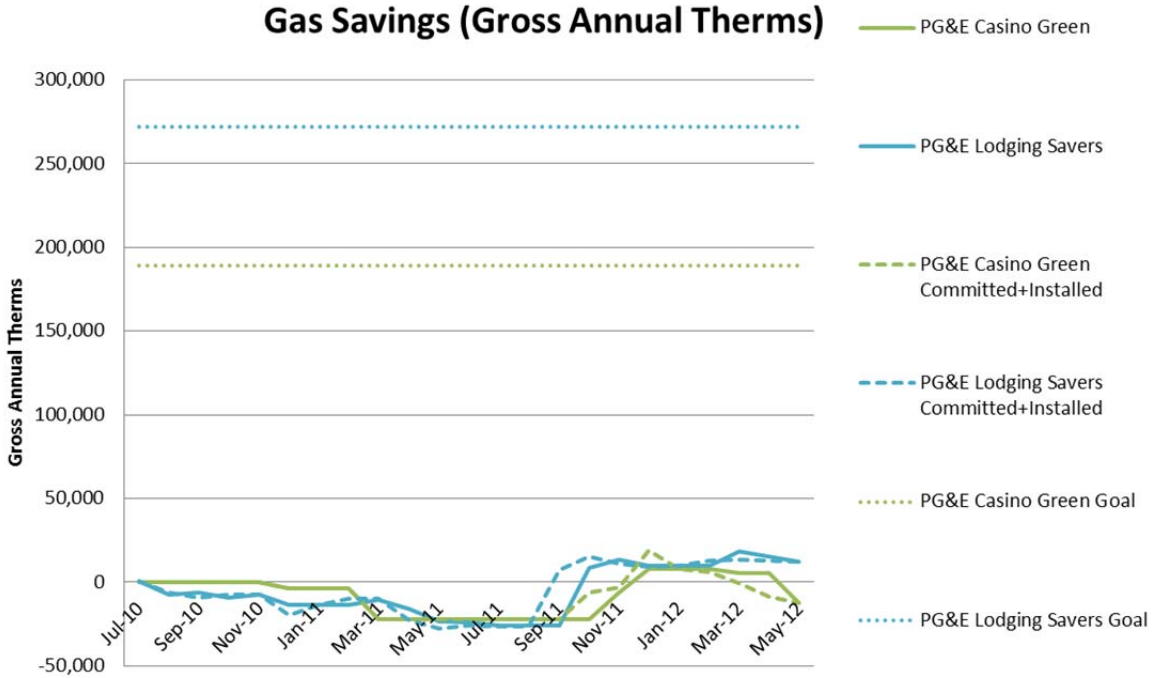


Figure 29: Hospitality Program Therms Savings

12.2 Hospitality Program Practice Assessment by Program Component

The evaluation team assessed the hospitality programs against industry defined best practices, as defined in The National Best Practices Study²¹ and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control) and program implementation (including the participation process and marketing). Under each area, the evaluation team briefly describes each finding and how it applies to industry defined best practices. In addition to the best practices, there are other notable practices that are detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 12 shows a summary of the best practices for the hospitality sector. More detailed descriptions of these practices can be found in the following section.

Hospitality Best Practices
Foster ongoing relationships with larger lodging chains and collaborate on their equipment replacement plans.
Take a long-term approach to identification and installation of measures at large hospitality chains to achieve the deep retrofit in a staged approach that would not necessarily be feasible to undertake in one shot.

Table 12: Hospitality Sector Best Practices

12.2.1 Program Management: Project Management

A number of factors are contributing to successful project management in the diverse set of hospitality sector programs.

Both EE4EC programs, because they require a wide range of measure specifications and customization as-needed, are able to keep their projects on track by managing and performing all outreach, engineering, implementation and verification with in-house staff. This type of program structure for the entertainment center market keeps communications well-organized internally, as well as simple for the customer.

Also, the EE4EC programs consciously edited their project entry process forms to be as short as possible for ease of customer use and filing procedures. This practice helps customers get into the program faster and get started with an on-site audit to see what their interest or willingness is for EE retrofit measures.

²¹ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

12.2.2 Program Management: Reporting and Tracking

Using an online project tracking and reporting database tool that is specifically designed for third-party programs is cited as being a major element in successful program organization and management.

LodgingSavers and CasinoGreen, both being implemented by Ecology Action are managing, tracking, and reporting their projects using a proprietary online platform called energyOrbit, which Ecology Action has designed and built specifically for Third Party Programs. energyOrbit is accessible by PG&E and is a one-stop-shop management tool for the programs to stay on top of their projects and overall performance.

12.2.3 Program Management: Quality Control and Verification

All hospitality programs perform on-site audits for potential customers and work with customers to determine the correct measure mix for their property. The programs then calculate the estimated energy savings and cost-effectiveness for the project and send those calculations for engineering approval with the IOU. Once approved, projects move into implementation stage. All programs also perform in-person post-audits to verify that the correct equipment was installed in the correct manner. If any changes occurred during procurement and installation, the program engineers revise their savings calculations and have to get a final approval on them by the IOU engineers as well.

12.2.4 Program Implementation: Marketing and Outreach

Fostering ongoing relationships with larger lodging chains on their equipment replacement plans can promote long-term and ongoing measure installation. As customers across the board install more energy efficient measures, the “low-hanging fruit” is thinning out, and programs need to look for different ways to achieve their savings goals. By taking a longer-term, multi-cycle approach to implementation, programs can find savings by working in conjunction with the customers’ equipment lifecycles.

According to the interview conducted, The LEEP – SDG&E program has been in contact with customers over multiple program cycles, and returns to customers years after an audit was performed to work on measures that were previously identified for implementation as part of the customer’s long term budget. Budgets for larger/franchise hotels are strictly structured, requiring participation to be staged differently than smaller customers. However these budgets are also for proportionately larger expenses. The measure recommendations are more comprehensive and support the large chains in their planning for future years. In contrast, the smaller “mom and pop” customers can be better served by direct install programs offering low or no cost measures.

Also, CasinoGreen noted that their entire first program year was spent building relationships with the Native-American tribes in order to eventually gain full access and trust to perform audits and create EE action plans for the casinos in PG&E territory. If they had not taken a full year to get to know its customer segment, it would not be achieving the level of savings that it currently is.

Taking a long-term approach to identification and installation of measures at large hospitality chains helps achieve a deep retrofit in a staged approach that would not necessarily be feasible to undertake in one shot.

Also, a number of hospitality programs are taking advantage of the IOU Account Executives (AEs) to develop name recognition and credibility in the beginning of their program cycle. This practice can be particularly helpful for programs that are in their first program cycle.

12.2.5 Program Implementation: Installation and Delivery Mechanism

If customers have specified, local, or affiliated contractors who work with them, programs should build relationships with those contractors and educate and assist them through the project process to ensure successful installations.

Larger lodging or entertainment chains often have preferred contractors or in-house staff that performs the energy efficient retrofit. LodgingSavers, CasinoGreen, and LEEP programs educate the contractors on proper installation and inspects project throughout the implementation process to ensure a quality installation. LodgingSavers noted that many contractors overestimate the energy savings that result from a retrofit, and they work to educate the customer and the vendor on the actual energy savings. Both vendors and customers benefit from education and assistance provided by the programs.

Maintaining a highly trained staff of engineers to perform the calculations and installations necessary for complex retrofit situations can be beneficial if the market segment is niche and involves highly individual sites and building systems. Both EE4EC programs cited that the nature of their measure mix which includes Demand Control Ventilation (DCV) - a technology that very few contractors have experience installing – made it more effective for the program to do direct-installations and equipment fabrication on-site. DCV is currently required by Title 24 for new construction, however, according to the program implementer, there still is a shortage of qualified personnel with experience in retrofitting DCV for existing HVAC systems. Both programs cite that their success is due in part to their direct-install capabilities.

13. HEALTHCARE PROGRAMS

13.1 Category Characterization/Description

Hospitals are the second most energy intensive commercial sector in the state of California. Energy costs comprise of 40-60% of the total facilities operating budget annually, yet there is often reluctance amongst the hospital administrators to implement large scale building energy efficiency upgrades. Hospitals have massive instructional costs, so the energy expenses only comprise 1-3% of the total institutional costs. Consequently administrators see the high energy consumption to be a small expense in the grand scale. Hospitals plan large scale spending, like medical equipment upgrades, several years in advance, so program managers mentioned that it can be challenging to coordinate a large RCx project with the hospitals' budget cycles.

To reduce healthcare sector energy usage, California utilities have established four programs. All of the programs focus on the importance of deep, comprehensive retrofits and retro-commissioning efforts to achieve the greatest potential energy savings in the healthcare sector. Since two programs fall within the PG&E territory, one program in the territory covers Kaiser, Dignity Health (formerly Catholic Healthcare West) and Sutter Health. The other program focuses on all other facilities not associated with these healthcare systems. Programs in the SCE and SDG&E territories do include facilities managed by Kaiser, Dignity Health, Providence and St. Joseph's.

To meet the efficiency needs of the healthcare sector and the achieve potential savings, three 3P commercial programs were given implementation approval for PY2010-2012.

1. Medical Building Tune-Up (PGE2191) - Implemented by Quantum Energy Services Technology (Quest), this program provides incentives of \$0.09 per kWh electric and \$1.00 per Therm natural gas savings for energy upgrades and retrofits of hospitals and medical office buildings.
2. Healthcare Energy Efficiency Program (SCE-TP-006, PGE2206) - Implemented by Willdan Energy Solutions, CA Hospital Association (CHA), and CA Society for Healthcare Engineering (CSHE), this program, through PG&E, provides incentives to hospitals and medical buildings for lighting upgrades, air conditioning and refrigeration improvements, natural gas projects, and other equipment upgrades, including air compressors, EMS controls and specialized equipment.
3. Healthcare Energy Efficiency Program (SDGE3165) - Implemented by Willdan Energy Solutions, this program, through SDG&E, provides incentives to hospitals, psychiatric care centers, drug and alcohol rehabilitation facilities, and medical office buildings for lighting upgrades, air conditioning and refrigeration improvements, natural gas projects, and other equipment upgrades, including air compressors, EMS controls and specialized equipment.

13.1.1 Technologies

The technologies covered by the above listed programs include the following:

- ◆ HVAC-upgrades
- ◆ Appliance upgrades

- ◆ Comprehensive lighting
- ◆ Building RCx
- ◆ Cool roof
- ◆ LED exit signs
- ◆ RCx
- ◆ HVAC, appliance, and other upgrades
- ◆ Pipe and tank insulation
- ◆ CO sensors and virtualization of data center servers
- ◆ Solar-assisted water heating

Since energy efficiency building upgrades can be a challenge to initiate in the healthcare industry, programs strive to provide comprehensive building analysis to both the facilities managers and hospital administrators. Programs focus on the largest potential energy savings measures, which for hospitals are HVAC and RCx.

13.1.2 Interventions

- ◆ Comprehensive whole-building/systems technical audit
- ◆ Benchmarking analysis and facility planner training
- ◆ Retrofit design, specification and financial analysis
- ◆ Contractor screening
- ◆ Project implementation consulting
- ◆ Pre- and post-installation inspection
- ◆ Customer satisfaction surveys

In order to facilitate customer participation in the program, implementers aim to streamline the customer's experience. After the audit, the implementer's prepare a report to be presented to the client including list of measures and the potential energy savings, implementation cost, incentive and simple payback time for each measure. Since hospital administrators are generally more focused on meeting the needs of the medical personnel, the programs focus their marketing efforts on the benefits of cost savings from installing energy efficient measures can be redirected to other areas.

13.1.3 Marketing and Outreach

Three out of the four programs began their program implementation by reaching out to large healthcare providers, such as Dignity Health or Sutter Health, with whom they already had relationships. One program even began the program cycle with formal commitments from several providers. Programs also relied heavily on industry specific organizations like the California Hospital Association and the California Society for Healthcare Engineering to locate potential projects and to gain credibility in the market. The staff of each program also realizes outreach efforts need to be focused at the executive level decision makers early enough in the budgeting cycle.

13.1.4 Long Term and Short Term Outcomes

The short term goals of the program are to create deep energy savings and to exceed the program savings goals. The programs perform full audits for each facility, and then provide retrofit and RCx solutions that include a combination of RCx, HVAC and lighting upgrades. Programs work to provide customers with contractors that are experienced with working in the healthcare sector and doing installations in compliance with OSHPD.

The long-term objective of the programs is to increase awareness of the energy savings potential of the sector. The programs work closely with both the facilities manager and the hospital administrators to educate them on the simple pay back times of measures that can be implemented. Several programs include measures not within the scope of the program in the final report, to further educate clients on future building upgrades.

13.1.5 Role of Comprehensive Deep Audit

Deep comprehensive audits are essential to encouraging participation in the programs. One program has incorporated whole building intensity benchmarking (kWh/ft²) into their site audit. This practice is common in new construction but is not commonly used in retrofits, and allows the program to look at the potential for high yielding retrofits and examine metrics for integrated DSM. Other programs perform full audits and model various scenarios to present to the clients to show how the measures could impact their overall building performance. Another program noted that their measures are limited to RCx, so they are not allowed to perform comprehensive full building audits. Customers who are interested in a full retrofit and RCx have to work with several different programs which can complicate the process.

13.1.6 Evolution of this Program Category

The SDG&E and SCE HEEP programs existed during the 2006-08 program cycle, along with PG&E's MBTU program. For the current cycle PG&E sectioned Kaiser, Dignity Health, and Sutter Health off into its own program, under the HEEP umbrella. When the MBTU programs audience was sectioned off to not include the three major medical branches, the program offerings were also adjusted. The program no longer offered retrofits; it was restricted to retrocommissioning only.

13.1.7 OSHPD Requirements

Working with healthcare facilities can be complicated because of the many OSHPD requirements that have to be addressed when making changes to the building envelope. The programs have found that combining contractors with extensive experience in the hospital sectors with industry connections and trade organization memberships, they can gain credibility to work in the hospital sector. Implementers with more in house OSHPD expertise tended to have greater program success. Programs need to work closely with the utility to discuss the added time required by the OSHPD approval process and to take the additional approval time into account.

Additionally, there are government mandated building upgrade requirements that tend to get funding priority over energy efficiency upgrades. Most recently Senate Bill 1953 required building

upgrades to account for seismic activity. These types of mandates inhibit investments in energy efficiency.

13.1.8 Program Savings Achievements

The figures below (Figure 30, Figure 31, and Figure 32) are based upon information from EEGA. This data shows the status of reported energy savings submitted by March 2012. While the data give each program a status check, it does not reflect projects currently committed to the program. For example, at the time of these interviews the SCE HEEP indicated that it will reach their energy savings goals because of the number of projects currently underway in the program process. In addition, it applied for additional funding due to its current pipeline being over committed. While it is anticipated the SCE HEEP will meet its energy savings goals, the PG&E HEEP program was optimistic about meeting their goals. The program was split into two programs, with the MBTU program taking over the three major healthcare systems. Given this circumstance both programs are uncertain if they will achieve their savings goals.

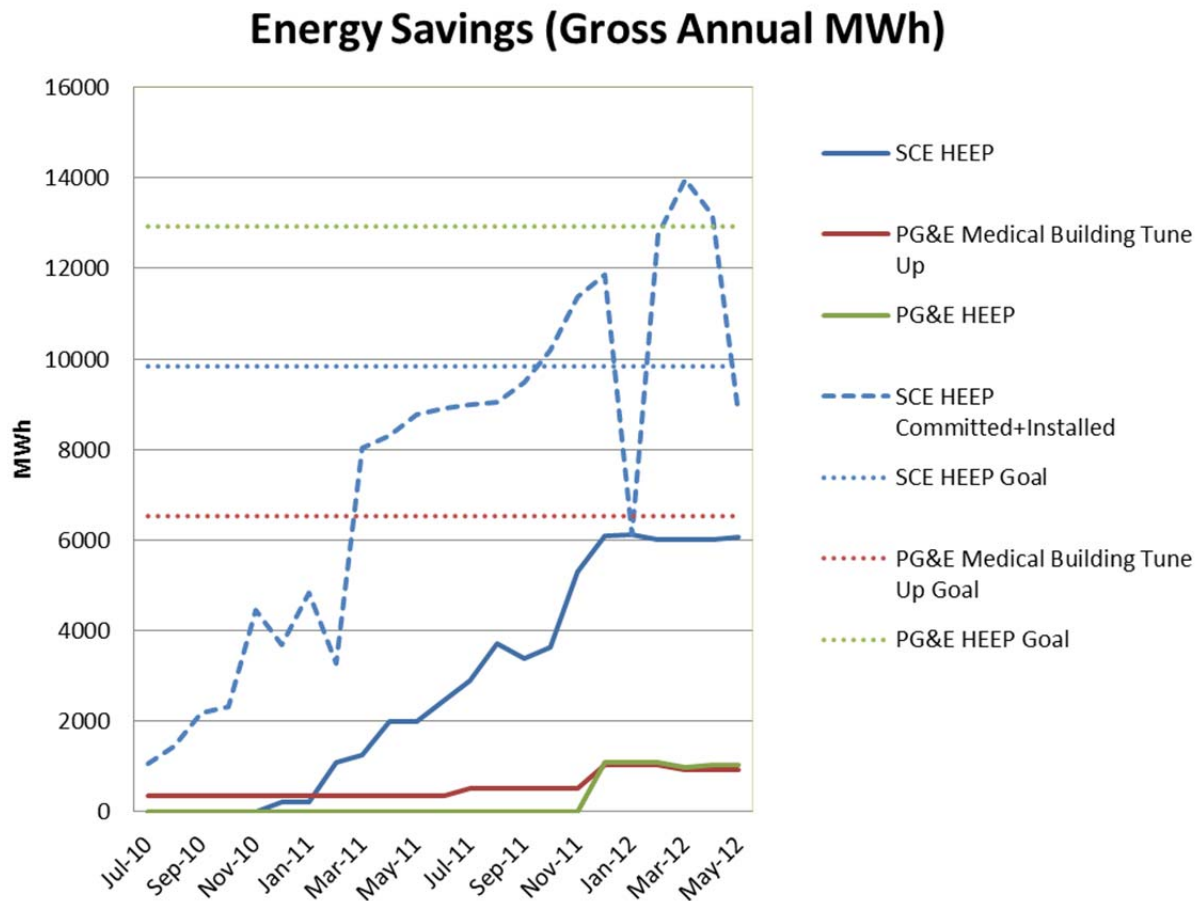


Figure 30: Healthcare Programs MWh Energy Savings

Demand Reduction (Gross Peak kW)

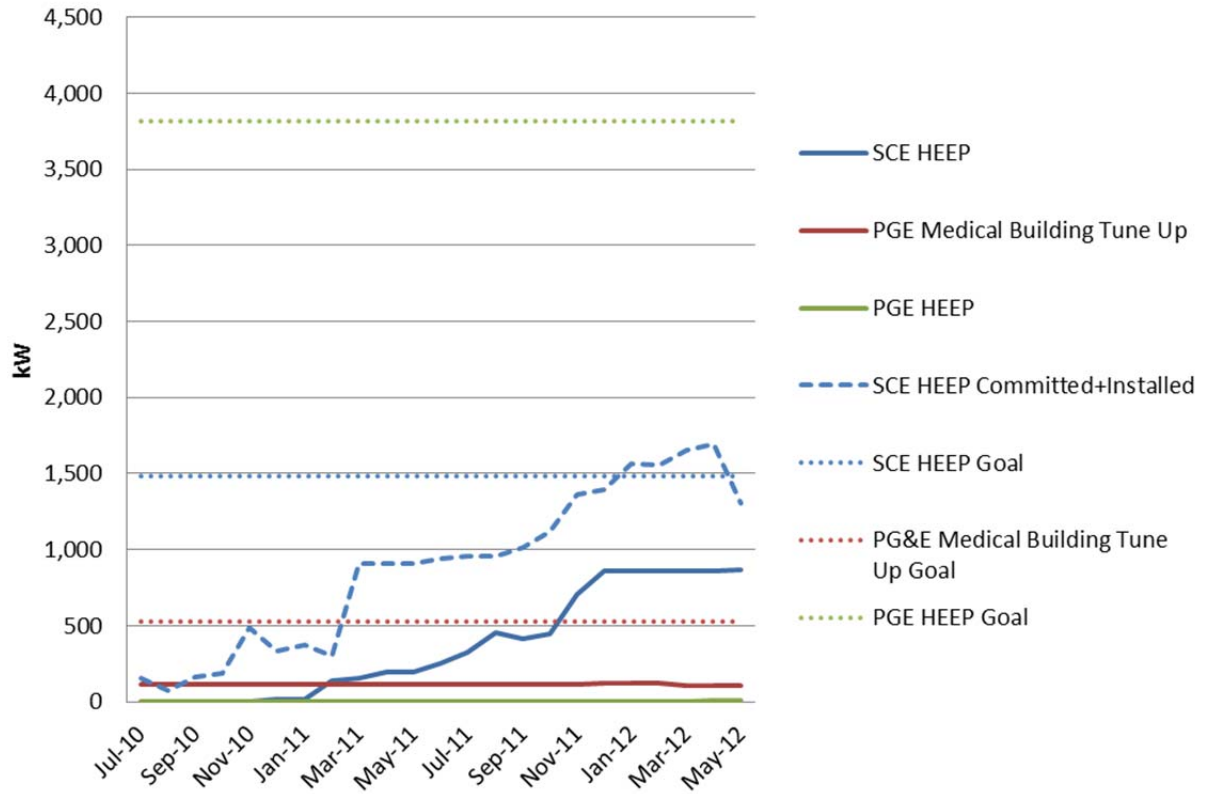


Figure 31: Healthcare Programs Demand Reduction

Gas Savings (Gross Annual Therms)

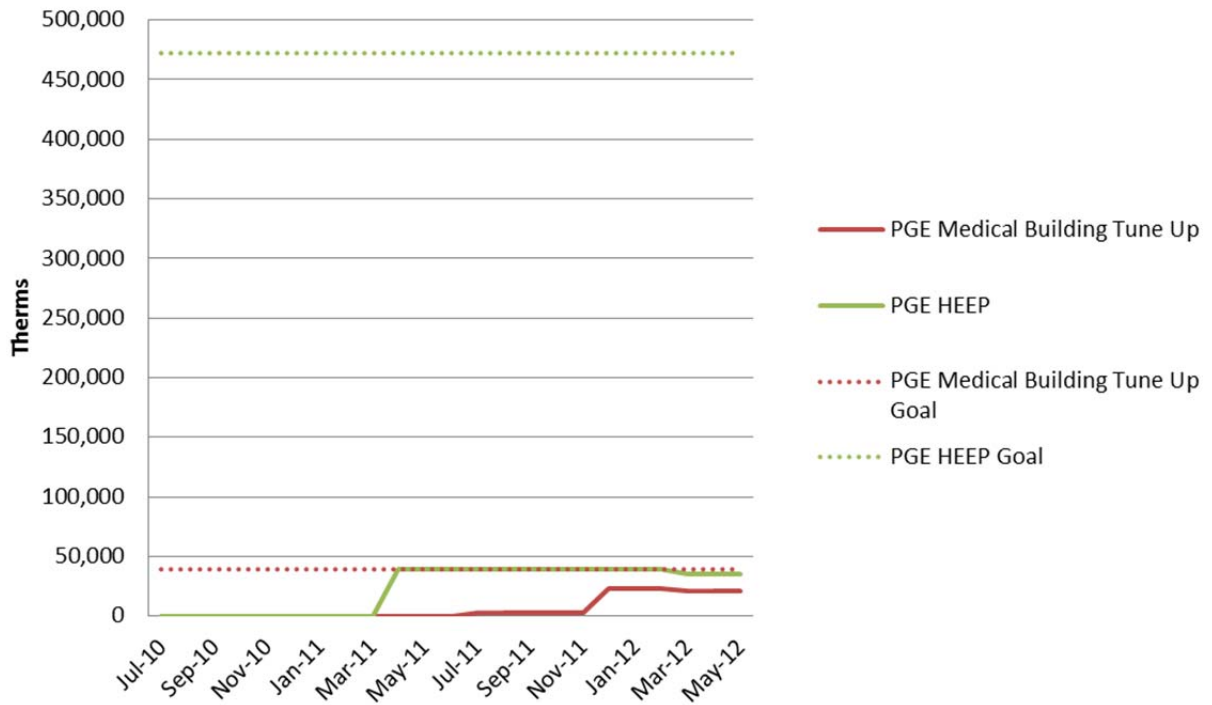


Figure 32: Healthcare Programs Therm Savings

13.2 Healthcare Program Practice Assessment by Program Component

The evaluation team assessed the healthcare programs against industry defined best practices, as defined in The National Best Practices Study²² and also reviewed the programs to look for new best practices. These findings are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each finding and how they apply to industry defined best practices. In addition to the best practice, there are other notable practices that are detailed below. These practices were of interest and further study is warranted before making a judgment call on the effectiveness of these findings.

Table 13 shows a selected best practice for the healthcare sector.

²² Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

Healthcare Best Practice

Ensure implementers are aware of OSHPD regulations.

Table 13: Healthcare Sector Best Practice

13.2.1 Program Theory and Design

The theory and design behind the programs servicing the healthcare sector was to provide energy efficient resources to buildings housing a variety of medical facilities. These types of facilities are typically unique and hard to reach due to the regulations imposed upon them through the OSHPD. The OSHPD regulations are heavily regulated and impose added time and cost burdens to the facilities. Meeting these regulations takes experienced program implementers and engineers who are aware of OSHPD regulations when implementing such energy efficiency programs. In addition to understanding the exact OSHPD rules, it is also important to understand the time that the OSHPD approval process takes, and to educate the customer on reasonable time frames to be able to install.

Willdan, the 3P implementer for three of the four healthcare programs within the portfolio created the Hospital Pilot Program as an IDEEA program. This program has now evolved into the current HEEP. Willdan had experience with energy efficiency in medical facilities prior to submitting the program design for the healthcare sector programs. After Willdan won the RFP to implement three out of the four healthcare sector programs, this experience was transferred into the current programs. Willdan used their expertise in this sector, the utility, industry stakeholders, and past experiences in the healthcare industry to make any improvements to the program when transitioning from the 2006-08 cycle to the current cycle. The goal was to create a program that offers a comprehensive list of upgrade measures to achieve deep energy savings.

13.2.2 Program Management: Project Management

Project management amongst the 3P implementers has been expressed as one of the strengths of the programs. This can be attributed to the well-organized processes and frequent communication between the IOU staff, 3P staff, and customer. The project management style for each program is slightly different based on the program offerings.

The SCE and PG&E HEEPs have a very similar structures and project management tools. The SCE program was first to be implemented by Willdan, which allowed them to lay the groundwork for the second two HEEPs in SDG&E and PG&E territories that they ended up implementing during the current program cycle (2010-12). The project management method was mostly left up to the 3P's to design its structure based on what needed to be tracked in the IOUs' tracking software. This varies depending on the IOU. In general, each of the 3P's staff follows the projects from start to finish. The program manager is the primary individual serving the projects and reporting to the utility. The program manager also has administrative support staff as needed, in addition to 3P and utility engineers to support the audit, energy savings, and monitoring aspects of the program.

SDG&E's HEEP is structured slightly different because it is a non-resource program that only offers audits to customers. After it completes the audits and suggests energy efficient upgrades, the customer is then directed to the utilities core programs for further assistance. The project

management of this program is performed by one 3P employee who facilitates the audits and upgrade recommendations. This program provides audits to any customer interested in energy efficiency. There is also a large educational component to this program, which is also carried out by 3P staff.

13.2.3 Program Management: Reporting and Tracking

Having a reporting and tracking method established at the start of the program is essential to gathering necessary program metrics and tracking energy savings goals. This is especially the case for programs offering a comprehensive list of energy savings measures. Overall communications with the utility are strong and open, which in turn creates a good working relationship with 3Ps and utilities. Each of the 3Ps implementing the programs have noted that their good working relationships with the utility staff has helped to improve the programs overall functionality. In addition, the 3Ps have indicated that reporting requirements on a weekly, monthly and quarterly basis has been effective and is of the correct frequency. In one case, the quarterly reports are only monthly reports combined into one. It may be more beneficial to the utility and 3Ps to use the quarterly report as a tool to report additional information such as current status and anticipated projects compared to program goals.

Tracking of program metrics is conducted differently across utilities, but each 3P has indicated the method of tracking to be sufficient, with only minor improvements suggested. In the case of PG&E's HEEP, the 3P has designed their own system for tracking all aspects of a project. This is an online tool used mainly by the 3P staff (utility has access) to track a project from the time of a lead all the way to verification of a project. The system tracks measures, incentives, energy monitoring, and verification, and attaches program documents to certain milestones. The program works well and has built in alert systems to keep projects moving and correspondence completed in a timely fashion. This program tracking tool could be considered to be the most effective and comprehensive out of all the healthcare programs in the IOU portfolio.

The other programs employ either programs used by the utilities or Microsoft Excel databases to track program metrics. While these are both acceptable methods of tracking, the system developed by QuEST for the MBTU program demonstrates an easy to use interface, document tracking, and alarm mechanisms to ensure timely response to customers.

13.2.4 Program Management: Quality Control and Verification

Quality Control and verification are also performed differently across the healthcare sector programs. Some are very rigid and comprise an extensive verification of each measure installed, while others are done only upon reaching certain energy savings thresholds. The MBTU program contract was structured so that 100% of the implemented measures must be verified by the 3P. The IOU is committed to verifying 100% of the first ten projects, and then 20% of the remainder. The 3P provides scaled verification for each project. The following thresholds are set by CPUC and PG&E - <25,000 kWh consists of a visual verification including photos and obtaining signatures, >25,000 kWh requires trending and physical measurements. The 3P in-house engineers perform 100% of on-site verifications along with PG&E staff attending 100% of first ten projects and 20% of the remainder. In addition, the 3P provides direct supervision of instruments and installation crews

throughout the project. The quality control process involves a two week logging period to verify performance which is evaluated by the 3P engineering staff.

Ex-ante savings estimates are developed for every project, using verified and/or logged data. Rebates are calculated from ex-post savings, not ex-ante. Therefore, rebates are calculated from logger data and verified measures. The 3P indicated it would be impossible to look at ex-ante utility bills, because it would delay the rebates. Most customers do not use Energy Star Portfolio Manager or similar to track usage. Quality control and verification of the SCE and PG&E HEEPs are very similar, except that both the 3P and utility engineers do verification on 100% of projects and installed measures.

In the case of the non-resource SDG&E HEEP, verification of projects is completed by SDG&E staff. The 3P tracks the savings and acts as a link between implementation contractor and SDG&E verification team. The quality control is performed by comparing achieved savings verses estimated savings. If a project is not performing to its estimates, the 3P works with various parties to determine why a project is not meeting its estimated targets. The quality control is not extensive, but was deemed sufficient (by the 3P) for a non-resource program.

Overall, the 3P implementers indicated the quality control and verification they set in-house and what the IOU requires is sufficient. They have indicated no major issues with the verification process. If an issue arises with a particular project, the 3P staff and utility staff work together to solve the issue and move the project forward.

13.2.5 Program Implementation: Marketing and Outreach

Due to strict OSHPD regulations making energy efficient upgrades difficult to implement, the 3P and utility staff marketing the programs need to be well informed and aware of the difficulties healthcare facilities face when participating in such programs. Utility account representatives bring in the largest number of participants for all of the programs. This strategy works well because of the excellent communication between account representatives and the 3P Program managers. It seems to be most effective when 3P Program managers are brought in early on in the program introduction to the healthcare facilities. Forming relationships early on and understanding the facilities' budgeting cycles and industry audit periods is key to influencing the decision makers to participate in the program. Each of the programs indicated there was not a shortage of customers given to them by the utility representative, but getting them to work through the OSHPD barrier and financial commitments were the most challenging parts.

While account representatives bring in the majority of projects, it is important for the 3P to maintain relationships with key trade groups, chains of medical facilities and campuses, and present at conferences or trade group functions. Distributing marketing among several channels is an effective tool to spread the word and capture a wide range of participants. In addition, working with contractors, explaining the benefits of the program to them, can introduce the program to new customers.

13.2.6 Program Implementation: Participation Process and Customer Service

As indicated previously, the utility account representatives typically bring the customer to the 3P. The 3P does an initial prescreening of the projects to determine if they would be a good candidate for the program. Each of the programs, except SDG&E's HEEP, recognize that getting high corporate level personnel involved and convinced upfront is key for projects to participate, stay committed, and have the financial resources to carry out a project. Each program has designed a participation process outlining the different stage a project goes through while in the program. The typical project lifecycle follows these steps and can vary depending on the program: 1) customer enrolls in the 3P Program, 2) audit performed by 3P (or consultant), 3) audit results reviewed by technical engineer, 4) project approved and customer agreement signed, 5) installation agreement, 6) equipment is ordered, 7) installation, 8) installation QC and verification, 9) incentive paid out, 10) CPUC audits and EM&V. Throughout this process a 3P staff member is following the projects through the program and addressing any issues that may arise. The process has worked thus far and the 3Ps indicate it has been working effectively.

The MBTU program is unsure if the program will be renewed for the next program cycle. This is a big problem that the program has reached the point in the cycle where they cannot enroll more customers because they will not be able to complete within this cycle. Hospital projects typically take 12-18 months to complete; therefore, the program is no longer enrolling projects for the current program cycle.

13.2.7 Program Implementation: Installation and Delivery Mechanisms

The number one barrier to delivering the program is OSHPD regulations and the costs associated with doing any retrofit or upgrade in the healthcare sector. This hinders the customer from doing projects, because they have to go through a very expensive approval process. This can triple the cost of a simple retrofit project, and adds to the time. The 3P implementers indicated there is nothing the programs can do about this; it is not something to be worked around, but rather followed. These additional engineering and administrative costs can prohibit a facility from doing anything other than capital improvements.

When a project is able to participate, the 3Ps have not encountered any issues during installation of measures. Having engineering staff experienced in OSHPD and healthcare facilities has helped to lessen any installation barriers that may arise. If any occur, the engineers are able to work quickly to solve the issue at hand, and not hold up the project.

14. VENDOR-IMPLEMENTED PROGRAMS

14.1 Category Characterization/Description

In the 2010-12 program cycle, the IOUs selected programs that were implemented by product vendors/manufacturers. This was a break from the traditional Third Party implementer, usually a vendor neutral company with expertise in a sector or technology. The potential benefit to using vendors as program implementers is that they often have strong sales departments that have existing relationships with IOU customers. The vendor/manufacturers have the ability to help finance projects through performance contracting (PC), assisting customers with identifying financing or giving short term loans to cover the incentives. The vendors proposed to implement programs for schools, commercial office buildings, retail, lodging and restaurants. The programs proposed were primarily focused on HVAC and domestic hot water measures.

This section describes findings for programs that are implemented by the manufacturer or vendor that produces or controls the equipment. Seven 3P commercial programs implemented by vendors were approved for PY2010-12.

1. Cool Controls Plus (PGE2189) - Implemented by Honeywell International, this program provides free, energy efficient retrofits targeting wasteful use of HVAC systems in small hotels and motels.
2. GreenVent for Energy-Efficient Kitchens (PGE2204) - Implemented by Honeywell International, this program provides rebates to restaurants, hotels and campuses for the installation of Melink Company Intelli-Hood® controls.
3. Cool Schools (PGE2210 and SCE-TP-023) - Implemented by Trane Company, this program provides incentives schools with a peak usage of at least 200 kW for the installation of a broad spectrum of energy efficient upgrades.
4. Cool Cash (PGE2242) - Implemented by Trane Company, this program provides incentives to businesses with a peak demand of at least 200 kW for the installation of efficient evaporative pre-coolers.
5. Retail Energy Action Program (SCE-TP-025) - Implemented by Trane Company, this program provides incentives to retail spaces for improvements to HVAC, lighting and the building envelope.
6. Commercial Utility Building Efficiency (SCE-TP-026) - Implemented by Trane Company, this program provides incentives to real estate and management company buildings for improvements to HVAC, lighting and the building envelope.
7. SaveGas Hot Water Control (SCG3673 and SDGE3162) - Implemented by EDC Technologies, this program provides incentives to hotels and motels for the installation of hot water controller technology.

14.1.1 Technologies

The vendor-implemented programs focused their efforts on HVAC and domestic hot water measures. These measures are often more difficult to target since they have longer paybacks and

high up-front costs. In the beginning of the program cycles the programs applied to implement the following measures:

- ◆ Lighting,
- ◆ HVAC Rooftop Units (RTUs),
- ◆ HVAC Split Systems (Splits),
- ◆ Chillers,
- ◆ HVAC Controls,
- ◆ Intelli-Hood® controls,
- ◆ Infrared Occupancy Sensors,
- ◆ Thermostats for Package Terminal Air Conditioning Systems (PTACs), and
- ◆ Evaporative Pre-Coolers.

Before the programs began implementation the RTUs, splits and the chillers were removed from the programs and moved to an upstream program. The reduction in the measure mix made it difficult initially to implement some of the programs. Some of the programs have added advanced lighting measures to the program to help increase demand for their targeted sectors.

14.1.2 Interventions

The vendor-implemented programs are providing audits, facility benchmarking, rebates/incentives, financial assistance and some customer education.

14.1.3 Marketing and Outreach

Most of the programs assumed that they could target the programs through the IOU AEs even though the vendors have established sales organizations in the service territories. This did not work as well as they expected, and the programs were forced to change their strategy. The programs are now working with trade groups and networking events. They are also working more heavily with their internal sales staff to market the programs and with an advanced lighting implementer to help target their customers. The new marketing approaches appear to be increasing participation in the program.

The GreenVent program used cold calls, email blasts, and relationships with industry trade groups to market the program to customers. The email blasts and the relationships with industry trade groups have been especially effective at targeting customers. The program was able to implement a project with the president of an industry trade group. This really helped the program gain referrals in the industry.

14.1.4 Long Term and Short Term Outcomes

The short-term goal of the programs is to reach the savings goals. The programs are attempting to reach their energy savings goals through vendors, either internally or working with a vendor network. The payback for many of the projects is higher than two years, so the project is sometimes a difficult sell.

The long-term goal of the programs is to educate customers on the energy efficient technologies and assist customers in their budgeting of capital intensive projects in their long term planning.

The programs are giving customers facility specific, reliable audit information that can be used to budget for the projects.

14.1.5 Role of Comprehensiveness, Deep Retrofit

The purpose of the majority of the vendor-implemented programs is to create comprehensive projects with deep energy savings. The intent is for the vendors to leverage their financial resources, sales networks and other programs to create comprehensive projects. The programs have struggled to create comprehensive projects. There are several reasons the programs are struggling such as:

- ◆ Weak economy in targeted sectors,
- ◆ Competing programs, and
- ◆ Program measure re-alignment.

With the economy continuing to struggle, customers are reticent to make capital-intensive improvements. This has hampered the progress of the programs in the retail, schools, commercial office buildings and restaurant sectors and has impaired the ability to implement comprehensive projects with deep energy savings.

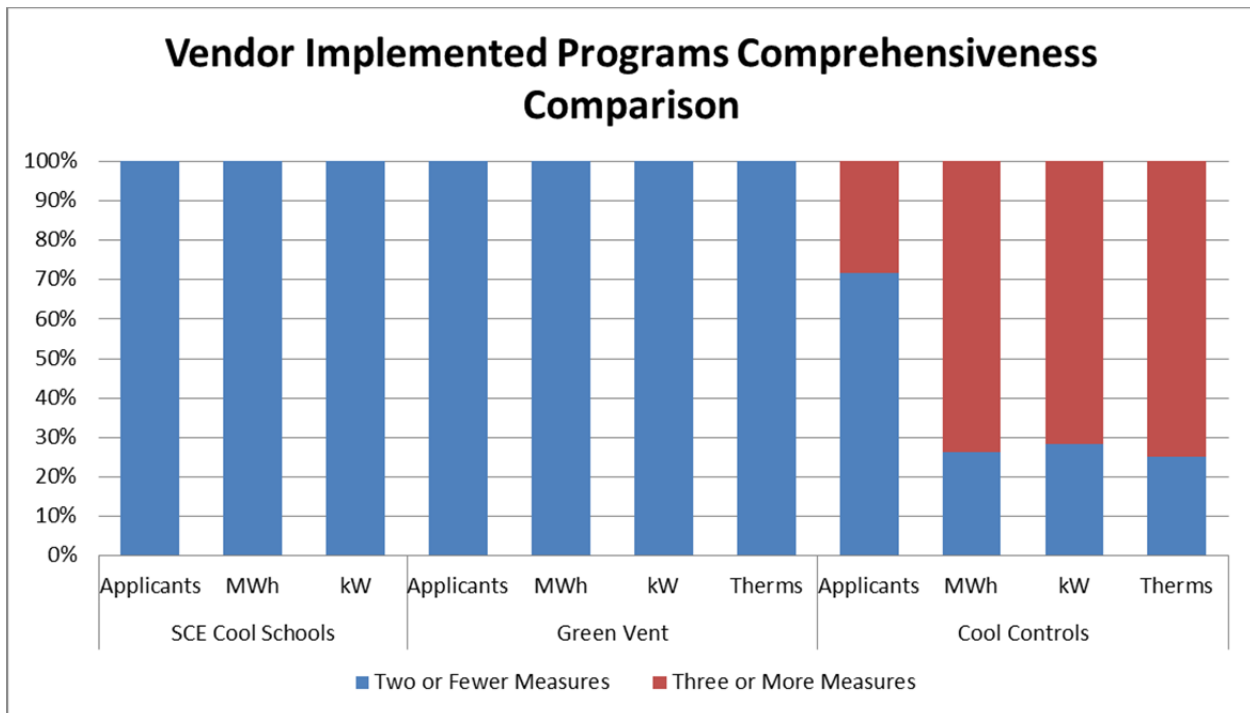


Figure 33: Vendor Implemented Program Energy Savings Analysis

In the school sector, the programs have struggled to gain a foothold in the market because of competing programs. One of the main methods of reaching the school market for the vendor-implemented programs was to use performance contracting. This works well when projects can bundle high cost and low cost measures to create a project that allows a customer to install a project with comprehensive measures. Performance contracting has historically done well in the school sector. It is not working very well in the Cool School Programs because there are competing

programs that are installing free lighting in schools. It has been difficult to work with the other programs in the sector due to timing issues. It takes only a few months to install free lighting at a school district, but it takes much longer to install a capital intensive project (9-12 months on average). Once a district has received the free measures, it is not interested in installing the capital intensive project.

Figure 33 above shows the percent of projects and savings in each program that included 3 or more measures or two or fewer measures. Cool Controls is the only program that had installed projects that included 3 or more measures. Twenty-five percent of their projects are comprehensive, yet these projects account for three quarters of the overall energy savings achieved by the program.

14.1.6 Evolution of this Program Category

The vendor-implemented programs started as new programs in the 2010-12 program cycle. The new programs were in response to a general solicitation that allowed the implementers to design programs that they thought were new and innovative. The implementers chose technologies and markets that they had traditionally been successful at targeting. In several instances, they worked with consultants in the energy efficiency field to help design the program.

14.1.7 Savings Achievements

Based upon the most recent data available through EEGA, the programs are not meeting their energy savings goals. The PG&E Cool Controls Program and the PG&E Cool Cash program have been closed down.

The figures below show the installed and committed savings for the programs throughout the program cycle. At the time of the report, HMG did not receive a confirmation of the new goals for the PG&E programs so the goals reflected in the table are the original goals filed in the PIPs.

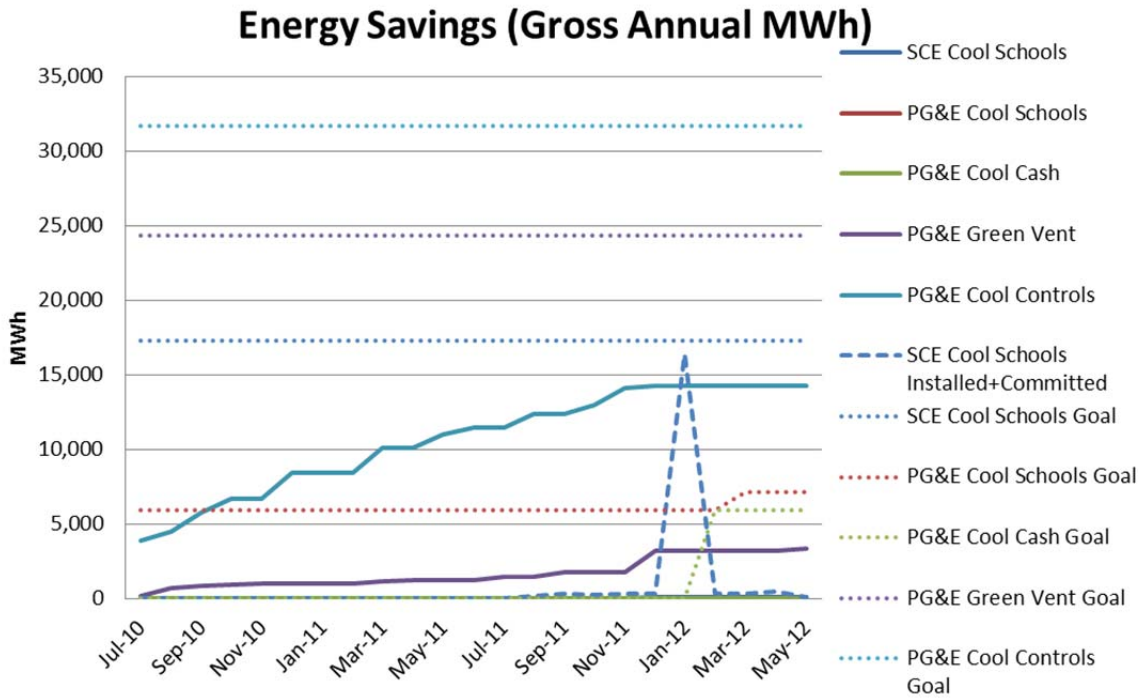


Figure 34: Vendor-Implemented Programs MWh Energy Savings

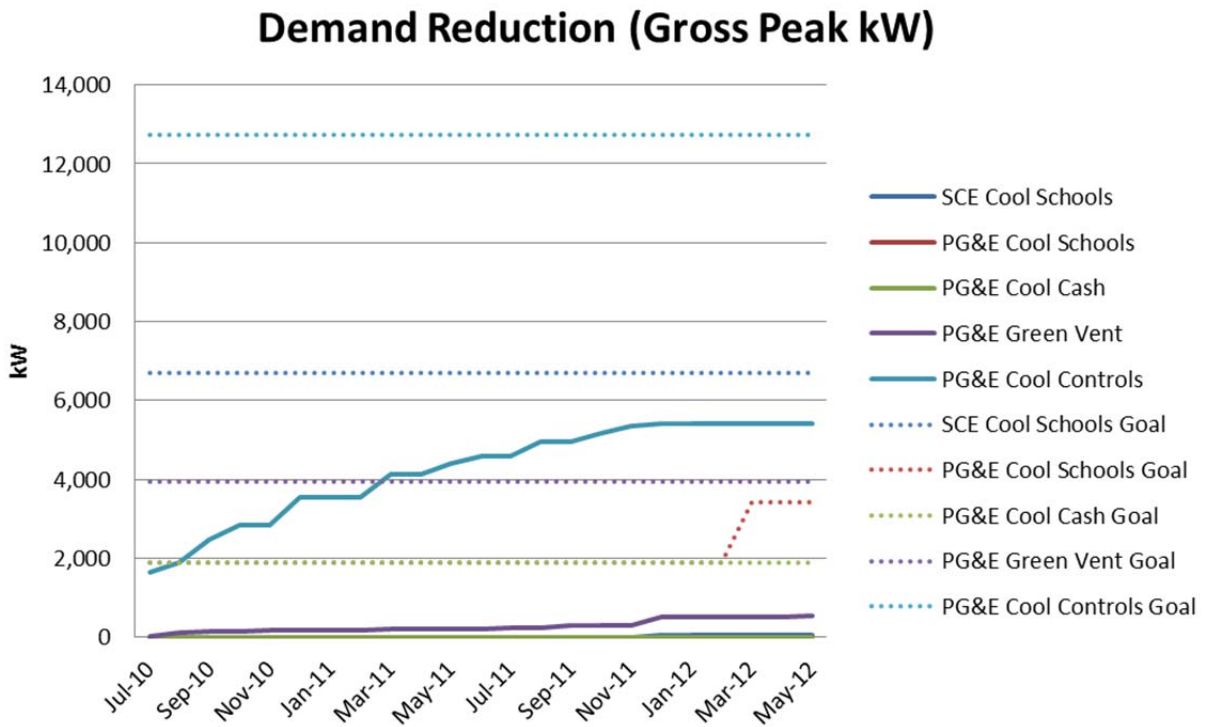


Figure 35: Vendor-Implemented Programs Demand Reduction

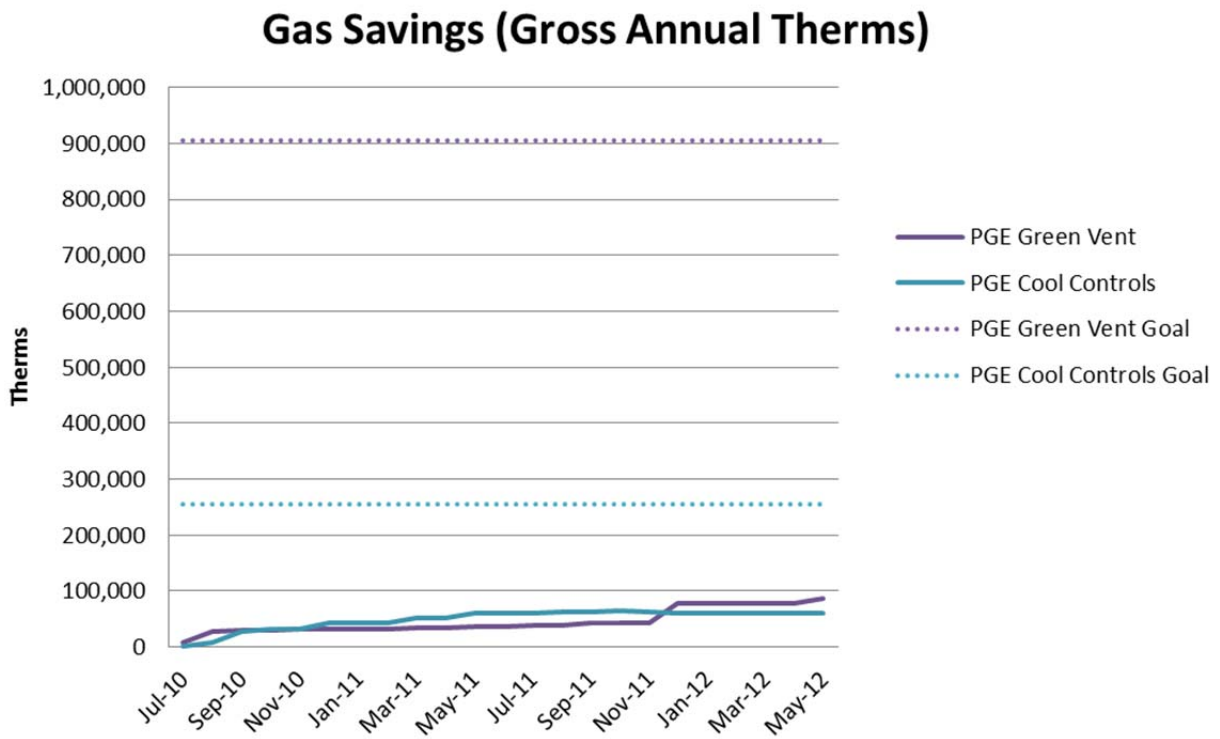


Figure 36: Vendor-Implemented Programs Therm Savings

14.2 Vendor Implemented Program Practice Assessment by Program Component

The evaluation team assessed the vendor implemented programs against industry defined best practices, as defined in The National Best Practices Study²³ and also reviewed the programs to look for new best practices. While the team did not find true best practices there were many successful practices that are listed below. These successful practices are grouped into four main areas: program theory and design, program management (including reporting and tracking and quality control), program implementation (including the participation process and marketing) and program evaluation. Under each area, the evaluation team briefly describes each practice.

14.2.1 Program Theory and Design

Currently there is a single vendor implementing programs for the IOUs. Other vendors can participate in the program by submitting a rebate application to the vendor implementing the

²³ Volume S – Crosscutting Best Practices and Project Summary. Quantum Consulting. December 2004. This study was managed by Pacific Gas and Electric Company under the auspices of the California Public Utility Commission in association with the California Energy Commission, San Diego Gas and Electric, Southern California Edison, and Southern California Gas Company.

program, which includes information on project pricing. The participating vendor must allow the implementer vendor—a potential competitor—to conduct an on-site inspection of the project. The implementer stated that it was not an issue for competing vendors to participate in the programs. The implementer is entering into Memorandums of Understanding to mitigate the concern from other vendors in participating in the programs. The PM did admit that one competitor would not participate in the vendor-implemented programs.

Where possible, IOUs should allow several vendors (not just the manufacturer) to implement programs in the same sector, similar to the SCE industrial program model. This would allow customers to work with their preferred manufacturer/vendor and increase competition in the market. (This may not be possible for equipment or control technologies that only the manufacturer or a limited number of entities know how to install or operate.) Figure 37 and Figure 38 illustrate the current and recommended structure of the vendor-implemented programs.

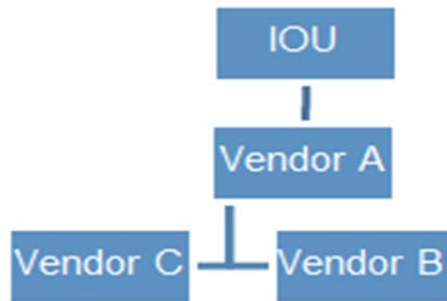


Figure 37: Current Structure of Vendor Programs

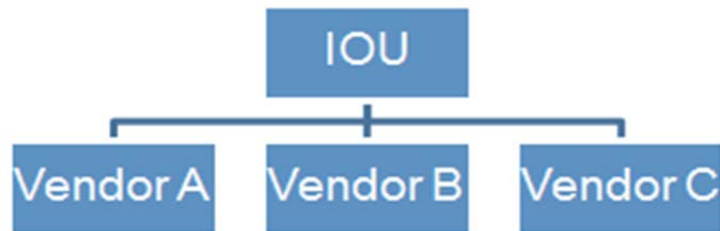


Figure 38: Proposed Structure of Vendor Programs

14.2.2 Program Management: Project Management

A best practice in the HVAC Programs is to clarify the implementation requirements through the contracting period. The IOU and the 3Ps should discuss the requirements of the engineering review and the 3Ps' approach to meeting it. Acceptable calculation methods and appropriate documentation should be established in the beginning. When measures are added to the program, there should be an agreement on the approved calculation methods and documentation for the added measures.

One of the 3Ps planned to use proprietary engineering software to determine the energy savings for their projects. The original budget and compensation estimates were based upon using the software. One of the IOUs disallowed the software because they said that they could not verify the accuracy of the energy savings calculations, but the same software is being used in a different service territory. Changing the acceptable calculation tools increased the cost to the 3P of running the programs. The program performance payments did not increase to account for the increased costs. This also created inconsistency in how the program is implemented at the two utilities.

The contracting process should be detailed to ensure that all important process-related issues are established before the contract is signed and the program begins. This ensures that the 3P and the IOUS are on the same page when it comes to program requirements.

14.2.3 Program Implementation: Participation Process and Customer Service

A best practice is to adjust the incentives based upon market demand. In the GreenVent program, the incentive levels in the PIP were set based upon the economic condition at that time. Between the PIP and the current program cycle, the restaurant and lodging sectors experienced greater economic stress. As a result, the incentives were too low to move the market. The 3P ran a cost-effectiveness test to see if the program would be cost-effective at a higher incentive level and a market assessment to determine what the appropriate incentive level would be to move the market. They worked with the IOU to run a test period at the higher incentive levels. The program participation increased to the level expected in the PIP. After the test period, the IOU approved an incentive level increase that was higher than the PIP but lower than the test period. The incentive levels were lowered because of budget concerns. The program currently is experiencing reduced program participation compared to the test period. The 3P would like to have greater flexibility to change the incentive levels to increase market demand while still running a cost effective program.