PY2013–14 Third Party Commercial Program Value and Effectiveness Study Report (Volume I of II)

California Public Utilities Commission
Energy Division

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Prepared by

Opinion Dynamics Corporation

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Prepared under the direction of the **Energy Division** for the

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1. Executive Summary

This report presents the findings from a value and effectiveness study completed by Opinion Dynamics. The purpose of the study is to characterize the unique value that the 2013–14 Third Party (3P) Commercial programs bring to the market and how effectively the third party organizations and investor-owned utilities (IOUs) implement and manage those programs. Throughout the 2013–14 program cycle, the 3P Commercial programs included 53 disparate resource and non-resource programs contracted by four IOUs[1]: Pacific Gas and Electric (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), and San Diego Gas and Electric (SDG&E). This evaluation focused exclusively on programs classified as 3P Commercial resource programs that were active when the evaluation team developed the research scope. Figure 1 presents the 38 programs included in this study. Table 4 further provides the program IDs and the abbreviated program names used in this report.

Figure 1. Programs Included in Study

Active Programs (29)

PG&E
Air Care Plus
Boiler Energy Efficiency Program
Casino Green
Energy Fitness Program
Energy Savers
EnergySmart Grocer
Enovity SMART
Furniture Store Energy Efficiency
Healthcare Energy Efficiency Program
K-12 Private Schools and Colleges Audit Retro
LED Accelerator
Lincus WISE
LodgingSavers
Nexant AERCx
PECI AERCx
RightLights
RSG AERCx
School Energy Efficiency

SCE
Commercial Utility Building Efficiency
Cool Schools
Data Center Energy Efficiency
Enhanced Retrocommissioning
Healthcare EE Program
Lodging EE Program
School Energy Efficiency Program

SCG
3P- Program for Resource Efficiency in Private and Public Schools

SDG&E
SW-COM Direct Install
SW-COM-Calculated Incentives-RCx
SW-COM-Deemed Incentives-HVAC Commercial

Closed Programs (9)

PG&E
California Preschool Energy Efficiency Program
Energy-Efficient Parking Garage
Enhanced Automation Initiative
Monitoring-Based Commissioning
Monitoring-Based Persistence Commissioning
Ozone Laundry Energy Efficiency
Small Business Commercial Comprehensive

SCG
3P-SaveGas

SCE
Energy Efficiency for Entertainment Centers

Methodology

To develop the findings in this report, the evaluation team conducted a range of research tasks that combined a secondary data review with in-depth interviews and quantitative surveys. Table 1 summarizes the specific research tasks that form the findings for this study.

[1] Programs where the implementer is "third/local party implementer" and the target market is "commercial" in the 2013–2014 Monthly Energy Efficiency Program Reports, filed with the California Public Utilities Commission (CPUC).

Table 1. Summary of Data Collection Tasks

Research Task	Number of Respondents	Target	Method	Timing
For all 38 programs				
Secondary Data Review	n/a	38 3P programs	Extracted and analyzed multiple data sources	March 2014–November 2015
IOU Program Management Interviews	19	Staff represented all 38 programs	Telephone in-depth interviews	February–March 2015
IOU 3P Portfolio Data Extraction	3 of 4 IOUs	4 IOUs	Email inquiry	October–November 2015
3P Implementation Staff Interviews	32 (representing all 38 programs)	Implementers of all 38 programs	Telephone in-depth interviews	March 2015
Case Studies (10 of 38 programs selected)				
Literature Review	n/a	47 reports	Reviewed and synthesized secondary literature	October 2015
Participant Surveys	262	6,112 contacts	Quantitative telephone interviews	October–November 2015
Implementation Models	n/a	10 3P programs	Synthesized information from in-depth interviews and program materials	August–October 2015
Conversion Rates	n/a	10 3P programs	IOU data request	August 2015

Program Characteristics

Energy efficiency programs in California have been around since the early 1980s. Initially, the IOUs implemented most of California's energy efficiency programs and occasionally subcontracted program components to external entities. This changed in 2006, after the California Public Utilities Commission (CPUC) directed IOUs to seek 3P solicitations for 20% of their energy efficiency portfolio (D.05-01-055). In response, the IOUs issued competitive solicitations that targeted hard-to-reach sectors and solicitations that focused on innovative technologies or program design strategies. While the CPUC approved IOU plans to seek competitive solicitations for 20% of their 2006–08 energy efficiency funds, the IOUs had already had three 3P Commercial programs operating since 2002. More than one-third (14 of 38) of the programs examined in this study began in the 2006–08 program cycle and another third began in 2010. Although some of the newer programs in 2010–12 focused on innovative or hard-to-sell technologies, the majority of programs in the 3P Commercial portfolio remained focused on hard-to-reach markets or regional needs. This changed after the solicitation for new programs starting in 2013. All of the programs that launched in 2013 emerged from the Innovative Design Energy Efficiency Activities 365 (IDEEA 365) solicitation process, led by the IOUs and vetted through the CPUC and other stakeholders, that allows vendors to submit innovative program ideas on a frequent basis.

Based on reported savings estimates of program costs and energy savings, the 38 3P Commercial resource programs included in this study contributed 14% of the electric savings and 13% of the therm savings coming from all Commercial programs in 2013–14. These programs cost 17%[2] of the total cost to implement Commercial programs; while the cost was 17%, the savings contribution was lower, indicating that potentially investing more money in Core programs would produce more cost-effective savings. It is not surprising that these programs are more expensive relative to the savings they produce, however, as they offer more services

[2] While it was stated earlier that the CPUC directed the IOUs to spend a minimum of 20% on 3P programs, that 20% minimum includes spending on residential, industrial, cross-cutting, and non-resource programs that are not included in this study.

to customers in hard-to-reach markets and are therefore costlier to run Notably, most 3P programs are cost-effective, as shown later in this report.

Table 2. Overall Contribution of 3P Programs to the Commercial Portfolio

	Cost (Million $)	GWh	GW	MMTherms
All Commercial Programs (N=79)[a]	$839.8	1,915	342.56	34.0
All Commercial 3P Resource Programs (N=38)[b]	$140.8	277	0.05	4.3
Contribution of 3P Commercial Resource Programs	17%	14%	<1%	13%

[a] Data for the Commercial portfolio accessed from EE Stats EE Data Portal on March 21, 2016. We selected portfolio savings and time series by year and summed 2013 and 2014 savings data with the selection (Sector=Commercial). Total number of programs in the Commercial portfolio determined by IOU Monthly Energy Efficiency Program Reports from December 2014 (Sector=Commercial).
[b] Actual savings and program costs for 3P Commercial programs are based on the CPUC's Quarterly Tracking Program Database. Actual program costs were calculated by Itron in November 2015 based on quarterly IOU data submissions that included program-level spending, including incentive payments for the 2013–14 program cycle.

Of the 38 programs administered in 2013 and 2014, the IOUs closed 9 programs, began 5 new programs via the IDEEA 365 solicitation process, and continued 24 programs. The continued programs had forecasts for energy savings; reported estimates show that these programs came very close to meeting their electric saving forecast and exceeded their gas saving forecast.

Table 3. Projected and Actual Portfolio Savings of Active Legacy Programs (N=24)

Unit	Electric Savings (GWh)	Gas Savings (Million Therm)	Combined Savings (MMBTU)
Projected Savings[a]	293.6	2.8	1,285,892
Actual Savings[b]	261.9	3.1	1,200,122
Percent Achieved	89%	111%	93%

Data sources: [a]IOU Monthly Energy Efficiency Program Report, December 2014; [b] CPUC Program Database.

The Evaluation Team analyzed the participation in 3P versus comparable Core programs by business size (see Table 16). The 3P programs are significantly smaller than Core programs. The 3P programs reached approximately 12,000 customers while the Core programs reached over 74,000 customers. Both program types are reaching a mix of large, medium, and small business customers; 93% of the 3P participants are small or medium customers compared to 87% of Core participants. In terms of penetrating the market based on business size, the 3P programs reached 1% of the small businesses, 3% of the medium businesses while the Core programs reached another 4% of the small businesses and 16% of medium businesses.

The programs with the highest combined electric and gas savings were PG&E's EnergySmart Grocer, PG&E's Boiler EE, and SDG&E's Direct Install programs; these programs generated almost one-third (31%) of active Legacy program savings. Legacy programs are programs (24 in total) that launched before 2013. Of the 24 active Legacy programs, 13 came close to or exceeded their forecasts (90%–766%) and 11 fell shy (18% - 85%) of forecasts. Some variations from forecasts are expected in any program given that implementation staff and IOUs determine the forecasts well ahead of the program cycle and can reallocate funds as needed in response to market conditions. However, large variations from forecasts warrant deeper investigation. Five programs achieved less than half of their savings forecasts. These include SCE's Enhanced RCx, Cool Schools, Data Center EE, and CUBE and SCG's PREPPS. According to IOU and implementation staff, these programs fell significantly short of savings forecasts for the following reasons:

- For SCE's Cool Schools and SCG's PREPPS, Prop 39 caused a pause among schools seeking energy efficiency improvements. Dispositions[3] that reduced claimed savings for pool covers also affected PREPPS as this was one of the program's most popular measures.
- SCE's Enhanced RCx program, according to IOU and implementation staff, had a slow start and only ramped up in 2013. The program is experiencing low levels of customer knowledge about fault detection and diagnosis software that is requiring more customer education than anticipated. Retrocommissioning (RCx) projects in this program have long implementation times (up to 18 months).
- PG&E's Data Center EE program stalled due to implementer staff turnover. This program was also heavily affected by savings reductions due to the new Title 24 baseline that went into effect in this program cycle.
- For SCE's CUBE program, both IOU and implementation staff explained that the Title 24 code change and further lighting dispositions hindered the program's ability to reach its savings forecasts.

The five programs that emerged under IDEEA 365 faced unique challenges since they were not fully operational until 2014 and some only had one year to perform. Even though all five programs generated lower savings than program staff had anticipated,[4] both IOU and implementation staff touched on a number of valuable contributions. For example, the AERCx programs had a first chance at testing their data analytics software with PG&E smart meter data and were able to use it to identify some RCx savings opportunities. Implementers also highlighted gaining more experience with persistence monitoring, which may produce data to help address the current short life cycle of savings from RCx measures. These programs fell short of savings forecasts for a number of reasons that are common to launching new programs:

- Late program starts due to contract negotiations
- Time spent building trust amongst customers for a new program
- Interval data transfer issues for advanced analytics programs
- Lincus WISE, a program focused on large retrofits of water pump stations, experienced several ramp-up and short-term market barriers, indicating that longer-term investments are important before water agencies invest in major retrofits.

Section 5 of this report outlines the main findings from the study as they relate to the value and effectiveness of these programs. Section 6 provides overall conclusions and recommendations for the 3P programs based on the key findings presented in Section 5.

Below is a summary of the key findings that indicate these programs are valuable and effective, in addition to the recommendations for how the programs can further maximize their value and effectiveness. More detailed findings under each topic header below can be found in Section 6. Specific recommendations are highlighted in bold text throughout the sub-sections below.

[3] Formal documents from the CPUC that outline policy direction for what measures qualify for energy savings reductions and the level of savings

[4] PG&E did not establish savings forecasts for these programs.

Indicators of High Value

Below are indicators that the 3P programs provided value to the commercial market:

- The 3P programs in this study contributed sizable savings to the Commercial portfolio, generating 277 GWh, 0.05 GW, and 4,300 million therm savings during 2013–14. They accounted for 14% of all electric savings and 13% of all gas savings in the commercial portfolio of programs.

- By design, the programs provided value by serving multiple target markets and technologies with known hard-to-reach barriers to energy efficiency. The literature review for 10 of the programs confirmed that customers in some of the key 3P program target markets lack the capital, knowledge, and personnel to complete energy efficiency projects.

- The programs commonly offered technical assistance in additional to financial incentives. The technical assistance helped customers identify energy efficient opportunities, select projects and measures, determine the return on investment (ROI), and in some cases directly install products. Technical assistance was provided above and beyond what was offered to the same customers through the IOU Core Commercial programs, which, according to IOU program staff, only offer incentives while the customer is responsible for other aspects of the project. The programs varied slightly on what services they offered to customers, but most were a variation on the definition of technical assistance provided above.

- Research with participants in the 10 case study programs, which reflected the majority of the savings from 3P programs and most of the target markets served, revealed that customers did need most of the programs' services to adopt energy efficiency. Case study participant surveys contained a set of questions that asked customers to rate their need for program features for them to adopt energy efficiency measures. Participants rated each program feature on a scale from 0 to 10, where 0 was "not needed at all" and 10 was "critically needed." The evaluation team used responses to these questions to calculate importance scores (based on average ratings) for each program feature and for the program overall. We used importance score to assess the program value. Participants gave mostly high scores of seven or higher, indicating that customers participating in the 3P programs critically need the 3P program services to pursue energy efficiency improvements.

How Value Could Increase

Below we describe how the value of these programs could increase.

Sector Specific Recommendations

- In terms of program design, the case study importance scores (as described above) can help assess the services offered to customers and determine whether they all are critically needed to help customers overcome barriers to energy efficiency. The programs should consider what is most valued to pursue energy efficiency upgrades in hard-to-reach markets to best cater to customers' needs.

    - **Place less of an emphasis on the audit for small and medium-size businesses as a selling point in promotional efforts to prospective participants.** For small and medium-size businesses, the no- or low-cost measures and direct install services are more critical than some of the technical assistance services (such as the audit) for the customer to pursue energy efficiency upgrades. Although the audit received lower importance scores, it is needed for the program to assess the facility and to identify energy efficiency improvements; therefore, it is valuable to the program's implementation even if it may be of lesser value to the customer than free, direct install measures.

As such, we do not recommend ceasing the audit service but instead place less of an emphasis on the audit for small and medium-size businesses as a selling point in promotional efforts to prospective participants.

- **Better targeting may be needed to reach only those hospitality customers who would not pursue energy efficiency upgrades on their own without the program's technical assistance.** For customers in the hospitality industry, case study importance scores indicate diverse market needs, as some highly valued technical assistance and some did not. The LodgingSavers program served very large hotel chains and smaller "mom and pop" hotels. The program also offered both direct install services and larger, customized retrofits. These findings speak to the diverse nature of the program's current target market and suggest that better targeting may be needed to reach only those hospitality customers who would not pursue energy efficiency upgrades on their own without the program's technical assistance.

- **School programs could provide more value by expanding their measure mix with more outdoor lighting (particularly for stadiums and parking lots), LEDs, and hallway lighting.** Customers in the school sector expressed a mixed need for technical assistance. Schools highly valued the technical assistance related to retrocommissioning, and even suggested that further assistance and training in this area would be beneficial. However, schools that pursued retrofit measures through PREPPS or SCE's School EE program expressed only a moderate need for technical assistance (refer to Table 17). Based on participant feedback regarding what services they need to pursue more EE improvements, it is clear that the school programs could provide more value by expanding their measure mix with more outdoor lighting (particularly for stadiums and parking lots), LEDs, and hallway lighting.

- **Healthcare programs should consider whether it should emphasize technical assistance more than rebates to the healthcare sector.** Customers in the healthcare sector had polarized views on the importance of the rebate. The Healthcare EE program had only eight participants and only five of them responded to the case study participant survey, so the information is limited to only a few customers representing this sector. However, given the polarized view on the importance of the rebate, the program may consider whether it should emphasize technical assistance more than rebates to the healthcare sector.

- **Boiler rebates offered through PG&E's Core Program may adequately address market need.** Commercial customers upgrading boiler systems indicated only a moderate need for rebates and technical assistance. The program generated the highest gas savings and the second highest energy savings (measured in BTU) across all programs in the study. However, moderate importance scores (4.4–6.7) for core program features and low cost-effectiveness (total resource cost [TRC] of 0.64) raise the question of whether the rebate offered through PG&E's Core program would adequately address the market need.

Improve Program Offerings

- There was limited value to helping customers find and select contractors. Many non-direct install programs offered this service if customers requested it. The uptake of these optional services was low in most programs and low importance ratings indicate these services were not critically needed for customers to pursue energy efficiency. However, the cost to provide these services as needed is likely quite low and therefore can be continued.

- **While most customers described the program design of 3P programs as sufficient, they commonly recommended including more eligible energy efficiency products, more communication on energy saving opportunities and benchmarking to other businesses, additional training or assistance in advanced analytics-enabled retrocommissioning programs, and more guidance from implementation staff when developing the project scope.** Consider maximizing program value based on some of the customers' input from case studies regarding what the programs could further offer to help them save energy. Please refer to Section 6 for more details

Continuous Improvement

- **The IOUs should seek ways by which they can encourage more innovative program designs in 3P through its IDEEA 365 solicitation process. One way to do this may be to start better coordination with the Emerging Technologies Program throughout the program solicitation process.** The majority of 3P Commercial programs targeted hard-to-reach markets with established technologies (29 of 38). While these programs generated the bulk (93%) of combined savings (BTU) in the 2013–14 cycle, the 3P programs were intended as a vehicle to enable more innovation.

- **In the future, the IOUs and the working group should consider the latest findings from commercial potential studies when deciding what programs to keep, what programs to drop, and what new programs to launch**. Ensure that the program technologies and sectors align with where the energy saving potential is. These programs were providing great value if they obtained cost-effective net energy savings in technologies or sectors with the most energy saving potential.

Indicators That Programs Are Implemented Effectively

Below we describe indicators that demonstrate that the programs were implemented effectively.

- The majority of programs passed the TRC cost-effectiveness test: Almost two-thirds (24 of 38) of the programs were cost-effective, with net TRC above 1.0. Programs with the following characteristics tended to be more cost-effective: Direct Install programs, deemed measure programs, and those with at least four years of implementation time. Through staff interviews, we learned that many of the programs reduced the expected savings mid-cycle based on baseline changes and policy directives but still incurred the same program costs, which may explain why some of the programs were less cost-effective than others. However, there are likely other contributing factors.

- IOUs and implementers set mostly achievable forecasts: New programs launched in 2013 or 2014 did not typically set savings forecasts or some of the programs that did set savings forecasts fell short of forecasts given the need for ramp-up time. These programs did not have set savings forecasts for their ramp-up period, which is consistent with the previous evaluation's recommendation to give program's time to ramp-up before tying program contracts to performance metrics such as energy savings.

- Participants gave the implementers very high performance scores: The case studies found that participants gave high performance scores for all program features and almost all participants would recommend the program to other businesses, indicating that the implementers were effectively meeting customer expectations.

- The programs were targeting facilities that were ready for energy efficiency upgrades: Among the programs where conversion rates from audit to project completion were available, the case studies show that the programs converted at least one in two facility audits to energy efficiency projects. For five case study programs, the conversion rate was 67% or higher. This is an indicator that the programs were targeting customers in need and not spending a lot of resources on customers who may not

convert to a project. However, this finding is based on the limited number of programs that could provide this information and, therefore, conversion rate data tracking is also cited in the next section, where we discuss whose implementation could improve.

How Implementation Could Improve

Improve Program Processes

- **Consider more-systematic referrals to other energy efficiency programs via a centralized and statewide energy efficiency program website that provides easy access to energy efficiency program information for commercial customers, perhaps as part of the Energy Upgrade CA statewide marketing initiative.**

- **Ensure that processes and program rules are documented to allow for onboarding new staff and minimize staff turnover for highly specialized markets**. Some of these programs require specific areas of expertise with a given sector or technology to implement effectively, and one staff change at an implementer can cause major program disruption. Also, in the closed program analysis, we found that insufficient communication between newly appointed IOU staff and the program implementer in the MBPCx Program led to adverse consequences that ultimately led to program closure. A formal onboarding process for the new IOU staff, or a process that facilitates the transfer of knowledge from prior IOU staff to new IOU staff (incidentally, one of the HMG 2010–12 best practice recommendations), could have helped the new IOU staff better understand the program rules. Given the volume of staff across the IOUs and implementers, turnover is going to be inevitable and therefore good documentation of program procedures, processes and program rules, especially policy-directives, is needed for smoother staff transfers.

Improve Quality Control and the Quality of Program Data

- **Programs should enhance quality control processes for these case study programs: RightLights, SDG&E's Direct Install, LodgingSaver and Boiler EE.** While customer satisfaction with program implementation was high in the case studies, a few participants experienced issues with measure installation and product quality.

- **The programs should adopt tracking systems that allow for easy reporting on conversion rates**. Three of 10 case study programs did not track the necessary data to calculate a conversion rate from audits to completed projects. Collecting these data as part of the program databases would allow program staff and evaluators to identify inefficiencies and potential implementation issues.

- **PG&E stands to improve interval data transmission for AERCx programs.** Program implementation staff of all AERCx programs experienced issues with data provision. The implementers noted that the data provision process was difficult to navigate and that the IOU could lay out the process more clearly. PG&E acknowledged these issues and explained that the IOU does not have a team dedicated to smart meter data, which is causing a major barrier to faster and more structured data transmission to vendors.

Indicators That Programs Are Managed Well

The following are indicators that the programs are managed effectively:

- The IOUs have a coordinated and regulated approach to soliciting new programs and closing current programs. The IOUs jointly developed scorecards for the solicitations of IDEEA 365 programs and

reported positive experiences with the solicitation process thus far. The decisions to close programs are coordinated among implementers, the IOUs, and the CPUC.

- There is reasonable justification for closing most programs. The IOUs proposed to close nine 3P Commercial programs during 2013 and 2014. Three programs closed due to market saturation, three programs closed because they could no longer be cost-effective after Title 24 baseline code changes, and two programs closed due to implementation issues. Only one of the closed programs (EE for Entertainment Centers) had the potential to remain active from the perspectives of IOU and implementation staff. This program had a slow ramp-up after a new implementer took over in the 2013-14 program cycle, but was able to build a project pipeline after the IOU had filed for program closure. However, program staff determined that it was easier, administratively, to close and re-open the program in the new program cycle.

- The IOUs monitored program performance and pipelines on a monthly basis and appropriated funds as needed to balance their portfolios. The IOUs monitor program performance and strategize as needed to ensure that the entire portfolio of 3P programs achieves its energy saving commitments by reallocating resources across programs as needed. For example, the IOUs increased funding for seven programs during 2013–14 to allow for more energy savings.

- There is a positive relationship between the IOUs and program implementation staff: Program implementers described their relationship with IOU 3P staff as positive and collaborative. Many highlighted that IOU program managers actively assist the implementers as problems emerge. Implementers generally felt that they received sufficient notice of regulatory or programmatic changes.

How Management Could Improve

Consider Policy Adjustments to Facility Smoother Program Implementation

- **Consider ways to disseminate policy changes mid-cycle that affect claimable savings in a way that minimizes program operations and administrative costs to the extent possible.**

- **Allow contract periods of 2–3 implementation years for mature programs and up to 5 years for newer programs to allow sufficient time to build project pipelines and realize savings.**

Improve Communication About Reported Works

The secondary review process (SRP) is one of the main implementation and management challenges for the IOUs, implementers, and CPUC staff. While the previous evaluation recommended streamlining and simplifying the application process for these programs, the introduction of the secondary review process somewhat conflicts with this directive by adding more complexity. Many of the issues relate to the length of time required for the secondary review, communication issues among all parties involved, and a lack of clarity around documentation requirements. The secondary review process can stall due to delays in the provision of requested data and if the submitted data do not provide sufficient information for the review. All parties involved indicated a wish for more transparency related to the status of each secondary review project.

- **We recommend the following to address these issues:**

  - **Develop a communication tool to help all parties understand the status of and next steps for each project selected for secondary review.**

- **Enhance IOU reviews of custom applications in light of the issues that CPUC staff and their consultants are finding in the secondary review process to ensure that projects are following CPUC policy and program rules.**
  - **The IOUs need to develop a standardized report format for the minimum required information for each custom project.**
- **Provide more opportunities for frequent "information exchanges" between IOUs and implementers to discuss common review issues so that implementers can incorporate lessons learned moving forward.**
  - **Implementers should learn from secondary review outcomes and apply them to future projects.** CPUC staff and their consultants noted that most of the secondary review projects are repeat cases with the same 3P implementer and that the results of subsequent reviews are often identical to previous reviews, indicating that the implementers are not applying the results to subsequent projects.
  - **IOU's need to better communicate claimed savings changes and directives coming from dispositions and secondary review outcomes proactively to the implementers.**

Finally, as part of this study, the evaluation team reviewed some of the Best Practice recommendations from Heschong Mahone Group's (HMG) 2010–12 3rd Party Commercial Resource Program Needs Assessment[5] against the findings from this study. Many of the best practices have been addressed or partially addressed but others have not been implemented. Some best practices may be in conflict with some of the policy directives for these programs. For example, the implementers are challenged with streamlining and simplifying the project approval and participation processes due to program rules requiring multiple check—points and requirements from multiple parties. Further details on these past recommendations can be found in Table 34 and Appendix B.

[5] Heschong Mahone Group, 2013: California Nonresidential Program Assessments Study. Third Party Commercial Resource Program Group Report. Program Years 2010–2012.

2. Structure of This Report

The PY2013–14 Third Party (3P) Commercial Program Value and Effectiveness Study consists of two volumes. Volume I, contained in this document, provides a summary of the methodology, key findings, and conclusions from the entire study. Volume II is a separate document and contains descriptive summaries for each of the 38 programs individually and detailed results for each of the 10 programs selected for case study analysis.

3. Study Context and Purpose

3.1 PY2013–14 Third Party Programs Covered in Study

Throughout the 2013–14 program cycle, the 3P Commercial programs included 53 disparate resource and non-resource programs contracted by four investor-owned utilities (IOUs)[6]: Pacific Gas and Electric (PG&E), Southern California Edison (SCE), Southern California Gas (SCG), and San Diego Gas and Electric (SDG&E).

This evaluation focused exclusively on programs classified as 3P Commercial resource programs. In March 2013, the evaluation team identified 38 3P Commercial resource programs based on the IOUs' Monthly Energy Efficiency Program Reports.[7] The IOUs initiated 10 other 3P Commercial programs after March 2013; however, we did not include these programs in this evaluation because these programs were not mature enough to assess their value and effectiveness. Appendix E provides a list of the 3P Commercial programs outside the scope of this study.

Table 4 shows the 38 programs included in this study. For simplicity throughout this document, we abbreviate the program names listed on the Energy Efficiency (EE) Stats website.[8] The table shows the program names and identification numbers for each program, as well as the abbreviated program name.

Table 4. 3P Programs in Study

Program ID	Program Name in IOU Monthly EE Program Reports	Program Abbreviated Name Used in This Document
PG&E (18 active programs)		
PGE21016	Air Care Plus	Air Care Plus
PGE21017	Boiler Energy Efficiency Program	Boiler EE
PGE210122	Casino Green	Casino Green
PGE210113	Energy Fitness Program	Energy Fitness
PGE210114	Energy Savers	Energy Savers
PGE21018	EnergySmart Grocer	EnergySmart Grocer
PGE210128	Enovity SMART (School & Municipal Advanced Retrocommissioning & Tune-Up)	Enovity SMART
PGE210118	Furniture Store Energy Efficiency	Furniture Store EE
PGE210123	Healthcare Energy Efficiency Program	Healthcare EE (PG&E)
PGE210126	K-12 Private Schools and Colleges Audit Retro	K-12 Private Schools
PGE210119	LED Accelerator	LED Accelerator
PGE210135	Lincus WISE	Lincus WISE

[6] Programs where the implementer is "third/local party implementer" and the target market is "commercial" in the 2013–14 Monthly Energy Efficiency Program Reports, filed with the California Public Utilities Commission (CPUC).

[7] To determine the number of existing Commercial Third Party programs in California, we reviewed the 2013–14 Monthly Energy Efficiency Program Reports, filed with the CPUC, from March 2014. We identified 43 Commercial Third Party programs based on two fields: Program Implementer contains the word "Third" and the Target Market is "commercial." However, five programs are non-resource programs and are not included in this evaluation since they would require a different research plan and the budget is limited for evaluation.

[8] This is a CPUC-maintained website of the statistics around the 2010–12 and 2013–15 energy efficiency program savings. Additionally, many relevant and useful documents are located at this site. Source: http://eestats.cpuc.ca.gov/Views/Documents.aspx.

Program ID	Program Name in IOU Monthly EE Program Reports	Program Abbreviated Name Used in This Document
PGE210111	LodgingSavers	LodgingSavers
PGE210129	Nexant AERCx (Technology Enhanced Retrocommissioning)	Nexant AERCx
PGE210131	PECI AERCx (Analytics Enabled Retrocommissioning)	PECI AERCx
PGE210115	RightLights	RightLights
PGE210130	RSG AERCx (Analytics Enabled Retrocommissioning)	RSG AERCx
PGE210112	School Energy Efficiency	School EE (PG&E)
SCE (7 active programs)		
SCE-13-TP-014	Commercial Utility Building Efficiency	CUBE
SCE-13-TP-013	Cool Schools	Cool Schools
SCE-13-TP-004	Data Center Energy Efficiency	Data Center EE
SCE-13-TP-021	Enhanced Retrocommissioning	Enhanced RCx
SCE-13-TP-003	Healthcare EE Program	Healthcare EE (SCE)
SCE-13-TP-005	Lodging EE Program	Lodging EE
SCE-13-TP-018	School Energy Efficiency Program	School EE (SCE)
SCG (1 active program)		
SCG3758	3P- Program for Resource Efficiency in Private and Public Schools	PREPPS
SDG&E (3 active programs)		
SDGE3226	SW-COM Direct Install	Direct Install (SDG&E)
SDGE3221	SW-COM-Calculated Incentives-RCx	RCx (SDG&E)
SDGE3224	SW-COM-Deemed Incentives-HVAC Commercial	HVAC Commercial
Closed Programs (7 PG&E, 1 SCG, 1 SCE)		
PGE210125	California Preschool Energy Efficiency Program	CA Preschool EE
PGE210117	Energy-Efficient Parking Garage	EE Parking Garage
PGE21019	Enhanced Automation Initiative	Enhanced Automation Initiative
PGE210120	Monitoring-Based Commissioning	MBCx
PGE210110	Monitoring-Based Persistence Commissioning	MBPCx
PGE210124	Ozone Laundry Energy Efficiency	Ozone Laundry EE
PGE210116	Small Business Commercial Comprehensive	CoolBiz
SCG3766	3P-SaveGas	SaveGas
SCE-13-TP-017	Energy Efficiency for Entertainment Centers	Entertainment Centers

3.2 California History of Third Party Energy Efficiency Programs

EE programs in California have been around since the early 1980s. Initially, the IOUs implemented most of California's EE programs and occasionally subcontracted program components to external entities. This changed in 2006, after the California Public Utilities Commission (CPUC) directed IOUs to seek 3P solicitations

for 20% of their energy efficiency portfolio (D.05-01-055). In response, the IOUs issued competitive solicitations that targeted hard-to-reach sectors and solicitations that focused on innovative technologies or program design strategies. The Energy Efficiency Policy Manual states:

> ***Competitive Bidding for Third Party Programs.*** *Competitive solicitations can help to identify innovative approaches or technologies for meeting savings goals with improved performance that might not otherwise be identified during the program planning process, and can take advantage of the unique strengths that third parties bring to the table. For each program planning cycle, the IOUs shall propose a portfolio of programs that reflects the continuation of successful IOU and non-IOU implemented programs. As part of that process, the IOUs will identify a minimum of 20% of funding for the entire portfolio of programs that will be put out to competitive bid to third parties for the purpose of soliciting innovative ideas and proposals for improved portfolio performance.*[9]

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 ultimately selected 3P programs from the successful PY2006–08 3P programs to fund and implement and new programs from the solicitations to implement in the 2010–12 program cycle.

Decision D.12-05-015 then further guided the 2013–14 3P portfolio of programs. Instead of making fundamental changes to the portfolio, the decision instructed IOUs to review existing programs and "remove what is not working well, and modify programs that have merit but are not realizing full ratepayer benefit." The decision also directed the IOUs to "identify additional opportunities to enlist new third-party implemented programs through competitive solicitations."

In response to the directive, the statewide IOUs jointly developed a scorecard to help assess the 2010–12 programs. Each IOU conducted this review internally. The IOUs also worked together to develop a rolling solicitation process for Innovative Design Energy Efficiency Activities 365 (IDEEA 365) that allows vendors to submit innovative program ideas on a more frequent basis rather than only at the beginning of a program cycle. This solicitation process was vetted by a Peer Review Group (PRG) and was described in SDG&E's filing for the 2013–14 program cycle. IDEEA 365 and Technology Resource Innovation Outreach[10] (TRIO) solicitations were the only additions to the 3P portfolio in 2013–14.

The IOUs designed the IDEEA 365 solicitation process "to allow for continuous introduction of innovative ideas and technologies into the energy efficiency portfolio by drawing from the skill, experience, and creativity of the energy efficiency community." To balance reaching niche markets versus testing innovative approaches, IDEEA 365 solicitations have two tracks for new 3P programs: "innovative" and "targeted." SCG's 2013–14 Program Implementation Plan for 2013–14 EE programs[11] describes these two types of solicitations as follows:

> *Targeted solicitation will support identified program and market needs and technologies such as, but not limited to, water/energy nexus, hard-to-reach markets such as tenant-landlord in residential and commercial customers, a high tech program incorporating state-*

[9] R.09-11-014. Energy Efficiency Policy Manual. Version 5, July 2013. http://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/EEPolicyManualV5forPDF.pdf. Accessed in March 2014.

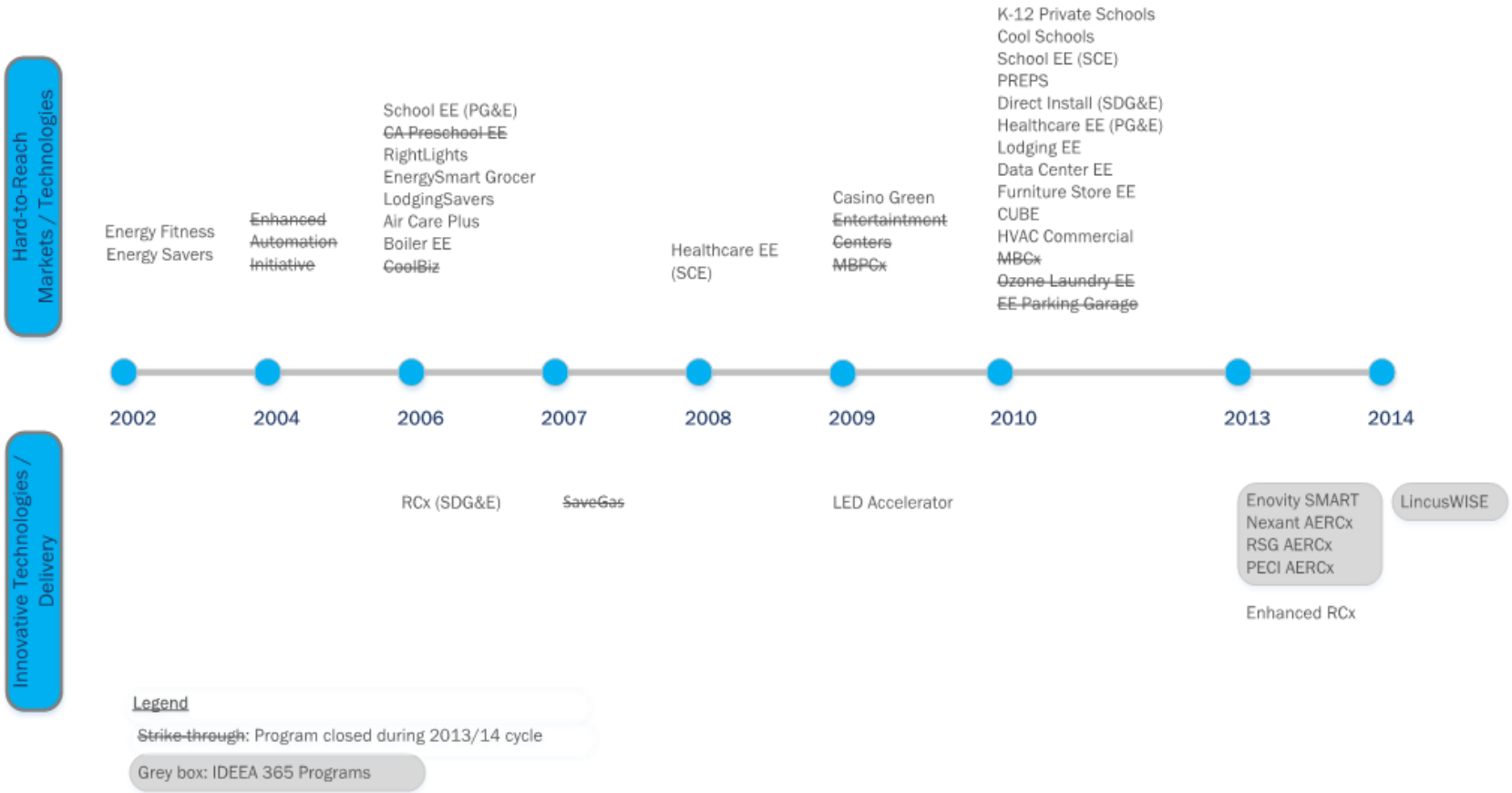
[10] TRIO is a statewide program that provides training and networking for entrepreneurs and companies focused on energy saving technologies. TRIO is a non-resource program and was not included in this evaluation.

[11] https://www.socalgas.com/regulatory/documents/A-12-07-003/3%20-%20Appendix%20C%20Section%20a.%203P.pdf. Accessed on December 22, 2014.

> *of-the-art information technology, and programs supporting an integrative approach. The second type of solicitation promotes innovation delivered by Third Party programs. [SCG] encourages new service providers who develop and deploy new and existing emerging technologies or have innovative ideas to submit proposals through this process.*

While the CPUC approved IOU plans to seek competitive solicitations for 20% of their 2006–08 energy efficiency funds (A.05-06-004), the IOUs had already had three 3P Commercial programs operating since 2002. More than one-third of these programs (14 of 38) began in the 2006–08 program cycle and another third began in 2010. Although some of the newer programs in 2010–12 focused on innovative or hard-to-sell technologies, the majority of programs in the 3P Commercial portfolio remained focused on hard-to-reach markets or regional needs. This changed after the solicitation for new programs starting in 2013. All of the programs that launched in 2013 emerged from the IDEEA 365 solicitation process. Figure 2 shows the launch date of the 38 programs covered by this evaluation.

Figure 2. Launch Year of 3P Commercial Resource Programs



3.3 Purpose of the Study

The study sought to characterize the unique value that the 3P Commercial resource programs bring to the market and how effectively the third party organizations and IOUs implement and manage these programs.

Research questions related to the value of programs included:

- What are the characteristics of the 3P Commercial programs?
- How do they provide value to the commercial and industrial (C&I) market? What is innovative about the programs? How do they differ from Core? What need in the marketplace are these programs trying to fill? How do the programs capture savings that would not have happened through the programs or naturally in the marketplace?

Research questions related to implementation effectiveness included:

- How are the program marketed? How do they coordinate with local government partnerships? How do they cross-market or coordinate with other programs serving the same sector?
- How have the programs performed against savings forecasts (claimed) and the cost per kWh and therms saved?
- What is the delivery channel, measure mix, and cost-effectiveness of each program?
- What activities do the programs use to move from finding customers to completing energy saving projects? What is the project "conversion" rate?
- How have the 3P Commercial programs responded to the best practice suggestions from the previous study?[12] (Notably, this research question was lightly covered during staff interviews and is summarized in Appendix B).

Research questions to explore the management effectiveness of Third Party Programs included:

- How are the programs managed by the IOUs? Do the IOUs provide sufficient notice to 3P Commercial programs about incentive changes, low savings, and program closure?
- What is the nature of the 3P implementer relationship with the IOUs?
- What are the perspectives on best methods to deal with program cycles and funding to develop a systematic approach to more flexible contracting?
- Why did some programs close, from the perspective of the IOU and the program implementers?

[12] Heschong Mahone Group, 2013: California Nonresidential Program Assessments Study. Third Party Commercial Resource Program Group Report. Program Years 2010–2012.

4. Methodology

4.1 Overview

This study includes results from a range of research tasks that combined a secondary data review with in-depth interviews and quantitative surveys. Table 5 summarizes the specific research tasks that form the findings for this study. This is followed by a brief overview of the methodology applied to accomplish each task. We provide data collection instruments and more detailed methods in Volume II.

Table 5. Summary of Data Collection Tasks

Research Task	Number of Respondents	Target	Method	Timing
For all 38 programs				
Secondary Data Review	n/a	38 3P programs	Extracted and analyzed multiple data sources	March 2014–November 2015
IOU Program Management Interviews	19	Staff represented all 38 programs	Telephone in-depth interviews	February–March 2015
IOU 3P Portfolio Data Extraction	3 of 4 IOUs[a]	4 IOUs	Email inquiry	October–November 2015
3P Implementation Staff Interviews	32 (representing all 38 programs)	Implementers of all 38 programs	Telephone in-depth interviews	March 2015
Case Studies (10 of 38 programs selected)				
Literature Review	n/a	47 reports	Reviewed and synthesized secondary literature	October 2015
Participant Surveys	262	6,112 contacts[b]	Quantitative telephone interviews	October–November 2015
Implementation Models	n/a	10 3P programs	Synthesized information from in-depth interviews and program materials	August–October 2015
Conversion Rates	n/a	10 3P programs	IOU data request[c]	August 2015

[a] PG&E did not respond to this request via email or phone. However, the other IOUs had consistent decision-making processes related to their 3P programs portfolio.
[b] Of the 6,112 contacts for all programs, 4,945 contacts were participants in SDG&E's Direct Install program.
[c] The evaluation team reviewed conversion rates including tracking data to back up the IOUs' conversion rate calculations.

4.2 Research Tasks for All 38 Programs

Secondary Data Review

The evaluation team reviewed a number of data sources to collect and synthesize information on all 38 programs. We extracted information from three data sources, including the IOU Monthly Energy Efficiency Program Reports, the CPUC's Program Database, and the Program Implementation Plans.

Table 6 summarizes the key data reviewed from each of data source.

Table 6. Secondary Data Sources Leveraged for Study Findings

Data Source	Relevant Data
IOU Monthly Energy Efficiency Program Reports[a]	▪ Budget and expenditure: 2013–2014 Adopted Program Budget; 2013–2014 Revised Program Budget; Program Expenditure (Inception-to-date) ▪ Energy savings (gross annual kWh, Therms and gross summer peak kW): Program Revised Projected; Installed Savings (Inception-to-date) ▪ Measure impact type
CPUC Program Database[b]	▪ Energy savings: Gross Savings (kWh,kW, Therms) with realization rates, lifecycle savings (kWh, kW, Therms) ▪ Program spending: 2013–14 expenditure including program costs and incentives ▪ Participant information: service account ID, contact name, contact phone, ▪ Site information: address, zip code, city ▪ Measure data: Measure group, measure category ▪ Cost effectiveness data: Net total resource costs (TRC)
Program Implementation Plans for the 2013–14 Energy Efficiency Portfolio[c]	▪ Program description (summary, target market, list of measures and services) ▪ Program rationale and expected outcomes (barriers in the target market, program design to overcome barriers) ▪ Program implementation: planned program delivery and coordination, marketing activities

[a] We used the final versions of the December 2014 Monthly Energy Efficiency Program Reports to extract data on the programs budget and savings forecasts and the measure impact type. Accessed on http://eestats.cpuc.ca.gov.
[b] Accessed near-final database in May 2015 for 2013–14 to develop samples for the case study participant surveys. Accessed the final database of 2013–14 claim records in November 2015 to obtain final 2013–14 energy savings and the number of participants per program. Itron compiles the claim records on behalf of the CPUC.
[c] Program Implementation Plans accessed on http://eestats.cpuc.ca.gov.

We used the CPUC's Program Database from November 2015 to determine the programs' ex ante claimed energy savings, participant counts, and measure information. We took the following steps to prepare the data for analysis:

1. We extracted the programs included in this study. We found data for 35 of the 38 programs. Three programs did not appear in the final database because they had not claimed savings by December 2014. These programs include some of the freshly launched IDEEA 365 programs: Nexant AERCx, RSG AERCx, and Lincus WISE. These programs also showed zero savings in the IOU Monthly Energy Efficiency Program Reports.

2. For each claim record, we determined its end-use category (e.g., lighting, boilers) based on the measure description and measure group variables in the database. We used the variables that provided first year gross savings[13] to estimate the claimed energy savings by end-use.

3. For each program, we collapsed the claim-level data to the program level, summing the total first-year gross savings, savings by end-use, and the number of participants defined by unique service account IDs.

[13] Variable names were SavingsFirstYearGrosskWh, SavingsFirstYearGrosskW, SavingsFirstYearGrossTherm. These variables take into account the realization rate.

4. For each program, we converted the installed kWh and therms savings to MMBTU[14] to determine the combined energy savings from gas and electric measures. Some programs listed negative savings that resulted from interactive effects. Consistent with savings forecasts, we included the negative effects in the combined installed savings.

Furthermore, we extracted the 2013–14 costs for each program from the CPUC Program Database. We also used this source to obtain data to calculate the program-level net TRC for the combined years of 2013 and 2014. Itron compiled this information in a separate data file based on quarterly IOU submissions. The program costs take into account any program-level spending, including incentive payments.

IOU Individual 3P Program Management Staff Interviews

In February and March 2015, the evaluation team conducted in-depth interviews with 19 IOU program staff who managed the contracts for all 38 programs in study (1 hour via telephone for each interview, most staff managed more than one contract). The purpose of these interviews was to characterize the programs in terms of the target markets and services, learn more about the program theory and why they are needed compared to the IOU's Core programs, understand how the programs are managed by the IOUs, and gain the IOU's perspective on how these programs are performing and why. The evaluation team also asked about how the IOUs responded to some of the best practice suggestions from the 2010–2012 Third Party Commercial Resource Program Assessment Study.[15]

IOU 3P Portfolio Data Extraction

In October and November 2015, the evaluation team followed up with each IOU to learn more about the design and selection process for the portfolio of 3P programs. We reached out to IOU staff who were knowledgeable about the decision making pertaining to the 3P programs portfolio and received written responses to our questions from SCE, SDG&E, and SCG. PG&E did not respond to multiple requests via email and voicemail on this topic. However, PG&E's feedback was not critical to our research because we found that the IOUs had consistent decision-making processes related to their 3P programs portfolio.

3P Implementation Staff Interviews

In March 2015, the evaluation team conducted in-depth interviews with 32 staff members implementing the 38 programs in the study. The purpose of these interviews was to learn more about the program design and delivery, verify secondary data, and gain the implementer's perspective regarding program performance and IOU management. Nine of the 38 3P Commercial programs were shut down during or at the end of the 2013–14 program cycle. For these programs, implementer interviews focused on exploring why these programs were closed.

4.3 Case Studies of 10 Programs

The evaluation team selected 10 programs for individual case study analysis, which included a deeper dive into the programs. We began the selection process by removing the nine programs that had closed. Next, we analyzed the value propositions of the 29 remaining programs and categorized each program into one of four distinct quadrants based on the program's market strategy (vertical vs. horizontal) and measures/delivery models (established technologies vs. innovative technologies or delivery models). We then examined the

[14] 1 Therm=100,000 BTU; 1 kWh=3,412 BTU.

[15] "California Nonresidential Program Assessments Study, Third Party Commercial Resource Program Group Report." Program Years 2010–2012. Prepared for the CPUC and the California IOUs. Heschong Mahone Group.

number of programs, installed energy savings,[16] and participants[17] in each quadrant. After this, we selected 10 programs for case study based on the following criteria.

1. Ensured that all IOUs have at least one program for case study analysis
2. Captured varying sectors, i.e., some have a vertical focus and some have a horizontal focus
3. Captured varying delivery models and services offered, e.g., direct install versus technical program assistance programs, retrocommissioning versus retrofit
4. Captured programs with varying value propositions, e.g., hard-to-reach versus innovative technology programs

In Table 7, we show all programs by quadrant and call out the 10 programs selected for case studies (underlined). In total, these 10 selected programs represent:

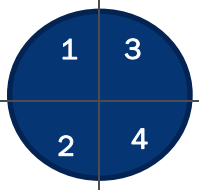
- 59% of the reported MMBTU savings from active 3P Commercial programs
- 69% of all participants from the active 3P Commercial programs

[16] Savings per date as per IOU Monthly Energy Efficiency Program Report from December 2014, covering January 2013 to December 2014.

[17] Participant counts established based on unique service account IDs in the CPUC's Program Database for 2013 and 2014. Accessed in May 2015.

Table 7. Programs Selected for Case Studies by Value Proposition Quadrant

	Hard-to-Reach Markets or Technologies	Innovative Technologies and/or Delivery
Vertical	**Schools** School EE (SCE)*♦ PREPPS School EE (PG&E) K-12 Private Schools *♦ Cool Schools **Hospitality** Lodging EE LodgingSavers♦ Casino Green♦ **Healthcare** Healthcare EE (SCE) Healthcare EE (PG&E) **Other** EnergySmart Grocer* Data Center EE Furniture Store EE*♦	**Data-Enabled Retrocommissioning in Schools** Enovity SMART ■ Nexant AERCx ■ PECI AERCx ■ RSG AERCx ■ **Pump Overhaul and RCx for Water Agencies** Lincus WISE ■
Horizontal	**Small and Medium Businesses** Direct Install (SDG&E)*♦ RightLights*♦ Energy Fitness*♦ Energy Savers* **Measure/Service Focus** Boiler EE Air Care Plus* CUBE HVAC Commercial*	**Data-Enabled Retrocommissioning** Enhanced RCx RCx (SDG&E) **Lighting** LED Accelerator



* Deemed measures only; ♦ Direct Install programs; ▪ IDEEA 365; Underlined = case study programs

Refer to Volume II for a more detailed discussion regarding the selection process.

The evaluation team conducted case studies that included participant surveys, literature reviews, and the development of implementation models with project conversion rates for 10 3P Commercial programs. Each case study built on data collected from program staff and program materials and sought to substantiate the program's value proposition hypothesis and implementation effectiveness. In particular, the case studies addressed the following research questions:

- What activities do the programs use to move from finding customers to completing energy saving projects? What is the program "conversion" rate?
- How do the programs capture savings that would not have occurred through the Core programs or naturally in the marketplace (From the participant perspective)?
- How do participants experience the program in terms of the participation process, measures installed, program interaction, awareness of Core programs?

Volume II provides a dedicated chapter with detailed results for each case study.

Participant Surveys

The evaluation team conducted telephone interviews with a sample of customers who participated in the case study programs. The evaluation team developed the sample frame for each survey based on data available in the CPUC's Program Database from May 2015.[18] We added additional contact information (contact names, phone numbers, email addresses) that IOUs[19] provided for programs with little or inconsistent contact data to help maximize the number of interviews that we could complete. This additional contact information was critical to this study for several reasons. First, the CPUC's Program Database did not capture contact information for all claims. Second, program implementers used inconsistent contact fields to capture business and contact names, and third, some cases included contact information for the person who received the rebate instead of the key person within the company who directly coordinated with the program throughout the project.

To determine the sample frame of unique program contacts, we then removed duplicate records (same phone number or contact name) and records with missing phone numbers. A data review revealed several duplicate contact names or phone numbers because some individuals participated with multiple locations that the database listed with distinct service account IDs.

Table 8 shows the number of unique service account IDs and the number of unique contacts in the sample frame for each participant survey. The table also presents the sampling strategy and target number of interviews to complete for each program. Given the sample size of unique contacts in the selected programs, we attempted to reach a census of program participants for all programs except for PG&E's RightLights and SDG&E's Direct Install program. For these two programs, the sample frame was large enough to use a simple random sampling approach and set a target of 68 completed interviews for 90/10 precision.

Table 8. Case Study Sampling Approach per Program

Program Name	Unique Service Account IDs	Unique Contacts[a]	Sampling Approach	Target Completes
EnergySmart Grocer	394	101	Census	Census
School EE (SCE)	188	35	Census	Census
PREPPS	39	27	Census	Census
LodgingSavers	207	161	Census	Census
Healthcare EE (SCE)	8	7	Census	Census
Direct Install (SDG&E)	5,016	4,945	Simple Random	70
RightLights	838	745	Simple Random	68
Boiler EE	53	46	Census	Census
Enovity SMART	18	9	Census	Census
LED Accelerator	236	36	Census	Census

[a] Unique contact defined by unique and valid phone number.

The evaluation team fielded the participant surveys between October 2015 and November 2015 and achieved response or completion rates between 13% for big sample programs (Direct Install) and 89% for small sample programs (Enovity SMART). To maximize the completion rates in programs with fewer than 50 participants, we

[18] As noted above, the CPUC's Program Database from May 2015 is not the finalized version. However, it included claims from January 2013 to December 2014.

[19] As per data request response from August 2015. We requested data for the following programs: LED Accelerator, Enovity SMART, Boiler EE, EnergySmart Grocer, PREPPS, and Direct Install (SDG&E).

utilized subject matter staff to conduct telephone surveys for programs that had fewer than 40 unique contacts or if participants' cooperation was lower than expected after attempting to field the survey through Opinion Dynamics' CATI (Computer Assisted Telephone Interviewing) at Opinion Dynamics' telephone interviewing center. For programs with larger sample frames, we fielded the surveys only through the center. Despite lower completion rates for large-sample programs, we interviewed sufficient customers to meet the 90% confidence level.

Table 9. Case Study Participant Survey Response Rates and Methods

Program Name	Sample of Unique Contacts	# of Completed Interviews	Completion Rate[a]	# of Sites Represented by Survey Respondents	Data Collection Method
EnergySmart Grocer	101	21	21%	71	CATI
School EE (SCE)	35	11	31%	70	Analyst
PREPPS	27	18	67%	21	Analyst
LodgingSavers	161	34	21%	41	CATI
Healthcare EE (SCE)	7	5	71%	5	Analyst
Direct Install (SDG&E)	4,945	72	13%[a]	72	CATI
RightLights	745	64	14%[a]	73	CATI
Boiler EE	46	18	39%	19	CATI & analyst
Enovity SMART	9	8	89%	15	Analyst
LED Accelerator	36	11	31%	43	Analyst

[a] Completion rates are the number of survey completes divided by the number of unique contacts, except for RightLights and Direct Install (SDG&E). For those two programs, the response rate is based on the standards and formulas set forth by the American Association for Public Opinion Research (AAPOR) Response Rate 3 (RR3) as the sampled populations were large enough to warrant this method.

Each interview averaged 10 minutes and was focused on questions related to the value of program features and how well the program delivered those features. As such, all participant surveys contained a set of questions that asked customers to rate their need for program features for them to adopt EE measures: Participants rated each program feature on a scale from 0 to 10, where 0 was "not needed at all" and 10 was "critically needed." We then asked participants to score how well the program performed on each of these features on another scale from 0 to 10, where 0 was "very poor" and 10 was "excellent." The importance scores were captured to measure how much the customer truly needed the program's services to pursue EE and are therefore, an indicator of program value to the marketplace. The performance scores were captured to indicate how effectively the programs delivered that value to the customer and are therefore, an indicator of program implementation effectiveness. The evaluation team used responses to these questions to calculate importance scores and performance scores (based on average ratings) for each program feature and for the program overall. We used importance score to assess the program value and the performance score to assess the implementation effectiveness from the perspective of the participants.

The program features varied by program but often included such features as the facility audit, economic/return on investment (ROI) analysis, product recommendations, 360° project assistance where the program shepherds participants through all aspects of an EE project from beginning to end, financial assistance (in the form of a rebate, discount, or free measures), sector expertise, and information for internal decision making.

To calculate the importance or performance score for each program feature, the evaluation team averaged all participant ratings for a given feature.[20] We further calculated the standard deviation for each program feature to help understand the distribution of participant ratings. To produce a program's overall importance or performance score, we averaged the importance scores and performance scores of core features. We divided program features into two categories per program: "core" or "optional" based on whether the program provided that feature to all participants or not.

Implementation Models and Conversion Rates

Based on program materials and in-depth interview findings, the evaluation team developed an implementation model for each case study that shows how each program moves from initial customer contact to closing a project. The implementation models highlight the key implementation steps and identify the varying parties involved in the implementation process. The implementation models also show a "project conversion rate," defined as the number of completed projects divided by the number of facility audits. We obtained these close rates from a data request to the IOUs in August 2015 and verified their close rate calculations with tracking data submitted through the same data request. We received conversion rate data for 7 of the 10 case study programs.

Literature Review

The evaluation team conducted literature reviews for all 10 selected programs. We explored any public reports that helped support the value proposition for each program by describing specific market needs related to EE upgrades. Volume II provides an overview of the literature reviewed in the case studies.

[20] We did not include the participant's rating if the respondent responded with "Don't Know" or if the respondent indicated that he did not receive this feature.

5. Key Findings

The study sets out to characterize the unique value that 3P Commercial resource programs bring to the portfolio of Commercial programs and how effectively they are implemented and managed. The section below teases out the key findings by research topic and draws summative findings from the more detailed information in Volume II.

5.1 3P Value to Commercial Demand Side Management Portfolio

5.1.1 Overall Contribution to the Portfolio

Based on ex ante estimates of program costs and energy savings, the 38 3P Commercial resource programs included in this study contributed to 14% of the electric savings and 13% of the therm savings coming from all Commercial programs in 2013–14. These programs cost 17%[21] of the total cost to implement Commercial programs; while the cost is 17%, the savings contribution is lower, indicating that potentially investing more money in Core programs would produce more cost-effective savings. However, the 3P program designs are costlier to run as they offer more services to customers that are needed to overcome barriers in hard-to-reach markets. Therefore, it is not surprising that these programs are more expensive relative to the savings they produce. Notably, most 3P programs are cost-effective as shown later in this report.

Therefore, roughly one in seven GWh or therm savings in the commercial sector can be attributed to 3P programs.

Table 10. Overall Contribution of 3P Programs to Commercial Portfolio

	Cost (Million $)	GWh	GW	MMTherms
All Commercial Programs (N=79)[a]	$839.8	1,915	342.56	34.0
All Commercial 3P Resource Programs (N=38)[b]	$140.8	277	0.05	4.3
Contribution of 3P Commercial Resource Programs	17%	14%	<1%	13%

[a] Data for commercial portfolio accessed from EE Stats EE Data Portal on March 21, 2016. We selected portfolio savings and time series by year and summed 2013 and 2014 savings data with the selection (Sector=Commercial). Total number of programs in the commercial portfolio determined by IOU Monthly Energy Efficiency Program Report from December 2014 (Sector=Commercial).

[b] Actual savings and program costs for 3P Commercial programs are based on the CPUC's Program Database. Actual program costs were calculated by Itron in November 2015 based on quarterly IOU data submissions that include program-level spending, including incentive payments for the 2013 and 2014 program cycles.

The following sections describe further findings as they relate to the value of the 3P programs, including program characteristics, target markets, measures and features, what needs the programs are designed to address, and how they compare to Core programs.

[21] While it was stated earlier that the CPUC directed the IOUs to spend a minimum of 20% on 3P programs, that 20% minimum includes spending on residential, industrial, cross-cutting, and non-resource programs that are not included in this study.

5.1.2 Program Characteristics

Target Markets

The value proposition of 3P programs aligns with what the 3P programs were designed to do: (1) generate energy savings in areas the IOUs have not served in the past or have struggled to serve in a cost-effective manner and (2) test innovative technologies or unique program delivery approaches. Of the 38 3P Commercial programs offered in 2013–14 prior to any closures, 29 programs offer measures and services for specific hard-to-reach segments or established but hard-to-sell technologies. The remaining nine programs promote innovative technologies or test new delivery models.

The 38 3P Commercial programs can further be placed into four distinct groups based on their value proposition, their target market, and the measures offered. Programs with a vertical market strategy cater to a specific sector, whereas programs with a horizontal market strategy serve all types of commercial customers (although some focus on a certain size, e.g., small and medium businesses) and do not focus on one specific sector.

- Quadrant 1: Vertical Markets with Established Technologies (15 Programs): These programs focus on hard-to-reach customers, including schools, lodging facilities, healthcare facilities, and other sectors. These programs intend to help customers overcome common market barriers to EE upgrades with sector-specific expertise and guidance. Schools, for example, are commonly budget- and resource-constrained, whereas customers in the healthcare segment face long decision-making processes and sector-specific regulation. Lodging facilities on the other hand vary in size, may or may not be resource-constrained, but favor low-occupancy times to undergo retrofits. Program implementers have worked in these markets for many years and claim to offer sector-specific expertise that is needed to encourage EE upgrades. These programs intend to serve specific sectors that lack the knowledge and resources to pursue these more complex upgrades on their own.

- Quadrant 2: Horizontal Markets with Established Technologies (14 Programs): These programs target commercial customers generally with direct install measure services or one specific measure or service. Programs without a direct install component in this category focus on selling the value of specific service, including HVAC maintenance and retrofits, boiler upgrades, conventional retrocommissioning, efficient lighting for parking garages, and ozone laundry interventions. These programs intend to broadly serve commercial customers who lack the knowledge and resources to pursue these more-complex upgrades on their own. These 3P program implementers claim to have the measure-specific technological expertise needed to sell these measures.

- Quadrant 3: Vertical Markets Focused on Innovative Programs (5 Programs): All programs in this group originated through the IDEEA 365 program selection process.[22] This group includes four programs that are testing the concept of using remote data analytics (using 15-minute interval usage data) to identify retrocommissioning opportunities specifically for small and medium-sized commercial customers in the schools and municipal sectors. This group also includes Lincus WISE, which is aimed at promoting comprehensive pump overhauls and retrocommissioning in water and wastewater agencies.

- Quadrant 4: Horizontal Markets Focused on Innovative Programs (4 Programs): Similar to Quadrant 3, this group includes two programs that are testing the concept of using remote data analytics (using

[22] The "Innovative Design for Energy Efficiency Activities 365" program (IDEEA 365), is an IOU solicitation process that provides a platform for bidders to submit proposals for new "targeted" or "innovative" technologies and unique delivery approaches. The first 3P Commercial programs under IDEEA 365 originated in 2013.

15-minute interval usage data) to identify retrocommissioning opportunities, but these do not have a sector-specific focus. This category also includes the LED Accelerator program, which aims to increase the saturation of higher-efficiency LEDs that are not yet approved by ENERGY STAR. It also includes the SCG's SaveGas Program, which wanted to employ a new approach to remotely monitor and manage hot water usage in hotels, senior care facilities, and buildings with onsite kitchen and laundry facilities, but was closed in the program cycle.

Table 11 shows the distribution of the 38 3P Commercial programs across quadrants.

Table 11. Value Proposition Quadrants

	Hard-to-Reach Markets with Established Technologies	Innovative Technologies and/or Delivery
Vertical	**Schools** School EE (SCE)*♦ PREPPS School EE (PG&E) K-12 Private Schools *♦ Cool Schools ~~CA Preschool EE*~~ **Hospitality** LodgingSavers♦ Lodging EE Casino Green♦ **Healthcare** Healthcare EE (SCE) Healthcare EE (PG&E) **Other** EnergySmart Grocer* Data Center EE Furniture Store EE*♦ ~~EE for Entertainment Centers~~	**Data-Enabled Retrocommissioning in Schools** Enovity SMART ■ Nexant AERCx ■ PECI AERCx ■ RSG AERCx ■ **Pump Overhaul and RCx for Water Agencies** Lincus WISE ■
Horizontal	**Small and Medium Businesses** Direct Install (SDG&E)I*♦ RightLights*♦ Energy Fitness*♦ Energy Savers* ~~CoolBiz*~~ **Measure/Service Focus** Boiler EE Air Care Plus* CUBE HVAC Commercial* ~~EE Parking Garage~~ ~~Ozone Laundry EE Program~~ ~~Monitoring-based Persistence Commissioning~~ ~~Monitoring-based Commissioning~~ ~~Enhanced Automation Initiative~~	**Data-Enabled Retrocommissioning** Enhanced RCx RCx (SDG&E) **Lighting** LED Accelerator **Hot Water Controls** ~~SaveGas~~

1 3
2 4

* Deemed measures only; strikethrough flags programs that closed during the 2013–14 cycle; ♦ Direct install programs; ■ IDEEA 365.

As seen above, most of the programs fall in the category of hard-to-reach segments and only nine of them are classified as offering innovative approaches. As we will see in Section 5.2.1, the majority of program savings

can be traced to the hard-to-reach programs compared to the innovative programs. This is expected, as 29 of 38 programs fall in the hard-to-reach group. However, the average program targeting the hard-to-reach sector also generated four times more savings than the average program focused on innovative technologies and/or delivery.

While more innovation is desired through the 3P programs, being truly innovative while also proving cost-effective savings can be challenging as innovative programswill likely propose measures that are not on the approved Database of Energy Efficiency Resources (DEER) list. However, some 3P implementers developed their programs to specifically advance new technologies and leverage new data sources and infrastructure. The retrocommissioning programs using advanced analytics software are good examples of programs designed around emerging technologies. For example, SCE's Enhanced RCx program and SDG&E's Calculated Incentives RCx program both leverage multiple software options for smart meter data analysis and fault detection and diagnosis, both of which are new. The implementer works with several software providers throughout the United States and helps customers find the most suitable software for their needs. Given that these programs do not focus on one set of technology, they can be flexible in responding to changing technologies as they emerge for retrocommissioning.

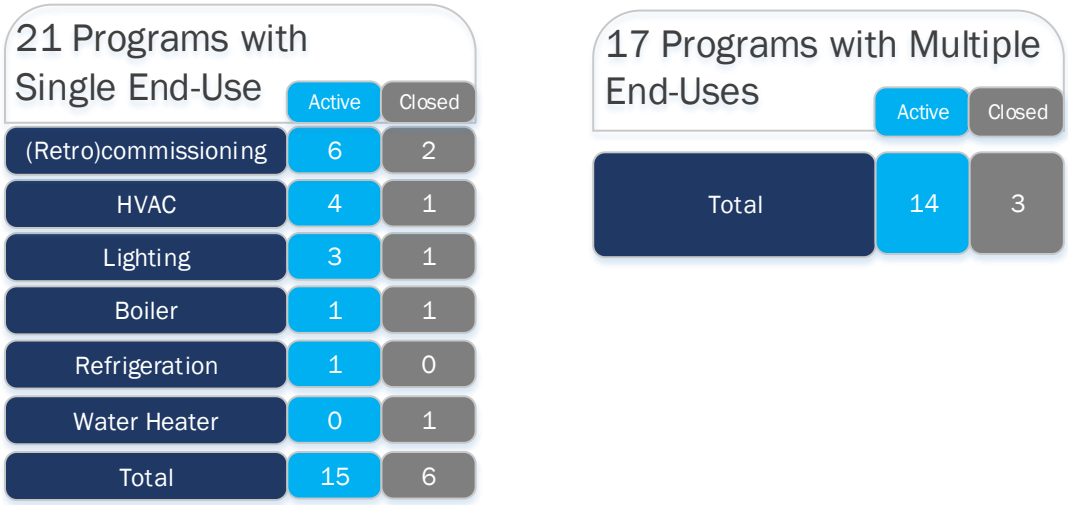
Mid- and Upstream Programs

All but two programs target downstream end-users. The two programs with midstream and upstream components focus on HVAC measures. SDG&E's HVAC Commercial program trains HVAC contractors to perform HVAC tune-ups and equipment installations. PG&E's Air Care Plus program trains contractors to use HVAC diagnostic software to facilitate HVAC tune-ups.

Program Measures

As many programs provide comprehensive EE upgrades, 3P Commercial programs offer a broad spectrum of measure types. Of the 38 programs, 14 offer deemed measures only, 11 offer custom measures only, and 13 offer both. The programs differ in the scope of measures offered to customers. More than half (21) focus on the installation of one specific end-use, whereas 17 programs install multiple end-use applications. The single-end-use programs most commonly offer retrocommissioning (8), HVAC (5), or lighting (4) upgrades. The multi-end-use programs generally conduct comprehensive site assessments to identify upgrade needs and offer more-comprehensive EE improvements to their customers. Notably, more programs with single rather than multiple end-uses closed during 2013–14, indicating that programs with a more-comprehensive measure mix might have more flexibility to find ways to save energy despite market or policy changes. Figure 3 provides an overview of programs with single and multiple end-uses.

Figure 3. Programs with Single and Multiple End-Uses



Barriers to Energy Efficiency

In addition to participant surveys, the case studies also included literature reviews to help describe the market barriers amongst commercial customers to pursue energy efficiency upgrades.

Table 12 presents the nine customer segments that sector-focused 3P programs target and the barriers identified through the literature reviews. We completed literature reviews for five of these segments, which include 21 programs from this study. The literature reviews confirmed the hard-to-reach nature of the 3P markets. As shown in the table below, customers in the 3P program markets lack the capital, the knowledge and the personnel to complete energy efficiency projects on their own.

Table 12. Literature Review Barriers to Energy Efficiency for Sector-Specific Programs

Sectors	Programs	Capital	EE Knowledge	Personnel	Other Priorities	Other Barriers
Schools	10	✓	✓	✓	✓	Complex organizational structures for project approval
Small and medium businesses	5	✓	✓			Split incentives
Hospitality	3	✓	✓			Guest inconveniences; Access to qualified contractors
Healthcare	2	✓	✓		✓	Healthcare regulations (OSHPD)
Grocers	1	✓	✓		✓	Performance concerns of new technology
Data Centers	1	No literature review				
Entertainment Centers	1					
Furniture Stores	1					
Water Agencies	1					
Total Sector-Focused Programs	**25**					
Total Programs without Sector-Focus	13					
Total Programs	**38**					

Table 13 presents the different technologies for measure-focused programs with a single end-use target, and the literature review findings related to their market barriers. We conducted literature reviews for two technologies in the case studies, retrocommissioning and LEDs. We also attempted a literature review on boiler energy efficiency, but did not identify any relevant sources.

The measure-specific literature reviews illuminated some of the same market barriers described above in general for pursuing EE independently such as capital and knowledge while further highlighting performance concerns as a key barrier to pursuing retrocommissioning and LED lighting in commercial facilities.

Table 13. Literature Review Barriers to Energy Efficiency in Measure-Focused Programs

Technology	Programs	Capital	Performance Concerns	EE Knowledge	Other Barriers
(Retro)commissioning	8	✓	✓	✓	Lack of personnel for maintenance
HVAC	5	No literature review			
Lighting	3				
Boiler	2	Literature review did not identify relevant sources			
Hot Water Controls	1	No literature review			
LEDs	1	✓	✓	✓	None
Refrigeration	1	No literature review			
Total Measure-Focused Programs (Single End-Use)	**21**				
Total Programs without Measure-Focus (Multiple End-Uses)	17				
Total Programs	**38**				

Program Features

The market barriers identified above go beyond a sample cost inhibiter amongst these sectors, indicating that these sectors need more than just financial assistance to pursue EE. By design, the 3P programs were created to minimize gaps in the C&I portfolio by offering new technologies not available through the Core programs or by offering more hands-on services to overcome many of the sector-specific barriers mentioned above. These barriers are diverse in nature but commonly include financial constraints, lack of human resources, lack of EE knowledge, and complex decision-making processes. The financial incentives are mostly paid as a rebate to the customer or the contractor based on expected savings. Only one program (SCE's School EE) still offers entirely free measures, while the other direct install programs have a co-pay for at least some of the measures. Table 14 shows that all 3P Commercial programs perform some customer outreach and offer some level of energy assessment (or audit), technical assistance, and incentive application processing to streamline EE upgrades.

Table 14. 3P Commercial Program Service Offerings

Program Features	All Programs N=38
Customer Outreach	38
Energy Assessment	38
Incentive Application	38
Technical Assistance	38
Direct Installation	10
Post-Installation Monitoring	7
Education and Training	6

Below we describe the service offerings in more detail.

- **Customer outreach:** 3P implementers actively approach eligible customers and explain the benefits and processes of EE projects in customer meetings. According to implementers, customer outreach adds significant value, as many customers in 3P target markets lack the time and knowledge to seek information independently. Additionally, many 3P implementers have worked in their respective target markets for several years and can thus leverage existing relationships to attract customers to the program. They are also expected to be knowledgeable about the main barriers in their target audience and about sector-specific regulations to help the programs engage more effectively with customers.

- **Energy assessments:** All programs offer no-cost assessments to develop recommendations for EE upgrades. These recommendations typically include a financial analysis that outlines the ROI for the measures and helps customers identify and prioritize EE projects. The majority of energy assessment activities inspect the entire facility and are conducted by program implementation staff. Approximately one-third of the programs focus the assessment on specific measures instead of the entire facility. These include retrocommissioning programs, programs that focus on hard-to-sell technologies (HVAC programs, boiler, pump test services through Lincus WISE), and programs with a lighting focus (School EE [SCE], LED Accelerator). The data-enabled retrocommissioning programs visit the site in addition to conducting remote building analytics.

- **Technical assistance:** All implementers offer some form of technical assistance to program participants. Implementers help customers evaluate the recommended upgrades and develop a scope of work where necessary. From the implementer and IOU perspective this is important, as many customers lack the knowledge or time to do so themselves and require additional "handholding" from an expert who is familiar with the sector. For direct install programs, the technical assistance generally ends with scheduling an installation date. Naturally, custom projects that are complex and expensive require more implementer input and guidance than direct install programs. Implementers also help customers navigate project implementation, which includes assisting customers with contractor bids and interacting with installation contractors throughout the upgrade process. One exception is Air Care Plus in PG&E's service territory. In this midstream program, the implementer provides technical assistance to contractors who perform the customer-facing HVAC diagnostics.

- **Incentive application and processing:** All implementers provide program participants with incentive estimates and submit project documentation for IOU approval with the intent to make program participation as simple as possible. This includes post-installation verification, which implementers schedule or conduct.

- **Direct installation of low- or no-cost measures:** Ten 3P implementers offer direct installation of the program measures, which they typically provide at low or no cost to the customer. This helps resource-constrained customers running small and medium-size businesses, lodging facilities, or schools perform upgrades.

- **Post-installation monitoring or maintenance:** The four AERCx programs and two conventional retrocommissioning programs that closed during the 2013–14 cycle offered continuous monitoring of building performance after initial program participation. Monitoring allowed facility staff or implementers to identify energy savings potential from retrocommissioning measures over time. Another program (SaveGas) installed hot water controller technology and offered customers monthly monitoring at an additional fee. This program closed during the 2013–14 program cycle.

- **Education and training:** While some knowledge transfer occurs through technical assistance and facility assessments, few 3P Commercial programs formally offer an education component. Many programs have pay-for-performance contracts with the IOUs that, according to implementers do not

allow the implementer to spend time and resources educating customers. One program that includes consulting services is PG&E's School EE program, as program implementers received additional funds to consult school customers on Prop 39 planning. Other programs with educational components train contractors to use proprietary software for energy modelling and diagnostics.

In addition to these services, some programs offer optional services to customers. Two common optional services are helping customers find contractors to implement projects and helping customers review contractor bids for projects.

Comparison to Core Programs

One of the research objectives of this study was to explore the differences between 3P and Core programs as an indicator of the additional value that 3P programs provide. The main difference between 3P and IOU Core Commercial programs is the level of service that 3P implementers provide. According to IOU staff, the Core programs offer mainly incentives and customers generally perform project functions like rebate applications themselves, while the 3P programs offer more of a valet service to customers. However, measure offerings and incentives are mostly consistent between Core and 3P programs. Table 15 presents an overview of the key differences between 3P and Core programs.

Table 15. 3P and Core Program Differences

	Core Programs	3P Programs
Measures		
Measure Offerings	As per IOU catalog	Similar: 11 programs offer additional measures (i.e., high-efficient LEDs, pool covers, select RCx measures)
Incentive Levels	As per IOU rate	Direct install programs offer no-cost or low-cost measures; incentive levels for other program types vary
Services		
Participant Identification	Limited through IOU account representatives and contractors	Active outreach through implementer, IOU, and contractors
Energy Assessment	Customer responsibility	Free to the customer
Technical Assistance	No additional service	High level of service
Measure Installation	Customer responsibility	Direct installations for some programs, contractor liaison if customer hires contractors
Incentive Application	Customer responsibility	Implementer responsibility

5.1.3 Capturing Savings beyond Core or Naturally Occurring Behavior

The Evaluation Team analyzed the participation in 3P versus comparable Core programs by business size (see Table 16). The 3P programs are significantly smaller than CORE programs. The 3P programs reached approximately 12,000 customers while the Core programs reached over 74,000 customers. Both program types are reaching a mix of large, medium and small business customers; 93% of the 3P participants are small or medium customers compared to 87% of Core participants. In terms of penetrating the market based on business size, the 3P programs reached 1% of the small businesses, 3% of the medium businesses while the Core programs reached another 4% of the small businesses and 16% of medium businesses.

Table 16. Core and 3P Participation by Business Size

	Business Size				
	Large	Medium	Small	Unknown	Total
Number of Participating Sites by Business Size					
3P Sites	589	1,614	9,885	225	12,313
CORE Commercial Retrofit Sites	3,887	9,765	54,947	5,408	74,007
Total Participating Sites	4,476	11,379	64,832	5,633	86,320
Business Size Proportions by Program Type					
3P Commercial Retrofit Participating Sites (N=12,318)	5%	13%	80%	2%	100%
CORE Commercial Retrofit Participating Sites (N=74,007)	5%	13%	74%	7%	100%
Market Penetration					
Total Commercial Customer Sites Amongst IOUs	11,955	60,158	1,294,590	256,617	1,623,320
3P Penetration	5%	3%	1%	0%	1%
CORE Penetration	33%	16%	4%	2%	5%

Source: CPUC 2013-2014 Program Tracking Database & 2013-2014 IOU Customer Usage Data. Business size based no annual energy consumption. For PGE, SCE, and SDGE site ID's aggregated and defined as: Small = <300,000 kWh, Medium = 300,000 to less than 1,750,000 kWh, Large = 1,750,000+ kWh, Unknown = consumption is not known or zero. Fore SCG, site aggregation is not possible and instead based on unique gas accounts and business size defined as: Small = < 18,250 Therms, Medium = 18,250- less than 109,500 Therms, Large = 109,500+ Therms. 3P Programs include the 38 included in this study. Core programs selected for this analysis are the Core Commercial Deemed, Calculated, Direct Install and/or Lighting programs from each IOU.

While the 3P programs were designed to capture savings missed by Core programs, and also target customers with large financial, structural, or knowledge barriers to pursuing EE opportunities on their own, this study sought to determine whether the 3P programs were in fact providing this value. As such, we designed the case studies to explore the value of program features by having the participants rate their need for the various program services to pursue energy efficiency. Participants scored each core feature (defined as program features that are offered to almost all participants) on a need scale from 0 to 10. We then averaged the need scores into one overall score that represents the importance of the collective program features to customers in that program's targeted market as an overall indicator of the program's value proposition.

Table 17 presents the mean importance scores of each program feature and each program's overall importance score. Participants highly valued most services that 3P implementers offer. Not all programs offer direct install services, but participants who received this feature valued it highly. Most participants also highly needed the program incentives to pursue EE upgrades, with two exceptions. Schools participating in the Enovity SMART program received no-cost retrocommissioning upgrades and could opt for rebated upgrades as needed. Participants in SCE's Healthcare EE program had polarized opinions regarding the rebate, but highly needed the implementers' technical assistance (economic analysis, sector expertise, and product recommendations) to complete EE upgrades. All programs offer some type of technical assistance, including economic analysis, sector expertise, project assistance, and product recommendations. These features were highest valued by participants who underwent more-complex retrofits through such programs as EnergySmart Grocer and SCE's Healthcare EE and by participants who participated in programs offering innovative technologies (LED Accelerator, Enovity SMART).

The program's overall mean importance scores range from 6.0 (Boiler EE) to 8.5 (LED Accelerator). Seven of the 10 programs in the study scored above 7, indicating that participants highly valued most features these programs offer. Three programs (LodgingSavers, PREPPS, and Boiler EE) received moderate mean importance scores for most of their program services. Participants in these programs gave mixed importance ratings, suggesting that some but not all customers in these programs' markets need help pursuing EE upgrades.

Table 17. Importance of Case Study Program Core Design Features

Case Study Programs	Direct Installation	Rebate/Free Measures	Economic Analysis	Sector Expertise	Project Assistance	Product Recommendations	Audit	Decision-Making Support	Overall Importance Score
LED Accelerator (n=11)		6.8	10.0	9.6	8.2	9.1	7.9		8.5
EnergySmart Grocer (n=21)		8.2	7.6	8.3	8.0	7.5	7.9		7.9
School EE (SCE) (n=11)	9.8	9.9	8.3	6.5	5.9	9.2	7.7	5.9	7.9
Enovity SMART (n=8)	7.0	4.8	8.7	8.1	8.5	8.0	7.9	6.4	7.8
RightLights (n=64)	7.8	8.3			7.5	7.3	6.9		7.5
Healthcare EE (SCE) (n=5)		5.5	7.2	8.0	6.2	8.2	7.2	6.8	7.0
LodgingSavers (n=35)	7.6	6.8	6.1	6.2	6.5	5.8	6.4		6.3
Direct Install (SDG&E) (n=72)	8.0	8.3			6.9	6.1	6.0		6.2
PREPPS (n=18)		7.3		6.1	6.7	5.5	4.9	6.1	6.1
Boiler EE (n=18)		6.7	6.6		6.1	4.4	6.4		6.0
Weighted mean score	**8.0**	**7.8**	**7.2**	**7.2**	**7.1**	**6.7**	**6.6**	**6.2**	

Note: Programs show the total number of survey respondents. N's for each question vary slightly as means are only based on valid responses. Scores range from 0 to 10, where 0 is "not at all needed" and 10 is "critically needed."

Table 18 summarizes the overall mean importance score for each case study program and our assessment of the value of the features in each program. The table also shows what participants mentioned when asked if they needed any additional features beyond what the 3P program provided to them.

Table 18. Case Study Core Design Feature Importance Assessment

Case Study Program	Overall Importance Score[a]	Key Takeaways on Value of Core Design Features	Additional Features Requested by Participants
LED Accelerator (n=11)	8.5	Technical assistance is very important; rebate is less important than technical assistance/polarized need for it	n/a
EnergySmart Grocer (n=21)	7.9	Current design is highly needed	More post-project communication to track energy savings
School EE (SCE) (n=11)	7.9	Diverse market needs for technical assistance; direct install and rebate is very important	LED product options; more exterior options, such as parking lots, hallways, and stadiums
Enovity SMART (n=8)	7.8	Current design is valued; financial assistance for further upgrades beyond direct install is moderate	More troubleshooting assistance, training on software, assistance in project scoping
RightLights (n=64)	7.5	Diverse market needs for technical assistance; direct install and rebate is highly needed	Want more product options
Direct Install (SDG&E) (n=72)	7.1	Diverse market needs for technical assistance; direct install and rebate is highly needed	Want more product options
Healthcare EE (SCE) (n=5)	7.0	Diverse market needs; rebate less important than technical assistance/ polarized need for rebate	LED product options
LodgingSavers (n=35)	6.3	Diverse market needs; polarized results on features	More information on expected energy savings
PREPPS (n=18)	6.1	Diverse market needs; technical assistance is low/moderate need, but rebate is highly needed	More information on qualified contractors to assist with projects
Boiler EE (n=18)	6.0	Diverse market needs for technical assistance; financial assistance is moderately needed	Want pre- and post-benchmarking of energy use

[a] Scores range from 0 to 10, where 0 is "not at all needed" and 10 is "critically needed."

The programs vary in what is offered as core features (features offered to almost all participants), and optional features. Table 19 shows the optional features in the case study programs, how many customers recall getting these features (uptake), and the customers' ratings of how much these were needed to pursue energy efficiency. The uptake of these features varies widely by program. The programs most commonly offer the optional feature of identifying contractors and reviewing bids but, as shown in the mean scores below, the importance of them is commonly low. As such, the programs could drop these services without compromising their innate value to the marketplace. However, offering these optional services as needed allows the programs to provide this value to customers only if and when a customer requests it and is probably not costly to maintain in the programs. Conclusively, these services seem marginal to customers but can likely continue as needed given the minimal cost to offer them.

SCE's Healthcare EE program offers policy support given that healthcare buildings are subject to the Occupational Safety & Health Administration (OSHA) guidelines for building retrofits, however the participants rated this service quite low indicating that they did not need the program to provide this in order for them to pursue EE. Other optional services were highly rated for importance; the optional direct install option for

LodgingSaver participants and financial incentives for Enovity SMART participants who opt for additional projects outside of the direct install services offered through the program.

Table 19. Case Study Program Optional Design Uptake and Importance Scores

Case Study Program	Identifying Contractors		Reviewing Contractor Bids		Direct Install		Policy Support		Financial Incentives	
	Uptake	Mean Score (0-10)	Uptake	Mean Score (0-10)	Uptake	Mean Score (0-10)	Uptake	Mean Score (0-10)	Uptake	Mean Score (0-10)
School EE (SCE) (n=11)										
PREPPS (n=18)										
Enovity SMART (n=8)									63%	4.8
Healthcare EE (SCE) (n=5)	80%	4.0	100%	2.0			100%	3.2		
EnergySmart Grocer (n=21)	71%	4.9	71%	5.2						
Boiler EE (n=18)	44%	4.3	50%	2.4						
LED Accelerator (n=11)	27%	2.7								
LodgingSavers (n=35)	11%	2.0	9%	3.2	49%	7.6				
RightLights (n=64)	5%	3.3	5%	1.0						
Direct Install (SDG&E) (n=72)	1%	7.0	1%	6.0						

Notes: Grey cells indicate that the program did not offer the optional feature.

5.2 Implementation Effectiveness

This section describes how the programs were implemented, marketed and coordinated with other programs and partnerships. It also describes how the programs performed across a number of different metrics, including conversion rates, energy savings against forecasts, program costs, and the customer experience.

5.2.1 Local Government Coordination and Cross-Program Marketing

Local Government Partnership Coordination

Of the active 3P Commercial programs, close to 40% (11 of 29) coordinated with Local Government Partnerships (LGPs). Seven of these 11 program implementers indicated that they relied almost entirely on LGPs for referrals or leads and coordination with LGPs to develop marketing strategies. While the other four did coordinate some with LGPs, they primarily worked with them on a one-off basis, taking advantage of opportunities at events and presentations to market their programs. The implementers work with LGPs if directed by the IOUs and where it made sense to either reduce redundancies in the marketplace or to help market the program. Programs that did not work with LGPs seemed to have the marketing support they needed. An LGP relationship would not necessarily make sense for all programs. For example, the Casino

Green program targets Native American tribal lands and an LGP probably would not help them increase participation or marketing within that target.

Table 20. Coordination with Local Government Partnerships

Program	IOU	Implementer mentioned some coordination with LGPs	Implementer's Account of how it worked with LGPs
Energy Fitness	PG&E	Yes	LGPs general program leads/referrals
Energy Savers	PG&E	Yes	LGPs general program leads/referrals; LGPs help develop campaign strategies
RightLights	PG&E	Yes	LGPs help shape marketing strategy, notify implementers of outreach opportunities and identify prospective participants. As of 2015, the program merged with EnergyWatch partnership
PECI AERCx	PG&E	Yes	LGPs general program leads/referrals
Nexant AERCx	PG&E	Yes	LGPs general program leads/referrals, Program contacts LGPs if some measure opportunities are not covered by program
RCx (SDG&E)	SDG&E	Yes	LGPs help identify buildings with high savings opportunities for the program
Direct Install	SDG&E	Yes	Partners with cities and chamber of commerce to promote program; Some LGPs perform audits and then refer customers to 3P program if measure needs align
LodgingSavers	PG&E	Yes	Ad hoc basis, attend/present at same events
School EE (PG&E)	PG&E	Yes	Ad hoc basis, attend/present at same events
Enovity SMART	PG&E	Yes	Ad hoc basis, attend/present at same events
RSG AERCx	PG&E	Yes	Ad hoc basis, attend/present at same events
Furniture Store EE	PG&E	No	Not Applicable
LED Accelerator	PG&E	No	
Casino Green	PG&E	No	
Healthcare EE (PG&E)	PG&E	No	
K-12 Private Schools	PG&E	No	
Lincus WISE	PG&E	No	
Air Care Plus	PG&E	No	
Boiler EE	PG&E	No	
EnergySmart Grocer	PG&E	No	
CUBE	SCE	No	
Healthcare EE (SCE)	SCE	No	
Data Center EE	SCE	No	
Lodging EE	SCE	No	
Cool Schools	SCE	No	
School EE (SCE)	SCE	No	
Enhanced RCx	SCE	No	

Program	IOU	Implementer mentioned some coordination with LGPs	Implementer's Account of how it worked with LGPs
PREPPS	SCG	No	
HVAC Commercial	SDG&E	No	

Coordination with Other Program Offerings

Among the 29 active programs, we explored how much and where 3P Commercial programs cross-market with other IOU program offerings. According to 3P implementation staff interviews, almost two-thirds (19 of 29) of the programs offer at least some referrals to IOU Core rebate, on-bill financing, and/or Demand Response (DR) programs; referrals are also made to other 3P programs.

Almost half of the program implementers reported that they refer participants to IOU Core programs if deemed beneficial to the customer. Several implementers highlighted that they refer customers to the Core program by telling them to speak with their IOU account executive for next steps. However, relying on account executives to inform customers of program opportunities can be problematic when there is account executive staff turnover. The case study research found anecdotal evidence from one participant who reported that the facility missed energy efficiency upgrade opportunities because of account executive staff turnover at SCE.

Program implementers refer customers to Core programs if they identify savings from measures that they do not offer through the 3P program. They refer customers to Core programs in two different instances:

- Retrocommissioning programs may identify non-RCx energy saving potential from other energy efficiency measures through remote building assessment or site visits.
- Direct install programs and programs targeting small and medium-size businesses refer customers to Core programs if they identify opportunities via the audit that are outside the 3P program's scope. SDG&E's Direct Install program coordinates with the Core programs by offering to install measures outside of the 3P program and helps customers with the Core application if applicable. This SDG&E program also actively refers customers to DR programs.

Almost half of the programs are referring some customers to the On-Bill Financing (OBF) program. These implementers refer customers to OBF when a customer's project cost exceeds $5,000. A small number of programs also refer customers to DR programs or other 3P programs. Beyond simply referring customers to other programs, the school sector program implementers mentioned that they work to coordinate with other programs to avoid pursuing the same customers. However, about one-third of programs are not attempting to coordinate much with other EE programs or refer customers to other programs for additional energy saving opportunities. This is likely because the program implementers have no incentive to do so and are instead focused on achieving their own participation and energy saving forecasts, as most of them operate under pay-for-performance contracts that are tied to energy saving performance metrics.

Table 21. Implementer Account of Cross-Program Coordination

Program	IOU	Program Refers Customers to:			
		Core	OBF	DR	Other 3P
Furniture Store EE	PG&E	Yes	Yes		Yes
K-12 Private Schools	PG&E	Yes	Yes		
RSG AERCx	PG&E	Yes	Yes		Yes
PECI AERCx	PG&E	Yes	Yes		
Energy Savers	PG&E	Yes	Yes		
School EE (PG&E)	PG&E	Yes	Yes		
Direct Install	SDG&E	Yes	Yes	Yes	
Nexant AERCx	PG&E	Yes		Yes	
Energy Fitness	PG&E	Yes		Yes	Yes
HVAC Commercial	SDG&E	Yes			Yes
RCx (SDG&E)	SDG&E	Yes			
Boiler EE	PG&E	Yes			
LodgingSavers	PG&E	Yes			
RightLights	PG&E		Yes		
EnergySmart Grocer	PG&E		Yes		
CUBE	SCE		Yes		
Healthcare EE (SCE)	SCE		Yes		
Data Center EE	SCE		Yes		
Cool Schools	SCE		Yes		
Enovity SMART[a]	PG&E				
Lincus WISE	PG&E				
LED Accelerator[a]	PG&E				
Casino Green	PG&E				
Healthcare EE (PG&E)	PG&E				
Air Care Plus	PG&E				
Lodging EE	SCE				
School EE (SCE)	SCE				
Enhanced RCx	SCE				
PREPPS[a]	SCG				
Total Programs		**14**	**13**	**3**	**4**

[a] Some participants reported in the case study interviews that they received at least some recommendations for other EE programs.

In the case studies, we explored how many participants recalled being informed of other program opportunities while participating in the 3P program. It remains clear that 3P implementers are performing some cross-promotion, but there is an opportunity to improve on this and better inform these hard-to-reach markets if deemed appropriate. Customers stated having an interest in finding more information on how they can take advantage of additional energy saving opportunities, particularly in the school sector. School sector customers even suggested a forum whereby school districts can exchange experiences and ideas.

Table 22. Case Study Program Participant Recall of Learning about Additional Program Opportunities

Case Study Program	Recall Hearing of Other Program Opportunities via 3P Program Experience
Healthcare EE (SCE) (n=5)	80%
Boiler EE (n=18)	72%
PREPPS (n=18)	44%
LodgingSavers (n=35)	40%
Enovity SMART (n=8)	38%
Direct Install (SDG&E) (n=72)	30%
EnergySmart Grocer (n=21)	29%
LED Accelerator (n=11)	27%
School EE (SCE) (n=11)	27%
RightLights (n=64)	25%

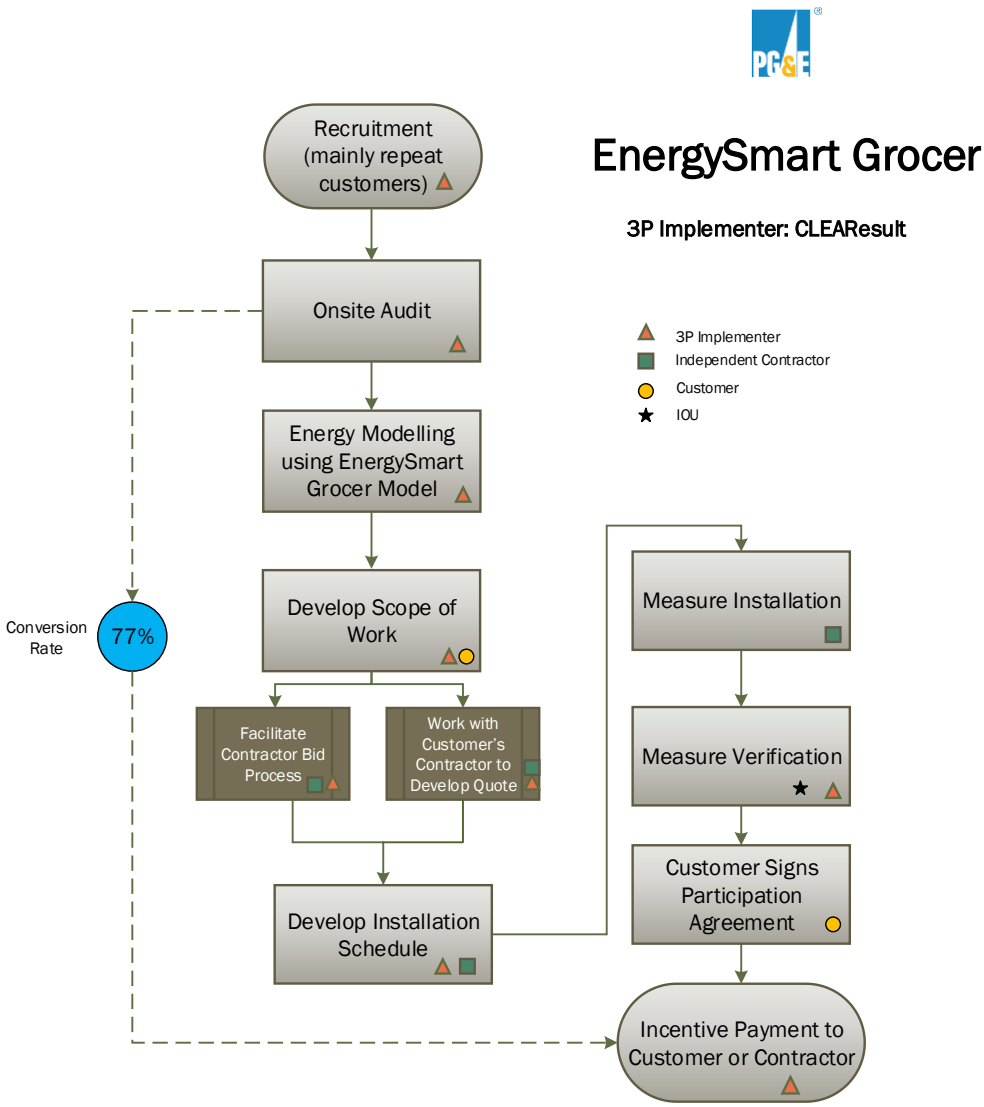
5.2.2 Program Implementation and Project Conversion

This section illustrates what activities the 3P programs use to move from finding a customer to completing an EE project. It also provides the conversion rates from audit to completed projects for the 10 case study programs.

How 3P Programs Find Customers and Complete Projects

Some programs directly market to customers while others rely on LGPs and/or IOU account representatives for referrals and leads. Program implementers commonly leverage existing relationships with customers in their target market, but also reach out to prospective participants through canvassing, direct calls (mainly used by programs targeting small and medium businesses), and industry events. Once programs have established a first contact, they conduct site visits to identify the facility's energy savings potential, and provide audit reports with upgrade recommendations and financial analyses to the customer. Figure 4 shows an example of the implementation steps for the EnergySmart Grocer program. This implementation model is a good illustration of the common steps involved in 3P program implementation. In Volume II, we provide specific implementation models for each of the 10 case study programs and an implementation overview for each program in the program-specific chapters.

Figure 4. 3P Implementation Model Example



Since most programs have an audit and several other steps during project implementation, it is important to know how successful the audit is in encouraging customers to conduct projects by examining the program conversion rates. Most program implementers do not proactively report on conversion rates. However, some program implementers have records that allow them to calculate conversion rates.

Among the 10 case study programs, seven were able to provide conversion rates as shown in Table 23. Among those seven, we do see some strong conversion rates, with two exceptions. The RightLights program conversion rate (54%) was lower compared to other programs, but the program was still able to be cost-effective and almost hit its saving forecast (97%). The conversion rate for RightLights may be more indicative of the hard-to-reach nature of the many small businesses in rural areas that RightLights is targeting rather than an implementation issue. Enovity SMART also has a lower conversion rate, but we note that it is a new IDEEA 365 program, so the conversion rate is based on the first few participants in a brand new approach to retrocommissioning and may improve over time.

Table 23. Case Study Program Conversion Rates

Case Study Program	Conversion Rates (Audit to Project)
EnergySmart Grocer (n=21)	77%
LED Accelerator (n=11)	72%
Boiler EE (n=18)	71%
PREPPS (n=18)	67%
LodgingSavers (n=35)	67%
RightLights (n=64)	54%
Enovity SMART (n=8)	44%
Healthcare EE (SCE) (n=5)	Not available when asked via data request
Direct Install (SDG&E) (n=72)	Not available when asked via data request
School EE (SCE) (n=11)	Not available when asked via data request

5.2.3 Program Performance

Overall Performance

For most programs, the IOUs established the program forecasts in collaboration with the implementer based on past experiences and the available program budget before the 2013–14 program cycle began. The programs collectively spent 95% of the forecasted funds while falling somewhat short of their electric saving forecast but far exceeding their gas saving forecast.

Table 24. Overall 3P Commercial Spending and Energy Savings

3P Commercial Resource Programs	Cost (Million $)	GWh	GW	MMTherms
Forecast 2013–14[a]	$147.8	324	0.06	3.4
Actual 2013–14[b]	$140.8	277	0.05	4.3
% of Forecast	95%	86%	83%	128%

[a] Forecast from IOU Monthly Energy Efficiency Program Report (December 2014) covering the 2013–14 program cycle.
[b] Actual savings and costs for 3P Commercial programs based on the CPUC's Program Database from November 2015 for the 2013–14 cycle.

After savings forecasts were set, there were several market conditions and regulatory changes, notably Dispositions and Title 24, during the 2013–14 program cycle that changed the savings that many of the 3P programs could claim. Below we describe these changes and the impact that they had on the 3P programs.

Savings Dispositions

The 3P programs offer a mix of deemed measures and custom measures. Deemed measures are measures with prescribed energy savings estimates that are documented in the DEER. Energy savings estimates (kWh, kW, and therm values), as well as assumptions and calculation methodologies, for many deemed measures that represent important contributions to the EE portfolios are prescribed in the DEER. Additionally, DEER

contains effective useful life and remaining useful life default values for many measures and all authorized net-to-gross (NTG) ratio values authorized for use. CPUC staff periodically updates DEER methods, assumptions, and point values to account for changes to adopted federal and California codes and standards, as well as for results provided by recent research. The DEER update process includes an opportunity for stakeholder input via workshops and informal as well as formal comments. During the 2013–14 cycle for EE programs, a new version (DEER 2014) was released on November 25, 2013. This update incorporated Codes & Standards requirements that went into effect in 2014, including California Title 20 Appliance Efficiency Regulations, California Title 24 Building Energy Efficiency Standards, and the United States Code of Federal Regulations.

The IOUs develop non-DEER work papers for measures or measure values, such as up-to-date costs not included in the most current version of DEER. A work paper describes the engineering algorithms, methods, and assumptions used to estimate the energy and demand savings based on DEER methods or new methods for measures not covered by DEER. The ALJ Ruling dated November 18, 2009 in A.08-07-021,[23] as modified in Decision D.12-05-015,[24] guides the work paper review process for the 2013–14 cycle.

For the 2013–14 portfolio cycle, the IOUs submitted more than 400 "Phase 1" work papers with their portfolio applications and identified "High Impact Measures" to help prioritize the CPUC's review. In addition, the IOUs submitted approximately 40 "Phase 2" work papers throughout the program cycle to add other non-DEER measures.

The CPUC staff, with assistance from their consultants, reviewed a subset of the submitted work papers and released dispositions with adjusted calculation methods, as well as savings values, as consultants found appropriate. Many of these adjustments affected measures offered through the 3P programs. Approved or revised savings values became effective upon approval or release of the disposition; however, some were retroactive to the beginning of the program cycle because some lighting measure savings were originally developed and submitted in a manner that did not comply with CPUC direction.

The work paper approval process includes a dispute mechanism adopted in D.12-05-015, which is utilized when disagreements between the IOUs and CPUC staff cannot be resolved and a CPUC resolution is needed. For disputed work papers, the CPUC and the IOUs are directed to hold meetings to resolve their disagreements. If these meetings remain unsuccessful, CPUC staff are required to develop a draft resolution every six months that is subject to a CPUC vote.[25] Note that all work paper disagreements to date have been resolved without the need for the adopted dispute resolution process.

Opinion Dynamics reviewed the dispositions released in the 2013–14 program years. Table 25 summarizes the four non-residential dispositions (one related to pool covers and three related to lighting), their release date, their effective date, and their proposed changes. These dispositions resulted in the modification and discontinuation of rebates offered in 3P programs. Both IOU and program implementation staff reported that this affected the savings a program could claim in addition to a Title 24 update that is discussed after the table.

[23] http://docs.cpuc.ca.gov/PublishedDocs/EFILE/RULINGS/110002.PDF.

[24] http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/166830.PDF.

[25] Ibid.

Table 25. Disposition Summary

Disposition Title	Release Date	Effective Date	Summary of Changes
Work Paper Disposition for Commercial Pool Covers	March 2013	Not provided	• Apply installation rates of 0.28 (PG&E) and 0.38 (SCG & SDG&E) • Revise NTG to 0.60
Summary of Changes for CFL-LED-CMH	August 2014	July 1, 2014	• Apply a wattage reduction ratio (WRR) of 3.47 for all plug-in (portable) torchieres • Update the WRR to 3.53 per DEER 2011 for all CFL fixtures (all applicability)
Summary of Changes – Linear Fluorescent	September 2014	October 2014	• Removed measures where the baseline and efficient measure are identical
		January 2013	• Identified code baselines
		July 2014	• Revised code baseline for high-efficiency measures
		Pre- and post-July 2014	• Revised code baseline for relamping and delamping retrofits
		January 2015	• Require relamping measures in combination with other retrofits to be claimed as single measure
		January 2015	• Revised wattage ratings
Summary of Changes – HighBay HID	November 2014	January 2015	• Energy reduction (ER) claims require supporting documentation of the pre-existing lighting measure and evidence that the replacement occurred due to program influence
		N/A	• Resubmit 2013–14 ER claims with revised application type ROB
		January 2013	• Identifies correct pre-existing and DEER code baselines for ROB and ER application types

Title 24 as the New Baseline for Code

Changes to the California Building Standards Code (Title 24) went into effect as of July 1, 2014. Title 24 now represents the new baseline for savings calculations because mandatory code requirements have been the baseline for claiming energy savings since the collaborative agreements between the IOUs and the CPUC dating back to 1991. The code change resulted in modifications and discontinuation of rebates for select measures offered by 3P programs, predominantly for lighting. IOU and program implementation staff representing 15 programs reported that Title 24 code changes negatively affected program performance. Implementer and IOU staff pointed to the following issues:

- **Changing implementation practices to avoid Title 24:** To avoid Title 24 code, 3P implementers limited the installation of lighting fixtures to 39, since Title 24 applies when replacing 40 or more light fixtures. This lowered potential energy savings and thus slowed participation. Implementers reported that it was difficult to explain to prospective participants why they could not upgrade more than 39 fixtures at a time through the program. One participant mentioned this in our case study. A participant in the Direct Install (SDG&E) program mentioned that the program could not retrofit all of his lighting and planned to return in 12 months to complete it all.

- **Unique school issues:** Implementation and IOU management staff said that Title 24 baseline conditions are unrealistic for schools: Several school program staff noted that T12 fixtures are still

prevalent across California's schools because schools lack the funds for replacement. However, the 2014 Commercial Saturation Study found that only 8% of schools have 4-foot T12 lamps, down significantly from 22% in 2006[26]. Title 24 changes removed the ability to claim savings for the replacement of T12 lamps. Furthermore, demand for occupancy sensors was high in school programs prior to Title 24 changes. With Title 24, schools must pay for sensors out of pocket themselves. Lastly, Title 24 space definitions negatively affect the school sector, as a space typically incorporates an entire campus. In order to avoid Title 24 code, the programs can serve only a small share of a school's area.

Many program implementers (16) reported that these savings reductions mid-cycle presented a challenge to reaching savings targets set at the beginning of the cycle. While implementers understand why code and policy changes are necessary and can change claimable savings, they explained that mid-cycle changes can cause ripple effects that disrupt program implementation and increase administrative costs.

- **Customer dissatisfaction and lower-than-expected participation:** As measure savings decrease, IOUs reduce available financial incentives, and the recommended upgrades become more expensive to the customer. From the implementer's perspective, this resulted in customer satisfaction issues, distrust, customer dropouts, and therefore lower-than-expected program participation. However, very few participants mentioned issues related to this in the case study participant surveys. Only one EnergySmart Grocer participant and one LED Accelerator participant mentioned his rebate was lower than expected. However, research with prospective or drop-out customers could have revealed different findings.

- **As savings decrease, some programs must now require a co-pay to stay cost-effective:** Reducing claimed savings for measures reduces the cost-effectiveness of programs, forcing some program implementers to decrease incentives so that the program would still meet cost-effectiveness requirements. Several direct install programs had to introduce a co-pay. One implementer also highlighted that direct install programs generally purchase measures in bulk, which makes a fast response to policy changes more difficult.

- **Increased program administrative costs:** New CPUC policies require internal staff training and education. New policies also require updating several administrative databases and communication tools both at the implementer and at the IOU. The IOU and implementer must update their systems with newly available data and ensure that both parties are in sync.

- **A perceived lack of protocols for when and how to respond:** IOU staff highlighted that they find it difficult to know when to implement Energy Division dispositions,[27] as there can be multiple iterations of dispositions before they are finalized. IOUs and implementers think that there is a lack of CPUC or IOU protocols around when dispositions are finalized, when they should be implemented mid-cycle, and how implementers should treat any customers who are midway through implementing a project.

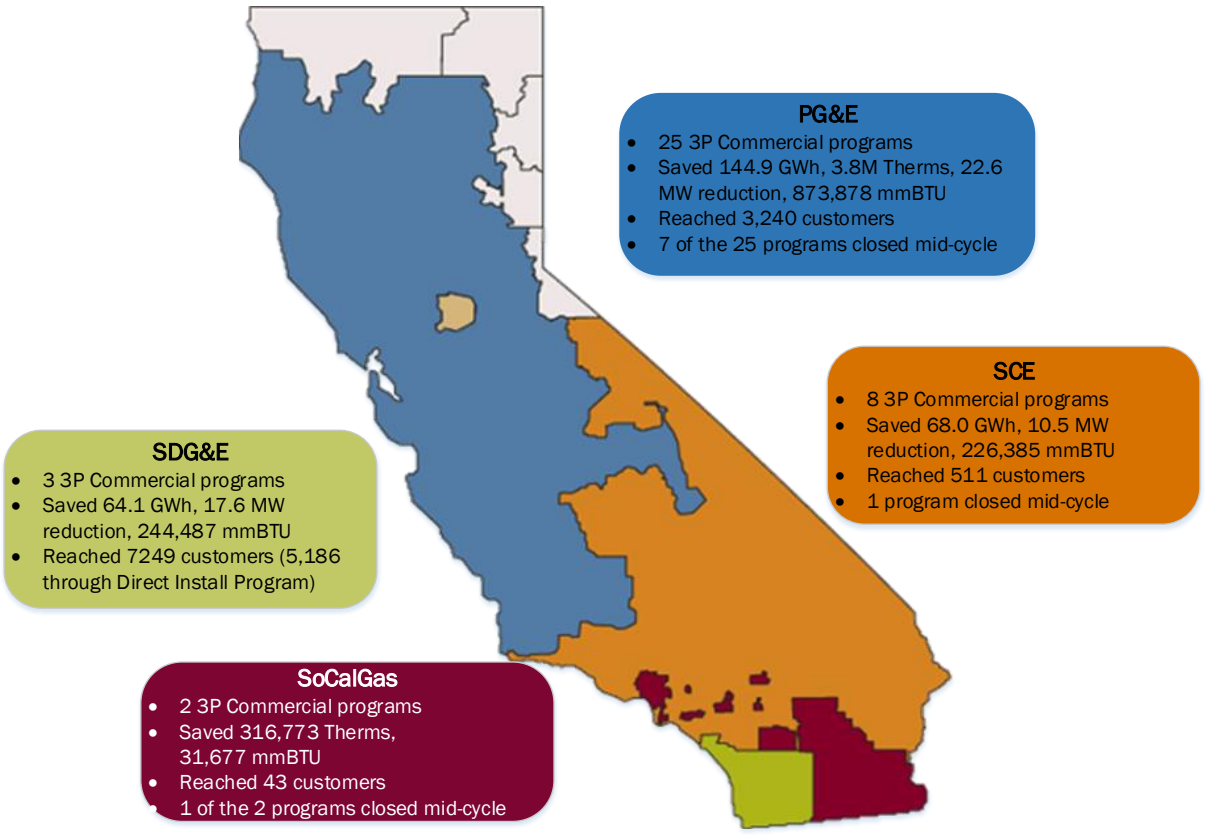
Program Reach by IOU Territory

Figure 5 provides a snapshot of program participation and ex ante savings for the 3P Commercial programs across IOU territories.

[26] Itron, 2014 California Commercial Saturation Study Report, Figure ES-5.

[27] Energy Division dispositions communicate any adjustments to claimable savings for EE measures upon review by the CPUC work paper group.

Figure 5. 3P Commercial Programs Snapshot Across IOU Territories



Note: There is some overlap between SCG and SCE service territories that is not reflected in the above figure. SCG service territory is larger than reflected here. Savings data and customer counts from the CPUC's Program Database from November 2015, Map source: compassrosebooks.blogspot.com.

Program Activity by Quadrant

Table 26 shows that the vast majority (93%) of energy savings during the 2013–14 program cycle came from programs that focused on hard-to-reach markets with established technologies. However, we expect that innovative programs generated lower savings, as many of them just launched in 2013 and because often their purpose is to identify and test innovative technologies or new delivery models on a limited basis before scaling up.

Table 26. Program Activity by Quadrant

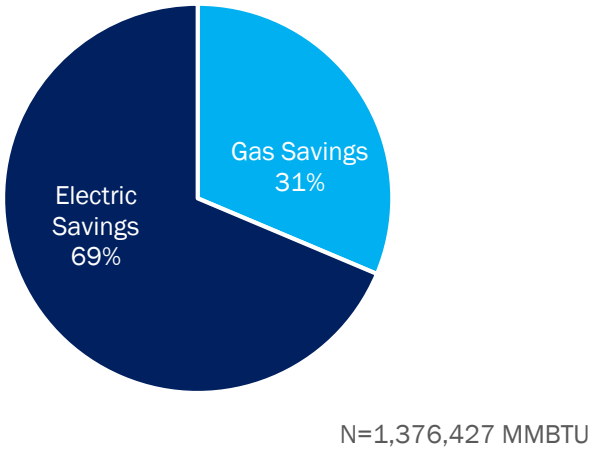
	Hard-to-Reach Markets with Established Technologies	Innovative Technologies and/or Delivery
Vertical	15 programs (13 active) 1,655 participants 603,437 MMBTU reported 44% of total MMBTU	5 programs[a] 27 participants 15,470 MMBTU reported 1% of total MMBTU
Horizontal	14 programs (9 active) 9,109 participants 670,644 MMBTU report 49% of total MMBTU	4 programs (3 active) 252 participants 86,876 MMBTU reported 6% of total MMBTU

Notes: Participant counts based on unique service account ID in program tracking data.
[a] Only two programs claimed savings during the 2013–14 program cycle. Percentages may not add up due to rounding.

Savings by Measure and Fuel Type

The majority of measures installed across the 38 3P programs generated electric savings as shown in Figure 6.

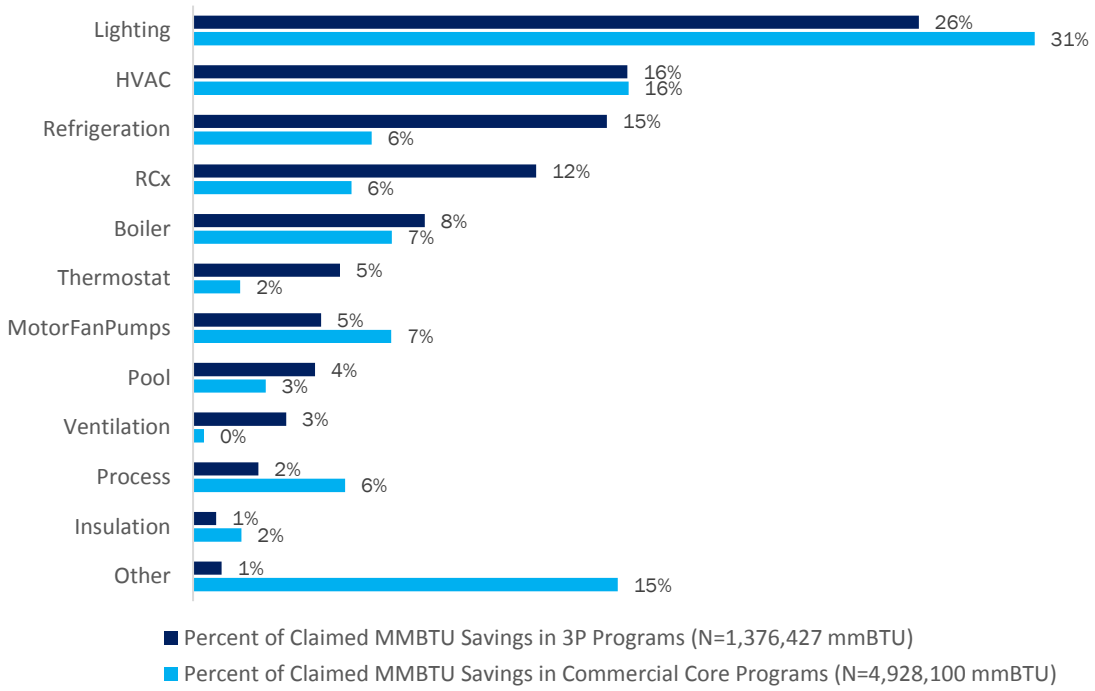
Figure 6. Percentage of Electric and Gas Savings



Source: CPUC's Program Database from November 2015.

Although 3P programs offer a variety of measures, energy savings were concentrated on three end-uses—lighting, refrigeration, and HVAC measures—which generated more than half (57%) of claimed energy savings (measured in BTU). These three measures made 83% of claimed electric energy savings. More than half (51%) of the gas savings resulted from boilers and retrocommissioning. Figure 6 presents the savings per end-use as a percent of total program savings for 3P programs and Commercial Core programs. The figure shows that a larger proportion of their energy savings is driven by refrigeration, retrocommissioning, boilers, thermostats, pool equipment and ventilation measures compared to Core programs.

Figure 7. 3P Ex Ante Claimed Savings by End-Use during 2013–14



Source: CPUC"s Program Database (35 3P programs: no data for Nexant AERCx, PECI AERCx and Lincus WISE); 11 Core programs (no data for SDGE's SW-COM-Deemed Incentives-HVAC Core)
*Note: Other includes thermostats, ventilation, cooking computers, vending m

Legacy 3P Commercial Programs

This section examines the performance of active 3P Commercial programs in terms of actual installed ex ante savings. Programs that emerged under IDEEA 365 during the 2013–14 program cycle (quadrant 3) faced unique challenges since they were not fully operational until 2014 and only had one year to perform. We therefore analyzed their performance separately from continuing 3P Commercial programs, which we refer to as Legacy programs below (this includes programs in quadrants 1, 2, and 4). We further exclude any programs that closed during the 2013–14 program cycle from this analysis.

Table 27 shows the combined forecasted and installed savings from active Legacy programs. Active Legacy programs installed 261.9 GWh and 3.1 million therms and achieved 93% of the IOUs' savings forecast for electric and gas savings combined.

Table 27. Projected and Actual Portfolio Savings of Active Legacy Programs

Unit	Electric Savings (GWh)	Gas Savings (Million Therms)	Combined Savings (MMBTU)
Projected Savings[a]	293.6	2.8	1,285,892
Actual Savings[b]	261.9	3.1	1,200,122
% Achieved	89%	111%	93%

Data Sources: [a] IOU Monthly Energy Efficiency Program Report of December 2014; [b] CPUC Program Database.

Table 28 shows the installed and forecasted savings for each active Legacy program sorted from highest to lowest energy savings. The programs with the highest combined electric and gas savings were EnergySmart Grocer, Boiler EE, and SDG&E's Direct Install program. These programs generated almost one-third (31%) of active Legacy program savings. The table also shows the percent of forecast, as well as the number of program participants,[28] for each active Legacy program. Appendix A summarizes projected and installed savings for electric and gas savings separately. Of the 24 active Legacy programs, 10 programs met or exceeded their forecasts, while three were close to reaching their forecasts (90%–99%) and 11 fell shy (<90%) of forecasts. Some variations from forecasts are expected in any program given that implementation staff and IOUs determine their forecasts well ahead of the program cycle and can make adjustments based on fund shifts. However, larger variations from forecasts warrant deeper investigation. Five programs achieved less than half of their savings forecasts. These include Enhanced RCx, Cool Schools, Data Center EE, PREPPS, and CUBE. According to IOU and implementation staff, the programs fell short of forecasts for the following reasons:

- For Cool Schools, Prop 39 caused a pause among schools. It slowed down schools' decision-making processes and program implementation more broadly as schools waited for that funding to become available before investing in projects. All school program staff discussed challenges with school participation in this program cycle given the release of Prop 39.
- SCE's Enhanced RCx program had a slow start and only ramped up in 2013. Furthermore, program staff highlighted that low levels of customer knowledge about fault detection and diagnosis software required significant education before customers would enroll in the program. Given the program projects have long implementation (up to 18 months), the program cycle was not long enough to achieve the program's savings forecasts.
- PG&E's Data Center EE program faced several challenges according to program staff. First, the program implementer saw some turnover in program management staff and had to put the program on hold until finding a replacement with the necessary expertise in both energy efficiency and data centers. The program was also impacted by reduced claimable savings due to the Title 24 baseline.
- The CUBE program faced savings reductions due to Title 24 and lighting dispositions.
- The PREPPS program faced challenges with Prop 39 that slowed down participation as schools were waiting for funding to become available. The program was also challenged by a disposition on pool covers that reduced claimable savings as pool covers were one of the program's most popular measures.

[28] Defined as the number of unique service account IDs per program in the CPUC's Program Database as of November 2015.

Table 28. 2013–14 Forecasted and Actual Savings of Active Legacy Programs

Program Abbreviated	Installed Savings (MMBTU)	Forecasted Savings (MMBTU)	% of Forecast Achieved	# of Participants (Unique SA)
EnergySmart Grocer	158,431	156,832	101%	395
Boiler EE*	143,618	128,636	112%	61
Direct Install (SDG&E)	123,076	107,615	114%	5,186
LodgingSavers	73,852	45,469	162%	207
Air Care Plus	70,478	93,883	75%	471
School EE (PG&E)	56,885	71,943	79%	117
RightLights	52,865	54,248	97%	838
Lodging EE	51,830	60,832	85%	35
School EE (SCE)	49,875	69,418	72%	351
HVAC Commercial	47,610	13,080	364%	1,427
Healthcare EE (SCE)	42,841	46,967	91%	12
RCx (SDG&E)	42,586	39,517	108%	10
LED Accelerator	39,315	5,130	766%	236
CUBE	37,535	76,356	49%	28
Healthcare EE (PG&E)	32,732	30,317	108%	7
Furniture Store EE	32,695	20,462	160%	304
Energy Fitness	31,214	42,688	73%	626
PREPPS*	29,746	70,379	42%	40
Data Center EE	26,574	64,438	41%	12
Casino Green	22,996	23,402	98%	12
Energy Savers	13,163	18,631	71%	305
K-12 Private Schools	9,797	8,425	116%	83
Cool Schools	7,364	20,336	36%	30
Enhanced RCx	3,044	16,889	18%	3

Notes: Installed savings take into account electric and gas savings for the 2013–14 cycle based on the CPUC's Program Database from November 2015. Asterisk denotes programs with a gas focus (more than 90% of MMBTU savings come from gas measures). Participants defined by unique service account ID.

IDEEA 365 Programs

The IOUs followed processes set out in the IDEEA 365 Program Implementation Plan. They post upcoming bids to the statewide Proposal Evaluation and Proposal Management Application, where potential bidders register and submit their abstracts or proposals. The IOUs then review and score each proposal internally, using staff that includes program managers, account managers, engineers, policy advisors, and supply management staff. SCE further consults with the New Product Development/Emerging Technologies group, and SDG&E hires a consultant to ensure consistency in scoring. Before vendors are notified, a PRG reviews the IOU proposals. While the IOUs shared best practices related to program design and coordinated the approach to IDEEA 365 solicitations, the IOUs did not coordinate when selecting 3P programs.

Five programs (all PG&E) emerged under the IDEEA 365 process in late 2013 in PG&E territory. These include four AERCx programs and Lincus WISE.

Table 29. IDEEA 365 Program Overview

Program	Inception	Target Market	Participants
Enovity SMART	Late 2013	Schools	9
Nexant AERCx	Late 2013	Schools	3
RSG AERCx	Late 2013	Schools	8
PECI AERCx	Late 2013	State government and universities, small commercial	2
Lincus WISE	February 2014	Water agencies	8

Note: Number of participants reported came from implementer interviews given that the claims data did not have any data listed for most of these programs. Only two programs (Enovity SMART, RSG AERCx) claimed energy savings in the CPUC Program Database or monthly reports.

Even though all five programs generated lower savings than program staff had anticipated,[29] both IOU and implementation staff touched on a number of valuable contributions. For example, the AERCx programs had a first chance at testing their data analytics software with PG&E AMI data and were able to use it to identify some RCx savings opportunities. Implementers also highlighted gaining more experience with persistence monitoring, which may produce data to help address the current short life cycle of savings from RCx measures. These programs fell short of savings forecasts for a number of reasons that are common to launching new programs.

- **Late program start due to contract negotiations:** PG&E's AERCx programs signed contracts in late 2013 and ramped up the programs in the first quarter of 2014. Lincus WISE did not commence until February 2014.
- **Initial relationship and trust building:** All implementers of IDEEA 365 programs explained that relationship building is important but time-intensive. For example, implementers of school programs highlighted that several stakeholder groups, including IOUs, program implementers, and LGPs, serve the school sector. They explained that building relationships with these stakeholders was important to obtain buy-in for the program and avoid targeting the same customers. Lincus WISE implementation staff highlighted that they spent significant time building trust with customers. Implementation staff felt that customers commit to large and costly upgrades only when they understand the value of the program and trust the implementer's engineers.

The following ramp-up challenges were unique to AERCx programs.

- **Interval data feed:** As noted above, all implementers of PG&E's AERCx programs described the availability of quality smart meter data as a major barrier to program ramp-up and stronger program performance. They explained that the process of data transmission was slow and difficult to navigate due to PG&E's extensive data protocols and the involvement of several stakeholders. Other issues surrounded the quality of the interval data: Implementers explained that they spent considerable time cleaning and preparing the data but still had missing data feeds for approximately 20% of the smart meters in the customers they were targeting. This was a significant challenge as AERCx programs can perform upgrades only where interval data exist, and they subsequently missed out on project

[29] PG&E did not establish savings forecasts for these programs. Nevertheless, both IOU and implementation staff acknowledged during in-depth interviews that the programs generated fewer savings than expected based on their experiences in the market.

opportunities. The program manager acknowledged that PG&E does not have a team dedicated to smart meter data and therefore relies on manual and labor-intensive procedures to provide data to the implementer, which slows down program implementation.

- **Regulatory uncertainties:** Both IOU and implementation staff noted a lack of clarity to define the boundaries between RCx and retrofits in the early stages of the program. While this did not impede program implementation, it caused uncertainty as to whether an AERCx program could claim select measures.

The following ramp-up challenges were unique to Lincus WISE.

- **Long, expensive, and geographically dispersed projects:** Upgrades of water distribution systems require large capital investments and likely take between 6 and 8 years to complete a full overhaul.
- **Interruptions of pump operations require long-term planning:** From the implementer's perspective, customers are reluctant to move forward as comprehensive upgrades require significant construction and cause interruptions to pump operation. This is significant at times of drought, when pumps are running at full capacity.
- **Finding contractors to perform the upgrade:** Pump contractors have plenty of business, especially during a drought. Contractors prioritize work related to deeper wells and drilling rather than system optimization.
- **General market barriers/lack of commitment in the target market:** The implementer identified a large number of customers but faced difficulties in getting customers to move forward on comprehensive EE upgrades. The implementer suggested that this was in part because the water sector has traditionally focused on the provision of clean drinking water; electricity costs or energy savings have not been a priority for this customer segment.
- **Implementer cash flow:** One challenge for the implementer is cash flow, as projects take a while to generate energy savings for the program. Although PG&E makes an initial performance payment upon initial project approval, the implementer does not want to utilize these funds as long as the project is still under way. This is because of a claw back clause in the contract that allows PG&E to recall the initial performance payment if project hardware is not installed within twenty-four (24) months of payment, at a date set by the PG&E Program Manager, or if a customer drops out of the project. Initial project performance payments were established for Third Party Implementers to mitigate cash flow concerns, but cash flow can also be mitigated for programs with long term projects by building a robust pipeline of projects.

5.2.4 Cost-Effectiveness

The Energy Efficiency Policy manual requires that each IOU's EE portfolio have higher benefits than costs. The IOUs use a cost-effectiveness calculator as one of the key screening criteria for selecting 3P programs.[30] This section discusses the cost-effectiveness of the 3P programs and some of the trends associated with cost-effective programs. The TRC for all the 3P programs included in the study combined is 1.44 based on IOU-reported ex ante savings, indicating that as a whole these programs are delivering higher benefits than costs.[31]

[30] Cost-effectiveness metrics include the TRC and Program Administrator Cost.

[31] We calculated the net TRC based on data available on the EE Stats data shelf (ChartsV6 for PY2013-14.xls). For each program, we divided the total net electric and gas benefits by the TRC (Net TRC = (ElecBen + GasBen) / TRC_Cost). Net electric and gas benefits

For the purpose of the trend analysis, the evaluation team reviewed each active program's net TRC for the 2013–14 program cycle. Almost two-thirds (19 of 29) of the active programs were cost-effective during the 2013–14 program cycle with a TRC above 1.0. Most programs that were not cost-effective also missed their energy savings forecasts for a variety of reasons (refer to section 5.2.3), with the exception for Boiler EE and Healthcare EE. Table 30 ranks all active 3P Commercial programs by their net TRC and presents additional program characteristics. The table shows a few trends when comparing cost-effective programs to their counterparts. Programs with the following characteristics tend to be more cost-effective:

- Direct Install programs
- Programs that offer only deemed measures
- Programs operating for at least four years (in this case, programs that launched before 2010)

Notably, we also explored any trends in the Quadrants and target markets for these programs but did not find any correlations with cost-effectiveness.

Table 30. Cost-Effectiveness of Active 3P Commercial Programs during 2013–14

Program	IOU	Net TRC	Launch Year	Measure Impact Type[a]	Direct Install
6 Programs with a TRC above 2.0					
School EE	SCE	4.10	2010	D	No
EnergySmart Grocer	PG&E	2.82	2006	D	Yes
LodgingSavers	PG&E	2.26	2006	C and D	Yes
Energy Fitness	PG&E	2.22	2002	D	Yes
Casino Green	PG&E	2.18	2009	C and D	Yes
CUBE	SCE	2.02	2010	C and D	No
13 Programs with a TRC between 1.0 and 1.9					
LED Accelerator	PG&E	1.80	2009	C	No
Energy Savers	PG&E	1.76	2002	D	No
HVAC Commercial	SDG&E	1.76	2010	D	No
RCx (SDG&E)	SDG&E	1.57	2006	C	No
Lodging EE	SCE	1.47	2010	C and D	No
Enovity SMART	PG&E	1.46	2013	C	No
Furniture Store EE	PG&E	1.39	2010	D	Yes
RightLights	PG&E	1.37	2006	D	Yes
K-12 Private Schools	PG&E	1.24	2010	D	Yes
Data Center EE	SCE	1.14	2010	C and D	No
Healthcare EE	SCE	1.10	2008	C and D	No
Direct Install	SDG&E	1.09	2010	D	Yes
School EE	PG&E	1.08	2006	C and D	No
7 Programs with a TRC below 1.0					
Air Care Plus	PG&E	0.78	2006	D	No

are reported by the IOUs and take into account the net present value of life cycle avoided costs for net electric and gas savings. The TRC include the gross program administrator cost and the net participant incremental measure cost.

Program	IOU	Net TRC	Launch Year	Measure Impact Type[a]	Direct Install
Enhanced RCx	SCE	0.74	2013	C and D	No
PREPPS*	SCG	0.71	2010	C and D	No
Cool Schools	SCE	0.67	2010	C and D	No
RSG AERCx	PG&E	0.64	2013	C	No
Boiler EE*	PG&E	0.64	2006	C and D	No
Healthcare EE	PG&E	0.57	2010	C and D	No

[a] Three programs did not claim savings and did not have TRC data (Nexant AERCx, PECI AERCx, Lincus WISE). Measure impact type: C=Custom, D=Deemed. Asterisk denotes programs with a gas focus (>90% of MMBTU savings came from gas). Green cells highlight program characteristics found to increase cost-effectiveness.

5.2.5 Participant Feedback on Program Performance

Table 31 presents the overall performance score for each of the 10 case study programs, as well as participants' performance ratings for each program feature. Participants rated the implementer's performance on each feature on a scale from 0 to 10, where 10 represents "excellent" performance. The average of all scores accounts for the overall performance mean score.

Participants consistently gave high performance scores for the all program features—between 7.8 and 10.0—indicating that the implementers provided high-quality services from the perspective of participants. The programs' overall program performance scores ranged from 8.2 (Enovity SMART) to 9.1 (School EE [SCE]), suggesting that participants are satisfied with the 3P programs in general.

Table 31. Performance of Case Study Program Core Design Features

Case Study Programs	Direct Installation	Rebate/Free Measures	Economic Analysis	Sector Expertise	360° Project Assistance	Product Recommendations	Audit	Decision-Making Support	Overall Program Score
School EE (SCE) (n=11)	10.0	10.0	9.2	8.1	9.0	8.6	8.9	8.8	9.1
PREPPS (n=18)		9.2		9.0	9.0	8.7	8.9	9.0	9.0
RightLights (n=64)	8.8	8.9			8.8	9.1	8.7		8.9
Healthcare EE (SCE) (n=5)		8.8	8.0	9.0	9.4	9.4	8.0	9.0	8.8
EnergySmart Grocer (n=21)		8.4	9.0	8.8	8.5	8.6	8.5		8.6
Direct Install (SDG&E) (n=72)	8.6	8.5			8.8	8.4	8.7		8.6
LED Accelerator (n=11)		8.4	8.8	8.5	8.1	8.6	7.9		8.4
LodgingSavers (n=35)	7.9	8.6		8.4	8.3	8.2	7.9		8.3
Boiler EE (n=18)		8.1	8.4		8.7	7.8	8.3		8.3
Enovity SMART (n=8)	8.1	8.2	8.7	8.5	8.5	8.1	8.4	8.0	8.2

Consistent with high performance scores, most participants would recommend the program to others, as shown in Table 32. However, a few of the 263 respondents (generally 1–3 participants in each program) highlighted some implementation issues that we describe in the table below.

Table 32. Case Study Program Core Design Performance Scores & Implementation Issues

Case Study Program	Core Design Feature Performance Scores Multiple Features per Program Overall Mean Score (0–10)	% Recommend Program	Implementation Issues
School EE (SCE) (n=11)	9.1	91%	Some lighting output insufficient for classroom needs, audits not tailored to individual schools, did not capture all measure opportunities
PREPPS (n=18)	9.0	100%	One noted issues with custom project approval time and rebate processing time
RightLights (n=64)	8.9	99%	Product quality and installation issues
Healthcare EE (SCE) (n=5)	8.8	100%	Staff turnover at SCE; some operation and maintenance (O&M) opportunities were initially overlooked in audit
EnergySmart Grocer (n=21)	8.6	95%	Some installation issues; one complained of lower rebate than expected
Direct Install (SDG&E) (n=72)	8.6	93%	Some installation issues; incomplete measure install, lack project contact person, lack responsiveness to customer inquiry
LED Accelerator (n=11)	8.4	100%	Long implementation time, scope of work challenges
LodgingSavers (n=35)	8.3	94%	Quality assurance/quality control issues with product quality, work quality and scheduling; some did not see any energy savings
Boiler EE (n=18)	8.3	100%	Long implementation time, contractor communication issues
Enovity SMART (n=8)	8.3	100%	Some issues with finding a contractor and defining the scope of work

As noted in the Value section, the programs offered select program features only if needed by participants. These optional features varied by programs and commonly included help identifying contractors and reviewing contractor bids. Performance ratings for these optional features were generally high, except for three programs (LED Accelerator, LodgingSavers, Boiler EE). However, these optional features received moderate importance scores, indicating that few participants critically need help in this area to pursue EE projects. Program implementers should therefore only consider improving their support with contractor identification and bid review if feasible in a cost-effective manner, but continue to prioritize other program services.

5.2.6 Participant Willingness-to-Pay Portion of Project in Free Programs

When savings are reduced, some programs need to reduce incentives to remain cost-effective. In some cases, this leads program implementers to require a co-pay from the customer, when they previously did not. The case studies included three programs that offered no-cost measures to some or all customers. The majority

of participants who did not pay for their project reported that they would be willing to cover a co-pay in the future. However, there is potential to over-estimate participants' willingness to pay due to cognitive dissonance bias because participants already find value in the upgrades and would contradict themselves by saying they would not pay for this value in the future.

The acceptance of a co-pay was highest among customers in the hospitality industry: In the LodgingSavers program, the majority of participants (23 of 35) surveyed already paid a co-pay, and 9 of the remaining 12 would be willing to pay a portion. We explored whether the co-pay versus free model had an impact on the program performance scores and did not find any correlation or differences among the groups.

In the School EE program, 6 out of 10 participants indicated a willingness to pay a portion of the direct install measure cost in the future, indicating a strong need for no-cost measures in this segment.

On the other hand, only half (51%) of the small and medium-size businesses participating in SDG&E's Direct Install program indicated that they would be willing to pay a portion of the cost for EE upgrades, indicating a stronger need for no-cost measures in this segment.

5.3 Management Effectiveness

This section explores IOU management approaches, methods for dealing with program cycles and funding the nature of the relationship between the IOUs and implementers, why nine programs stopped operating, and how programs responded to best practices from previous evaluations.

5.3.1 IOU Management Approaches

IOU Role in Program Implementation: Contract Management and Beyond

As contract managers for the 3P programs, the IOUs provide the following four main types of support to 3P implementers:

- **Management support:** All IOUs assign program managers to the 3P programs who serve as a point of contact for implementers and oversee program performance throughout the contract. The IOUs also monitor the energy savings potential for all their 3P programs and execute fund-shifts based on over- and underperformance. Changes in savings forecasts typically require contract amendments, whereas new measures only require program change forms. SCE further administers customer incentive payments for the program implementers.

- **Engineering review:** IOU engineers review the implementer's savings calculations for custom projects. For some programs, IOUs outsource parts of the review process. For example, PG&E works with an external reviewer to perform post-installation reviews in AERCx programs, and SCE outsources post-installation site inspections.

- **Customer identification and outreach:** Almost all 3P implementers work with IOU account executives to identify and reach out to prospective program participants. In PG&E's service territory, Energy Solutions & Services representatives assist programs that target small and medium-size businesses, which often do not have assigned account executives. However, only 8 of the 29 active programs rely heavily on the utility to generate project leads, as shown in Table 33.

- **Customer meter data:** PG&E and SCE provide retrocommissioning programs with customer interval data to enable remote building assessments. SDG&E provides its retrocommissioning program, as well

as its Direct Install program, with customer billing data. While PG&E transfers any meter data from eligible customers to the implementer, the other utilities do so only after a customer has signed up for the program.

While all of the IOUs conducted the management activities outlined above, 17 programs relied more heavily on the IOUs than other programs. Nine programs highlighted in the table below relied quite heavily on the IOU's account executives to find and refer participants to the program. For these nine programs, the implementer did minimal marketing on its own and relied on the IOU to generate leads. Further, eight programs, by design, used the IOU's usage data as part of the implementation process and relied on the IOU to provide these data. Of these, four programs also relied on IOU account executives to introduce them to the customer to make sure the customer knew that remote building assessments based on the customer's data was legitimate.

Table 33. Programs with Greater-than-Average Reliance on IOUs

Program	IOU	Relies on IOU for Most Project Leads	Relies on IOU for Customer Introductions	Analyzes Usage Data for Implementation
School EE	PG&E	Yes		
Energy Savers	PG&E	Yes		
Furniture Store EE	PG&E	Yes		
K-12 Private Schools	PG&E	Yes		
Enovity SMART	PG&E		Yes	Yes
Nexant AERCx	PG&E		Yes	Yes
RSG AERCx	PG&E		Yes	Yes
PECI AERCx	PG&E		Yes	Yes
Lincus WISE	PG&E			Yes
Air Care Plus	PG&E	Yes		
Boiler EE	PG&E	Yes		
Healthcare EE (SCE)	SCE	Yes		
Data Center EE	SCE	Yes		
School EE (SCE)	SCE	Yes		
Enhanced RCx	SCE			Yes
RCx (SDG&E)	SDG&E			Yes
Direct Install (SDG&E)	SDG&E			Yes
Total Program Count		**9**	**4**	**8**

Portfolio Management Approach

- The IOUs appear to be trying to minimize gaps and redundancies among the 3P programs.
  - **Monitoring performance and appropriating funds as needed:** As specified in Table 33, the IOU program management staff monitored the performance of the programs on a monthly basis in light of their energy saving achievements against their forecasts. The IOUs monitored this performance and strategized as needed to ensure that the entire portfolio of 3P programs achieved its energy saving commitments. Many of the programs underwent changes in the 2013–14 cycle based on the IOUs' ongoing monitoring of the programs. This monitoring helped the IOUs assess which

programs were underperforming and which ones had the potential to overperform. The IOUs then shifted resources accordingly where feasible (please refer to section 5.2.3 for a more-detailed discussion of reasons for missing energy savings goals). The IOUs increased funding to seven programs to allow for more energy savings. For example:

- PG&E's Furniture Store EE program built a large pipeline of participants and could increase its energy saving contribution with additional funds. PG&E therefore appropriated funds from other underperforming programs to increase the Furniture Store EE program's energy saving contribution to the 3P portfolio.
- SDG&E's RCx program received additional funds after generating higher-than-expected therm savings.

- **Consolidating programs to reduce redundancies between LGP Programs and 3P programs:** With the advent of LGP programs, many of the long-standing direct install programs started to experience some overlap in offerings. As such, some of the direct install programs are starting to merge with LGP programs to provide one seamless offering to the customer under one branded program name.
  - For example, PG&E's RightLights program has recently merged with the LGP named Energy Watch and will operate under the Energy Watch name going forward.
- **Setting geographic boundaries to avoid redundancies:** In cases where the IOU wanted to pilot new program ideas with multiple vendors, the IOU management set geographic zones for each vendor. For example, PG&E started four AERCx programs in its territory in 2013 all with similar designs and offerings.
- **Closing programs when needed:** The IOUs proposed to close nine programs. The evaluation team explored the circumstances surrounding closure (see Appendix A for detailed analysis). In summation:
  - Three programs closed due to market saturation; both the IOU and 3P implementer agreed that there were valid reasons for closure and that the programs had essentially run their course. In these three cases, the programs could not generate adequate savings due to competition from other programs.
  - Three programs closed in response to a regulatory or process change that affected the programs greatly such that they needed to close. Examples are where Title 24 or the loss of the Modified Lighting Calculator (MLC) significantly reduced program savings and these programs were not able to implement a redesign or expand their scope to make up the loss.
  - Two programs closed due to implementation issues, such as burdensome administrative requirements or misunderstandings due to insufficient communication.
  - One SCE program closed a bit too early and all parties are in agreement that it should continue again in some form. In this case, a new program implementer started in 2013 and was able to build a project pipeline but this was after the IOU staff had already filed to close the program. SCE staff thought that the process for re-opening a program was too onerous and instead opted for re-filing the program as a new one in the next program cycle.

Based on this review, it appears that the IOUs are instituting effective management practices to run cost-effective 3P programs that aim to fill distinct gaps in the marketplace. However, ongoing monitoring and reexamination of the market and its program options by the IOUs and the CPUC is needed since program options offered by the IOUs are always evolving. As such, upon review of program design elements and input from program implementation staff, we identified two 3P programs that are experiencing some competition from some non-3P programs offering similar options.

- PG&E's LED Accelerator program implementation staff mentioned that there is some customer confusion between which program to choose for LED lighting needs. There are some LGPs that offer incentives for some of the same measures as the LED Accelerator program, but the local governments are offering higher incentives per measure.

- PG&E Air Care Plus is a program that trains contractors to use software to diagnose HVAC equipment needs. It originated in 2006 and operated as PG&E's primary commercial HVAC offering until 2010, when the Commercial Quality Maintenance Program originated as a statewide effort implemented by CSG to transform the HVAC market. According to implementation staff, the program is now competing with the Quality Maintenance program for contractor mind-share and is noticing some customer confusion between the programs. As such, the implementer recommended that PG&E start to consider some consolidation of HVAC commercial programs. PG&E may have already identified this issue, as it closed this program midway through this evaluation in 2015.

5.3.2 3P Implementer Relationships with the IOUs

Program implementers described their relationship with IOU 3P staff as positive and collaborative. Many highlighted that IOU program managers actively assist the implementers as problems emerge. Implementers generally felt that they received sufficient notice of regulatory or programmatic changes, although they acknowledged that it takes time for information to "trickle down." However, implementers described the following challenges related to IOU organization and processes:

- **Interval data feed:** Comprehensive provision of quality interval data was the main challenge to PG&E's AERCx programs. The implementers noted that the data provision process was difficult to navigate and that the IOUs could lay out the process more clearly. PG&E acknowledged these issues and explained that the IOU does not have a team dedicated to smart meter data, which was a major barrier to a faster and more-structured data transfer.

- **Extensive IOU review processes:** While implementers acknowledged the importance of IOU project reviews, some noted that existing review processes are extensive and slow down project implementation. For example, custom projects in SCE's service territory require the utility's approval at three different stages, whereas PG&E approves projects twice (before and after installation). Some implementers explained that the IOU review delayed projects by several months. Several implementers of data-enabled retrocommissioning programs further highlighted that programs would run more cost-effectively if they could leverage interval data for verification instead of being subject to the same post-installation review and verification as non-data programs. Several customers in custom programs also mentioned long implementation time as an issue when asked how programs could improve in the future as part of the case study participant surveys. However, this did not seem to deter them from completing the participation process or affect their likelihood to recommend the program. It is unknown how much this process deterred non-participants.

5.3.3 Secondary Review Process for Custom Projects

As with deemed measure work papers, custom measures and projects are also subject to CPUC staff selection for review (referred to in this study as "Secondary Review Process" or SRP) by CPUC staff and their consultants (also known as the "ex ante team"). This review process began during the 2010–12 program cycle as ordered by D.11-07-030.[32] The secondary review process is associated with the CPUC's ex ante review process, the intent of which "is to evaluate the reasonableness of the IOUs' forecasted energy efficiency program savings."[33] The SRP was introduced after previous program evaluations frequently reported lower ex post evaluation results compared to ex ante. This new process was introduced to ensure that individual project applications comply with CPUC policies and Program Administrator program rules, in addition to ensuring that calculation methods and measurement and verification approaches are sound and provide realistic results. According to the ex ante team, they reviewed 2-3% of all custom commercial projects in 2013-2014 including the 3P and Core programs.

The intent of this review is ultimately to improve the program administrators' (which in this case are the IOUs) internal due diligence, as the IOUs review all custom project applications at several stages in the project (once upon application submission to determine if the project qualifies and once again with the final project specifications to approve the rebate amount). The secondary review focuses on identifying any potential issues related to savings calculation methodology; baseline assumptions; project incremental cost determination; free-ridership; CPUC policy; program administrator program rules; or pre- and post-installation evaluation, measurement, and verification (EM&V).[34] Although custom measures are expected to utilize methods and assumptions from DEER or work papers for the same measures, if available, the savings values are based on site-specific details and, when there are no related DEER or work paper measures, project-specific calculation methods and measurement and verification (M&V) are required. Decision D.11-07-030 Attachment B[35] details the adopted review process for custom projects and measures continued throughout 2013–14 as directed by Decision 12-11-015.[36]

The process requires the IOUs to submit a list of all custom projects on a bimonthly basis. The CPUC staff then selects projects for secondary review, which requires complete project information to be provided by the IOUs, including evidence or survey data used to support baseline assumptions plus calculation methods and M&V plans that will be used to support energy use estimates. Upon completion of the review, Commission staff issues project review findings that identifies issues regarding calculation methodology or M&V plans, baseline assumptions, free-ridership, and project incremental cost determination. After project completion, unless the CPUC waives the project from post-installation review, the IOU submits post-installation inspection reports, post-installation M&V data, final proposed savings calculations, and final project cost. The CPUC review disposition includes any issues regarding the post-installation data and calculations and may include adjusted final values for the project.

Implementers and IOU staff from four of 19 3P programs that offered custom measures reported that the secondary review posed a challenge to program implementation. This is not a new challenge in this program cycle. The previous evaluation of the 2010-2012 3P programs cited that "the project approval process (including Ex Ante Review) is one of the biggest issues facing 3P custom programs. The original, lower-rigor

[32] http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/139858.PDF.

[33] Ex Ante Review Fact Sheet #2. http://www.cpuc.ca.gov/NR/rdonlyres/CF097D75-8357-42A3-A164-D714143F9D88/0/ExAnteReviewFactSheet2Exanteprocess.pdf.

[34] CPUC Ex-Ante Review Fact Sheet #2, http://www.cpuc.ca.gov/NR/rdonlyres/CF097D75-8357-42A3-A164-D714143F9D88/0/ExAnteReviewFactSheet2Exanteprocess.pdf.

[35] http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/139860.PDF.

[36] http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M034/K299/34299795.PDF.

approach allowed 3Ps to spend less time on each project before the customer agreed to the project. Now, 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". When interviewed for this study, goth IOU staff and implementers cited the following challenges related to the secondary review process:

- **Time to complete the secondary review:** The secondary review process adds time to the custom project approval process, which delays projects for customers and can increase administrative costs.

- **Lack of communication and transparency throughout the process:** According to the IOUs and implementers, one of the main challenges is a lack of communication regarding the status of a secondary review and timeline expectations. If implementers do not know how long the secondary review process will last, they cannot effectively communicate with customers. This makes it difficult to manage customer expectations and installation contractors and balance other implementation processes. Several implementers also felt that the IOUs could communicate review requirements more proactively as decisions emerge or guidance changes because they are responsible for communicating policy directives to the implementers. The IOUs recognized this need: SDG&E has already taken on the task of placing dispositions in a database. They noted that the IOUs tend to notify implementers about EM&V rule changes only when they are going through the secondary review process themselves. The implementers highlighted that they could benefit from learning about other implementers' failings and from receiving new guidance from the CPUC directly. While the implementers may want direct communication with the CPUC on these issues, the implementers are under contract with the IOUs and it may not be appropriate for the implementers to have direct contact with the CPUC. However, these issues do seem to warrant more opportunities for frequent "information exchanges" across the IOUs and implementers on common issues that the CPUC is finding in the SRP and the lessons learned that need to be applied moving forward.

- **Uncertainty regarding custom project documentation requirements:** At the time of this evaluation, the IOUs and implementers did not think that they had a clear picture of the expectations or protocols for the secondary review process despite several checklists and guidance documents and that many of these parties experienced the process several times. Several implementers reported that existing guidelines for what information the IOU and CPUC require for pre- and post-engineering review reports is unclear. They explained that clear guidance—including a reporting template and/or guidance on the best engineering model to use—would provide clarity and efficiency to the reporting process.

Similarly, CPUC staff and review contractors experienced related challenges in the SRP.

- **Incomplete or missing documentation and supporting material delayed the secondary review and made scheduling reviews difficult:** The ex ante team reported that when they selected a project for secondary review, they rarely knew when project documentation would become available. When documentation was supplied, it was usually incomplete or inadequate to perform a review, thus leading to multiple requests for missing or supporting documentation. This led to problems in scheduling the review in a timely manner, as well as long review times from start to finish. The ex ante team thinks that the IOUs must implement better standards for required documentation and perform more internal reviews on custom projects to ensure that all documents are available before submitting information to the ex ante team.

- **A need for more communication throughout the review process:** Upon selecting a project for secondary review, the ex ante team reported that there was little communication from the IOUs or their implementers, on when the project documents would be available. Further, there was a lack of

communication to the ex ante team on when a project was complete and ready for review of post-installation information. This created scheduling issues and delayed the review process.

- **Unclear IOU internal review requirements and results:** The ex ante team reported that often it was unclear that any IOU internal review had been undertaken, what actions had been taken as a result of the IOU's review, and how the results of previous secondary reviews had been taken into account in the current project. Often the ex ante team found identical issues in past reviews that were communicated to the IOUs over a year prior. The ex ante team thinks that the IOUs need a better mechanism to ensure review issues and resolutions are disseminated across all relevant program activities.

While the secondary review process is critical to ensuring the reasonableness of the IOUs' forecasted energy efficiency program savings, it is also one of the main implementation and management challenges for the IOUs, implementers, and CPUC staff. In order for the process to run smoothly, the CPUC, IOUs and the implementers all need to have clear direction on what is required to support energy saving forecasts for custom projects. Since that documentation may evolve based on secondary review findings, it's important that clear communication channels are established amongst all parties to stay abreast of the iterative learnings and updated program rules. Many of the issues noted above relate to the length of time for the secondary review, communication issues among all parties involved, and a lack of clarity around documentation requirements as perceived by implementers. From the perspective of CPUC staff, the secondary review process can stall due to delays in the provision of requested data and if the submitted data do not provide sufficient information for the review. The implementers involved wish there was more transparency related to the status of each secondary review project, e.g., milestones, such as when the project is selected, when the IOU provides all required documentation, and when the ex ante team expects to provide results.

5.3.4 Methods to Deal with Program Cycles and Funding for a More Systematic Approach to More Flexible Contracting

Historically, program cycle times varied between 2 and 3 years. The CPUC's ruling from January 2014[37] changed the general framework and structure of program cycles for EE programs. As of 2016, programs in California's EE portfolio are subject to "rolling portfolios," which allow for longer-term cycles. Implementers generally welcomed this change toward longer program cycles to avoid program ramp-down unless necessary.

To provide additional insights that can guide IOU contracting within rolling portfolios, we asked 3P implementers about the ideal length of program cycles and found the following.

- Program cycle times between 2 and 3 years suffice for mature programs (programs that are not starting up for the first time) that offer only deemed measures.
- The majority of implementers who managed mature programs with custom and deemed measures (7 of the 11 active ones) described the past cycle times of 2–3 years as reasonable. They mostly preferred 3 over 2 years, as custom projects commonly face long implementation times. Some implementers who target the lodging and school sectors further noted that upgrades in these sectors are often only possible during times of low building occupancy, making 2-year contracts particularly challenging. Some implementers also noted that 2-year contracts are difficult when projects have long lead times.

[37] http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M085/K901/85901089.PDF.

- New programs that promote new technologies require more time to educate customers, build trust, and establish project pipelines for larger retrofits. All implementers of retrocommissioning programs felt that 2 years was not enough to promote a new technology and utilize interval data. Some suggested that program contracts should last at least 3 years, while others prefer up to 5 years. Implementers of other technology-focused programs, such as LED Accelerator and Lincus WISE, also recommended longer cycles lasting 4 years or more.

6. Overall Conclusions and Recommendations

This section provides the overall conclusions and recommendations for 3P programs based on the key findings presented in Section 5 and focused on the main research objectives of this study, which were to assess the value and effectiveness, implementation, and management of the 3P programs. This section also discusses the many findings that indicate that these programs are valuable and effective while also recognizing that there are multiple ways by which the programs can further maximize their value and effectiveness. Specific recommendations are highlighted in bold text throughout the sub-sections below.

6.1 Indicators of High Value

Below are indicators that the 3P programs provided value to the commercial market:

- The 3P programs in this study contributed sizable savings to the Commercial portfolio, generating 277 GWh, 0.05 GW, and 4,300 million therm savings during 2013–14. They accounted for 14% of all electric savings and 13% of all gas savings in the commercial portfolio of programs.
- By design, the programs provided value by serving multiple target markets and technologies with known hard-to-reach barriers to EE.
  - By design, the programs provided value by serving multiple target markets and technologies with known hard-to-reach barriers to EE. The literature review for 10 of the programs confirmed that customers in some of the key 3P program target markets lack the capital, knowledge, and personnel to complete energy efficiency projects.
  - Of the 38 programs in this study, 20 targeted specific vertical hard-to-reach markets, such as healthcare, education, tribal lands, and hospitality; the other 18 programs served commercial customers generally.
  - In terms of the technologies, the majority of programs focused on encouraging savings through long-established energy efficient products, such as lighting, boiler, refrigeration, HVAC, and standard retrocommissioning improvements. Nine of the programs were designed to provide value by helping jump-start new approaches to energy efficiency, such as helping large retail chain stores adopt the latest advances in LED technologies, using advanced interval data analytics to identify retrocommissioning opportunities, and facilitating new approaches to saving both water and energy among both commercial customers and large water pump stations. Additionally, 17 programs offered multiple EE measures to customers, indicating that the recommendation from the 2010-12 process evaluation to ensure a comprehensive measure mix is being implemented.
- The programs commonly offered technical assistance in addition to financial incentives. The technical assistance helped customers identify energy efficient opportunities, select projects and measures, determine the ROI, and in some cases directly install products. Technical assistance was provided above and beyond what was offered to the same customers through the IOU Core Commercial programs, which offered only incentives while the customer was responsible for all other aspects of the project. The programs varied slightly on what services they offered to customers, but most were a variation on the definition of technical assistance provided above. Some programs offered a set of core services to all customers, while others offered some optional services, such as assistance with finding and selecting contractors for projects. Research with participants in the 10 case study programs, which reflected the majority of the savings from 3P programs and most of the target markets

served, revealed that customers did need most of the programs' services to adopt energy efficiency. Case study participant surveys contained a set of questions that asked customers to rate their need for program features for them to adopt EE measures: Participants rated each program feature on a scale from 0 to 10, where 0 was "not needed at all" and 10 was "critically needed." The evaluation team used responses to these questions to calculate importance scores (based on average ratings) for each program feature and for the program overall. We used importance score to assess the program value. Participants gave mostly high scores of seven or higher, indicating that customers participating in the 3P programs critically need the 3P program services to pursue EE improvements.

- Across specific sectors, case study importance scores show that customers highly valued technical assistance in programs that target more-complex upgrades or newer technologies.
  - In the LED Accelerator program, which served large retail chain stores, participants needed the program's support with product recommendations and economic analyses and the program's expertise in LED technologies and how they are best applied in a large retail setting to most effectively illuminate products (importance scores ranged from 9.1 and 10 for these features).
  - Schools participating in the EnovitySMART program highly needed the program's recommendations, ROI analysis, and assistance with the upgrades (mean importance scores between 8.0 and 8.7).
  - Notably, in two programs serving healthcare in large retail chain sectors (Healthcare EE, LED Accelerator), customer importance scores for technical assistance services were consistently higher than the incentive scores, indicating that they needed technical assistance even more than incentives for energy efficient upgrades.
- For programs serving small and medium-size businesses broadly regardless of sector, case study importance scores show that no- or low-cost measures and direct install services were highly critical to help these customers install energy efficiency upgrades. Mean importance scores were 8.3 for the no- and low-cost measures in both programs, and participants rated their need for direct install services at 7.8 (RightLights) and 8.0 (SDG&E Direct Install).
- In the school sector, financial incentives or free measures were highly important to customers (PREPPS 7.3, School EE 9.9), highlighting the financial constraints it faces for energy efficient retrofits. Case study importance scores also show that schools highly valued the technical assistance for retrocommissioning services (8.0 to 8.7).
- For customers in the grocery sector, case study findings show that both incentives and technical assistance were critical to the adoption of more energy efficient refrigeration and lighting. Grocers commonly have complex refrigeration systems and operate with small profit margins of around 2%. They rated their need for rebates with 8.2 and their technical assistance features (product recommendations, economic analysis, sector expertise, project assistance) scores ranged from 7.5 to 8.3.

6.2 How Value Could Increase

Below we describe how the value of these programs could increase.

- In terms of program design, the case study importance scores can help assess the services offered to customers and determine whether they are all critically needed to help customers overcome barriers to energy efficiency. The programs should consider what is most valued to pursue EE upgrades in hard-to-reach markets to best cater to customers' needs.

  - For small and medium-size businesses, the no- or low-cost measures and direct install services are more critical than some of the technical assistance services (such as the audit) for the customer to pursue EE upgrades. Consistent with this finding, participants requested more product options when asked about other services that the program could offer to help them pursue energy efficient opportunities. Given these scores, the programs serving small and medium-size businesses with direct install and free/co-pay measures may want to consider expanding the program's measure mix. Although the audit received lower importance scores, it is needed for the program to assess the facility and to identify energy efficiency improvements; therefore, it is valuable to the program's implementation even if it may be of lesser value to the customer than free, direct install measures. As such, we do not recommend ceasing the audit service but instead **place less of an emphasis on the audit as a selling point to small and medium-size businesses in promotional efforts to prospective participants.**

  - For customers in the hospitality industry, case study importance scores indicate diverse market needs. More than half of the participants highly valued the rebate (64%) and technical assistance features (52% to 62% give scores of 7 or higher). However, the remaining participants gave low (0–3) or moderate (4–6) scores. The LodgingSavers program served very large hotel chains and smaller "mom and pop" hotels. The program also offered both direct install services and larger, customized retrofits. **These findings speak to the diverse nature of the program's current target market and suggest that better targeting may be needed to reach only those hospitality customers who would not pursue EE upgrades on their own without the program's technical assistance**.

  - Customers in the school sector expressed a mixed need for technical assistance. Schools highly valued the technical assistance related to retrocommissioning (6.4–8.7), and even suggested that further assistance and training in this area would be beneficial. However, schools that pursued retrofit measures through PREPPS or SCE's School EE program expressed only a moderate need for technical assistance (refer to Table 17). **Based on participant feedback regarding what services they need to pursue more EE improvements, it is clear that the programs could provide more value by expanding their measure mix with more outdoor lighting (particularly for stadiums and parking lots), LEDs, and hallway lighting.**

  - Customers in the healthcare sector had polarized views on the importance of the rebate. The Healthcare EE program had only eight participants and only five of them responded to the case study participant survey, so the information is limited to only a few customers representing this sector. However, **given the polarized view on the importance of the rebate, the program may consider whether it should emphasize technical assistance more than rebates to the healthcare sector.**

  - Commercial customers upgrading boiler systems indicated only a moderate need for rebates and technical assistance. The program generated the highest gas savings and the second highest energy savings (measured in BTU) across all programs in the study. **However, moderate importance scores (4.4–6.7) for Core program features and low cost-effectiveness (TRC of 0.64) raise the question of whether the rebate offered through PG&E's Core program would adequately address the market need. A closer look at case study importance scores suggests that a rebate may be sufficient to some customers (about half give low or moderate scores for technical**

assistance), but the majority still highly valued the program features, including the audit, the economic analysis, or the project assistance. These data support the implementer's claim that many customers lack the knowledge to reveal and assess energy savings from their boiler systems; thus, better targeting may be needed to identify these customers who need the assistance of a 3P program implementer.

- There was limited value to helping customers find and select contractors. Many non-direct install programs offered this service if customers requested it. The uptake of these optional services was low in most programs (below 50%, except for Healthcare EE and EnergySmart Grocer). Additionally, customers who received assistance with contractors expressed mixed opinions about the importance of these features to help pursue energy efficiency upgrades (scores of 5.2 or lower). However, there were a few participants who highly valued these services to move forward with the energy efficiency upgrade. This suggests that the programs' strategy to offer optional contractor bid review and identification is appropriate. The cost to provide these services as needed is likely quite low and therefore can be continued.

- The majority of 3P Commercial programs targeted hard-to-reach markets with established technologies (29 of 38). While these programs generated the bulk (93%) of combined savings (BTU) in the 2013–14 cycle, the 3P programs were also intended as a vehicle to enable more innovation. **The IOUs should seek ways by which they can encourage more innovative program designs in 3P through its IDEEA 365 solicitation process. One way to do this may be to start better coordination with the Emerging Technologies Program (ETP) throughout the program solicitation process. Frequent meetings with the ETP program could begin a process whereby promising new technologies are further accelerated into the market via the third party program vehicle. Annual "idea-exchange" forums could also provide an opportunity for program designers, IOUs, the CPUC and ETP staff to come together to "pitch" new program and technology ideas for consideration prior to the formal IDEEA program proposal submittal process.**

- **Consider maximizing program value based on some of the customers' input from case studies regarding what the programs could further offer to help them save energy**:

  - While most customers described the program design of 3P programs as sufficient, they commonly recommended including more eligible EE products. Although program implementation staff described adding measures as feasible, such changes require careful review by the IOUs and CPUC to balance any changes with cost-effectiveness requirements and to limit potential overlap with other programs.

  - Some customers requested more communication about energy saving opportunities and benchmarking to other businesses (mentioned by customers in school programs and the Boiler EE program). This may include information on post-retrofit energy usage and further energy savings potential, and may be indicative of customers realizing the benefits of energy efficiency investments. However, such additional program features may impinge on the program's cost-effectiveness and may only be feasible if they require little investment from implementation staff.

  - Customers participating in the Enovity SMART analytics-enabled retrocommissioning program mentioned that they would benefit from additional training or assistance to troubleshoot and continue optimization post-installation. Enovity SMART already offers six months of post-project monitoring and could use this monitoring service as a way to further train customers.

  - A few participants in the LED Accelerator program wanted more guidance from implementation staff when developing the project scope. Two of 11 participants reported that they struggled to

provide the requested information on existing lighting and the planned retrofit (type, wattage, quantity, usage, envisaged LED models and brands). A comparison of mean importance and performance scores further supports this finding: Program features related to product recommendations, economic analysis, and sector expertise underperformed slightly in comparison to participants' need in these areas (−0.6, −1.1, −1.2, respectively). The program could increase value by offering better technical assistance to customers in the project scoping stage, as the current approach requires that customers have technical knowledge of which LED measures they want to pursue.

- **Ensure that the program technologies and sectors align with where the energy saving potential exists.** These programs were providing great value if they obtained cost-effective net energy savings in technologies or sectors with the most energy saving potential. In the future, the IOUs, and the working group should consider the latest findings from Navigant's Potential Study[38] when deciding what programs to keep, what programs to drop, and what new programs to launch.

6.3 Indicators That Programs Are Implemented Effectively

Below we describe indicators that demonstrate that the programs were implemented effectively.

- The majority of programs passed the TRC cost-effectiveness test: Almost two-thirds (24 of 38) of the programs were cost-effective, with net TRC above 1.0. Programs with the following characteristics tended to be more cost-effective: Direct Install programs, deemed measure programs, and those with at least four years of implementation time.

- IOUs and implementers set mostly achievable forecasts: New programs launched in 2013 or 2014 did not typically set savings forecasts or fell short of forecasts given the need for ramp-up time. Among the Legacy programs that did not close in 2013–14, almost all (19 of 24) came close to or exceeded forecasts. Only five of these programs fell significantly short (less than 70%) of spending or combined electric and gas savings forecasts. These programs did not have set savings forecasts for their ramp-up period, which is consistent with the previous evaluation's recommendation to give program's time to ramp-up before tying program contracts to performance metrics such as energy savings.

- Participants gave the implementers very high performance scores: The case studies found that participants gave high performance scores for all program features, ranging from 7.8 to 10.0, and almost all participants would recommend the program to other businesses, indicating that the implementers were effectively meeting customer expectations.

- The programs were targeting facilities that were ready for EE upgrades. Among the programs where conversion rates were available, the case studies show that the programs converted at least one in two facility audits to EE projects. For five case study programs, the conversion rate was 67% or higher. This is an indicator that the programs were targeting customers in need and not spending a lot of resources on customers who may not convert to a project. However, this finding is based on the limited number of programs that could provide this information and, therefore, conversion rate data tracking is also cited in the next section, where we discuss whose implementation could improve.

[38] Navigant Consulting, Inc, 2015. Energy Efficiency Potential and Goals Study for 2015 and Beyond. Stage 1 Final Report. Accessed through http://www.cpuc.ca.gov/General.aspx?id=2013

6.4 How Implementation Could Improve

- **Consider more systematic referrals to other EE programs:** According to program implementation staff, about one-third (10 of 29) of the active programs did not refer their participants to other IOU programs. The remaining implementers did not have formal referral processes, but mentioned Core programs and on-bill financing to participants or IOU Account Executives as they saw fit. Only a few also mentioned DR programs or other 3P programs. Having few referrals is not surprising; implementers had little incentive to refer customers because they operated under pay-for-performance contracts and focused on participation in their own programs. To maximize energy savings from hard-to-reach customers in the commercial sector, the IOUs should therefore consider a process that supports or incentivizes referrals to other energy efficiency programs. One way to overcome this disincentive is to centralize EE program information in one statewide website that provides easy access to EE program information for commercial customers, perhaps as part of the Energy Upgrade CA statewide marketing initiative. Another way may be to build a requirement to provide referrals to the appropriate Core programs into the contract between the IOU and implementer.

- While customer satisfaction with program implementation was high in the case studies, a few participants experienced issues with measure installation and product quality. **Programs should enhance quality control processes for these case study programs.**

  - RightLights: In this Direct Install program for small and medium-size businesses, a few participants (6 of 64) reported that the lighting products did not work at first (3), that they experienced scheduling issues (2), and that they were dissatisfied with the installation contractor (program implementer) more broadly (2).

  - Direct Install (SDG&E): In this Direct Install program for small and medium-size businesses, a small number of participants (6 of 72) highlighted diverse issues. Most commonly, they complained about incomplete measure installations because the implementer did not directly install thermostats. Additionally, individuals pointed to the lack of a designated program contact and slow responsiveness to customer inquiries.

  - LodgingSaver: A few participants (3 of 35) experienced issues with the contractor's work: One pointed to scheduling issues and another participant noted quality issues with lighting products.

  - Boiler EE: Two of 18 participants highlighted contractor issues, including difficulties finding a contractor and communicating effectively throughout the measure installation.

- **For school programs, the electric saving programs offering lighting retrofits need to ensure that lighting output is enough for classroom activities and should attempt to tailor audits to schools as much as possible.** One participant noted issues with the lighting output in classrooms. In addition, one School EE program participant in the case studies noted that the audit could take into account the specific school size, age, and classroom sizes. **Further, the program needs to ensure that all lighting opportunities are covered in the audit and recommended measures**, as one participant said that the implementer missed some opportunities initially but later rectified them.

  - For PREPPS, a gas saving program that does not directly install measures, customers indicated that implementation could improve if the program offered a larger list of potential contractors/vendors and more information on what other districts are doing to save energy.

- **The programs should include O&M savings opportunities where possible**. Programs serving the healthcare sector with comprehensive building audits, and perhaps all programs offering comprehensive building audits, should cover both O&M procedures in energy saving recommendations in addition to retrofit recommendations. One customer in the Healthcare EE program selected for case study analysis mentioned this oversight but said it was later rectified. All comprehensive audit programs should ensure that they are accounting for O&M savings opportunities throughout the audit process.

- **PG&E should improve interval data transmission for AERCx programs**. Program implementation staff of all AERCx programs experienced issues with data provision. The implementers noted that the data provision process was difficult to navigate and that the IOUs could lay out the process more clearly. PG&E, as the only IOU administering these programs, acknowledged these issues and explained that the IOU does not have a team dedicated to smart meter data, which is causing a major barrier to a faster and more structured data transmission to vendors.

- **Ensure that processes and program rules are documented to allow for onboarding new staff and minimize staff turnover for highly specialized markets**. Some of these programs require specific areas of expertise with a given sector or technology to implement effectively, and one staff change at an implementer can cause major program disruption. For example, in the Data Centers program, the implementer lost its program manager and the program stalled for almost 12 months while it searched for a replacement. The search was extensive and time-consuming since data center expertise is rare. Also, in the closed program analysis, we found that insufficient communication between newly appointed IOU staff and the program implementer in the MBPCx Program led to adverse consequences that ultimately led to program closure. A formal onboarding process for the new IOU staff, or a process that facilitates the transfer of knowledge from prior IOU staff to new IOU staff (incidentally, one of the HMG 2010–12 best practice recommendations), could have helped the new IOU staff better understand the program rules. Including the implementer during this onboarding process, such as having the new team discuss a predetermined set of topic areas, could have prevented misunderstandings well in advance and ultimately prevented program closure.

- **The programs should adopt tracking systems that allow for easy reporting on conversion rates**. Three of 10 case study programs did not track the necessary data to calculate a conversion rate from audits to completed projects. Collecting these data as part of the program databases would allow program staff and evaluators to identify inefficiencies and potential implementation issues.

6.5 Indicators That Programs Are Managed Well

The following are indicators that the programs are managed effectively.

- The IOUs have a coordinated and regulated approach to soliciting new programs and closing current programs. The IOUs jointly developed scorecards for the solicitations of IDEEA 365 programs and reported positive experiences with the solicitation process thus far. The decisions to close programs is coordinated among implementers, the IOUs, and the CPUC.

- There is reasonable justification for closing most programs. The IOUs proposed to close nine 3P Commercial programs during 2013 and 2014. Three programs closed due to market saturation, three programs closed because they could no longer be cost-effective after Title 24 baseline code changes, and two programs closed due to implementation issues. Only one of the closed programs (EE for Entertainment Centers) had the potential to remain active from the perspectives of IOU and implementation staff. This program had a slow ramp-up after a new implementer took over in the

2013-14 program cycle, but was able to build a project pipeline after the IOU had filed for program closure. However, program staff determined that it was easier, administratively, to close and re-open the program in the new program cycle. While justification is mostly reasonable after analyzing program closures (See Appendix A), there are many ways by which this process can be improved and is touched upon in the next section.

- The IOUs monitored program performance and pipelines on a monthly basis and appropriated funds as needed to balance their portfolios. The IOUs monitor program performance and strategize as needed to ensure that the entire portfolio of 3P programs achieves its energy saving commitments by reallocating resources across programs as needed. For example, the IOUs increased funding for seven programs during 2013–14 to allow for more energy savings.

- There is a positive relationship between the IOUs and program implementation staff: Program implementers described their relationship with IOU 3P staff as positive and collaborative. Many highlighted that IOU program managers actively assist the implementers as problems emerge. Implementers generally felt that they received sufficient notice of regulatory or programmatic changes.

6.6 How Management Could Improve

- **Consider ways to disseminate policy changes mid-cycle that affect claimable savings in a way that minimizes program operations and administrative costs to the extent possible.**

- **Allow contract periods of 2–3 implementation years for mature programs and up to 5 years for newer programs to allow sufficient time to build project pipelines and realize savings.** Historically, program cycle times varied between 2 and 3 years. Most implementers of mature programs described this cycle time as reasonable but generally preferred 3 over 2 years, as custom projects commonly face long implementation times. However, according to implementation staff, new programs or programs promoting new technologies require more time to educate customers, build trust, and establish project pipelines for larger retrofits. They suggested that contracts should last at least 3 years or up to 5 years for these programs. In addition, experience with the IDEEA 365 programs has shown that 1–2 years is not enough time to determine performance or value. While IOUs are still in the process of planning for rolling out energy efficiency portfolios, consider allowing longer program cycles to provide a cushion for program ramp-up.

- The secondary review process is one of the main implementation and management challenges for the IOUs, implementers, and CPUC staff. Many of the issues relate to the length of time for the secondary review, communication issues among all parties involved, and a lack of clarity around documentation requirements as perceived by implementers. While the previous evaluation recommended streamlining and simplifying the application process for these programs, the introduction of the secondary review process somewhat conflicts with this directive by adding more complexity. From the perspective of CPUC staff, the secondary review process can stall due to delays in the provision of requested data and if the submitted data do not provide sufficient information for the review. All parties involved wish there was more transparency related to the status of each secondary review project, e.g., milestones such as when the project is selected, when the IOU provides all required documentation, and when the ex ante team expects to provide results. Given the large number of program administrators (four IOUs), implementation companies (10), and individual programs (38), there are many staff involved in ensuring effective implementation of this process. Given the sheer volume of staff involved in implementation, it is important to have clear and well-documented program rules regarding the review process protocols and custom project documentation requirements. We recommend the following to address these issues:

- **Develop a communication tool to help all parties understand the status of and next steps for each project selected for secondary review.**
- **Enhance IOU reviews of custom applications in 3P programs in light of the issues that the ex ante team is finding in the secondary review process to ensure that projects are following CPUC policy and program rules.**
  - **The IOUs need to develop a standardized report format for the minimum required information for each custom project.** This would also help educate the implementers on what data to collect and submit for all custom projects.
- **Provide more opportunities for frequent "information exchanges" between IOUs and implementers to discuss common review issues so that implementers can incorporate lessons learned moving forward.**
  - Implementers should learn from secondary review outcomes and apply them to future projects. The ex ante team cited that most of the secondary review projects are repeat cases with the same 3P implementer and that the results of subsequent reviews are often identical to previous reviews, indicating that the implementers are not applying the results to subsequent projects.
  - IOUs need to better communicate claimed savings changes and directives coming from dispositions and secondary review outcomes proactively to the implementers.
- **The IOUs need to consistently interpret and apply directives from the secondary review process across all programs.** In two closed programs, PG&E's interpreted outcomes of the secondary review process as requiring programs to cease using the Modified Lighting Calculator (MLC). However, in other PG&E programs in this study that have not closed, use of the MLC was allowed and contributed to program success (e.g., RightLights, Casino Green). It is unclear why some 3P programs were allowed to use the MLC while others were told they could not.

- **Consider whether the timing for filing program closures is sufficient.** At SCE the lead time to file an advice letter for program closure appears to be six to nine months before the end of a program cycle, which forces the IOU to make a determination on closure only about halfway through the program cycle when a program may still be ramping up. A decision-making window that occurs closer to the end of the program cycle would give programs more time to show results, especially in new programs, programs that drastically change implementation mid-cycle or programs that have projects with long lead times. It is unclear if the filing time to close programs is of similar length for the other three IOUs.
- **Consider some improvements to the program revival process.** If an IOU wishes to bring back a program that has been closed, the administrative requirements and resources necessary to see this through are especially burdensome. In the case of SCE and its EE for Entertainment Centers Program, they were burdensome enough that SCE preferred to tell implementers to reapply as a new program rather than restore a closed program. This delays programs and associated energy savings as implementers must wait for a new solicitation to apply and receive approval before moving forward. If there is interest in bringing back programs that may have been inadvertently or unintentionally closed, the process to restore a closed program should be streamlined.
- **Consider whether some program participant requirements are appropriate for innovative programs.** With new business models and innovative technologies emerging in IOU energy programs, it may be time to assess whether administrative requirements put in place for existing, largely retrofit programs,

are appropriate for virtual energy saving technologies. The SaveGas Program example of requiring the implementer to obtain a contractor's license for installing virtual software is a case where existing regulatory requirements designed for traditional retrofit programs may in fact be discouraging new technologies and new ways of saving energy. These requirements may need to be reviewed, or exceptions made where appropriate, if IOU programs are to continue to encourage new, innovative programs and technologies that may not fit into traditional definitions of energy efficiency programs.

Finally, as part of this study, the evaluation team reviewed some of the Best Practice recommendations from Heschong Mahone Group's (HMG) 2010–12 3rd Party Commercial Resource Program Needs Assessment[39] against the findings from this study. Many of the best practices have been addressed or partially addressed but others have not been implemented for various reasons stated in Table 34 below. Some best practices may be in conflict with some of the policy directives for these programs, for example the implementers are challenged with streamlining and simplifying the project approval and participation processes due to program rules requiring multiple check—points and requirements from multiple parties. Several of these Best Practices speak to a much larger overhaul of how these programs are administered instead of specific changes that the IOUs or implementers could make to a specific program. The table summarizes the key best practice recommendations from the previous report, the status of each, and our assessment of whether that recommendation has been addressed or is still outstanding. Further details on these past recommendations can be found in Appendix B.

[39] Heschong Mahone Group, 2013: California Nonresidential Program Assessments Study. Third Party Commercial Resource Program Group Report. Program Years 2010–2012.

Table 34. Status of Previous Evaluation's Best Practice Recommendations

2010-2012 Best Practice Recommendation	2013–14 Status Based on 3P Value & Effectiveness Study Findings	Overall Conclusion
Allow new programs to ramp up before requiring energy savings performance	Several of the newer programs in this cycle did not have set forecasts or forecasts for savings indicating that programs were given funds to ramp up and build a pipeline.	Is being addressed
Offer a Comprehensive Measure Mix	We see a good number of multi-measure programs in this program cycle. Some programs are comprehensive while others are not due to specific design/program forecasts and because by definition, they are trying to fill a "gap" in the market that the Core programs are not addressing.	Is being addressed
Streamline the Program Management Structure by using in-house	The majority of implementers claim they are using in-house staff.	Is being addressed
Maximize Net Program Savings	The ex ante team's efforts in relation to these programs are designed, in part, to maximize net program savings. Industry standard practices are still a point of contention between the parties involved.	Is being addressed
Leverage utility credibility to help sell programs	In all but one case 3Ps are leveraging utility credibility to market their programs.	Is being addressed
Leverage partnerships with community-based organizations, trade groups and Industry Associations	Only some programs marketed to trade associations; in most cases this was either not possible (i.e., no associations for that particular segment) or not needed, as existing marketing efforts were sufficient in building a project pipeline.	Is being addressed
Have program focus flexibility to allow to changing market conditions	Having multiple programs focusing on different sectors and measure types coupled with frequent assessments of program performance throughout the cycle and reallocating resources as needed in response to market conditions indicate that as a portfolio, the 3P programs had the flexibility to adapt to market conditions. However, individual programs do not necessarily have flexibility as several closed because they could not produce savings based on new market conditions such as Title 24.	Partially addressed
Use a Well-Qualified Engineering Staff	The implementers and the IOUs think they are assigned well-qualified engineering staff. However, opportunities still exist to ensure that all engineers across all parties align on calculation methods and documentation to support savings claims for custom projects.	Partially addressed
Use Electronic Project Management Tools	The previous study found all 3P programs in compliance with this. Programs are still using some form of electronic management tool. Some programs could improve by starting to track conversion rates.	Partially addressed

2010-2012 Best Practice Recommendation	2013–14 Status Based on 3P Value & Effectiveness Study Findings	Overall Conclusion
Maintain Consistency in Personnel Over Time with Both the IOU and Third Party Staff	Experience levels vary across the IOU and implementer. Several IOU PMs were relatively new to their position at the time of interviews indicating that consistency is still a best practice to strive for while recognizing that staff turnover is inevitable across a vast number of PAs and implementers.	Partially addressed
Encourage Cross Promotion	The IOUs claim all program information and contacts are available on their websites. Many implementers refer customers to other programs on an ad hoc basis. Some reported that because there is no incentive for 3Ps or IOUs to cross promote, current activities are limited.	Partially addressed
Inform Product Development/Work with manufacturers to drive product improvement & advancement	Only a handful of programs reported working with manufacturers to drive product advancement; most programs did not work directly with manufacturers to do this. Working with manufacturers is not necessarily applicable to most 3P programs.	Partially addressed
Integrate All Program Data into a Single Database	The CPUC database, managed through Itron, for all energy efficiency program is a central repository for all programs. Several 3P program implementers still need to develop one tracking database for all audits and projects so they can easily track and report on a conversion rate.	Partially addressed
Hire Experienced Program Management & Reduce staff turnover	Experience levels vary across the IOU and implementer. This is something everyone strives for. One program, Data Centers, froze the program for almost 12 months while it actively searched for a qualified PM. Several IOU PMs were relatively new to their position at the time of interviews indicating that this is still a best practice to strive for while recognizing that staff turnover is inevitable across a vast number of PAs and implementers.	Partially addressed
Provide a Single Point of Contact for customers with comprehensive program offerings offered for their sector, especially for statewide chain businesses	Some customers do have a single-point of contact in account representatives but smaller customers do not. This BP speaks to have one PA implement a statewide program who is able to offer one point of contact for specific sectors. Acting upon this recommendation would require a major shift from how these programs are currently administered and delivered throughout the state.	Not acted upon yet
Minimize changes mid-cycle that impact contracts	Changes occurred mid-cycle and some programs were closed due to cost-effectiveness concerns. While all parties understand there are costs involved in changing program requirements, no compensation was given to cover the cost of compliance. Therefore, this recommendation was not acted upon. The decision to give compensation for this in the future is a policy decision.	Not acted upon yet

2010-2012 Best Practice Recommendation	2013–14 Status Based on 3P Value & Effectiveness Study Findings	Overall Conclusion
Program Qualification Changes: Avoid mid-cycle program policy changes or allow a grace period if changes are necessary	Mid-cycle program policy changes still occurred in this cycle and no grace period was given. This is a policy issue.	Not acted upon yet
Facilitate IOU – Implementer Communication/ Develop and maintain clear lines of responsibility and communication with the IOUs	Communication is mostly good but needs to improve to better facilitate the custom and secondary review processes amongst all parties involved.	Not acted upon yet
Provide Education on Regulatory Process/Keep 3rd Party Implementers well informed about program features and changes through seminars, training sessions and annual meetings of key groups	There are still gaps in knowledge on what is required to justify energy saving claims for custom measures. More coordination, communication and collaboration is still needed.	Not acted upon yet
Minimize Documentation Requirements	A little over half of programs reported some issue with reporting requirements, albeit minor issues. One 3P reported that IOU program tracking would lose projects and these were not discovered until weeks later. A few other 3Ps felt that there were too many reporting tools. Others lamented over last minute audit requests, unclear guidelines, or difficulties obtaining customer data.	Not acted upon yet
Articulate the Data Requirements Needed to Measure Success	The IOUs still need to improve in this area to help the implementers comply with all policy and program rules at the start of the contract.	Not acted upon yet
Streamline or simplify the project approval/ participation process	The new secondary review process in this program cycle conflicted with this best practice recommendation of streamlining the application and project approval process as it added layers of review. This is a challenging one to address as simplifying participation is at odds with the other policy objective of ensuring reliable net savings.	Not acted upon yet

7. Study Limitations

The following are some limitations to the study findings:

- The evaluation scope for this study originally planned to include findings from Itron's 2013–14 Comprehensiveness Analysis Research to help answer these questions:

    a. How much channeling actually occurs between the 3P Commercial and Core programs? That is, what customers participate in both 3P Commercial and Core/SW programs and to what degree?

    b. Does the type of 3P Commercial program make a difference in terms of deeper savings?

  The comprehensiveness research was delayed at the time of this reporting and may offer additional insights into the 3P programs. Itron currently expects to deliver draft findings in June 2016.

- PG&E did not respond to requests regarding how the 3P portfolio overall is managed and how programs are selected. Responses from other IOUs were similar indicating that PG&E may follow the same process but this is not confirmed.

- The case studies include surveys with participants but did not survey non-participants or drop-outs. Research with program drop-outs could illuminate further implementation and management issues than those mentioned by participating customers.

- We conducted this evaluation in accordance with the California Energy Efficiency Evaluation Protocols for process evaluation.[40] Given the varying nature of the 38 programs, we cannot extrapolate the findings from the case studies to the entire population of 3P programs. However, some of the information collected via case studies may be relevant to a few other programs that either reach the same sector or have the same delivery model. For example, the two school programs recommended for case studies may reveal findings that are relevant to the other nine school-focused programs that were not selected for case studies. Conversely, the information collected from three Direct Install[41] delivery model programs may reveal relevant findings to other five Direct Install programs that were not selected for case studies.

- Participant survey results have some biases even though steps were taken to mitigate them.

    - Reliability, Bias, and Uncertainty: There are a number of potential biases and threats to validity of survey research. The evaluation team took following steps throughout survey planning and implementation to mitigate these issues including sampling error, measurement error, and non-response bias.

        - **Sampling error**: Sampling error occurs when we estimate statistical characteristics of a population from a subset or sample of that population. Given we used a census approach for eight of the case studies, the potential for sampling error only applied to the survey results of two case studies; the Direct Install program and the RightLights program. To mitigate sampling

[40] TecMarket Works. 2006. California Energy Efficiency Evaluation Protocols: Technical, Methodological and Reporting Requirements for Evaluation Professionals.

[41] We define direct Install programs as programs in which the implementer installs the energy efficient measures, opposed to using a subcontractor. Notably, PG&E categorizes their Energy Savers program as a direct install program. However, we do not classify it as such for this study since the implementer revealed that their staff does not directly install the measures.

error in these surveys, the evaluation team designed the sample to achieve the 90/10 criteria as an industry convention. At the 90% confidence level, we achieved precision of +/- 10% assuming a coefficient of variation of 0.5. The actual precision of each survey question differed depending on the variance of responses to each question.

- **Measurement error**: To address measurement error, we carefully designed and reviewed all surveys to assure that our instruments are both reliable and valid. We reviewed questions to assure that double-barrel questions (i.e., questions that ask about two subjects, but with only one response) and "loaded" questions (i.e., questions that are slanted one way or the other) are not asked. Where multiple items are provided for in the value and performance battery, their order was randomly changed. In addition, draft survey instruments and analysis plans were shared with the CPUC and the PCG, and approved by the CPUC before fielding. To determine if the wording of the questions was clear and unambiguous, we pre-tested each survey instrument and reviewed the pre-test survey data. During the pre-tests, we checked that the overall interview flow did not confuse respondents and thereby decrease reliability. Lastly, we utilized experienced interview staff from the Opinion Dynamics phone bank or analyst staff pool.

- **Non-response bias:** Given that we did not interview all program participants, there is the potential for non-response bias. We attempted to mitigate possible bias by calling each potential respondent several times unless the respondent refused to participate, the participant was no longer with the company, or the phone number from the tracking data was deemed ineligible and an online search did not identify alternative numbers to call. In addition, we provided participants with flexible interview times both during or after business hours.

- **Recollection bias**: Given that we interviewed customers about their program participation in 2013 or 2014, there is the potential for recollection bias that would reduce the validity of participant responses. To mitigate this error, we trained interviewers prior to conducting the survey, and provided them with detailed prompts in case the respondent asks questions about the program. We also omitted interviews from the analysis if the respondent could not recall any program features offered by the program. This occurred in two instances, once for the Boiler Energy Efficiency Program, and once for Lodging Savers.

Appendix A. Program Closure Findings

Program Closure Decision Making

The evaluation team explored the circumstances surrounding closure of nine 3P programs in the 2013–14 cycle. In all cases but two, programs closed because they could not generate adequate savings. In an effort to look into the reasons why this occurred, the team collected data from three sources: The Advice Letter that officially closed the program, an interview with the IOU Program Manager, and an interview with the 3P Implementer. From these data collection efforts, the evaluation team was able to characterize closure into four general categories.

Table 35. Types of Program Closure

Type	Description	# of Programs
Market Saturation	Agreement on Closure; Other Programs Are Meeting Demand	3
Should Have Been Kept Open	Agreement that program should not have closed	1
Implementation Issue	An implementation issue led to closure	2
Regulatory Issue	A regulatory or process change led to closure	3

Programs with a grey box labeled "Market Saturation" are programs where both the IOU and 3P implementer agreed that there were valid reasons for closure and that the programs had essentially run their course. In these three cases, the programs could not generate adequate savings due to competition from other programs.

Programs with an orange box labeled "Should Have Been Kept Open" are programs that both the IOU and 3P agreed should not have been closed. There is one program that met this criterion. In this case, filing to close the program occurred before the program realized success.

Programs with a yellow box labeled "Implementation Issue" are those that closed because of an implementation issue such as burdensome administrative requirements or misunderstandings due to insufficient communication. Two programs met this criterion.

Programs with a green box labeled "Regulatory Issue" are those where a regulatory issue, whether it be a mid-cycle change or decision as a result of a regulatory change, affected the program in such a way that led to its closure. Examples are where Title 24 or the loss of the MLC significantly reduced program savings and these programs were not able to implement a redesign or expand their scope to make up the loss. Three programs met this criterion.

These characterizations carry through to Table 36, which present each program along with the circumstances surrounding closure as reported by each source. Table 36 also presents the evaluation team's conclusion as to why the program ultimately closed, including whether there was any disagreement between the IOU and 3P implementer on whether the program should have closed. Closure type for each program is indicated by color on the far right.

Table 36. Circumstances Surrounding Closure

Program	Circumstances	Reason for Closure	
Monitoring-Based Commissioning (MBCx) PGE210120 2010–2014 3P: EnerNOC	Advice Letter (AL): Program was still completing projects that began in the prior cycle and was not able to develop a pipeline of new projects for 2013–14. IOU: Customers preferred this program to Core as its participation process was easier, however they were wary of the technology as it had to be installed at hundreds of points in a building, posing a security or system interference concern. 3P: Developing a project pipeline was difficult due to limited customer demand, challenging regulatory requirements, and the hassle of navigating split incentives.	Program could not generate a robust pipeline to deliver expected savings. IOU-3P agreement on closure. Valid reason for closure.	Market Saturation
Enhanced Automation Initiative PGE21019 2004–2014 3P: DNV-GL	AL: Program delivered 0% of its MWh savings forecasts and 36% of its MW savings forecasts in 2013. Program was innovative at inception but growing market saturation and increased competition in the building controls sector has reduced the program's effectiveness. IOU: A much more mature market meant the program is no longer "the only game in town." Customers can choose from a multitude of other options or programs for such measures. 3P: Implementer was surprised program was closed, but cites several reasons for the low savings and pipeline, including: inflexibility to broaden the program scope, high cost of extensive engineering requirements, and changes to claimable savings from Title 24.	Low savings; program ran its course. Market need is being met elsewhere. IOU-3P disagreement on reasons for closure, however, valid reason to close.	Market Saturation
Ozone Laundry PGE210124 2010–2014 3P: Willdan	AL: Program delivered 29% of its forecast in 2013. Active program vendors in 2010–12 have since left the area and the technology offered through the program is already available through two other deemed programs. IOU: Same as AL. Also that the technology was still facing distrust by consumers because of earlier issues with it. 3P: Initiated closure because could not meet savings forecasts. The main reason was because the technology was offered as a deemed rebate in other programs, whereas the custom process of this program made participation more time consuming and onerous.	Low savings and competition from other programs. IOU-3P agreement on closure. Valid reason for closure.	Market Saturation

Program	Circumstances	Reason for Closure	
Monitoring-Based Persistence Commissioning (MBPCx) PGE210110 2009–2014 3P: Enovity	AL: Implementer oversubscribed program which put them out of compliance with contract. IOU: Same as AL. Project pipeline of $14 million in commitments was developed for a program budget of $2 million, putting customers and program at high risk. Furthermore, the Core MBPCx Program could address this market without such risk. 3P: Acknowledges large pipeline but explains that program had a new IOU PM this cycle and previously the program regularly received additional funding if greater demand was generated. Attributes result to insufficient communication between parties.	Over-subscribed program risky to IOU. IOU-3P disagreement on closure. 3P believes program was successful. Unclear if Core can generate same level of interest.	Implementation Issue
SaveGas 2007–2014 SCG3766 3P: EDC Technologies	AL: Reports that the 3P requested closure claiming the hospitality market is already saturated with the technology IOU: Same as AL. Also suggested to the 3P that they expand program offerings to other technologies, but explains that the 3P was not interested in doing so. 3P: Unnecessary administrative requirements made the program too burdensome and costly for the implementer to want to be a part of. The implementer was required to apply for a contractor's license despite the program installing virtual software (and no physical retrofits). The implementer claims that they are going to sell their technology on the open market without the assistance of program rebates.	Administrative requirements were not commensurate, causing the 3P to consider it too burdensome to be part of the program. IOU-3P disagreement on the reasons for closure, however, valid reason to close.	Implementation Issue
EE for Entertainment Centers SCE-13-TP-017 Transferred to current implementer in Jan 2014 and closed end of cycle 3P: FESS Energy	AL: N/A IOU: Once the current implementer took over program implementation from another third party, a motion to close the program had already been filed based on the program's poor performance to date. The new implementer made significant improvements to the program in a matter of months and by September 2014 the program was fully subscribed. However, by this time the AL decision to close the program had already been approved and the process to revive the program after being closed was deemed too onerous to pursue. Instead of trying to revive the program, the IOU suggested to the 3P that they resubmit the program under the IDEEA 365 solicitation. 3P: Same as IOU. As of March 2015, the implementer was still waiting for the IDEEA 365 solicitation to start accepting bids and had not yet submitted the program.	Program did not build a promising pipeline by the filing deadline. Program was able to build a pipeline after the deadline. SCE will likely propose this program again in the next cycle.	Should Have Been Kept Open

Program	Circumstances	Reason for Closure	
Cool Biz/Small Commercial Comprehensive Refrigeration Program PGE210116 2006–2014 3P: DNV-GL	AL: Implementer requested closure due to decreased claimable savings, high customer copays, increased administrative burden, and greater competition from other programs. IOU: Same as AL. The program had been using the MLC to determine program savings, but upon the advent of secondary review was told to cease using the tool when PG&E's engineering department interpreted the review process as requiring a clear distinction between deemed and custom programs. A determination was made to have the program become deemed, and doing so significantly reduced claimable savings. 3P: Same as IOU. Once the program was classified as deemed, it faced greater competition from other deemed refrigeration programs. Additionally, the implementer was told upon signing the program contract that no changes would be made this cycle, however, these changes all occurred mid-cycle without modification to the program budget or savings forecasts.	Implementer was unable to recover program costs due to changes in how claimable savings are calculated, specifically, the loss of the MLC. IOU-3P Some disagreement on closure. 3P believes had the IOU provided more resources to compensate for the loss of the MLC, the program could have continued.	Regulatory Issue
EE Parking Garages PGE210117 2010–2014 3P: EFM Solutions	AL: Program delivered 10% of its savings forecast in 2013 and did not develop a robust pipeline. IOU: Same as AL. The program had been operating as a quasi-deemed program since inception. The IOU claims it received direction from Energy Division that starting in 2013 programs had to be either deemed or custom. A decision was made for the program to become fully custom, and as a result the program became time-intensive and required extensive engineering rigors, making the program no longer cost effective.	Lack of savings and pipeline. Decision forcing the program to go custom contributed to closure. IOU-3P disagreement on the reasons for closure, however, valid reason to close.	Regulatory Issue
CA Preschool PGE210125 2006–2014 3P Low Income Investment Fund (LIIF)	AL: Implementer requested closure because implementation costs were too high and introducing a copay in the preschool/daycare market would not have been viable. IOU: Title 24 excluded de-lamping of T12 to T8, which comprised 80% of the program's energy savings. There was little flexibility to move to another sector. 3P: Prior to Title 24 the implementer had already been operating at a loss and losing T8 savings meant they could no longer afford to continue operating the program.	Drastic reduction in savings due to Title 24 and little flexibility to broaden scope. IOU-3P agreement on closure. Valid reason for closure.	Regulatory Issue

From these findings it becomes clear that although there were a handful of programs that closed because they were no longer needed in the marketplace (grey "Market Saturation"), the majority (6 of 9) closed because of reasons that, if adjustments had been made, may not have led to program closure. Below are the main takeaways with regard to closed programs:

- **Consider whether the timing for filing program closures is sufficient.** At SCE the lead time to file an advice letter for program closure appears to be six to nine months before the end of a program cycle, which forces the IOU to make a determination on closure only about halfway through the program cycle when a program may still be ramping up. A decision-making window that occurs closer to the end of the program cycle would give programs more time to show results, especially in new programs, programs that drastically change implementation mid-cycle or programs that have projects with long lead times. It is unclear if the filing time to close programs is of similar length for the other three IOUs.

- **The Process to Revive a Program after Closure is Onerous.** If an IOU wishes to bring back a program that has been closed, the administrative requirements and resources necessary to see this through are especially burdensome. In the case of SCE and its EE for Entertainment Centers Program, they were burdensome enough that SCE preferred to tell implementers to reapply as a new program rather than restore a closed program. This delays programs and associated energy savings as implementers must wait for a new solicitation to apply and receive approval before moving forward. If there is interest in bringing back programs that may have been inadvertently or unintentionally closed, the process to restore a closed program should be streamlined.

- **Mid-Cycle Energy Saving Reductions can greatly impact program viability.** Several programs were impacted by regulatory changes that trickled down and affected how much savings the program could claim and the types of measures the program could pursue. These changes significantly affected the cost of running the programs and caused misalignment of program design and the new operating environment. Changes like these especially affect those programs that target hard-to-reach markets who cannot afford copays (e.g., preschools), and programs where there is less flexibility to expand the program scope.

- **PG&E's Interpretation of Secondary Review Requirements May Differ Across Programs and Across Other IOUs.** In two closed programs, PG&E's interpretation of secondary review as requiring programs to cease using the MLC directly led to the program losing its competitive edge and being unable to meet program savings forecasts. However, in other PG&E programs in this study that have not closed, use of the MLC was allowed and contributed to program success (e.g., RightLights, Casino Green). It is unclear why some 3P programs were allowed to use the MLC while others were told they could not. It is also unclear whether programs in other IOUs had a similar interpretation or not.

- **Consider whether some Program Participant Requirements Are Appropriate in All Cases.** With new business models and innovative technologies emerging in IOU energy programs, it may be time to assess whether administrative requirements put in place for existing, largely retrofit programs, are appropriate for virtual energy saving technologies. The SaveGas Program example of requiring the implementer to obtain a contractor's license for installing virtual software is a case where existing regulatory requirements designed for traditional retrofit programs may in fact be discouraging new technologies and new ways of saving energy. These requirements may be need to be reviewed, or exceptions made where appropriate, if IOU programs are to continue to encourage new, innovative programs and technologies that may not fit into traditional definitions of energy efficiency programs.

- **Develop an Onboarding Process or Channels for Regular Communication when Staffs Change.** Insufficient communication between new IOU staff and the program implementer in the MBPCx

Program led to adverse consequences that ultimately led to program closure. A formal onboarding process for the new IOU staff, or a process that facilitates the transfer of knowledge from prior IOU staff to new IOU staff (incidentally, one of the HMG 2010–12 best practice recommendations), could have helped the new IOU staff better understand the unwritten rules of how the program had been implemented. Including the implementer during this onboarding process, such as having the new team discuss a predetermined set of topic areas, could have prevented misunderstandings well in advance and ultimately prevented program closure.

Appendix B. Status of Best Practice Recommendations from Previous Study

As part of this study, the evaluation team discussed some of the Best Practice recommendations from Heschong Mahone Group's (HMG) 2010–12 3rd Party Commercial Resource Program Needs Assessment[42] with program staff during depth interviews. Notably, many of the best practice topics are already covered in various capacities throughout the Key Findings Section in Volume 1 of this report. Many of the best practices have not been implemented as they may be in conflict with some of the policy directives for these programs, for example the implementers are challenged with streamlining and simplifying the participation process due to program rules requiring multiple check—points and requirements from multiple parties. Several of these Best Practices speak to a much larger overhaul of how these programs are administered instead of specific changes that the IOUs or implementers could make to a specific program.

Table 37. Best Practices from the HMG 2010–12 Report and Relevance to 2013–14 Study

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Program Ramp Up	Paying 3P programs to ramp up their sales process could allow programs to obtain strong savings in remaining years. HMG recommends the 3P contract payment structure be more weighted towards ultimate program forecasts (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. New programs typically spend the first year or two building a sales pipeline often through new customer relationships. Program success and savings in later years is often attributed to this first year outreach.	Several of the newer programs in this cycle did not have set forecasts or forecasts for savings indicating that programs were given funds to ramp up and build a pipeline.
Program Focus Flexibility	Programs should have flexibility to adapt to unexpected outside conditions, such as an economic downturn, or to expand to other sectors if their target market is already saturated. Other outside forces (e.g., changes in policy, changes in market conditions) could have similar effects on programs and not necessarily be an economic downturn. 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.	Having multiple programs focusing on different sectors and measure types coupled with frequent assessments of program performance throughout the cycle and reallocating resources as needed in response to market conditions indicate that as a portfolio, the 3P programs had the flexibility to adapt to market conditions. However, individual programs do not necessarily have flexibility as several closed because they could not produce savings based on new market conditions such as Title 24.

[42] Heschong Mahone Group, 2013: California Nonresidential Program Assessments Study. Third Party Commercial Resource Program Group Report. Program Years 2010–2012.

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Single Point of Contact	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 customers to have a single point of contact for all their facilities in California. For large customers, the Account Executives 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. Customers prefer a single point of contact. Chain customers especially prefer having one point of contact for all their facilities in California. Differing requirements across jurisdictions is confusing and adds additional work for 3Ps.	Some customers do have a single-point of contact in account representatives but smaller customers do not. This BP speaks to have one PA implement a statewide program who is able to offer one point of contact for specific sectors. Acting upon this recommendation would require a major shift from how these programs are currently administered and delivered throughout the state.
Contract Changes	The IOUs, CPUC, and 3Ps should understand the costs associated with changes in requirements, and if changes render programs not cost-effective, a discussion across parties to decide whether to move ahead should occur. For any large changes, the contract should be renegotiated. During program cycles 3Ps were asked to make contract changes without compensation for the cost of compliance, often in these three categories: IOU mandated database changes, CPUC mandated regulatory changes, or IOU requested customer communications.	Changes occurred mid-cycle and some programs were closed due to cost-effectiveness concerns. While all parties understand there are costs involved in changing program requirements, no compensation was given to cover the cost of compliance. Therefore, this recommendation was not acted upon. The decision to give compensation for this in the future is a policy decision.
Comprehensive Measure Mix	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. Very few programs offered more than one measure, which contributes to less comprehensive projects. Customers continued to navigate to single-measure upgrades and often relied on DI measures to meet their financial threshold. Single-measure programs could only refer customers to more comprehensive programs, but had no indication of customers' follow-up.	We see a good number of multi-measure programs in this program cycle. Some programs are comprehensive while others are not due to specific design/program forecasts and because by definition, they are trying to fill a "gap" in the market that the Core programs are not addressing. Programs are still not following up to see if customers are pursuing additional opportunities through other projects mainly because they are not incented to do so.

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Streamline the Program Management Structure	In-house administration of the program tends to substantially reduce costs. IOU contract managers noted administrative costs are much lower if at least 2/3 of these tasks -- marketing, reporting, or engineering -- are done in-house.	The majority of implementers claim they are using in-house staff.
Program Qualification Changes	Avoid mid-cycle program policy changes that prevent customers from participating or allow a grace period if changes are necessary. This applies to changes to program market sectors and procedures as well. Changes cause confusion and frustration. In '10-'12 some customers who participated in the beginning of the cycle tried to participate again and were turned away.	Mid-cycle program policy changes still occurred in this cycle and no grace period was given. This is a policy issue.
Hire Experienced Program Management	PMs can affect program success: use a great PM. A bad PM can hinder a successful program and a great PM can make a bad program design successful. One PG&E contract manager indicated that program success was closely aligned with program management staff's ability to streamline program processes.	Experience levels vary across the IOU and implementer. This is something everyone strives for. One program, Data Centers, froze the program for almost 12 months while it actively searched for a qualified PM. Several IOU PMs were relatively new to their position at the time of interviews indicating that this is still a best practice to strive for while recognizing that staff turnover is inevitable across a vast number of PAs and implementers.
Maximize Net Program Savings	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 forecasts. Some measures were not being installed because of attribution (where programs may overlap in the same sector, and it is unclear under which program the project should occur), or industry standard concerns (where projects are considered standard practice by the IOU/CPUC but the 3P sees customers refraining from installing due to high costs).	The ex ante team's efforts in relation to these programs are designed, in part, to maximize net program savings. Industry standard practices are still a point of contention between the parties involved.
Use a 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. IOU engineers sometimes were caught up in obtaining detailed information on measures that had no significant impact on energy savings, used too junior staff who were unfamiliar with technologies for site visits, or who focused on whether the project selected was the most efficient option, instead of focusing on whether project savings were accurate.	The implementers and the IOUs think they are assigned well-qualified engineering staff. However, opportunities still exist to ensure that all engineers across all parties align on calculation methods and documentation to support savings claims for custom projects.

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
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. All of the 3Ps in '10-'12 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.	The previous study found all 3P programs in compliance with this. Programs are still using some form of electronic management tool. Some programs could improve by starting to track conversion rates.
Maintain Consistency in Personnel Over Time with Both the IOU and Third Party Staff	Maintaining IOU and 3rd Party staff helps maintain institutional knowledge and reduce program interruptions. Most staff in the '10-'12 cycle were in place over the program cycle. If there is a mid-cycle change, existing staff should transfer institutional knowledge to new staff before leaving.	Experience levels vary across the IOU and implementer. Several IOU PMs were relatively new to their position at the time of interviews indicating that consistency is still a best practice to strive for while recognizing that staff turnover is inevitable across a vast number of PAs and implementers.
Facilitate IOU – Implementer Communication / 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. Close, frequent, and flexible communication is necessary and agreements between parties should be documented in writing. In '10-'12 more than half of 3P's indicated that IOU staff shared ideas and BPs to help refine their processes; in turn keeping in close contact enabled the IOUs to help 3Ps find solutions to any issues that arose.	Communication is mostly good but needs to improve to better facilitate the custom and secondary review processes amongst all parties involved.
Inform Product Development/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. Generally, 3P programs have the ability to design performance requirements and better products in coordination with manufacturers and customers. For example, one lighting program worked directly with customers and manufacturers to develop more cost-effective products.	Only a handful of programs reported working with manufacturers to drive product advancement; most programs did not work directly with manufacturers to do this. Working with manufacturers is not necessarily applicable to most 3P programs.

Status of Best Practice Recommendations from Previous Study

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Provide Education on Regulatory Process/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. Some 3Ps, especially non-traditional implementers, may have an incomplete understanding of the regulatory process or terminology (e.g., free ridership, cost effectiveness, dual baseline) and should be properly educated and updated on any new regulatory requirements. Several newer 3Ps struggled to understand regulatory processes and the resources that were available to them.	There are still gaps in knowledge on what is required to justify energy saving claims for custom measures. More coordination, communication and collaboration is still needed.
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. One-size-fits-all reporting requirements were cumbersome for simple retrofits like lighting. Reporting requirements should be commensurate with program type. Find ways to streamline reporting requirements through automation or simplification. Large systematic changes should not be mid-cycle and should be reserved for logical transition points in the program cycle. 3Ps noted that the Bulk Load tool was still cumbersome and could be improved through automation and simplification.	A little over half of programs reported some issue with reporting requirements, albeit minor issues. One 3P reported that IOU program tracking would lose projects and these were not discovered until weeks later. A few other 3Ps felt that there were too many reporting tools. Others lamented over last minute audit requests, unclear guidelines, or difficulties obtaining customer data.

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Integrate All Program 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. Suggests using a single database to track all program data (from initial contact through verification), or if a small number of large projects use a simple spreadsheet to track data. Sales data could be tracked more effectively as well, letting the 3P and IOU gain a better understanding of which sales strategies are successful. Any other innovative solutions, such as programmable reminder emails or drop down menus to avoid spelling errors. In'10-'12 eighteen 3Ps built a program tracking database, others used SMART or CRM, or took a spreadsheet approach where the project volume was low.	The CPUC database, managed through Itron, for all energy efficiency program is a central repository for all programs. Several 3P program implementers still need to develop one tracking database for all audits and projects so they can easily track and report on a conversion rate.
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. Implementation requirements - including those related to engineering reviews -- should be clarified through the contracting period. One 3P program faced additional costs as the envisaged engineering software was not accepted by one IOU, although the same software is used in another service territory.	The IOUs still need to improve in this area to help the implementers comply with all policy and program rules at the start of the contract.
Streamline or simplify the participation process	3Ps in 2010–12 found success in this area. Strategies for streamlining included: completing and processing incentive applications and assuming other administrative tasks, floating incentives, creating one decision-point for customers, connecting customers with contractors, shortening the customer form. Helping customers through the entire project process helped 3Ps maintain customer relationships and created greater customer service and referrals.	The new secondary review process in this program cycle conflicted with this best practice recommendation of streamlining the application and project approval process as it added layers of review. This is a challenging one to address as simplifying participation is at odds with the other policy objective of ensuring reliable net savings.

Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Streamline Project Approval Process	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 QC through the need to manage risk of review outcomes. The project approval process (including Ex Ante Review) is one of the biggest issues facing 3P custom programs. The original, lower-rigor approach allowed 3Ps to spend less time on each project before the customer agreed to the project. Now, 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 a T&M component in contracts, others are paid only for installed savings, so any investment in a project that is ultimately rejected represents losses to the 3P. Because of the EAR process, IOUs are reticent to finalize payment of project incentives until the outcome of the review process is known. Projects can be delayed until the EAR process is completed. Delays can cause problems and costs to customers.	
Leverage utility credibility to help sell programs	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. IOUs have cultivated strong relationships and credibility in their service territories that can be leveraged by 3Ps. But 3Ps should have their own customer relationships and industry contacts to market programs.	In all but one case 3Ps are leveraging utility credibility to market their programs.

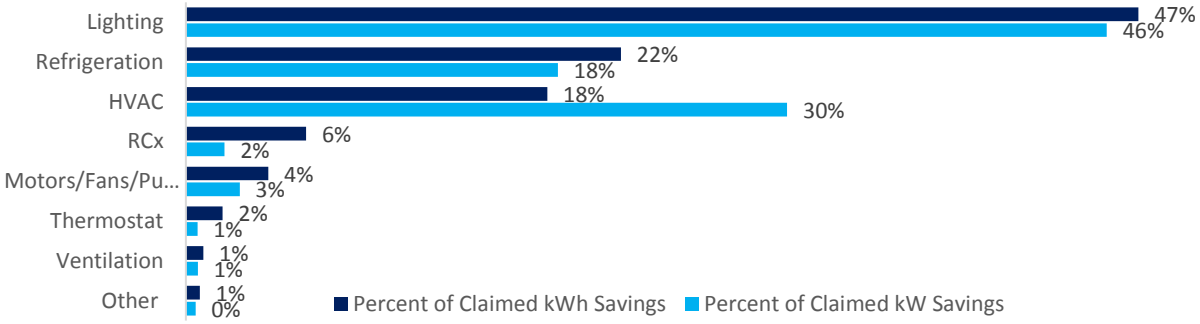
Best Practice	Rationale from Previous Study	2013–14 Status Based on IOU and Implementer Staff Interviews
Leverage partnerships with community-based organizations, trade groups and Industry Associations	Marketing to associations and trade groups, is more time effective than targeting individual customers. 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. 15 3Ps mentioned that leveraging industry associations helped market the program. This included 3Ps in the hospitality sector, the healthcare sector and some school programs. Private school associations are less involved in facility issues.	Only some programs marketed to trade associations; in most cases this was either not possible (i.e., no associations for that particular segment) or not needed, as existing marketing efforts were sufficient in building a project pipeline.
Encourage Cross Promotion	3Ps were unlikely to coordinate because they see each other as competition and have no incentive to cooperate. Programs are not incented to work together. In '10-'12, Grocer Programs targeting different market sectors did cross promote but one healthcare program that sought to cooperate found it difficult to determine the contact person for other programs. Perhaps have an IOU-developed database with contact and program information for all 3Ps and programs to facilitate greater cross promotion.	The IOUs claim all program information and contacts are available on their websites. Many implementers refer customers to other programs on an ad hoc basis. Some reported that because there is no incentive for 3Ps or IOUs to cross promote, current activities are limited.
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. Approximately 9 3Ps utilized case studies. Utilizing case studies in program marketing can generally help educate customers and demonstrate program benefits and energy savings. Some school programs shared BPs with other districts and case studies linked prospective customers to a source of unbiased information. In the next program cycle it would be helpful to structure program funding to allow for the production of case studies.	Case studies were not discussed during program staff interviews

Appendix C. Electric and Gas Savings by End-Use

As many programs provide comprehensive energy efficiency upgrades, 3P Commercial programs offer a broad spectrum of measure types. Of the 38 programs, 14 offer deemed measures only, 11 offer custom measures only and 13 offer both.

Although 3P programs offer a variety of measures, energy and demand savings are concentrated on three end-uses. Most of the 2013–14 electric energy savings came from measures related to lighting (47%), refrigeration (22%) and HVAC (18%) as Figure 8 shows. Cumulatively, these end-uses generated 86% of claimed electric energy savings and 94% of claimed demand savings among the 3P Commercial programs.

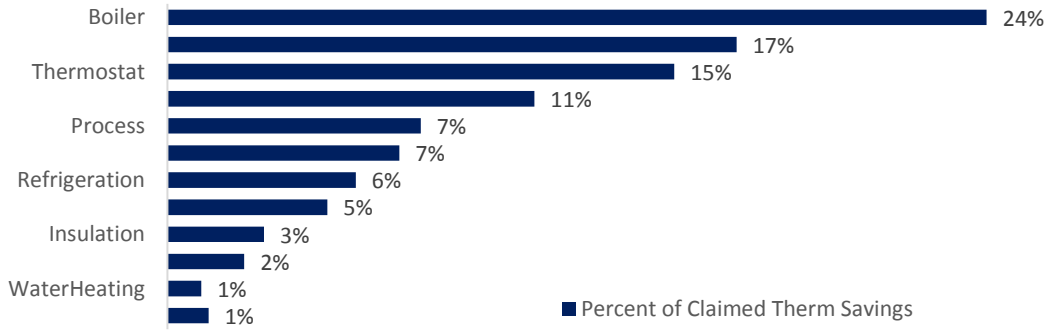
Figure 8. 3P Electric Ex Ante Claimed Energy and Demand Savings by End-Use during 2013–14



CPUC Programs Database from November 2015 (35 programs, no data for Nexant AERCx, PECI AERCx and Lincus WISE)
*"Other" includes thermostats, ventilation, computers, vending machines, window film, process optimization, insulation and other measures. Percen

Figure 9 shows that the largest share of gas savings came from boilers (24%), pool covers (17%) and thermostats (15%). These measures made up just over half (56%) of all 3P Commercial program therm savings.

Figure 9. Gas Savings by End-Use during 2013–14
(as a percent of 3P Commercial programs)



CPUC Programs Database from November 2015 (35 programs, no data for Nexant AERCx, PECI AERCx and Lincus WISE). "Other" includes thermostats, ventilation, computers, vending machines, window film, process optimization, insulation and other measures. Perc

Appendix D. Forecast and Installed Savings by Fuel-Type

Table 38. Electric and Gas Savings for Active Legacy Programs

Program ID	Program Abbreviated	Electric Savings (kWh)		Gas Savings (Therm)	
		Forecast	Installed	Forecast	Installed
PGE210111	LodgingSavers	13,045,130	19,024,346	9,592	89,407
PGE210112	School EE (PG&E)	5,480,945	7,327,502	532,419	318,835
PGE210113	Energy Fitness	14,853,645	10,223,237	-79,927	-36,679
PGE210114	Energy Savers	6,302,595	4,146,651	-28,731	-9,850
PGE210115	RightLights	19,341,924	16,797,299	-117,464	-44,473
PGE210118	Furniture Store EE	7,232,952	11,520,731	-42,170	-66,141
PGE210119	LED Accelerator	5,184,000	11,715,535	-125,581	-6,588
PGE210122	Casino Green	4,886,061	6,980,158	67,306	-8,206
PGE210123	Healthcare EE (PG&E)	6,247,800	1,913,548	90,000	262,027
PGE210126	K-12 Private Schools	4,075,921	3,777,677	-54,824	-30,926
PGE21016	Air Care Plus	19,008,885	6,453,916	290,242	484,577
PGE21017	Boiler EE	59,202	164,437	1,284,337	1,430,565
PGE21018	EnergySmart Grocer	39,222,095	40,594,594	230,060	199,226
SCE-13-TP-014	CUBE	22,378,693	11,643,857	0	-21,934
SCE-13-TP-003	Healthcare EE (SCE)	13,765,286	12,649,835	0	-3,206
SCE-13-TP-004	Data Center EE	18,885,577	7,861,909	0	-2,504
SCE-13-TP-005	Lodging EE	17,828,787	15,205,642	0	-514
SCE-13-TP-013	Cool Schools	5,960,197	2,190,819	0	-1,108
SCE-13-TP-018	School EE (SCE)	20,345,353	16,962,032	0	-79,990
SCE-13-TP-021	Enhanced RCx	4,950,000	892,055	0	0
SCG3758	3P-PREPS	0	0	703,788	297,461
SDGE3221	RCx (SDG&E)	8,779,000	3,572,300	95,628	303,974
SDGE3224	HVAC Commercial	3,960,939	13,913,363	-4,350	1,378
SDGE3226	Direct Install	31,820,791	36,377,117	-9,572	-10,428
Total		**293,615,776**	**261,908,561**	**2,840,754**	**3,064,904**

Source: CPUC Program Database from November 2015. Negative savings occur due to interactive effects

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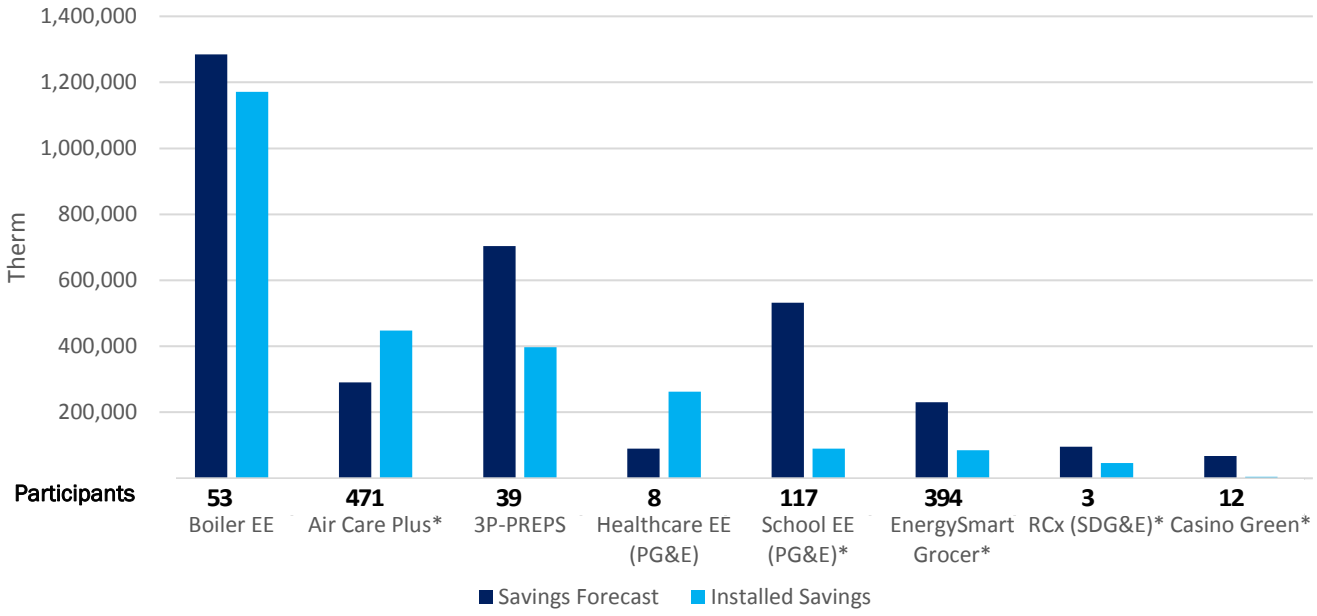
Of the 29 active 3P Commercial programs, only eight programs generated gas savings. The eight programs together achieved gas savings of 2.5 million therm savings. Figure 10 shows the savings forecasts and installed savings for these programs as well as the number of participants during 2013–14.

Figure 10. 2013–14 Forecasted and Installed Gas Savings of Legacy Programs



Source: EE Stats Monthly EE Report, December 2014. Omits programs with negative gas savings due to interactive effects.
* Actual or projected savings from monthly Energy Efficiency Reports from December 2014 differed to implementer's expectations.

Appendix E. 3P Commercial Programs Outside of Study Scope

Table 39 presents the 3P Commercial programs that were not included in this study.

Table 39. Commercial 3P Programs Outside of Evaluation

Program Name	Program ID	Reason
McKinstry Laboratory Fume Hoods	PGE210136	Resource program, but did not operate as of March 2013
Waypoint Commercial Outreach	PGE210137	Non-resource program
Data Center Air Flow and Temp Optimization	PGE210138	Resource program, but did not operate as of March 2013
SEI Energize Schools Program	PGE210139	Non-resource program
Mazzetti Dynamic Gas Scavenging System	PGE210140	Resource program, but did not operate as of March 2013
Lincus Commercial Mid-Market Program	PGE210141	Resource program, but did not operate as of March 2013
Cool Planet	SCE-13-TP-002	Non-resource program
3P-IDEEA 365-Instant Rebates! Point-of-Sale Foodservice Rebate Program	SCG3793	Resource program, but did not operate as of March 2013
3P-Energy Challenger	SCG3756	Non-resource program
3P-IDEEA 365-Commercial Sustainable Development Program	SCG3795	Non-resource program
3P-Energy Challenger	SCG3756	Non-resource program
3P – ZELDA	SDGE3307	Resource program, but did not operate as of March 2013
SW-COM-Customer Services-Audits Healthcare Energy Efficiency (HEEP)	SDGE3218	Non-resource program
SW-COM-Customer Services-Audits Lodging Energy Efficiency (LEEP)	SDGE3219	Non-resource program
SW-Com-Customer Services-Pump Test Services	SDGE3292	Non-resource program

Appendix F. Sector and Technology Focus Per Program

Table 40. Sector and Technology Focus per Program

Program Abbreviated	Quadrant	Status (Active - Closed)	Technology Focus	Sector Focus
LodgingSavers	1	Active	No technology focus	Hospitality
School EE (PG&E)	1	Active	No technology focus	Schools
Energy Fitness	2	Active	No technology focus	Small and medium size businesses
Energy Savers	2	Active	No technology focus	Small and medium size businesses
RightLights	2	Active	No technology focus	Small and medium size businesses
Furniture Store EE	1	Active	Lighting	Furniture Stores
LED Accelerator	4	Active	LEDs	Several sectors
Casino Green	1	Active	No technology focus	Hospitality
Healthcare EE (PG&E)	1	Active	No technology focus	Healthcare
K-12 Private Schools	1	Active	No technology focus	Schools
Air Care Plus	2	Active	HVAC	Several sectors
Boiler EE	2	Active	Boiler	Several sectors
EnergySmart Grocer	1	Active	Refrigeration	Grocery
CUBE	2	Active	HVAC	Several sectors
Healthcare EE (SCE)	1	Active	No technology focus	Healthcare
Data Center EE	1	Active	No technology focus	Data Centers
Lodging EE	1	Active	No technology focus	Hospitality
Cool Schools	1	Active	HVAC	Schools
School EE (SCE)	1	Active	Lighting	Schools
Enhanced RCx	4	Active	(Retro)commissioning	Several sectors
3P-PREPS	1	Active	No technology focus	Schools
RCx (SDG&E)	4	Active	(Retro)commissioning	Several sectors
HVAC Commercial	2	Active	HVAC	Several sectors
Direct Install	2	Active	No technology focus	Small and medium size businesses
Enovity Smart	3	Active	(Retro)commissioning	Schools
Nexant Aercx	3	Active	(Retro)commissioning	Schools
RSG Aercx	3	Active	(Retro)commissioning	Schools
PECI Aercx	3	Active	(Retro)commissioning	Schools
Lincus Wise	3	Active	No technology focus	Water Agencies
MBPCx	2	Closed	(Retro)commissioning	Several sectors
MBCx	2	Closed	(Retro)commissioning	Several sectors

Program Abbreviated	Quadrant	Status (Active - Closed)	Technology Focus	Sector Focus
CoolBiz	2	Closed	No technology focus	Small and medium size businesses
Entertainment Centers	1	Closed	No technology focus	Entertainment Centers
EE Parking Garage	2	Closed	Lighting	Several sectors
CA Preschool EE	1	Closed	No technology focus	Schools
Enhanced Automation Initiative	2	Closed	HVAC	Several sectors
Ozone Laundry EE	2	Closed	Boiler	Several sectors
SaveGas	4	Closed	Hot Water Controls	Several sectors