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2004/2005 Statewide Express Efficiency and Upstream HVAC Program Process Evaluation

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REPORT ONLY

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Prepared for the California Public Utilities Commission and the California's Investor-Owned Utilities

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Executive Summary

This Executive Summary highlights the findings and recommendations from the process evaluation of the 2004-05 Statewide Express Efficiency program (hereafter referred to as the "Express program") and the Upstream HVAC/Motors program (referred to as the "Upstream program"). The Express program is a business prescriptive retrofit program funded by California utility customers and administered under the auspices of the California Public Utilities Commission (CPUC). Express Efficiency is run on a consistent, statewide basis by the four investor-owned utilities (IOUs): Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDG&E), Southern California Edison Company (SCE) and Southern California Gas Company (SCG). The Express program offers financial incentives (rebates) to qualifying customers for installing selected energy efficient technologies. The Upstream program offered by the three electric IOUs seeks to change distributors' stocking practices by encouraging manufacturers and distributors to maintain sufficient inventories of high efficiency air conditioning (AC) equipment and motors so that they are available at the time the customer is making the buying decision, typically upon failure of existing equipment. Incentives are paid to participants upon proof that a qualifying model has been delivered.

The process evaluation of the 2004-05 Express and Upstream programs addresses several objectives. This study: (1) assesses customer behavior, (2) conducts a process evaluation, (3) performs a market opportunities assessment, and (4) benchmarks program success. An impact evaluation of the Express and Upstream programs was also completed, which: (5) verifies energy savings, (6) calculates ex post savings, (7) conducts a net-of-free-ridership analysis, and (8) estimates the overall energy and demand savings of the programs. Impact evaluation results are presented in a separate report.

1.1 Program Activity and Participation

1.1.1 IOU Claimed Savings Versus Targets

As in past years, performance targets for the 2004-05 program years were set in terms of energy, demand, and therm savings. Specifically, the claimed statewide net ex ante savings accomplishments reported by the IOUs for the two-year program cycle for Express were 778,446 MWh, 126,042 kW, and 15.9 million therms. As reported by the IOUs, the

statewide program almost met its kWh target, exceeded its therm target by 75%, and fell short of meeting its kW target by approximately 20%. SCG and PG&E outperformed SCE and SDG&E in reaching or surpassing their target net ex ante energy savings, though SCE was extremely close to meeting its target. After completing an impact evaluation of the 2004-05 Express program, the net ex post savings accomplishments were found to be lower than what the IOUs had originally claimed. Net ex post energy savings were 333,190 MWh, demand savings equaled 103,500 kW, and therm savings were estimated to equal 4.3 million therms[1].

1.1.2 Hard-to-Reach

The CPUC has encouraged the utilities to connect with hard-to-reach (HTR) nonresidential customers. These customers do not have easy access to program information or generally do not participate in energy efficiency programs due to a language, business size, geographic, or tenant barriers. The CPUC defines these HTR segments based on:

- Language – Primary language spoken is other than English,
- Business Size – Very small (<20 kW in peak demand) and/or less than ten employees,
- Geographic – Businesses in areas other than the San Francisco bay area, San Diego area, Los Angeles basin, or City of Sacramento, and
- Tenant – customers who lease rather than own their facilities.

Each of the IOUs set goals to reach a certain percentage of participants who fall into the HTR category. Table 1-1 reports the hard-to-reach goals set for each IOU, the IOU-reported HTR accomplishments provided in their final program narratives for the Express program, and Itron's estimated hard-to-reach accomplishments based on tracking data and responses from participants during the phone survey. A comparison of the goals to Itron's estimated accomplishments yields different results regarding the success each IOU had in reaching their HTR goals than when the goals are compared to the IOU-reported accomplishments.[2]

With the exception of SCE, all of the IOUs reportedly met or surpassed their targets. It is possible that the goal and accomplishments for SCE did not take into account those HTR

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[1] Itron, 2008. 2004/05 Statewide Express Efficiency and Upstream HVAC and Motors Program Impact Evaluation. Prepared for Pacific Gas &Electric Company. CALMAC Study ID# PGE0272.01.

[2] Itron developed weighted results from phone survey data and tracking data to estimate the percentage of Express participants that fell into the HTR category. Geographical data such as zip codes and business size were taken from the tracking data, while information regarding leasing versus owning, languages other than English, and number of employees were used from participant phone survey data. Since Itron only had participant phone survey data for a sample, the HTR accomplishments were weighted up to the population.

customers who lease rather than own their business, since this criterion was not mentioned. PG&E far surpassed its goal of 41% since virtually all of PG&E's Express Efficiency program participants could be classified as HTR. Note also that SCG surpassed its goal while SDG&E just met its HTR goal, based on the reported data from the IOUs.

Table 1-1: Hard-to-Reach Goals, Reported Accomplishments, and Verification from IOU's Program Tracking Databases*

Hard-to-Reach	SCE	SCG	PG&E	SDG&E
Goals	40%	43%	41%	63%
Weighted Results from Phone Survey Data/Tracking Data	71%	79%	77%	77%
Reported by IOU	37%	73%	99%	63%

* Express Efficiency program narratives provide the HTR reported accomplishments and goals presented in this table. SCE's program narrative is dated Feb 2006, PG&E's is dated Dec 2005, and SDG&E's and SDG&E's are dated Jan 2006.

1.1.3 Historical Participation Trends in Customer Size

In 2003, about half of all Express applications were submitted by very small customers. During the 2004 and 2005 program years, there was a significant increase in large customer participation. The 2002-2003 program cycle was a time during which the California IOUs focused on recruiting small and medium customers to participate in the Express program. In fact, large customers and large chain accounts were ineligible for the Express program in 2002. Though larger accounts were again allowed to participate in Express in 2003, the program still was focused on fairly small jobs (i.e., CFL installations) and smaller customers. By 2004, participation by larger customers was again sought by the IOUs and it continued through 2005. By expanding eligibility to include large customers, participation of very small customers decreased to less than a third in 2004 and decreased slightly further in 2005. Though participation of small customers declined, they are not precluded from continuing to participate in the Express program. Looking forward to future program years, given the large energy efficiency goals that have been set, continuing to allow large customers in the program may be necessary in order to meet these savings goals.

1.1.4 Historically Dominant Measures

Lighting has historically dominated the program (CFL installations in smaller businesses were a main focus of the program, especially in 2002 and 2003); however, during the last program cycle, there was a noticeable increase with HVAC measures in the percentage of applications and rebate dollars paid during the 2004-05 program cycle. Creation of the Upstream program successfully encouraged the sales of rebated CACs, which explains the

increase in HVAC measures during the 2004-05 program cycle (results for both Express and Upstream are presented together for the purpose of continuity). Furthermore, eligibility was expanded to include large customers, which led to more participation in HVAC measures.

1.1.5 Business Type Trends

Business type trends again follow the changes that occurred with program eligibility and incentives. In 2002, rebates to smaller customers were emphasized which led many miscellaneous commercial establishments to participate (e.g., personal services and community services). In 2003, participation was fairly even across all of the business categories.[3] In program years 2004 and 2005, more than a third of the total participants were from the other business types, while the participation of the retail category decreased further.

1.1.6 Summary of Program

Compared to 2002 and 2003, the 2004-05 program received a significantly larger budget (about double), which resulted in a rise in the number of unique sites participating, number of applications submitted, and total rebate dollars paid, as shown in Table 1-2. The energy savings in 2004 fell between the savings totals achieved in 2002 and 2003 while in 2005, Express Efficiency had the largest program budget and yielded the highest energy savings over the six-year history. A potential explanation for the moderate energy savings in 2004 followed by a sharp rise in 2005 is that the Express program was run for a two-year cycle, thus allowing the utilities to evaluate their accomplishments at the end of 2004 and revise program strategies, incentive levels, funding, and program marketing to improve program performance in the following year. Furthermore, there was some startup required to get the 2004-05 program operating at peak efficiency, and in informing vendors about the program. For example, the 2004 program only half of the budget went towards rebates, compared to almost two-thirds of the 2005 budget, implying more start-up costs in 2004. The rebate dollars spent per kWh decreased from 5.5 cents in 2004 to 4.5 cents in 2005, implying a more cost-effective portfolio that may have been achieved through lower incentives and/or targeting more cost-effective measures.

[3] The business type categories are Office, Miscellaneous Commercial, Retail, Restaurant/Grocery, and Other. It is important to note that over half of the Other business type is comprised of records in the program tracking data for which we were unable to obtain valid SIC codes to create the business type classification.

Table 1-2: Historical Express Efficiency Summary

Program Year	Unique Sites	Unique Apps	Rebate Dollars	Net Ex Ante Energy Savings (kWh)	Total Program Budgets	Rebate $ / kWh	Prgm $ / kWh
2000	25,745	27,606	$28,601,065	296,742,627	$39,002,828	$0.10	$0.13
2001	10,681	11,072	$30,927,758	467,036,559	$45,581,918	$0.07	$0.10
2002	8,400	9,628	$12,855,669	318,691,965	$20,097,382	$0.04	$0.06
2003	9,342	9,573	$12,660,701	278,485,302	$21,362,747	$0.05	$0.08
2004	10,625	15,762	$19,391,205	295,620,518	$37,777,931	$0.07	$0.13
2005	14,129	23,707	$30,089,022	551,346,805	$46,307,095	$0.05	$0.08

1.2 Market Opportunities Assessment

The goal of the market opportunities Express Efficiency task was to identify customer segments and measures with significant remaining achievable energy savings potential. To meet this goal, the Express Efficiency team reviewed and assessed measures targeted by historic and current programs, examined the high efficiency measure penetration estimates in the CEUS database and the recent energy efficiency potential studies, and conducted market research of the nonparticipant population to explore possible future program and measure level acceptance.

Following a thorough review of the information on recent program accomplishments and estimates of savings potential from the 2006 and 2008 Energy Efficiency Potential Studies[4], the project team determined that the market opportunities analysis would focus on commercial lighting and strip curtains.

1.2.1 Lighting Market Opportunities

Substantial progress has been made in retrofitting T12 linear fluorescents to T8s and incandescent lamps to compact fluorescent bulbs (CFLs), but as of the end of the 2004-05 program cycle, significant savings potential remains for these measures. If these measures remain a primary focus of the upcoming program cycles, however, rebated CFLs will increasingly be purchased to replace CFLs. The industry will therefore need to search for higher efficiency lighting and other end uses to achieve energy saving goals as the market is increasingly saturated with first and second generation T8s and CFLs.

[4] Itron, Inc. *Energy Efficiency Potential Study, Volumes 1 and 2.* May 2006 and Itron, Inc. and KEMA. *California Energy Efficiency Potential Study*, Sept 2008. Both prepared for Pacific Gas & Electric Company.

A significant fraction (40%) of the linear fluorescent lighting used in agriculture, community buildings, grocery stores, industrial processing and manufacturing, warehouses, and miscellaneous still includes standard efficiency measures. The linear fluorescents in these segments present the utilities with a significant market opportunity for savings.

Over 40% of sites in agriculture, condominiums, construction, grocery stores, industrial processing and manufacturing, restaurants, retail and miscellaneous report that they use incandescent lamps, indicating that significant retrofit opportunities and energy savings potential remain for CFL lighting.

Approximately 42% of nonparticipant sites have lighting equipment in use at their facilities that is more than 10 years old. These sites are likely to provide the utility programs with significant savings potential.

1.2.2 Strip Curtain Market Opportunities

More than 40% of the community, industrial processing and manufacturing, institutional, restaurants, retail, and miscellaneous segments responded that their site included walk-in refrigeration measures without strip curtains. However, based on an engineering analysis conducted as part of the impact evaluation for the Express Program, the potential savings available from strip curtains is significantly less than was estimated in the ex ante workpapers. This engineering analysis was completed based upon onsites and self-report data, which indicated that the hours of open door time were 60% lower than assumed in the ex ante work papers, and that strip curtains were installed on more coolers than freezers, further reducing the per unit savings associated with the measure.

1.2.3 Market Opportunities Recommendations

While lighting has historically been a dominant source of energy efficiency savings for the Express program, there are still opportunities to achieve energy efficiency savings from this end use. Over time, however, savings from existing lighting measures (first-generation T8s and CFLs) will become saturated. As stated above, Itron recommends that the IOUs look into rebating newer higher efficiency lighting measures such as later-generation T8s and LEDs and measures in other end uses to garner additional savings.

Strip curtains were also highlighted as a measure that is not fully saturated, and therefore may have significant remaining market potential. To evaluate the potential energy savings for this measure, an engineering analysis of strip curtains was conducted using information gathered during onsite visits. One key parameter, the hours per day of refrigerator/cooler open door time, was found to be 60% lower than originally assumed in the ex ante work papers, and therefore reduced ex post savings by 60%. As a result, strip curtains were found

to be less effective at saving energy than had previously been believed, which suggests limited market opportunities associated with their installation.[5] However, because this result is so sensitive to the open door time parameter, which was based on a small sample of customer self report data, we recommend a more comprehensive evaluation of strip curtains, including the monitoring of open door time. These findings do indicate that the IOUs should use caution with this measure and not rely to heavily on this measure in their portfolio. A comprehensive evaluation of these measures is currently underway as part of the 2006-08 program evaluations, which can be used to further decide on whether or not to continue to pursue potential energy savings from this measure in this or other programs, and to what extent.

1.3 Express Process Evaluation

1.3.1 Satisfaction with Express Program

Program participants were surveyed to determine their levels of satisfaction with various program attributes including the contractor used to install program rebated equipment, the application process, the bill savings from the installation of program qualifying equipment, and the Express program overall. The percentage of satisfied program participants (those who stated that they were "very satisfied" or "somewhat satisfied" with each of the program elements) across the various program attributes stayed relatively constant since the 2002-03 program cycle.

There was, however, a slight decrease in the percentage of very satisfied customers relative to somewhat satisfied customers between 2002-03 and 2004-05 with regard to the application process. The percentage of customers very satisfied with the application process fell from 76% in 2002-03 to 66% in 2004-05.

1.3.2 Sources of Awareness

Utility representatives were the biggest source of awareness for participants (34% of participants became aware of the program through utility representatives during the 2004-05 program cycle). This is a significant increase from 2002-2003 when only 18% of program awareness was a result of utility representatives. Previously, contractors were the greatest source of awareness and they still remain an important source of information for program participants

[5] Strip curtains were also installed less on freezers and more on coolers than had been assumed in the workpapers as well, thus affecting the energy savings estimates of this measure.

1.3.3 Vendor Importance

Person-to-person contact is an important motivator for customers to participate in an energy efficiency program. Sixty-two percent of participants said their vendor was "very important" in deciding what equipment to install.

1.3.4 HTR

Relative to the previous program cycle, the IOUs increased awareness of very small (<20kW), rural, and non-English speaking customers (from 35% to 45% for very small customers, 27% to 53% for rural customers, and 40% to 47% for non-English speaking customers, respectively). Renters remain at 40% as the lowest reached category of HTR customers. IOUs made remarkable improvements in notifying rural customers of the program.

1.3.5 Participation Drivers

Rising energy bills were very influential in a customer's decision to purchase equipment through the program. The rebate itself was the second most influential factor.

This process evaluation marks the first time Express customers were asked about the influence of global warming on their purchasing decisions. Based on the results of the survey, it is a somewhat or very influential factor for approximately half of the customers in the program.

1.3.6 Program Effects

Just over 40% of surveyed participants stated that the program was very or somewhat influential on the level of efficiency of the equipment purchased. However, 57% of the surveyed customers stated that the program did not influence them to install the high efficiency measure.

Though the above finding might lead to the conclusion that the Express program was not as influential as would be expected, the timing of certain types of equipment purchases was accelerated by the program's existence. Surveyed participants who purchased HVAC and agricultural equipment tended to replace their old equipment even when it was still in good condition, though participants who purchased refrigeration and water heating equipment waited until it was old or inoperable. Overall, 20% of the old equipment was in good condition when replaced though a majority of the equipment replaced was either broken or in poor condition.

1.3.7 Express Process Evaluation Recommendations

Customers are encouraged to participate in the Express program more through person-to-person contact and less so by mass marketing. Itron therefore recommends that the IOUs continue to market the Express program to customers through vendors and IOU representatives using information workshops, printed brochures, fact sheets, and mailings. Participants tended to become aware by utility representatives (34%) and contractors (27%), and to a lesser extent mass market channels (21%); whereas the majority of nonparticipants became aware through mass market channels (59%), a lesser amount through utility representatives (21%) and very few through contractors (only 5%). This is an indication of the effectiveness of contractors and utility representatives, relative to mass market channels. Since mass media is less effective in driving participation, Express marketing managers could shift their marketing mix to better leverage contractors and their IOU representatives and not focus on mass marketing since the returns to this form of marketing are limited. Utility representatives were the biggest source of awareness for participants, and the majority of participants said their vendor was "very important" in deciding what equipment to install.

While a high level of satisfaction exists amongst participants of Express, there is still room for improvement with certain programmatic attributes, such as the application process. The percentage of customers very satisfied with the application process fell from 76% in the 2002-03 program cycle to 66% in 2004-05. Based on suggestions provided by vendors and distributors and the best practices benchmarking assessment, the application process and reservation processes would benefit from a conversion to an electronic system rather than continued use of hard copy applications.

The influence of the Express program should take into account how the program affects the timing of purchases of energy efficient equipment; therefore any analysis of free-ridership associated with the Express program should not rely solely on whether or not customers said they were influenced by the program. Based on customer responses to the question of how influential the Express program has been on their purchases of high efficiency equipment, it at first appears as if the program has far less influence than it had during the 2002-03 program cycle. Previously, 91% of the surveyed participants stated that they were influenced by Express to purchase rebated equipment, but in 2004-05 only 42% answered that they were influenced. However, the significance of the difference in these findings over the two program cycles is reduced when we consider how the Express program has affected the timing of purchases. Only 39% of customers said that they would purchase the same equipment at the same time if no rebate were available. Also, HVAC and agricultural equipment tended to be replaced when the old equipment was still in good condition (early replacement). The net-to-gross analysis presented in the impact evaluation of the Express and Upstream program not only examines whether or not customers stated that

they were influenced by the program, but it also takes into consideration how the timing of purchases were affected.

1.4 Upstream Process Evaluation

1.4.1 Satisfaction with Upstream Equipment

Based on survey responses from Upstream-rebated central air conditioners (CAC) and motors purchasers, customers were overwhelmingly satisfied with the equipment they purchased. When asked to rate their satisfaction with the equipment purchased and its performance, over 75% were very satisfied, approximately 20% were somewhat satisfied, and no one was dissatisfied with their equipment purchase or its operation.

1.4.2 Program Awareness

More than half of the CAC distributors and three out of four of the motor distributors learned about the program through a program representative (57% and 75%, respectively).

1.4.3 Reasons for Participation

Both CAC and motor distributors reported that the main motivation for their participation in the Program was the ability to obtain a rebate for the stocking and sale of program-qualifying equipment. The next most common reason was to increase sales of efficient equipment.

The larger motor distributors reported that the 2004-05 program and its rebates provided incentives for the dealer to stock and sell the NEMA Premium Motors, and generally increased premium motor sales. One distributor, who verbalized the overall viewpoint of participating motor distributors, stated that the program provided the means to stock NEMA Premium Motors "and proved that NEMA Premium Motors were far easier to sell than (had been) anticipated once we had them in stock."

CAC distributors felt that the 2004-05 rebates had a stronger effect on their business than the motor distributors. During 2006-07, CAC distributors attributed significantly more sales to the program than motor distributors. In fact, more than 20% of CAC distributors believed that the rebates had no impact on the number of units they were able to sell, compared with 47% of motor distributors.

1.4.4 Upstream Process Evaluation Recommendations

Based upon the process evaluation and the suggestions for program enhancement by vendors and distributors as well as program staff, the following recommendations are made for the Upstream program:

Continue IOU outreach to distributors as this is the most effective way distributors have learned about the program. Three quarters of the participating motors distributors and 57% of the participating CAC distributors became aware of the program through an IOU representative. The IOUs should continue to hold frequent information sessions and workshops and regularly provide printed material to vendors to keep them apprised of any changes to the Upstream program. Through these outreach efforts, the utilities can inform vendors of changes in the types of equipment that qualify for rebates, the level of rebates offered for equipment, updates to the application materials they need to submit, and changes to the process by which rebates are paid out. Distributors can use this information to improve their services to final purchasers of CACs and motors.

The focus of the Upstream program should be on expanding vendor awareness of the ease of selling NEMA premium motors, especially to vendors who still think they are difficult to sell and do not stock them accordingly. As discussed in this evaluation, distributors found that selling energy efficient motors was not difficult once they had an incentive to stock them in their inventories. However, it is not clear that the general population of CAC and motors vendors have been made aware of the successes of existing Upstream program participants. This message should be carried to potential Upstream program participants to encourage them to also change their stocking practices, which will in turn lead to higher volumes of energy efficient equipment in the market.

The IOUs should develop a system to track the stocking practices and sales of successful Upstream program participants. Collection and dispersion of this type of information is essential to continuing success of the Upstream program. These data are what the utilities can use to inform potential program participants of the benefits of the Upstream program and provide them with additional motivation to participate. Historical data about the high levels of program satisfaction amongst end users who purchase equipment from program participants can also be used to recruit new participants to the Upstream program.

Future self report net-to-gross analysis approaches should examine not only the self reported effect of sales by the program, but also how stocking practices have changed. Approximately half of the motors distributors and one quarter of the CAC distributors stated that they would have sold the same number of program qualifying equipment in the absence of the program. However, the majority of distributors claimed that the program had some affect on their stocking practices, increasing the inventory of program qualifying equipment.

Therefore, it may be that some respondents are assuming that sales would have been the same given what inventory they had, but are not considering that the program affected their inventory.

1.5 Express Vendor/Distributor Assessment

The following are the findings made from the Express Efficiency program vendor/distributor assessment:

1.5.1 Drivers of Program

SCE, SDG&E, and PG&E depend on vendors as the main drivers of the Express Efficiency program while SCG has traditionally looked to its account executives.

1.5.2 Methods of Marketing

Each IOU used its own method of marketing to the vendors. PG&E did a mass mailing, SCG marketed at a tradeshow, SDG&E distributed fact sheets, and SCE mainly relied on account representatives to spread the word.

1.5.3 Role of Vendors

- One quarter of participants learned about the program through a vendor.
- Fifty-seven percent of participants used a vendor to install their measures
- Thirty-nine percent of the participant population who hired a vendor had not used that vendor before.
- Fifty-seven percent of the participant population who used a vendor said their vendor was very important in their decision to install energy efficient equipment.
- Over 90% of customers were either very satisfied or somewhat satisfied with their vendor. Of the customers who were not satisfied, the most common complaint was poor quality of light.

1.5.4 Equipment

Overall, records show that participant vendors sell about 27% of their CFLs (weighted based on the size of the company) through the Express Efficiency. This is down from 47% during the 2002-2003 program years. Furthermore, participant vendors sell about 62% of their T8s through the program, which is substantially higher than the 22% sold through Express in the 2002-2003 program years suggesting that the current rebate levels are more appealing to vendors and/or customers.

Thirty-percent of participating CFL installers stated that they leave extra lamps, while 44% of nonparticipant CFL installers leave extra lamps. These vendors tend to leave roughly 15% extra lamps (i.e., 15% of total job size) to perhaps simplify the replacement of burned out CFLs with new CFLs. For participating vendors, leaving behind extra lamps that are not installed has implications over first year energy savings, as these lamps may not be installed within a year. Furthermore, there are affects on the net present value of the lifetime savings of these measures as savings are discounted over time.

Seventy-eight percent of the T8 jobs completed by participating vendors in 2004 and 2005 involved delamping, where delamping is defined as the removal or reduction of the number of lamps in existing fixtures.[6] This has increased significantly since 2002-2003 program years when only 26% of the T8 jobs involved delamping, possibly as a result of increased rebates provided for delamping. The importance of delamping for the Express program can be seen in this trend and as mentioned in the lighting market opportunities subsection (1.2.1), significant savings potential remains from the delamping of T12 linear fluorescents and replacement of T-12s with T8s.

1.5.5 Express Vendor/Distributor Assessment Recommendations

Continue to leverage vendors to market the program. Fifty-seven percent of participants used a vendor to install their measures, and the majority of participants who used a vendor said their vendor was very important in their decision to install energy efficient equipment. Based upon this finding, vendors clearly play an important role in influencing customers to participate in the Express program.

Implement an inspection process and better educate vendors in a manner that will discourage vendors from rebating ineligible CFLs, which include those that are left behind as additional uninstalled lamps, or that are replacing existing CFLs. Thirty-percent of participating CFL installers leave behind uninstalled lamps (roughly 15% of total job size). Furthermore, 28% of the CFLs installed by vendors replaced existing CFLs (up from 11% in 2002-03). IOU staff needs to better educate participating vendors, and program materials need to be clear, that CFLs not installed (left as extras) or CFLs replacing existing CFLs should not eligible for a rebate under the program qualifying guidelines. Although energy savings may possibly result in the future if these CFLs are eventually installed, current program guidelines indicate that only installed CFLs should be rebated. If in the future,

[6] Included in the definition of delamping is reducing the number of lamps per fixture during a T12 to T8 retrofit. For example, retrofitting a 4 lamp T12 fixture to a 3 lamp T8 fixture would count as a both a T8 retrofit and a one lamp delamping in the IOU program tracking systems.

uninstalled CFLs are eligible for the program, approaches should be considered on how to develop savings for these measures, as no (or reduced) first year savings would be present.

Inspections are used by the IOUs to verify and potentially adjust rebate applications amounts when ineligible measures are found. Post inspections can be used to identify vendors that are leaving behind additional lamps that are being left in storage. Implementing pre-inspections will identify vendors replacing CFLs with CFLs, in addition to making other replacements that are not program qualifying. Although the nature of the Express program may make it difficult to implement pre-inspections, these inspections could be based on a random sample of customers who utilize the Express program reservation system to state their intent to participate in the program. ***Continue to promote delamping and retain current rebate levels.*** Delamping has increased significantly since 2002-2003, with delamping occurring in 78% of the T8 jobs in 2004-05 compared to only 26% in 2002-2003, when rebates were lower. According to the market opportunities assessment, significant savings potential remains from delamping. However, it is important to ensure that proper lighting levels are maintained and comply with state standards. Given the current high levels of satisfaction with the program and this measure, we don't expect this to be an issue.

Increase outreach efforts to nonparticipating vendors. As mentioned above, vendors are a key delivery mechanism for the program. However, over half of the nonparticipating vendors were unaware of the Express Efficiency rebate program, suggesting the need for more outreach and education regarding the program. Suggestions for additional outreach efforts include announcements in trade journals and mailers and/or phone calls to all vendors informing them of the advantages of encouraging participation in the Express program.

Develop an online application and automate the reservation system to speed up the application and payment processes. Based on the process evaluation overall, we recommend not only creating an online application system but also to implement an electronic reservation process. This would greatly simplify the reservation process and would simplify participation for their vendors and their customers. Seventy-three percent of the vendors would prefer to apply online.

While Express program managers stated they keep vendors apprised of program activities, they need to continue to improve their modes of communication regarding the Express program. Vendor and distributor survey results showed more dissatisfaction than satisfaction with regard to their communication with the utilities, suggesting room for improvement for the utilities. Several participating vendors suggested receiving information via email, online applications and submittals, and better response times from the customer service agents.

1.6 Upstream Vendor/Distributor Assessment

The following are the findings made from the Upstream HVAC and Motors program vendor/distributor assessment:

1.6.1 Satisfaction with Vendor

Virtually all sampled end users (92%) of Upstream-rebated equipment were either satisfied or very satisfied with their contractor. Of those participants who were satisfied, 70% stated they were very satisfied and 22% were somewhat satisfied with the equipment suggestions of their contractor. Only five percent of all surveyed participants stated that they were not at all satisfied with their contractor, with another 3% responding that they did not know how satisfied they were or were not.

1.6.2 Vendor Influence

Fifty-four percent of the Upstream program end user population surveyed stated that their contractor was important in their decision regarding the specific type of energy efficient equipment to install.

1.6.3 Distributor Satisfaction with Upstream Program

Larger distributors were asked to rate their satisfaction with the program enrollment process. Virtually all participating large motor distributors were satisfied with the program enrollment process (63% were extremely satisfied, and the remainder were somewhat satisfied). A lower fraction of large CAC distributors were satisfied (66%). Forty-four percent said they were extremely satisfied and 22% stated that they were somewhat satisfied.

1.6.4 Obtaining End User Information

Large CAC distributors, who felt that the process of obtaining customer information from contractors was difficult, faced a variety of issues. The most common issue was the difficulty in verifying where the product had been installed. Weather-related construction delays and larger projects with multiple buildings are two reasons why verification could be difficult. The only difficulty explained by large motor distributors was that mechanical contractors did not want to give out information about their customers for fear that their competitors would seek out their business.

1.6.5 Satisfaction

Overall, approximately 75% of both CAC and motors distributors were satisfied. For CAC, 35% were satisfied and 45% were extremely satisfied with the program. We found similar

results for motors distributors: about 41% of motors distributors were very satisfied and 34% were somewhat satisfied with the Upstream program. Large CAC distributors were generally satisfied with the online rebate application process, with less than a quarter claiming some level of dissatisfaction with the process. Approximately 80% of participating distributors rated their satisfaction with the rebate amount as somewhat satisfied (32%) or extremely satisfied (47%). Finally, 40% of CAC distributors reported that they were somewhat satisfied (20%) or very satisfied (20%) with the overall program, compared with approximately 63% of motors distributors. Of the motors distributors 31% said they were very satisfied and 32% said they were somewhat satisfied.

1.6.6 Upstream Vendor/Distributor Assessment Recommendations

Based upon the findings from the vendor/distributor assessment of the Upstream program, a few salient recommendations are made to further enhance its operation:

The IOUs should continue to focus on delivering CAC and motors measures upstream. Historical data from the past two program cycles show that end-user downstream rebates were less successful than upstream rebates in terms of moving energy efficient CACs and motors in the marketplace. As the longitudinal assessment presented in Section 3 showed, participation in 2004-05 was significantly higher than in 2002 and 2003. There were over 15,000 CAC and nearly 2,000 motors applications in 2004-05 compared to just over 1,000 CAC and under 100 motors applications in 2002-03. These data provide support for the continuation of the upstream programmatic form. Furthermore, satisfaction is very high among distributors, with 79% reporting they are very satisfied, and no distributors claiming dissatisfaction.

Use of an online rebate application process is essential to the accurate evaluation of the Upstream program and it should therefore continue, regardless of whether Upstream participants find the process difficult. A majority of large program participants actually felt that the process of obtaining customer information from contractors was easy. However, 33% of large CAC distributors and 22% of large motor distributors felt that the application process of obtaining customer information was difficult or very difficult. Large CAC distributors who felt that the process of obtaining customer information from contractors was difficult faced a variety of issues. The most common issue was the difficulty in verifying where the product had been installed. Weather-related construction delays and larger projects with multiple buildings are two reasons why verification could be difficult. However, accurate data that tracks the ultimate purchaser of the rebated CACs and motors and the location(s) at which they are installed is vital to the accurate estimation of ex post energy savings from the program.

Revisit the online application process periodically to ensure it is streamlined, up-to-date, and asking for relevant information. Approximately 90% of large CAC distributors and three-fourths of large motor distributors reported that the level of information requested on the program's rebate applications in 2004-2005 was appropriate. However, one-quarter of the large motor distributors felt that the level of information was not appropriate, and that there are unnecessary or burdensome aspects of the applications. Large motor distributors mentioned that the different formatting requirements and the collection of the serial numbers was challenging. The IOUs should make sure to streamline the application and standardize the way in which information can be entered. The following suggestions and observations were made by program participants and are supported by Itron's evaluation:

- The online process needed to be streamlined.
- Energy Solutions database should recognize military addresses.
- Keep file formatting requirements consistent so that contractors are prepared with the information they need to enter. Previously, serial numbers of rebated equipment were not required but a sudden change was made to require this information to help with the evaluation-related onsite visits.
- Make sure to frequently update the types of equipment models that qualify for program rebates in the database.

The IOUs should keep vendors informed of program changes to the Upstream program. The continued success of the Upstream program relies upon frequent and ongoing IOU outreach to distributors regarding revisions to rebates offered, types of equipment considered program eligible, and benefits of the installation of energy efficient equipment that can be passed down to end users they deal with. Keeping vendors informed of the program benefits will help to encourage continued participation in the Upstream program.

1.7 Best Practices

As part of this evaluation, Itron conducted a best practices benchmarking assessment of the 2004-2005 California Statewide Express Efficiency and Upstream HVAC and Motors programs. The study defines a "best practice" as one that, when compared to other business practices that are used to address a similar business process, produces superior cost effective results.

Findings from the best practices benchmarking assessment are summarized below for each program.

1.7.1 Express Benchmarking Findings

While the utilities have made use of electronic program tracking databases, the Express program does not accept electronic applications from customers applying for rebates. They (or more often, their hired contractors) must fill out an application for a rebate and submit it by mail.

With regard to the Express program, the IOUs do recognize the importance of keeping vendors abreast of the equipment for which rebates are available. By inviting them to presentation and information seminars related to the program, they are also able to inform contractors of any program changes.

One of the best practices described in the Nonresidential Lighting Best Practices Report but that are not included in the Express program is to conduct inspections of the first job completed by new vendors.

1.7.2 Upstream Benchmarking Findings

One implementation contractor was used the SCE, PG&E, and SDG&E for the Upstream program. This helped the IOUs to run the Upstream program with a certain level of consistency in the policies, procedures, and application submission processes followed to recruit and rebate program participants.

One issue that did arise with tracking on rebates for the Upstream program is that many of the distributors who participated in the program did not have the staff available to take the time and use the online application tool. According to one program manager, it was difficult to get distributors to use the tool on a consistent basis.

Another practice that greatly benefited the quality control and verification of the statewide Upstream program was the 100% rebate inspection policy carried out by the utilities.

One difficulty with providing rebates upstream is that the program managers were not assured that these rebates are being passed downstream to end users.

1.7.3 Best Practices Recommendations

An electronic application process would benefit the Express program by not only simplifying application processing, but it would also remove the need to manually enter data into program tracking databases from hard copy applications. Electronic applications can also be formatted so that the information entered is standardized and can be streamlined to make repeated data entry easier on program participants; this helps reduce errors in data interpretation and data quality assurance by the IOUs and program managers. It also helps

with catching errors and makes QC more efficient and automated. There may also be a benefit to creating an online reservation system instead of one that requires a phone call to the sponsoring utility. If the utilities choose to implement an electronic application process, past, current, and potential program participants should be offered training and workshops to improve the success of this type of programmatic change.

The IOUs should continue their coordination of policies, procedures, qualifying measures, and rebate amounts for both Express and Upstream programs. The high level of coordination allowed each of the program managers to bring their areas of expertise to the policies and procedures development process and work together to form a product useful to all of the IOUs in their program operations.

Both Express and Upstream program managers should conduct random pre-installation inspections to improve the evaluation and measurement of energy savings. Pre-installation inspections would help to provide accurate pre-program conditions of participating sites and would allow for more precise estimates of energy savings from the program. It would also benefit the programs by reducing the number of installations that are not program qualifying replacements, such as replacing CFLs with CFLs in the case of the Express program.

The IOUs offering the Express and Upstream programs should consider offering low-cost or no-cost financing options to offset high capital costs incurred by small businesses when they purchase program qualifying equipment and electronic application processing. Financing options were recommended in the National Best Practices Study as a way to provide added incentive to potential program participants.

Support Upstream program participants on the electronic application process. One issue that arose during the vendor and distributor assessment for the Upstream program is that many of the distributors who participated in the program did not have the trained staff available to take the time and use the online application tool. The IOUs should provide some support to assist program participants in filling out online applications (e.g., phone hotline).

2

Introduction

2.1 Background

This is the final process evaluation report prepared for the 2004-05 Statewide Express Efficiency (hereafter referred to as the "Express program") and the Upstream HVAC/Motors Program (referred to as the "Upstream program"). The Express program is a business prescriptive retrofit program for customers with peak demand less than 500 kW, funded by California utility customers and administered under the auspices of the California Public Utilities Commission (CPUC).[7] Express Efficiency is run on a consistent, statewide basis by of the four investor owned utilities (IOUs): Pacific Gas and Electric Company (PG&E), San Diego Gas and Electric Company (SDG&E), Southern California Edison Company (SCE) and Southern California Gas Company (SCG). The Express Efficiency program offers financial incentives (rebates) to qualifying customers for installing selected energy efficient technologies.

The Upstream program is offered by the three electric IOUs and seeks to change distributors' stocking practices by encouraging manufacturers and distributors to maintain sufficient inventories of high efficiency air conditioning (A/C) equipment and motors so that they are available at the time the customer is making the buying decision, typically upon failure of existing equipment. Incentives are paid to participants upon proof that a qualifying model has been delivered.

This process evaluation of the PY04-05 Express and Upstream programs offers both retrospective examination and prospective guidance in shaping current rebate programs for small and medium-sized nonresidential customers. Additionally, it meets the objectives set forth by the California Public Utilities Commission (CPUC) in Decision R.01-08-028 for

[7] Energy efficiency programs are funded from electric and gas public goods charge (PGC) funds, a charge applied to each customer's bill to support the provision of public goods. Public goods covered by California's PGC include public purpose energy efficiency programs, low-income services, renewable energy sources, and energy-related research and development.

monitoring and evaluation (M&E) studies, as well as those provided in the California Evaluation Framework[8].

This study, prepared by an independent third party evaluation team consisting of Itron, KEMA, ECONorthwest, and NERA, provides information about energy efficient equipment retrofits and replacements for the nonresidential population, evaluation findings regarding the energy and demand savings associated with program qualifying equipment, and program guidance through concrete recommendations.

2.2 Study Objectives and Approach

The objectives of this evaluation of the PY04-05 Express and Upstream programs are to: (1) assess customer behavior, (2) conduct a process evaluation, (3) examine the influence and effect of vendors and distributors on the program, (3) perform a market opportunities assessment, and (4) benchmark program success. A separate impact evaluation was also performed and presented in a standalone report.

The process evaluation studies of the Express and Upstream programs meet the research objectives by focusing on the following:

- ***Longitudinal Assessment.*** Trends in participation are presented by utility, technology, customer business type, customer size, application size, and type of delivery mechanism. Participation trends are presented for program years 2000-2005. These historic trends are analyzed to determine the effects of repealing the 500 kW aggregation eligibility requirements, a ruling that excluded chain businesses from participating in the program[9].

- ***Process Evaluation.*** Based on telephone survey data collected from participants and non-participants of the Express and Upstream programs as well as interviews with vendors and distributors and program managers, the process evaluation examine satisfaction, sources of customer awareness and program marketing and compares influence of participant drivers on decisions to purchase equipment.

- ***Vendor and Distributor Assessment.*** This is based on results of interviews with lighting vendors, program managers and participant surveys on the role that vendors played in their equipment purchases. The section describes IOU

8 June 2004.

9 The aggregation rule that allowed large customers to participate in the program was effective for a portion of the 2001 program year.

marketing efforts to vendors, based on interviews with program managers and presents findings on vendor outreach to customers and their influence on customer decisions, based on interviews with Express and Upstream participants.

- ***Recommendations for Program Enhancements***. A set of recommendations are based upon a synthesis of the results of the ex post savings study[10], participation trends analysis, the findings from the process evaluation, and the results of the best practices benchmarking assessment completed for both the Express and Upstream programs. These recommendations are in the form of tangible actions to improve the performance of the current programs. They are focused on identifying cost-effective marketing strategies and program delivery approaches, considerations for changes in incentives, potential energy efficiency measures to consider, and changes in program delivery that may result in higher customer satisfaction and increased effectiveness of the Program. A presentation of these recommendations is made in Section 8.

2.3 Overview of Research Activities

Study results are based on primary research conducted with customers and key market actors through interviews, phone surveys, and the analysis of participant tracking data and utility customer information databases.

2.3.1 Primary Data Collection

The primary forms of data collection included phone surveys conducted with Express program participants and nonparticipants, interviews with lighting, refrigeration, motors, and HVAC vendors and distributors, and interviews with Express and Upstream program managers.

Phone Surveys

A number of telephone surveys were conducted with participants and nonparticipants of the Express program. A total of 4,340 surveys (1,577 participant surveys and 2,763 nonparticipant surveys) were conducted to support various aspects of the impact and process evaluations including verification, billing analysis, net-of-free-ridership analysis, customer behavior assessment, market opportunities assessment, and process evaluation. Note that end

[10] The ex post savings study is presented in the 2004-05 Statewide Express Efficiency and Upstream HVAC/Motors Final Impact Evaluation. Recommendations presented in this report are based upon the findings from both the process and impact evaluations of the Express and Upstream programs.

users of rebated motors and central air conditioning equipment were interviewed along with participants of the Express program.[11] A sample of end users was developed by retrieving the names of individuals who purchased upstream rebated equipment from vendors and distributors who participated in the program. Data about these end users, while not always available, were entered by into an online application tool managed by Energy Solutions by Upstream program participants who stocked and sold these measures to them. Table 2-1 and Table 2-2 present the number and proportion of participant and nonparticipant surveys conducted in each of the IOUs' service territories.

Table 2-1: Participant Surveys by IOU Service Territory

Utility	Number of Surveys	% of Total
SCE	478	30%
PG&E	765	49%
SDG&E	207	13%
SCG	127	8%
Statewide	**1,577**	**100%**

Table 2-2: Nonparticipant Surveys by IOU Service Territory

Utility	Number of Surveys	% of Total
SCE	811	29%
PG&E	1,217	44%
SDG&E	381	14%
SCG	354	13%
Statewide	**2,763**	**100%**

Participant Surveys

Two types of participant surveys were developed to support different aspects of the overall evaluation. Both contained a set of identical questions to gather information about customer and facility characteristics, languages other than English spoken at the place of business, verification of the number and type of program measures installed, changes in the number and type of measures not rebated through the program, knowledge of energy efficient equipment, awareness of energy efficiency programs, and questions to support the self-report and discrete choice net-of-free-ridership analyses. One of the two survey types contained additional questions to support the process assessment, such as satisfaction with the program, and the measures installed through the program. The second survey contained supplemental

[11] The vendors and distributors who participated in the Upstream program were also interviewed and these data are used in the NTFR analysis included in this impact evaluation.

questions to support the market opportunities assessment, as well as the billing analysis, which is presented in the Express impact evaluation report.

Table 2-3 and Table 2-4 present the total number of the two participant survey types that were asked and shows the distribution of the process and supplemental surveys across IOUs. As these tables show, the process assessment questions were included in approximately a quarter of the participant surveys, while those with the supplemental billing and market opportunities questions were included in three-quarters of the participant surveys.

Table 2-3: Distribution of Participant Surveys by Survey Type

Survey Type	Number	% of Total
Process	418	27%
Supplemental	1,159	73%
Total	**1,577**	**100%**

The participant survey was segmented by IOU service territory and technology/end use. Table 2-4 shows the distribution of completed surveys by IOU and end use conducted with participating customers. Measures that had more significant participation received proportionally more sample.

Table 2-4: Number of Participant Surveys by IOU and End Use

End Use	PGE	SCE	SCG	SDGE	Number by End Use*	Proportion by End Use**
Agriculture	3	3	2	2	10	0.6%
Food Service	4	0	0	0	4	0.3%
HVAC	178	180	24	63	445	28%
Lighting	471	276	0	115	862	55%
Refrigeration	87	19	0	18	124	8%
Water Heating	22	0	101	9	132	8%
Total by IOU	**765**	**478**	**127**	**207**	**1,577**	**100%**

* End Use assigned to surveyed sites based on maximum savings

** Percentages are rounded for each end use and therefore do not sum to 100%

Nonparticipant Surveys

The original number of nonparticipant surveys proposed for this evaluation totaled 600; however, a large quantity of nonparticipant surveys were conducted to support a cross-program analysis Itron conducted, thereby increasing the total number of nonparticipant surveys from which data could be used. The nonparticipant surveys for the cross-program analysis were designed in such a way that they could be used to support the Express program

evaluation. The nonparticipant surveys were conducted with two major groups – (1) very small, small, and medium (VSSM) nonparticipants and (2) large nonparticipants. VSSM participants are defined as those customers not who did not receive a rebate from the Express program and have a maximum energy demand of 500 kW. Large nonparticipants are defined as those customers who did not receive a rebate from the Express program and have a maximum energy demand exceeding 500 kW. Table 2-5 shows the number and the proportion of nonparticipant surveys given to very small, small, and medium customers and to large customers.

Table 2-5: Distribution of Nonparticipant Surveys by Customer Size

Size	Number of Surveys	% of Total
VSSM	2,270	82%
Large	493	18%
Total	**2,763**	**100%**

The nonparticipant surveys were also used to support the market opportunities assessment, which can be found in Section 3. Not only were nonparticipants asked about the types of measures they have installed, but they were also asked about different types of energy efficient equipment that was not present as well. These questions help to determine the types of energy efficient equipment that have yet to penetrate the market.

Program Manager and Staff Interviews

Itron conducted a series of interviews with SCE, SCG, SDG&E and PG&E Express and Upstream program staff in September 2007. These qualitative interviews were conducted to discuss program evaluation objectives; obtain program manager input to help refine objectives and research issues that shaped subsequent interviews with vendors and customers; and to educate the evaluation team on program design, verification process, marketing activities, and vendor operations. Interview findings are reported in Appendix A in a separate report.

Vendor and Distributor Interviews

Close to 300 participating and nonparticipating market actors (contractors/vendors, distributors, manufacturers) were surveyed in the lighting, HVAC, motors, and refrigeration industries to learn about participating vendors' experience with the program, not to conduct supply-side baseline research. Fifty-two lighting vendors that participated in the Express program were interviewed because most of the program's energy savings accomplishments came from compact fluorescents and T-8s. The survey data were used to qualitatively assess

net program effects and support the customer behavior analysis and process evaluation. Results from these interviews are discussed in Sections 5 and 7.

2.3.2 Secondary Data Sources

Participant Tracking Data

Itron utilized its statewide integrated Express program database for the period 2000-2005 to assemble summary statistics on participation to date. This single statewide database merges key Customer Information System data, such as Standard Industrial Classification (SIC) codes, rate codes, usage, and demand data. Participation trends were compared over time. This analysis was used to identify gaps and unexpected trends in program participation.

IOU Quarterly Reports

We reviewed monthly and quarterly reports for IOU impact/participation goals, progress towards goals, program budgets, 2004-2005 expenditures, and marketing activities.

2.4 Report Outline

The report consists of 8 sections. Eleven accompanying appendices to this report have been issued in a separate document[12].

- **Section 1 (Executive Summary)** summarizes the high-level findings of the process evaluation study and provides recommendations for future analysis.
- **Section 2 (Introduction)** provides a brief description of the Express and Upstream programs, states the study objectives, and summarizes the research activities and data collection efforts of this evaluation.
- **Section 3 (Program Activity)** summarizes the Express and Upstream program background and evolution, highlights the IOU marketing activities, and provides the 2004/2005 goals and accomplishments.
- **Sections 4 and 5 (Express and Upstream Program Process Evaluations)** review and assess the implementation-related aspects of the Express and Upstream programs, respectively. These sections examine sources of awareness and program marketing, compare influence of various drivers on participants' decisions to purchase

[12] Itron, Inc. 2008. 2004/05 Statewide Express Efficiency and Upstream HVAC and Motors Program Impact Evaluation Appendices. Prepared for Pacific Gas and Electric Company. CALMAC Study ID# PGE0272.02.

equipment, assess customer satisfaction on various dimensions, discuss who filled out the application, examine awareness of online applications, and preference for application submission, and look at impact of reservation option and satisfaction with the process. Appendix F and G contain survey data tables that support these section findings.

- **Sections 6 and 7 (Express and Upstream Program Vendor and Distributor Assessments)** present results of interviews with lighting vendors, program managers and participant surveys on the role that vendors played in their equipment purchases. The section describes IOU marketing efforts to vendors, based on interviews with program managers; and presents findings on vendor outreach to customers and their influence on customer decisions based on interviews with Express and Upstream participants. This section also characterizes vendors' participation in Express and Upstream programs and their measure installation practices, presents vendor opinions on programs rebate structures and third party competition, their expectations about seasonal promotions, the influence of the rebate on CFL and T-8 sales and delamping efforts, and examines the application and reservation process and offers vendor suggestions for program enhancements. Appendix H contains survey data tables that support these section findings.
- **Section 8 (Best Practices Benchmarking Assessment)** relies upon the findings of the National Best Practices Study to conduct a benchmarking assessment of the Express and Upstream programs. Based upon the National Best Practices study, which successfully developed and implemented a method to identify and communicate excellent programmatic practices nationwide through a comprehensive database of energy efficiency best practices by program area, recommendations to enhance the Express and Upstream programs are made.
- Appendix A presents the results of program staff interviews.
- Appendix B summarizes participation for the number of applications; total rebates paid, and the IOU claimed total first year gross energy (kWh) savings by size, technology, and business type for each utility and statewide are shown for program years 2000 through 2005.
- Appendix C provides the participant surveys.
- Appendix D provides the nonparticipant surveys.
- Appendix E includes the market actors surveys used when lighting and refrigeration distributors were interviewed.
- Appendix F contains Express participant phone survey response tables.
- Appendix G provides Upstream participant phone survey response tables.
- Appendix H provides non-participant phone survey response tables.

- Appendix I provides the detailed measure engineering reviews.
- Appendix J presents the cursory measure engineering reviews.
- Appendix K presents details to support the lighting logger analysis.

3

Program Activity

This chapter provides a general overview of the Express and Upstream programs, presents the goals and accomplishments for the California statewide program and for each of the four IOUs, and compares the activity of the 2004/05 Express program to activity during previous years. The following areas discussed in this section include the following.

- **Program Description.** A description of both the Express and Upstream programs is provided, along with an overview of measures rebated through these programs.
- **Program Performance.** This section briefly presents each program's targets and accomplishments in terms of energy and demand savings.
- **High Level Logic Model.** This section presents the logic model and underlying program theory for the Express Efficiency program, which targets commercial customers and provides financial incentives for a range of equipment measures that deliver electricity and gas savings.
- **Historical Participation Trends.** Highlights in participation trends over the past six years are shown with respect to the types of measures installed, the size of the participating customers (in terms of energy demand), the types of businesses participating, and application size and cost effectiveness trends.
- **Market Opportunities.** The market opportunities assessment focuses upon existing and emerging energy efficiency measures that the Express Efficiency program can offer and the market segments upon which the program should be targeted.

To address these issues related to program activity, we rely on program tracking data, participant survey data, on-site verification data, program staff interviews, 2005 and 2006 IOU Annual Energy Efficiency Reports filed with the CPUC, and the latest IOU Express Efficiency and Upstream HVAC and Motors workbooks for the 2004-05 program cycle[13].

[13] The latest available Express Efficiency program workbooks were dated Dec 2005 for PG&E, dated Feb 2006 for SCE, and dated Jan 2006 for both SDG&E and SCG.

3.1 PY04-05 Express Efficiency Program Description

The 2004-2005 Express Efficiency program primarily focused on small and medium-sized business customers (those with electricity demands <500 kW) for the installation of selected lighting, refrigeration, air conditioning, food service, agricultural, and gas technologies shown to increase energy efficiency. Larger customers, though not focus of the Express, were eligible to participate in the program during the 2004-05 program cycle. Rebates (paid directly to the customer or the participating vendor) were paid for the retrofit or replacement of existing inefficient equipment with qualifying new energy efficient equipment. Energy and demand savings goals as well as serving a certain percentage of hard-to-reach customers were defined in each of the utilities' program implementation plans. A full description of the hard-to-reach customer segment is presented in subsection 3.3.2.

Since 2003, large chain accounts[14] have been eligible for the Express Efficiency program. The CPUC had excluded large chain accounts for the 2002 program year through a new eligibility requirement that precluded customers from participating in the Express program if their aggregate demand exceeded 500 kW. Small chains were eligible for the 2002 Express Efficiency program while large chains were excluded.[15]

3.2 PY04-05 Upstream HVAC and Motors Program

The 2004-2005 Upstream HVAC and Motors program provides distributors with upstream incentives to stock and sell qualifying high efficiency products, such as high efficiency packaged and split air conditioners, heat pumps, package chillers, and motors. During the 2002-2003 program cycle, the upstream program was temporarily discontinued and prescriptive downstream rebates were paid to customers who purchased program-eligible motors and HVAC through the Express Efficiency program. During the 2004-05 program cycle, the payment of downstream incentives to HVAC and motors participants was removed from the Express Efficiency Program and upstream rebates were then offered under the Upstream HVAC and Motors program.

The Upstream HVAC and Motors program was directly targeted towards the manufacturers and distributors of high efficiency air conditioning equipment and motors who serve

[14] Chain accounts are customers with two or more accounts that have the same billing address and same customer name but with more than one service address.

[15] A large chain is one whose total aggregated demand overall customer accounts is > 500 kW, or whose annual gas consumption > 250,000 therms. A small chain is one whose total aggregated demand is less than or equal to 500 kW, and whose annual gas consumption is less than or equal to 250,000 therms.

geographically defined HTR markets. Geographically defined HTR markets are described in more detail below.

3.3 Program Performance Targets

This section presents the claimed energy and demand performance targets for each of the IOUs and provides data gathered through primary research to show whether they met their targets for the Express and Upstream programs. An examination of each IOU's Energy Efficiency programs Annual Report, PY2004-05 program tracking database, and the latest available program workbooks was made to verify whether each utility met its performance targets.

3.3.1 Energy and Demand Savings

As in past years, performance targets for the 2004-05 program years were set in terms of energy, demand, and therm savings. Specifically, the statewide net ex ante savings accomplishments claimed before evaluation for the two-year program cycle were 778,446 MWh, 126,042 kW, and 15.9 million therms. As shown at the bottom of Table 3-1, the statewide program net ex ante claimed savings almost met its kWh target, exceeded its therm target by 75%, and fell short of meeting its kW target by approximately 20%.

Table 3-1: Summary of 2004-05 Express and Upstream Programs Net Energy Savings Targets and Accomplishments Based on Ex Ante Estimates Reported in the IOUs' Energy Efficiency Filings and Latest Workbooks*

Utility	CPUC Target	Net Ex Ante Actual and Committed	% Target Reached
PG&E			
Energy Savings, kWh	389,319,572	426,857,304	110%
Demand Reduction, kW	70,564	61,215	87%
Therm Reduction	2,495,002	8,255,248	331%
SCE			
Energy Savings, kWh	290,479,972	287,823,437	99%
Demand Reduction, kW	65,061	54,889	84%
Therm Reduction	-	-	-
SDG&E			
Energy Savings, kWh	103,924,471	63,655,766	61%
Demand Reduction, kW	19,129	9,938	52%
Therm Reduction	354,384	519,987	147%
SCG			
Energy Savings, kWh	34,531	109,000	316%
Demand Reduction, kW	-	-	-
Therm Reduction	6,214,018	7,088,790	114%
Statewide			
Energy Savings, kWh	**783,758,547**	**778,445,506**	**99%**
Demand Reduction, kW	**154,754**	**126,042**	**81%**
Therms Reduction	**9,063,404**	**15,864,025**	**175%**

* The latest available workbooks for PG&E were dated Dec 2005, dated Feb 2006 for SCE, and dated Jan 2006 for both SDG&E and SCG. The actual and committed savings accomplishment for each of the utilities is taken from either EE filings or workbooks. SCE, SDG&E, and SCG EE filings do not disaggregate accomplishments by program. For this reason, data for SCG and SDG&E are taken from the workbooks and data for SCE comes from email correspondence with SCE.

SCG and PG&E claimed to outperform SCE and SDG&E in reaching or surpassing its target energy savings, though SCE was extremely close to meeting its target. It should be noted that though SCG's kWh goal was quite low, its kWh savings accomplishment was nonetheless impressive. Given that this utility provides natural gas and not electricity, a relatively low kWh goal is not surprising. SCG staff attributed their program's overall success to strong sales of greenhouse heat curtains, water heating measures, and programmable thermostats.[16] Thermostats generated the bulk of the claimed kWh savings

[16] Appendix B shows 2004 and 2005 participation by technology.

accomplishments and greenhouse heat curtains and water heating measures, such as boilers, contributed to the therms savings accomplishments. PG&E attributes its accomplishments to the popularity of lighting measures, especially CFLs and occupancy sensors. SDG&E's accomplishments for kWh savings and demand reduction were fairly low, as it met only 61% of electric energy and demand savings goals. However, it was quite high in therms savings relative to its goal. The high level of therm savings for SDG&E can be attributed to a high volume of greenhouse heat curtains rebated.

It is important to note, however, that the impact evaluation of the 2004-05 Statewide Express program found the net ex post savings to equal 333,190 MWh, 103,500 kW, and 4.3 million therms, which are 42%, 67%, and 47% of the total CPUC targets reported in Table 3-1. These results are documented in the Impact Evaluation report for these programs.

3.3.2 Hard-to-Reach

The CPUC has encouraged the utilities to connect with hard-to-reach (HTR) nonresidential customers. These customers do not have easy access to program information or generally do not participate in energy efficiency programs due to a language, business size, geographic, or tenant barrier. The CPUC defines these HTR segments as:

- Language – Primary language spoken is other than English,
- Business Size – Very small (<20 kW in peak demand) and/or less than ten employees,
- Geographic – Businesses in areas other than the San Francisco bay area, San Diego area, Los Angeles basin, or City of Sacramento, and
- Tenant – customers who lease rather than own their facilities.

Each of the IOUs set goals to reach a certain percentage of participants who fall into the HTR category. Table 3-2 reports the hard-to-reach goals set for each IOU, the IOU-reported HTR accomplishments provided in their final program narratives for the Express program, and Itron's estimated hard-to-reach accomplishments based on tracking data and responses from participants during the phone survey. A comparison of the goals to Itron's estimated accomplishments yields different results regarding the success each IOU had in reaching their HTR goals than when the goals are compared to the IOU-reported accomplishments.[17]

[17] Itron developed weighted results from phone survey data and tracking data to estimate the percentage of Express participants that fell into the HTR category. Geographical data such as zip codes and business size were taken from the tracking data, while information regarding leasing versus owning, languages other than English, and number of employees were used from participant phone survey data. Since Itron only had participant phone survey data for a sample, the HTR accomplishments were weighted up to the population.

When the goals are compared to the IOU-reported HTR reach accomplishments, all of the IOU with the exception of SCE met or surpassed their targets. Only 37% of SCE's Express program participants were HTR when its goal was 40%. This information, which was retrieved from SCE's Express Efficiency monthly report narrative (Feb 2006), states that its program continues to focus on HTR customers or, those "who traditionally are less likely to install energy efficient technologies due to geographic, ethnic, and other market barriers." It is possible that the goal and accomplishments for SCE did not take into account those HTR customers who lease rather than own their business, since this criterion was not mentioned. PG&E far surpassed its goal of 41% since virtually all of PG&E's Express Efficiency program participants could be classified as HTR. Note also that SCG surpassed its goal while SDG&E just met its HTR goal, based on the reported data from the IOUs.

Table 3-2: Hard-to-Reach Goals, Reported Accomplishments, and Verification from IOU's Program Tracking Databases*

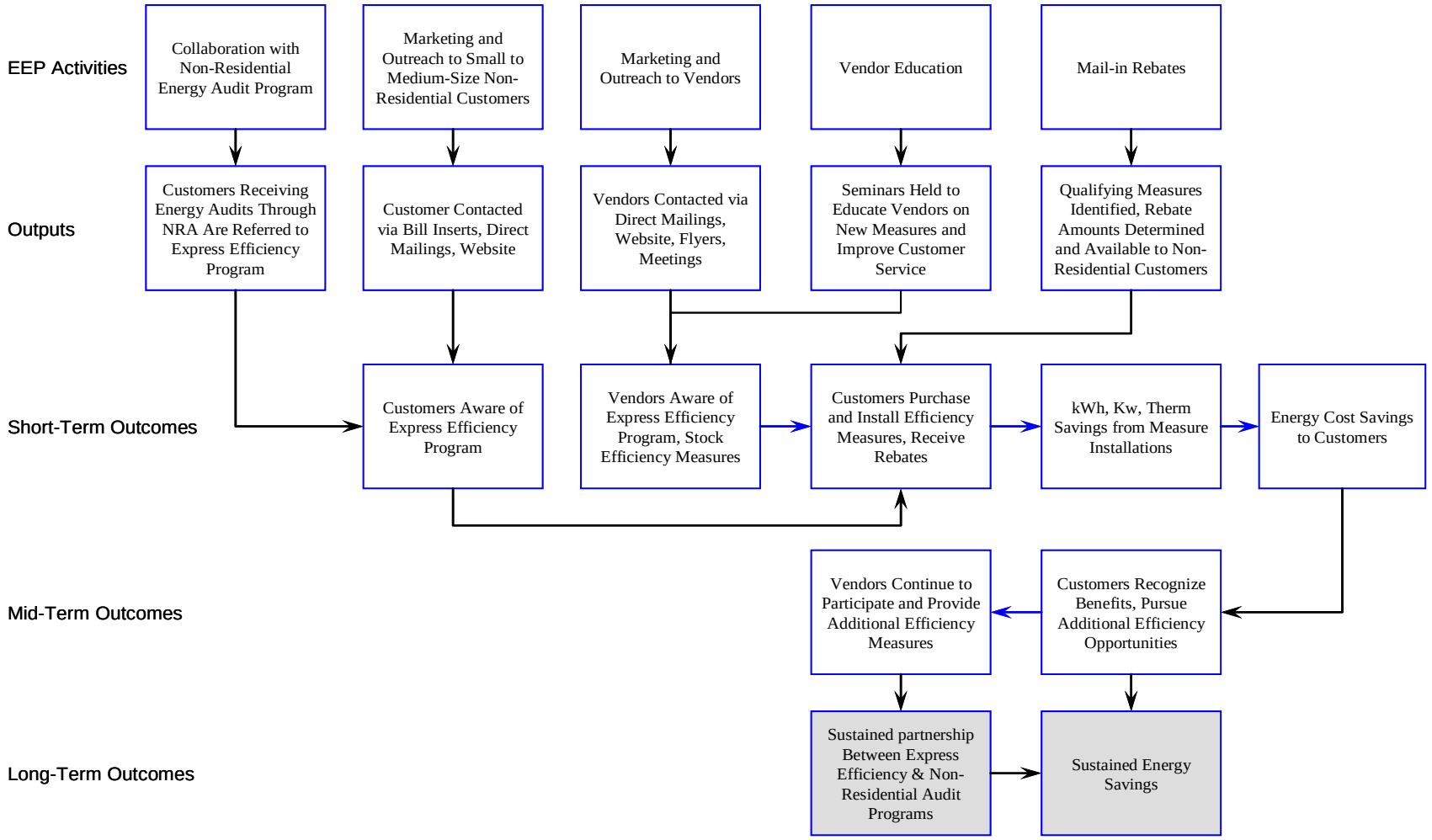
Hard-to-Reach	SCE	SCG	PG&E	SDG&E
Goals	40%	43%	41%	63%
Weighted Results from Phone Survey Data/Tracking Data	71%	79%	77%	77%
Reported by IOU	37%	73%	99%	63%

* Express Efficiency program narratives provide the HTR reported accomplishments and goals presented in this table. SCE's program narrative is dated Feb 2006, PG&E's is dated Dec 2005, and SDG&E's and SDG&E's are dated Jan 2006.

3.4 High Level Program Logic Model

This section presents the logic model and underlying program theory for the 2004-05 Statewide Express Efficiency program, which targets commercial customers and provides financial incentives for a range of equipment measures that deliver electricity and gas savings. The logic model diagram (Figure 3-1) is presented on the next page and shows the linkages between program activities and the direct outputs resulting from those activities. These outputs in turn will result in program outcomes that eventually lead to achieving the overarching program goals. Following the logic diagram, the program theory is presented that provides additional detail on the program activities, outputs, and outcomes.

Figure 3-1: Logic Model Diagram



* Shaded boxes indicate induced outcomes that are outside of the direct program influence.

Altogether, the following subsections present the program theory for the Express Efficiency program. The program theory builds on the program logic model and provides additional detail on program activities, outputs, and outcomes.

3.4.1 Express Efficiency Program Activities

This subsection describes the program activities that are carried out through the Express program.

Collaboration with Nonresidential Energy Audit Program. Express Efficiency and the Nonresidential Audit programs work together to provide energy audits and rebates to nonresidential customers. Customers who receive an energy audit are referred to the Express Efficiency program for rebates. Likewise, customers receiving rebates through Express Efficiency are offered audits if they have not already had one.

Marketing and Outreach to Small to Medium-Sized Nonresidential Customers. Small to medium-size nonresidential customers are contacted about the p through bill inserts, direct mailings, and utility websites. Information is distributed in multiple language formats as necessary depending on the customer make-up. Program updates and rebate forms will be available through the websites.

Marketing and Outreach to Vendors. Vendors are contacted to participate in the program via direct mailings, utility websites, flyers, and meetings.

Vendor Education. Seminars are held regularly to educate vendors on additions to the list of eligible energy efficiency measures and to assist with customer service. Assistance is also available to vendors to increase their product lines in order to better meet the needs of **Mail-in Rebates.** The primary goal of the program is to provide rebates to customers who purchase energy efficiency measures either through the Nonresidential Audit program or on their own. A list of measures that qualify for rebates is continually updated and made available to customers along with the rebate amounts.

3.4.2 Short-Term Outcomes

Express program activities result in a variety of outputs, which then lead to outcomes or program results. This and the following two subsections describe the short term outcomes, mid-term outcomes, and long term outcomes that stem from the outputs of the Express program activities.

Customers Aware of Express Efficiency Program. Customers become aware of Express Efficiency either by receiving an energy audit through the Nonresidential Energy Audit program or by receiving mailings and bill inserts.

Vendors Aware of Express Efficiency Program and Stock Efficiency Measures. Once vendors become aware of Express Efficiency through the various marketing tools in place, they will seek out efficiency measures to stock their stores in order to meet customer demand.

Customers Purchase and Install Efficiency Measures, Receive Rebates. When customers purchase eligible energy efficiency measures and install them in their buildings they will receive rebates through Express Efficiency. Customers receive rebates by submitting a program rebate form along with a proof-of-purchase to their IOU.

Energy and Demand Savings from Measure Installations. Customers who install efficiency equipment will see immediate reductions in their energy use in these areas.

Energy Cost Savings to Customers. The nonresidential customers will have reduced energy costs from the use of energy efficient appliances in their buildings.

3.4.3 Mid Term Outcomes

Customers Recognize Benefits, Pursue Additional Efficiency Opportunities. Customers will see the cost savings they are achieving by installing efficiency measures and seek out additional opportunities to lower their energy consumption.

Vendors Continue to Participate and Provide Additional Efficiency Measures. In response to customer demand and seeing the benefits of the program, vendors will continue to participate. They will make additional efficiency measures available to their customers.

3.4.4 Long-Term Outcomes

Sustained Partnership between Express Efficiency and Nonresidential Audit Programs. A program goal is to maintain and improve the link between the Nonresidential Audit program and Express Efficiency. Customers will be better served through the partnership of these two programs.

Sustained Energy Savings. Customers will continue to realize energy savings as long as energy efficient measures are in place. These energy savings will grow as customers install additional equipment.

3.5 Longitudinal Assessment

The longitudinal assessment presents historical participation trends, performance targets, and program delivery mechanisms of the Express program over PY2000 through PY2005. Though the Upstream HVAC/Motors component of the Express program was created as a separate program beginning with the 2004/05 program cycle, it is included in the longitudinal assessment for consistency with the program data from earlier years.

3.5.1 Historical Participation Trends

The discussion below highlights some of the key trends in participation over the six year period with respect to the types of measures installed and the size of participating customers in the program. Detailed participation summaries for the number of applications, total rebates paid, and total first year gross energy (kWh) savings by size, technology, and business type for each utility and statewide are shown for PY2000 through PY2005 in Appendix B (Participation Data Tables) under separate cover.

Customer Size Trends

Figure 3-2 and Figure 3-3 present the trends in participation from 2000 to 2005 by the size of the participating customer. These figures present the annual distribution of applications that were rebated and the annual percentage of energy savings by customer size and year. Customers are categorized as very small (less than 20 kW), small (20-100 kW), medium (100-500 kW), or large (greater than 500 kW). Though the Express program was primarily designed to serve small and medium customers, the category of large customers exists (1) because large customers were served in some capacity by the Express program in the past several years (except when they were ineligible for the program in 2002) and (2) due to the manner in which customers were classified in each utility's Customer Information System (CIS) data. In fact, during the 2004-05 program year, the proportion of customers classified as large dramatically increased from the prior program cycle. The fraction of customers who were classified as large was 17% in 2004 and 22% in 2005. In 2002 and 2003, only 2% of the customers served by the Express program were considered large (again, recall that large customers were not eligible to participate in Express in 2002). The bar chart presented in Figure 3-3 shows how each size category contributed to program savings and the numbers appearing above each bar indicate the average kWh savings per application for each of the size categories in a given year. A similar interpretation explains the numbers above each of the bars in Figure 3-5 as well.

With respect to the number of customers participating, PY2000 saw a large proportion of very small participants, primarily due to the vendor bonus that were paid as an incentive to vendors when they marketed rebated equipment to this customer group. In PY2000, 86% of

the applications rebated through the Express program were submitted by very small customers, compared to 42% in 2001, approximately 50% in program years 2002 and 2003, and just around 30% in 2004 and 2005. In 2001, large customers were allowed to participate in the program , thus accounting for 14% of the applications and 45% of the energy savings. In 2002, large customers were no longer eligible to participate as can be seen from the small fraction of applications rebated for them during this time period (though large customers were allowed to participate in the Express program in 2003, participation trends for this year are similar to those from 2002 as the program was still focused on smaller customers during this two-year program cycle). Participation by large customers rebounded after 2003 when the Express program was again marketed to this customer group in addition to small and medium customers.

In 2003, about half of all Express applications were submitted by very small customers, however this group of customers comprised only a fifth of the energy savings. Participation was very similar between 2002 and 2003 in every size category. During the 2004 and 2005 program years, there is a significant increase in large customer participation, with 17% of all applications rebated in 2004 and 22% of all applications rebated in 2005 coming from large customers. The participation of very small customers decreased to less than a third in 2004 and decreased slightly further in 2005. Overall, we do see a slight trend towards medium and large customers and away from very small customers submitting applications to the Express program. The same holds true regarding energy savings over the six-year period over which the program is examined.

Figure 3-2: Applications Rebated by Customer Size, PY2000-2005

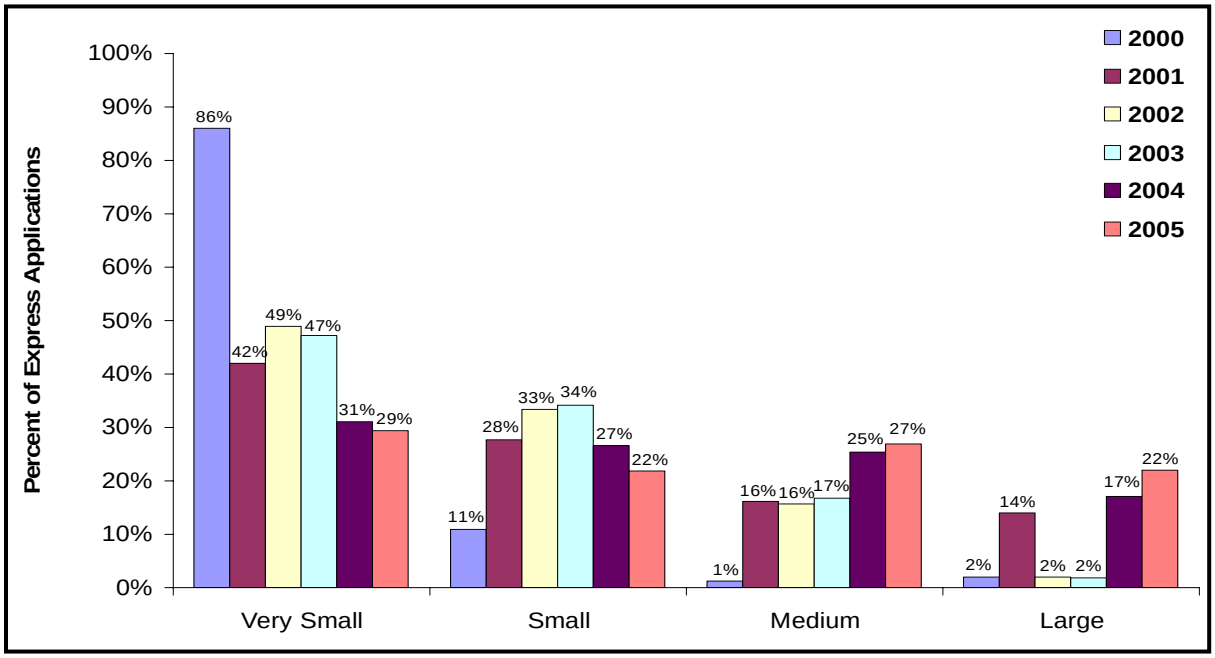
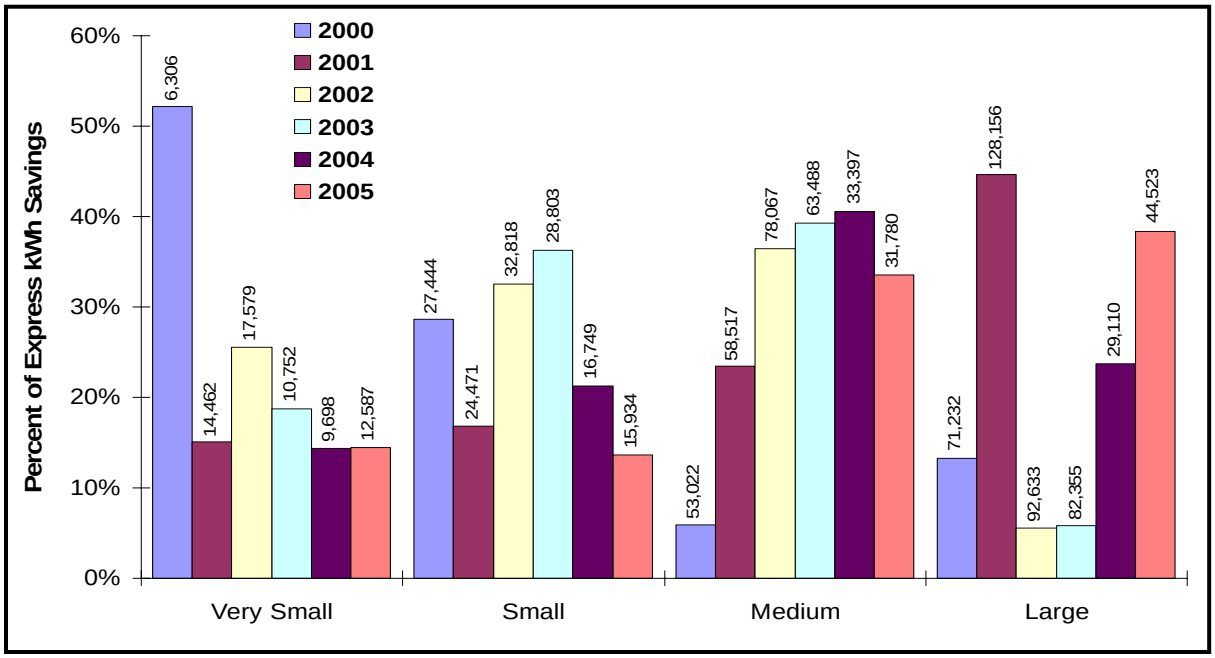


Figure 3-3: Net Ex Ante kWh Energy Savings by Customer Size, PY2000-2005*



* Note: Numbers above each bar indicate the average kW savings per application.

Technology/Measure Group Trends

Figure 3-4 through Figure 3-6 present the trends in participation from 2000 to 2005 among six key measure groups: CFLs, T-8s, miscellaneous lighting, HVAC, motors, and other measures (e.g., refrigeration, water heating, etc.). Figure 3-4 presents the percentage of applications that were rebated for a given year that contained any of these measures. Figure 3-5 and Figure 3-6 respectively show the percentage of energy savings and rebates paid per year by technology.

Lighting dominated the program as shown in Figure 3-4 through Figure 3-6 (especially in 2002 and 2003 when larger customers were not eligible to participate), however there is a noticeable shift away from lighting measures and towards HVAC measures in the percentage of applications and rebate dollars paid during the 2004-05 program cycle. This is evident in Figure 3-4, which shows a drop in the percentage of CFL rebated applications from 54% in 2003 to just below 20% in 2005, and an increase in HVAC applications rebated from 13% in 2003 to 45% in 2005. This shift away from CFL measures that tend to be less costly to purchase and install towards HVAC measures may have occurred in part due to the creation of the Upstream program, and due to large customers being eligible for the 2004-05 program. Data presented in Figure 3-6 further emphasizes this trend by presenting a drop in the percentage of rebated dollars paid away from lighting measures and towards HVAC measures by 2005. However, upon further examination of Figure 3-5, it is clear that lighting measures still contribute the largest levels of energy savings for Express Efficiency.

Figure 3-4: Applications Rebated by Technology, PY2000-2005

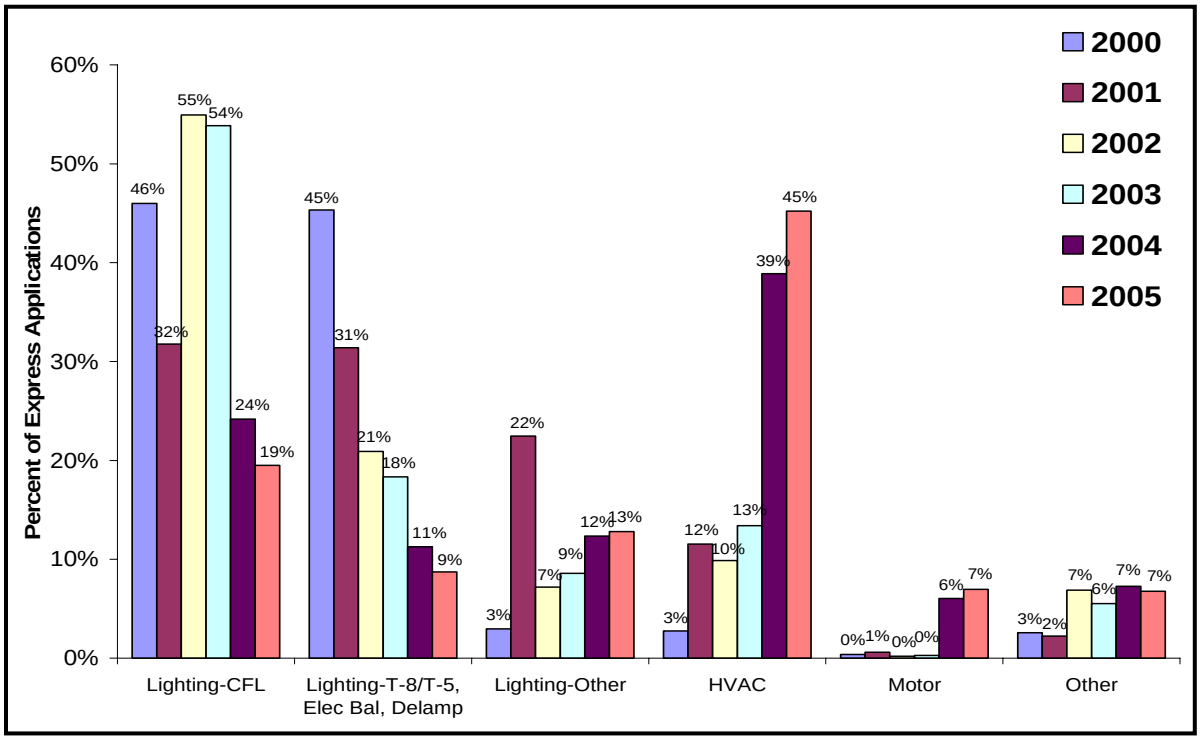
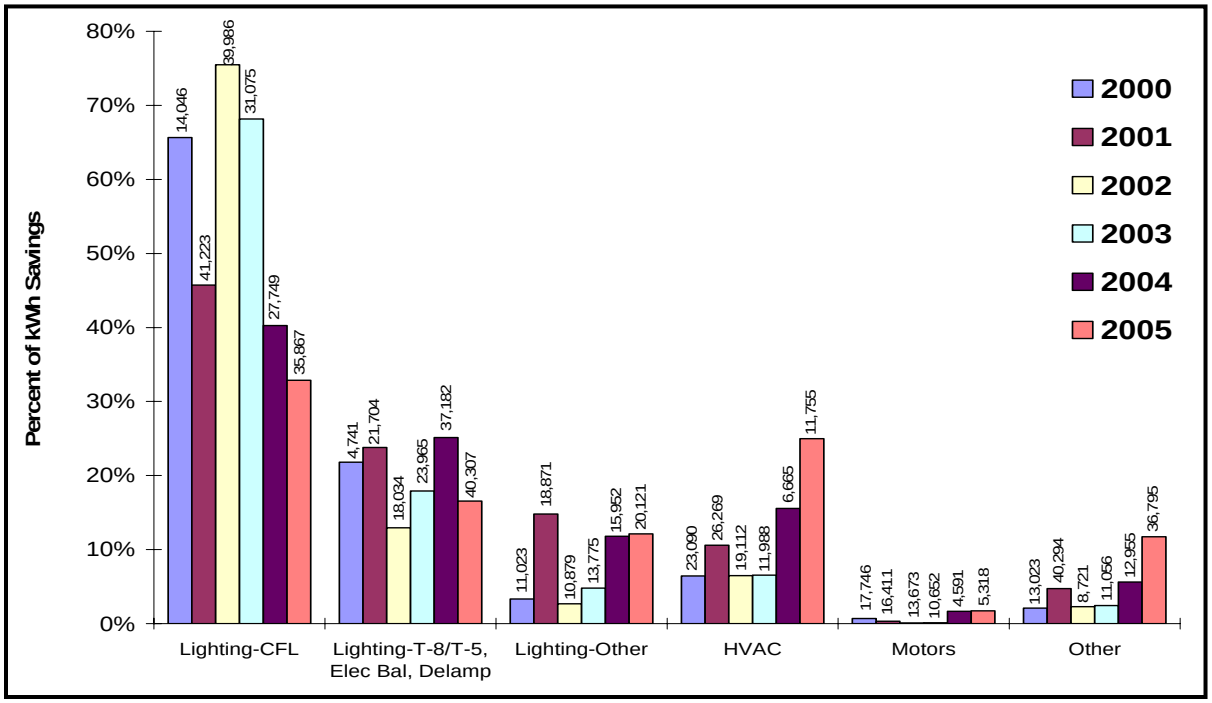
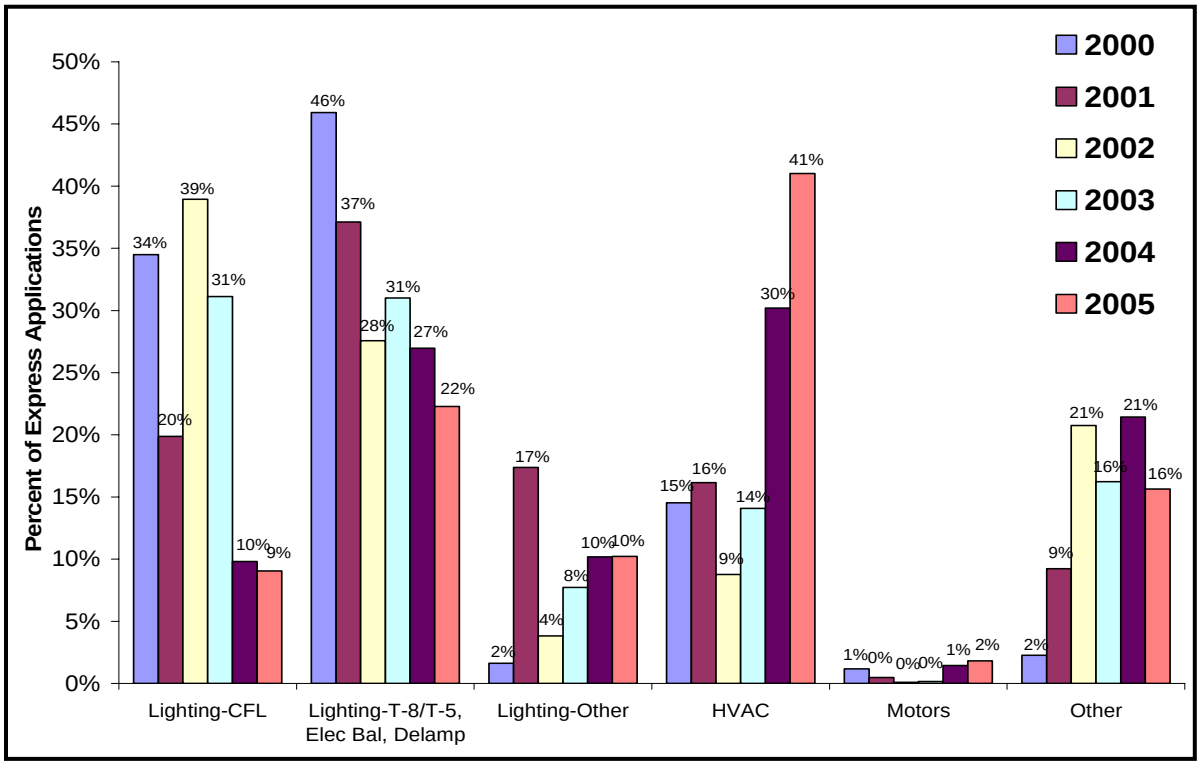


Figure 3-5: Average Measure Net Ex Ante kWh Energy Savings by Technology, PY2000-2005



* Note: Numbers above each bar indicate the average kW savings per application.

Figure 3-6: Rebate Dollars Paid by Technology, PY2000-2005



3.5.2 Historical Express Efficiency Summary

Table 3-3 summarizes the number of Express Efficiency applications, unique locations, rebate dollars, program budgets, and energy savings over the past six years. The large number of applications and unique locations participating in the Express Efficiency program in 2000 reflects the impact of vendor bonuses, which rewarded vendors for their recruitment of smaller customers into the program. Far fewer applications were submitted in 2001; however, Express Efficiency energy savings rose by close to 60% from the previous year. This is likely a reflection of programmatic change that allowed large customers (those with energy demand > 500kW) into the program for a portion of 2001. Even though the total rebate dollars paid in 2002 were less than half of what they were in the previous year, the 2002 Express Efficiency still managed to garner almost 70% as much savings as 2001. These relatively high savings underscore the cost-effectiveness of CFLs, as these were pushed heavily during 2002 and 2003. The budget during program year 2003 was similar to the budget in 2002, but savings dropped off slightly – saving about 90% of 2002 levels. This may be a reflection of higher rebate levels in 2003.

Compared to 2002 and 2003, the 2004 program year showed a rising trend in the number of applications submitted, total rebate dollars paid, and in the total program budget, but the energy savings for this year did not continue this upward trend. In fact, energy savings in

2004 fall between the savings totals achieved in 2002 and 2003. In 2005, however, Express Efficiency had the largest program budget and yielded the highest energy savings over the six-year history. The installed energy savings in 2004 followed by a sharp rise in 2005 could be explained by the fact that the Express program was run for a two-year cycle, thus allowing the utilities to evaluate their accomplishments at the end of 2004 and revise program strategies, funding, and program marketing to improve program performance in the following year. In fact, during the course of program manager interviews, one stated that there is a benefit associated with running a program on a two-year cycle because it allows the utilities "to get through a program year and really assess how the program is doing. You can look back and determine whether there might be a need to shift funds."

Another noticeable trend in Table 3-3 shows that the number of unique applications submitted closely reflects the number of unique sites participating in the program over most of the Express program (suggesting a ratio close to one application to one site). This trend seemed to end with the 2004-2005 program cycle. During these years, the number of unique applications submitted per site is, on average, greater than one per site. In fact, by 2005, the ratio was closer to one and a half-to-one. This is not surprising as one of the program managers of Express Efficiency explained that a unique application had to be submitted for each measure during the 2004-2005 program cycle. Any site choosing to install more than one type of rebated measure would have to submit additional applications.

Table 3-3: Historical Express Efficiency Summary[18]

Program Year	Unique Sites	Unique Applications	Rebate Dollars	Net Ex Ante Energy Savings (kWh)	Total Program Budgets
2000	25,745	27,606	$28,601,065	296,742,627	$39,002,828
2001	10,681	11,072	$30,927,758	467,036,559	$45,581,918
2002	8,400	9,628	$12,855,669	318,691,965	$20,097,382
2003	9,342	9,573	$12,660,701	278,485,302	$21,362,747
2004	10,625	15,762	$19,391,205	295,620,518	$37,777,931
2005	14,129	23,707	$30,089,022	551,346,805	$46,307,095

[18] Accurate program budget information in 2000 and 2001 that corresponded directly to the savings and rebate information contained in the program tracking databases was not available for all utilities. Therefore, the statewide program budgets for 2000 and 2001 were estimated based on rebate amounts and kWh savings for some utilities. Program budgets for 2004 reflect cumulative and committed funds through December 2004, with 2005 budget numbers equal to difference between the total program budget for the 2004/05 program cycle and cumulative and committed funds through December 2004. The cumulative and committed funds through December 2004 were not available for PG&E, thus the budget for this IOU was divided in half and summed to the cumulative and committed funds of the other IOUs through December 2004, with the remaining budget summed to the 2005 estimated budget of each of the other utilities. Although these are budgets, overall results are directional and unlikely to be affected by small changes in each IOU's budgets.

Table 3-1 presents the average rebate size per application, the average kWh savings per application, and the average program cost per kWh energy savings (both first year saving and lifecycle) over the six year period. During the 2000 program year, Express Efficiency focused upon recruitment of smaller customers through the provision of vendor bonuses in exchange for their service of this customer group. As noted earlier, Express allowed larger customers into the program for a portion of the 2001 program year, as is reflected by the relatively large rebate and kWh saving per application. The improved cost-effectiveness in 2001 stems from a reduction in fixed costs associated with the application, rebate incentive, and inspection processing. The 2002 and 2003 program years focused heavily on rebating CFLs, thus allowing the program to again focus on serving smaller customers. From a cost per kWh saved perspective, these two years were the most cost-effective, however they very well may have halted the program's potential to rebate a wider variety of measures. In fact, as stated in the Express Efficiency evaluation from 2003, "many potential T-8 retrofits may have been ignored by contractors marketing the program in order to get an easy CFL sale."

Looking over the historical performance of the cost effectiveness measures in Table 3-4 shows that Express Efficiency has evolved into a program that successfully meets a wide range of objectives including the maximization of energy savings while at the same time rebating a larger mix of measures and providing rebates to smaller customers as well. Up until the 2004-2005 program cycle, the Express program seemed to be "experimenting" with meeting different program objectives. Now the Express Efficiency program has reached equilibrium with regard to its diverse program objectives and accomplishments.

Table 3-4: Historical Job Size and Cost-Effectiveness

Cost Effectiveness/PY	2000	2001	2002	2003	2004	2005
Rebate/Application	$1,036	$2,793	$1,335	$1,323	$1,230	$1,269
kWh Savings/Application	10,749	42,182	33,101	29,091	18,755	23,257
Program Budget (Cents) / First Year kWh	13.1	9.8	6.3	7.7	12.8	8.4
Program Budget (Cents) / Lifecycle kWh	0.0126	0.0085	0.0065	0.0075	0.0107	0.0069

3.5.3 Program Delivery Mechanisms

During the 2002-2003 program cycle, rebates for HVAC and motors equipment were paid to vendors and distributors through the Express Efficiency program while it simultaneously offered rebates to end users of lighting, refrigeration, water heating, and other Express measures. While it was common knowledge that contractors and distributors were the main drivers of the Express program, end users were known to directly participate in program through purchases of lighting and other measures. Motors and central air conditioners were

almost exclusively sold through distributors however, and since end users rely heavily upon their advice and inventory, it was natural to break out the rebates for CACs and motors distributors into a separate program. By creating the Upstream HVAC and Motors program, the IOUs could focus on HVAC and motors distributors exclusively and not concern themselves with generalizing their marketing efforts towards end users as well.

3.6 Market Opportunities Assessment

The goal of the market opportunities Express Efficiency task is to identify customer segments and measures with significant remaining achievable energy savings potential. To meet this goal, the Express Efficiency team reviewed and assessed measures targeted by historic and current programs, examined the high efficiency measure penetration estimates in the CEUS database and the recent energy efficiency potential studies, and conducted market research of the nonparticipant population to explore possible future program and measure level acceptance.

Following a thorough review of the information on recent program accomplishments and estimates of savings potential from the 2006 and 2008 Energy Efficiency Potential Studies[19], the project team determined that the market opportunities analysis would focus on commercial lighting and strip-curtains. Commercial lighting accomplishments within the 2004/2005 Express Efficiency program represent approximately 67% of the electric energy savings accomplishment. In addition, historical savings from lighting installations have dominated the commercial energy efficiency program accomplishments in California. While the total savings potential of strip curtains is much smaller than is available in commercial lighting measures, strip curtains are believed to be highly cost effective and to have substantial remaining energy savings potential.

3.6.1 Lighting Market Opportunities

Commercial businesses have many different types of lighting which represent unique market opportunities for lighting based energy savings. Figure 3-7 illustrates the distribution of commercial lighting found in the California Commercial End Use Survey (CEUS) 2006.[20] The lighting type distribution found during the CEUS on-site surveys indicate that linear fluorescents dominate for most business types, while incandescent and CFL lamps represent

[19] Itron, Inc. *Energy Efficiency Potential Study, Volumes 1 and 2.* May 2006 and Itron, Inc. and KEMA. *California Energy Efficiency Potential Study*, Sept 2008. Both prepared for Pacific Gas & Electric Company.

[20] The CEUS surveys were undertaken during 2002-2004, but it is unlikely that the distribution of lighting types has changed dramatically at the time this study was conducted.

a substantial share of lighting for selected business types.[21] More than 80% of the lighting fixtures in colleges, grocery stores, larger offices, refrigerated warehouses, schools, small offices, and warehouses are linear fluorescent fixtures. In contrast, more than 20% of the lighting fixtures in health care, lodging, and restaurants are incandescent or CFL lamps.

Figure 3-7: CEUS Based Lighting Type Distribution in California Commercial Buildings

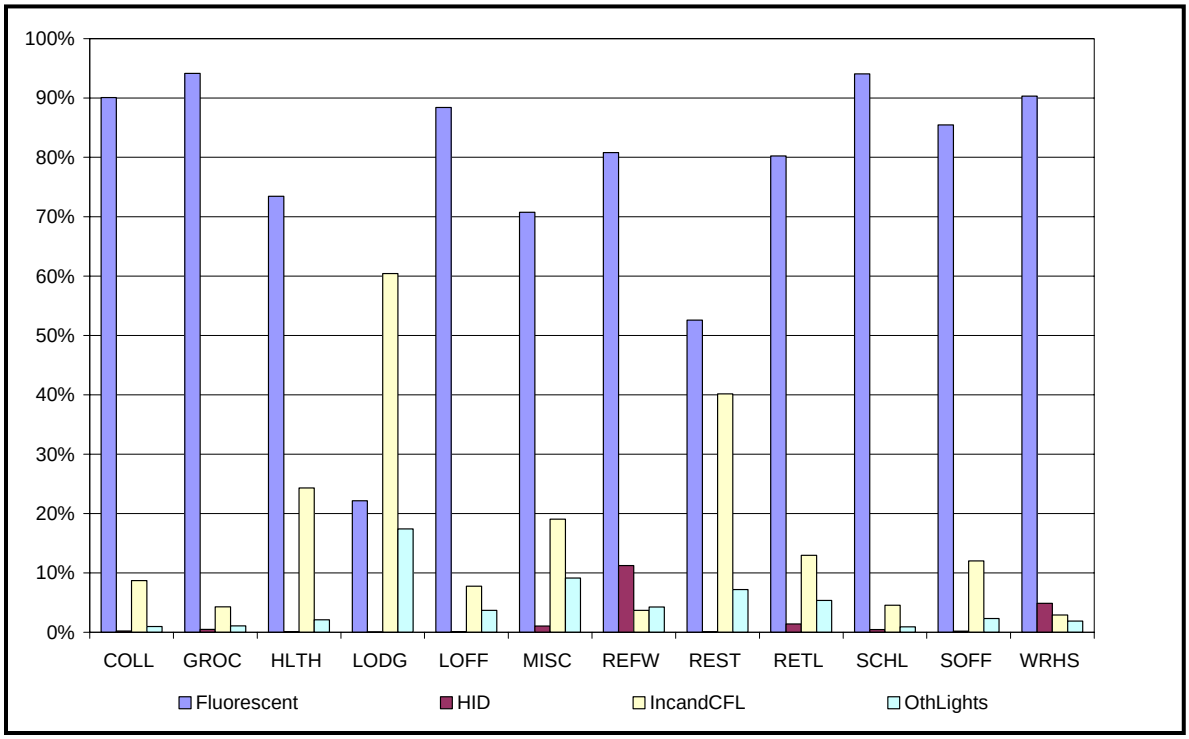


Figure 3-8 illustrates the distribution of base (T12) and high efficiency (T8) fluorescent fixtures in California as observed during the CEUS survey.[22] Comparing those building types with a high share of fluorescent fixtures with the distribution of high versus base energy efficiency, shows there remains substantial energy efficiency potential savings. Seven business types were identified in Figure 3-7 with over 80% of their lighting in fluorescent fixtures. Of these seven business types, four business types have converted less than 70% of their linear fluorescent fixtures to high efficiency T8 fixtures. The CEUS data

[21] The CEUS building segments are Colleges (COLL), Grocery Stores (GROC), Health Care (HLTH), Hotel/Motel (LODG), Large Offices (LOFF), Miscellaneous (MISC), Refrigerated Warehouses (REFW), Restaurants (REST), Retail (RETL), Schools (SCHL), Small Offices (SOFF), and Warehouses (WRHS).

[22] The CEUS survey was in the field during 2002-2004. It is likely that the current distribution of high efficiency versus standard or base efficiency fluorescent fixtures has a larger share in high efficiency. The distribution reflected in this figure, however, reflects the most recent distribution from a statewide onsite survey of commercial business.

indicate that refrigerated warehouses, schools, small offices, and warehouses represent business sectors with large market opportunities for additional linear fluorescent energy savings potential. In addition, significant savings potential is available in the other business types.

Figure 3-8: CEUS-Based Distribution of T12 and T8 Fluorescent Fixtures in California Commercial Buildings

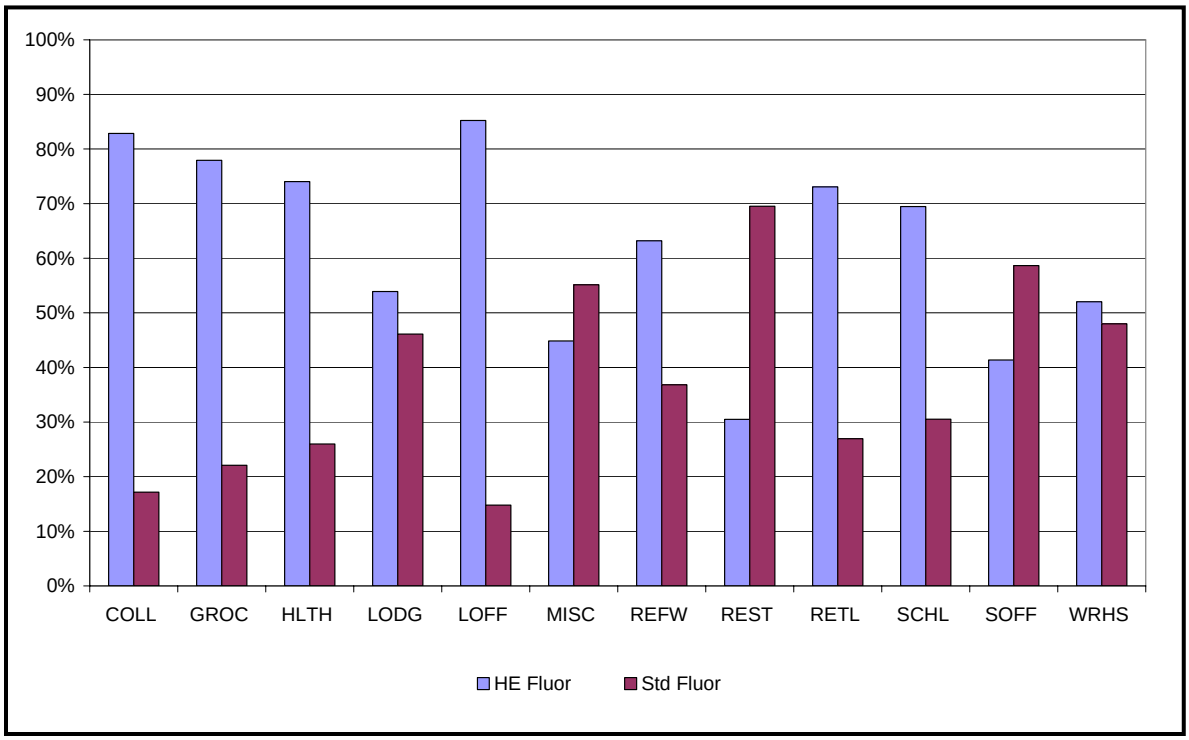
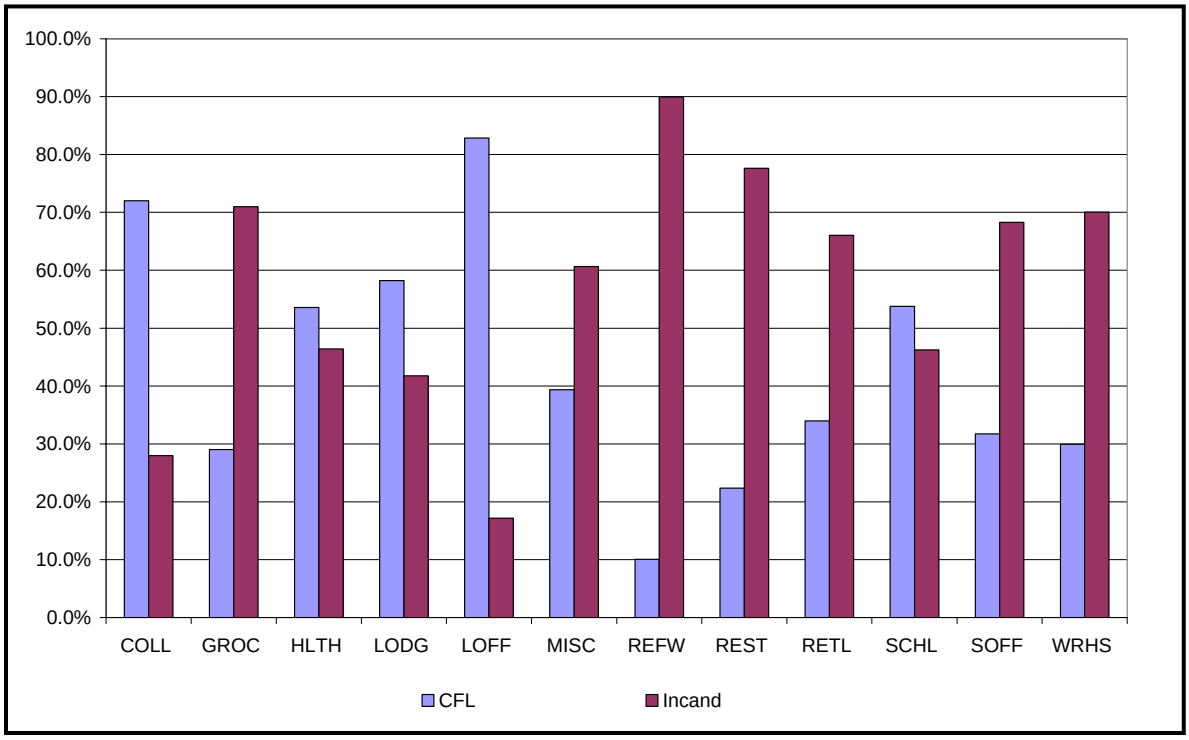


Figure 3-9 illustrates the distribution of incandescent and CFL lamps in California as observed during the CEUS survey, which was undertaken during 2002-2004. In Figure 3-7 above, health care, lodging, and restaurants appear to have over 20% of their lighting as incandescent and CFL lamps. The distribution of CFL versus incandescent lamps presented in Figure 3-9, indicates that the health care and lodging segments have retrofit between 50 and 60% of their lamps to high efficiency CFLs, while over 75% of this class of lighting in restaurants and refrigerated warehouses remains incandescent. The CEUS results presented in Figure 3-7 and Figure 3-9 indicate that as of 2004, substantial savings potential remains for commercial CFLs.

Figure 3-9: CEUS-Based Distribution of Incandescent and CFLs in California Commercial Buildings



Lighting Market Opportunity Survey Results

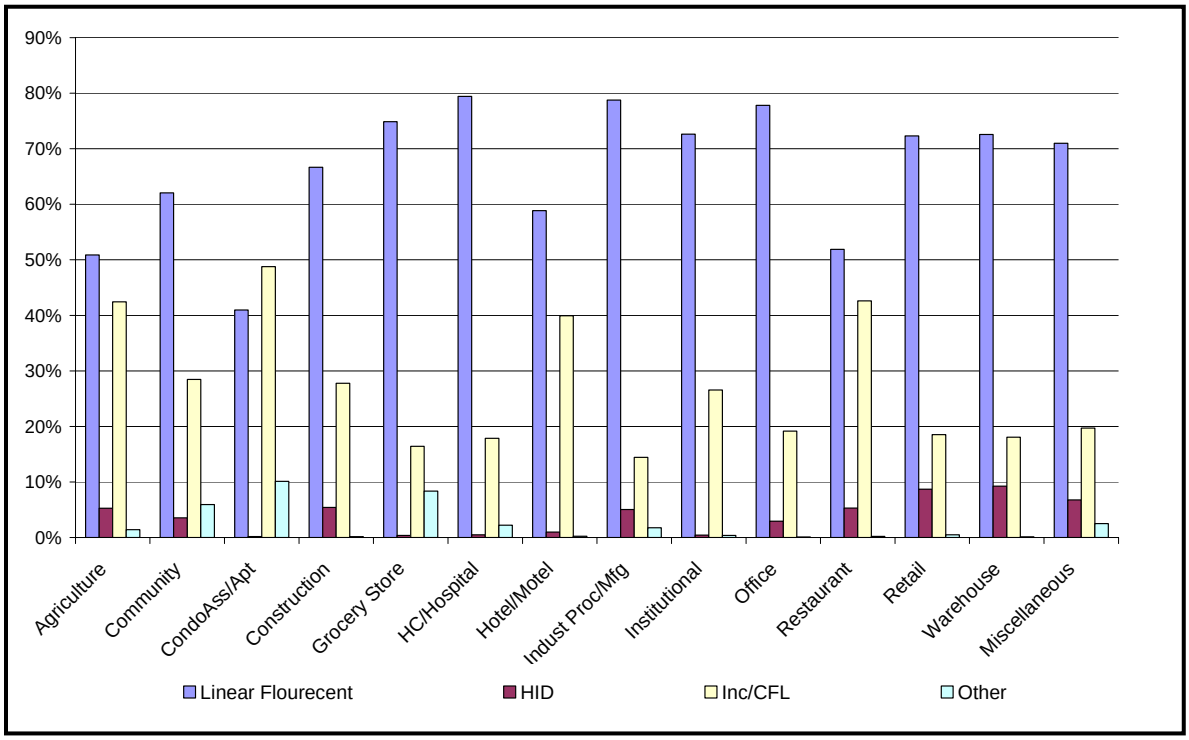
Given the market opportunities that the CEUS database indicates is remaining with commercial linear fluorescents and CFLs, the Express Efficiency Market Opportunities survey queried nonparticipants about the types of lighting currently used in their facility. These data were used to determine the distribution of lighting types for Express Efficiency business types.[23]

Figure 3-10 illustrates the distribution of lighting types for nonparticipant respondents to the market opportunities phone survey. The phone survey questioned participants about the type of lighting in their facility. A survey respondent could provide up to four types of lighting. The survey, however, did not question the market opportunities respondent about the number of lights included in each lighting type. The market opportunities survey data present slightly different information that the CEUS data do. The CEUS data in Figure 3-7 are the distribution of the number of lighting measures within the commercial sector.

[23] The market opportunities survey was undertaken on nonparticipants but the building types used to classify the phone survey respondents mirrored the building sectors used to categorize Express Efficiency participants.

Both the CEUS data and the Express market opportunities data, however, indicate that linear fluorescents dominate in the commercial sector, followed by incandescent and CFLs. Both sets of data find that CFL/incandescent are an important type of lighting in the lodging and restaurant segments. The market opportunities data also indicate that CFL/incandescent lamps are an important type of lighting in agriculture, community buildings, and condominium associations, which were building types not explicitly listed in the CEUS.

Figure 3-10: Express Market Opportunity Nonparticipant Lighting Type Distribution in California Commercial Buildings



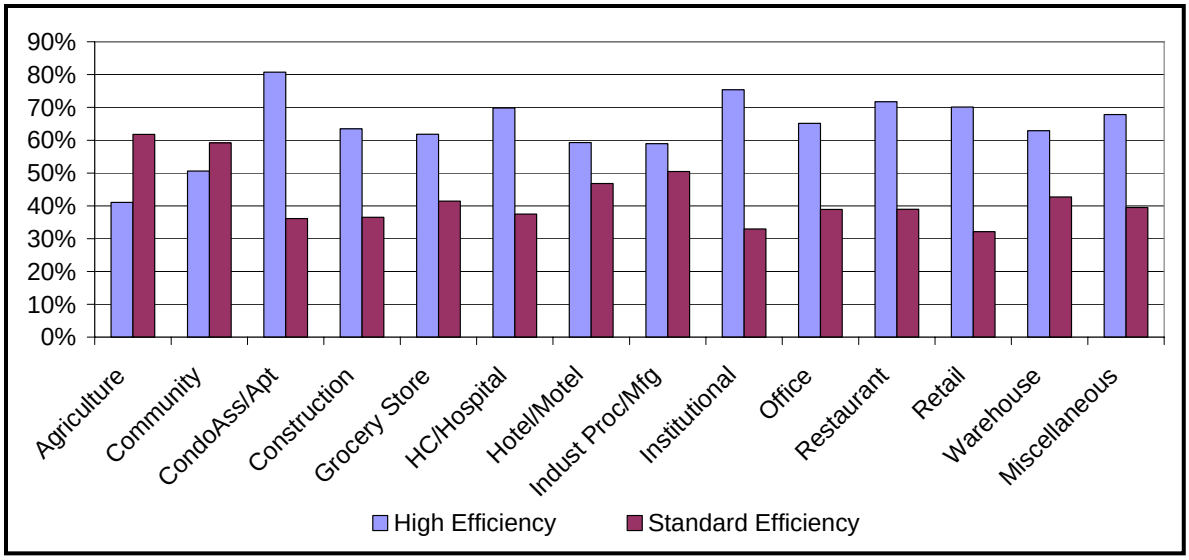
Linear Fluorescents

Figure 3-11 illustrates the results from the market opportunity phone survey on the distribution of linear fluorescents for those sites that responded that one of their lighting fixture types was a linear fluorescent. The distribution provided in Figure 3-11 represents the percentage of sites with high efficiency linear fluorescents versus standard efficiency linear fluorescents. The sum of the percentage of sites with high efficiency and standard efficiency linear fluorescents exceeds 100% for many segments because a site could state that they had both high and stand efficiency fluorescents.

The results illustrated in Figure 3-11 indicate that for most building types, nonparticipants were more likely to report that at least part of their linear fluorescents have been retrofit to T8s. For example, from Figure 3-10 we know that over 75% of offices responded that linear

fluorescents were included in their lighting equipment and more than 60% of the office sites with linear fluorescents responded that some of the lights in their facility were high efficiency linear fluorescents. The data also indicate, however, that slightly less than 40% of office sites with linear fluorescents responded that some of the lighting in the facility was standard efficiency linear fluorescents.

Figure 3-11: Express Market Opportunity Nonparticipant Lighting Linear Fluorescent Distribution in California Commercial Buildings



The results from the market opportunities survey indicate that substantial progress has been made in retrofitting linear fluorescents, but there are also significant savings potential remaining for additional savings. Segments with sites listing linear fluorescents as existing in over 70% of the sites surveyed include grocery, health care and hospitals, industrial processing and manufacturing, institutional, offices, retail, warehouses, and miscellaneous. In segments with a high share of linear fluorescents, Figure 3-11 shows that for grocery stores, industrial processing and manufacturing, warehouses, and miscellaneous over 40% of sites responded that their linear fluorescent lighting equipment still includes standard efficiency measures. These segments provide the utilities with significant savings potential in linear fluorescents.

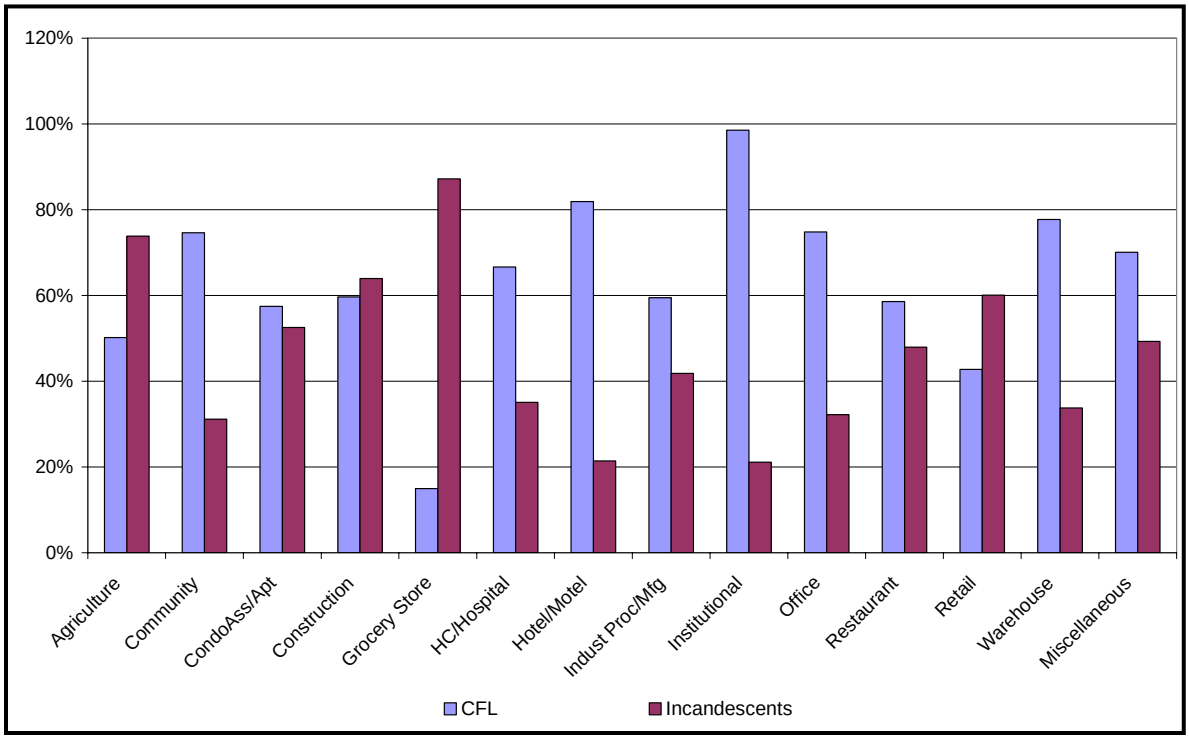
CFLs and Incandescent Lamps

Figure 3-12 illustrates the distribution of CFL and incandescent lamps in nonparticipant buildings for sites that reported having either CFLs or incandescent lamps. The distribution is provided at a site level and does not represent the number of bulbs for each type of lamp. The sum of the distribution within a building type exceeds 100% because a given site can respond that they have both CFLs and incandescent lamps.

The results presented in Figure 3-10 indicated that a significant share of nonparticipant businesses have both CFL and incandescent lamps. Figure 3-12 shows that many sites with CFL or incandescent lamps report having CFL lamps. In the institutional segment, over 25% of sites report having CFL or incandescent lamps. Of the institutional sites with CFL or incandescent lamps, 99% of sites responded that their facility had CFL lamps while 21% of the sites responded that their facility had incandescent lamps. Other segments within the survey, however, had a high share of sites reporting that CFLs/Incandescent lamps were included in their lighting equipment and that a high share of these sites reported incandescent lamps. Agriculture, condominium associations, and restaurant sites all report more than 40% of the sites had CFL or incandescent lamps and more than 40% of these sites reported that the site had incandescent lamps. These three segments provide the utilities with many site reporting lighting equipment in the CFL/incandescent group and many sites reporting that they still use incandescent.

The large number of sites reporting CFLs in their lighting equipment supports the belief that utility programs impact the distribution of lighting in this lighting group. The large number of sites that still report that they use incandescent lamps, however, indicates that significant retrofit opportunities and energy savings potential remain for CFL lighting.

Figure 3-12: Express Market Opportunity Nonparticipant Lighting CFL/Incandescent Distribution in California Commercial Buildings



Age of Existing Lighting

The market opportunities phone survey also asked nonparticipants about the age of their lighting equipment. Older lighting measures are more likely to be inefficient and these sites are therefore likely to present more market opportunities to retrofit the site to more efficient lighting types.

Table 3-5 lists the distribution of the age of lighting equipment at nonparticipant facilities across all business types. Approximately 26% of nonparticipant sites have updated their lighting equipment within the last 5 years while 28% of the nonparticipant facilities have not updated their lighting equipment within the last 15 years. Including the sites that state that their lighting is between 10 and 15 years old to the more than 15 years old classification, approximately 42% of nonparticipant sites have lighting equipment in use at their facilities that is more than 10 years old. These sites are likely to provide the utility programs with significant savings potential.

Table 3-5: Age of Lighting Equipment in the Nonparticipant Business Population

<LI3>How old is the lighting equipment currently in use at your facility? Would you say	Total
Less than 5 years old	26.4%
Between 5 and 10 years old	27.2%
Between 10 and 15 years old	14.8%
More than 15 years old	27.8%
REFUSED	0.2%
DON'T KNOW	3.7%

The distribution of linear fluorescents and CFL/Incandescent was also analyzed for the nonparticipant sites with lighting equipment that is 10 years old and older. Figure 3-13 illustrates the distribution of linear fluorescents for sites with lighting 10 years old and older. Comparing Figure 3-13 with Figure 3-11, sites with older lighting are significantly more likely to have linear fluorescents that are of standard efficiency when compared to all nonparticipant sites.

Figure 3-13: Express Market Opportunity Nonparticipant Linear Fluorescent Distribution for Sites with Lighting Equipment 10 Years Old and Older

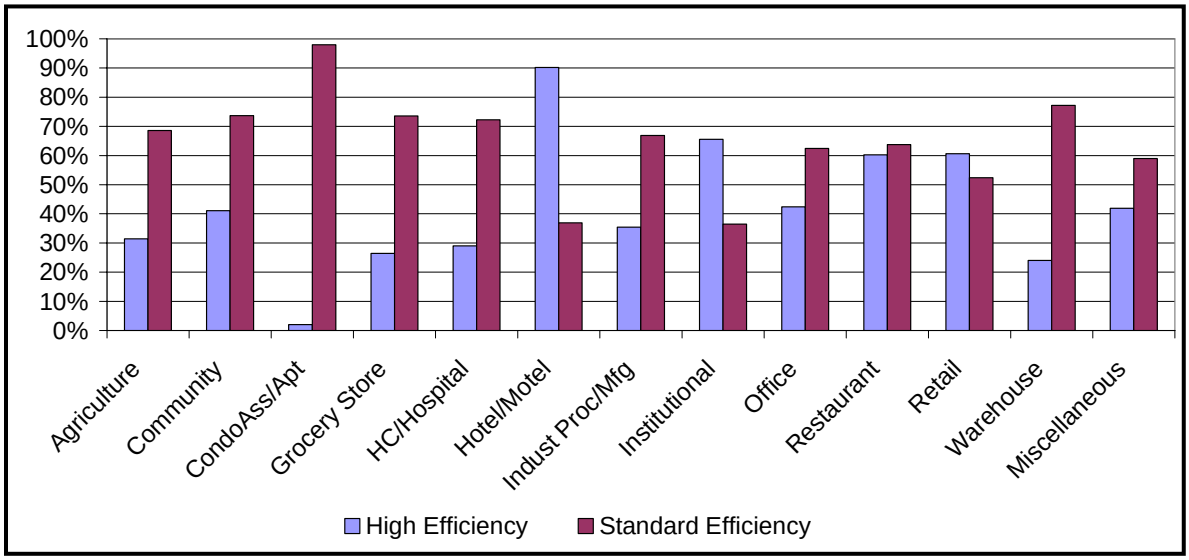
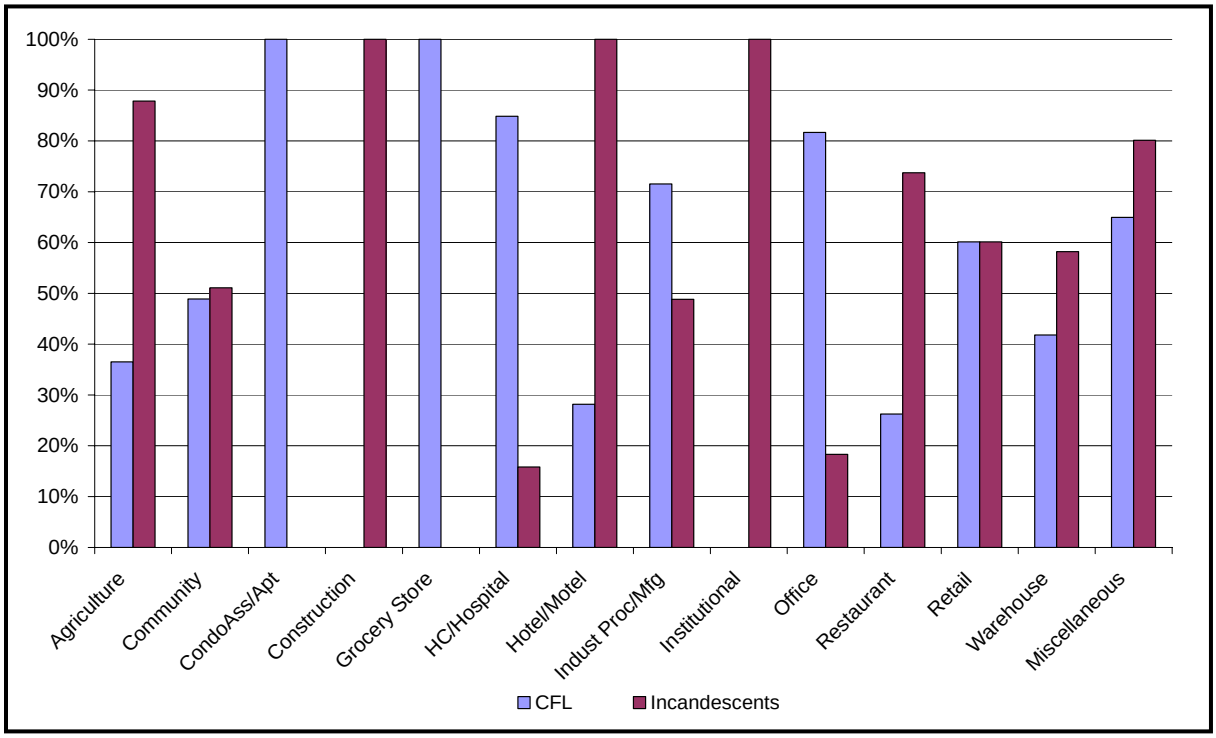


Figure 3-14 illustrates the distribution of nonparticipant CFL/Incandescent for site that reported that the lighting equipment in their facility was 10 years old or older. The relationship between high and standard efficiency lighting and the age of the lighting equipment is not as clear when looking at lamps. First, there are fewer sites that state that they have CFLs and incandescents than linear fluorescents. Second, incandescents are a relatively short-lived measure, increasing the likelihood that sites will have longer living CFLs relative to incandescents.

Figure 3-14: Express Market Opportunity Nonparticipant CFL/Incandescent Distribution for Sites with Lighting Equipment 10 Years Old and Older



Condition of Existing Lighting

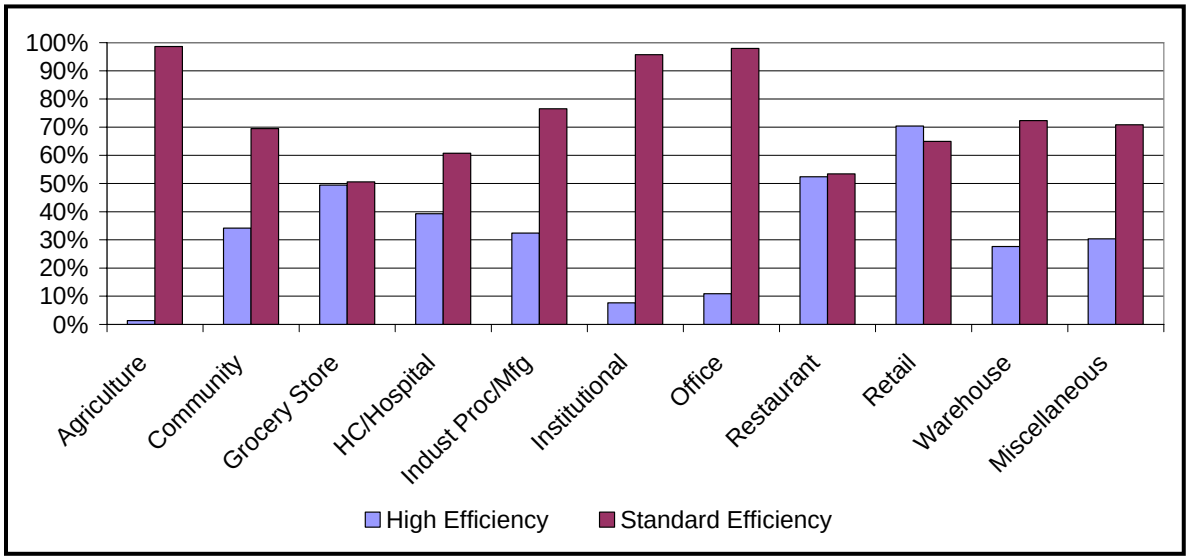
The market opportunities phone survey also questioned nonparticipants about the quality of their lighting. The vast majority of sites stated that their lighting equipment were in good condition. Given that only 28% of sites stated that their lighting was 15 years old and older, it is not surprising that 72% sites reported that their lighting equipment was in good condition.

Table 3-6: Condition of Lighting Equipment in the Nonparticipant Business Population

<LI4>How would you describe the condition of lights currently in use at your facility?	Total
In poor condition	3.9%
Fair condition, or	23.3%
Good condition	72.2%
Refused	0.0%
Don't know	0.6%

Figure 3-15 illustrates the distribution of linear fluorescents for sites with lighting equipment that is 10 years old and older and whose lighting equipment is in poor or fair condition. The business types listed in Figure 3-15 is limited those with sites that met the selection criteria. The illustration indicates that most of the sites with older lighting in fair or poor condition is lighting that is standard efficiency. This subset of sites provides the utilities with substantial energy savings potential.

Figure 3-15: Express Market Opportunity Nonparticipant Linear Fluorescent Distribution for Sites with Lighting Equipment 10 Years Old and Older That Are In Fair or Poor Condition



Plans to Replace Existing Lighting

The market opportunities survey also questioned nonparticipants about their plans to replace their existing lighting equipment. Eighty-six percent of survey respondents stated that they do not plan to replace their lighting equipment. Those who responded that they intended to replace their lighting equipment were asked a follow up question concerning the efficiency level of the planned future installations. An overwhelming percentage (78%) of those who responded that they were planning to install new lighting also stated that they were planning to install high efficiency lighting.

Table 3-7: Lighting Installation Plans in the Nonparticipant Business Population

<LI33A> Does your company have any plans to install new lighting equipment within the next year?	Total
Yes	11.0%
No	85.7%
Refused	0.0%
Don't know	3.4%

3.6.2 Strip Curtain Market Opportunities

Prior to the completion of this evaluation, many utility and evaluation personnel believed that strip curtain measures might provide the utilities with substantial energy savings potential. The engineering and billing evaluation results from an impact evaluation of the Express Program do not support this hypothesis. Note, however, that the energy efficiency savings from strip curtains are being further researched through the evaluation of the 2006-08 energy efficiency programs.

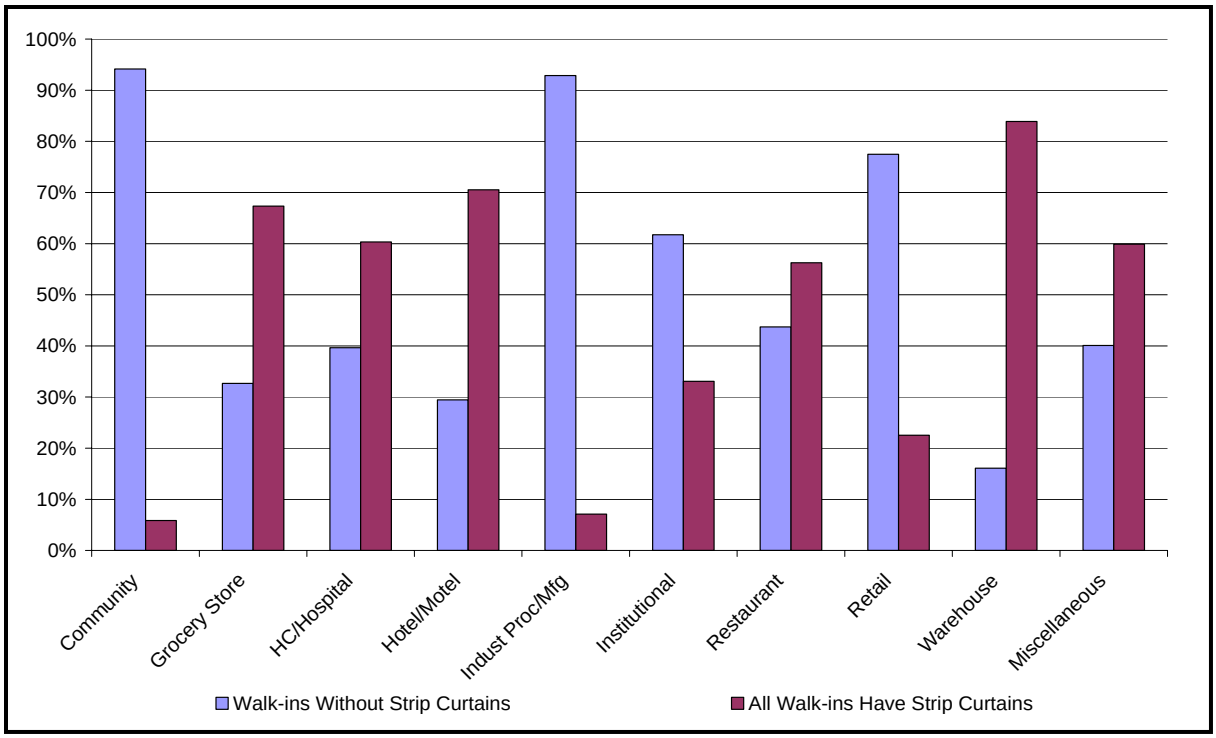
The market opportunities questions were fielded prior to the completion of the engineering and billing evaluations. This engineering analysis indicated that the hours of open door time were 60% lower than assumed in the ex ante work papers, and that strip curtains were installed on more coolers than freezers, further reducing the per unit savings associated with the measure. Therefore, there is clearly a significant effect on the savings depending on how the measure is used (open door time) and the application for which it is installed (cooler versus freezer). Furthermore, a billing analysis conducted as part of the impact evaluation was not able to estimate a statistically significant relationship between the installation of strip curtains on coolers and freezers and bill savings. These findings may support the need for further research into the issues associated with obtaining savings from this measure. A better understanding of the behavioral conditions of customers at sites with strip curtain opportunities that do not currently use them is a valuable first step in the information gathering process. A second step would be to examine the magnitude of the energy savings garnered from strip curtains installed specifically on freezers to determine if this measure is cost effectively energy efficient when used for this application in particular.

Figure 3-16 illustrates the distribution of strip curtains at nonparticipant sites with walk-in refrigeration measures.[24] The nonparticipant sites were asked if they had any walk-in refrigeration areas without strip curtains. More than 40% of the community, industrial

[24] Only segments with at least 5 sites with walk-in refrigeration measures were included in the figure.

processing and manufacturing, institutional, restaurants, retail, and miscellaneous segments responded that their site included walk-in refrigeration measures without strip curtains.

Figure 3-16: Express Market Opportunity Nonparticipant Walk-in Strip Curtain Distribution for Sites with Refrigeration Measures



Sites with refrigeration walk-in measures without strip curtains were also asked if they would consider installing strip curtains. The responses indicate that many of the sites would install strip curtains, but that most community, grocery store, lodging, industrial process, restaurant and retail sites that have walk-ins without strip curtains would not install the measure.

Sites that indicated that they would not install strip curtains on walk-ins were asked why they would not consider strip curtains. The answer to this question informs utilities as to why a measure that has been available for a considerable time has not been adopted by all sites with walk-in refrigeration units. Table 3-8 lists the explanations given by nonparticipants with walk-ins who refuse to install strip curtains. The primary response appears to be that the walk-ins have doors and the management believes that the doors are enough, this is followed by "do not need/can't use" and that strip curtains are too much of a hassle.

Table 3-8: Nonparticipant Sites with Walk-Ins Without Strip Curtains, Would You Install Strip Curtains

<SC5B>Would you consider installing strip curtains on these walk-in units?										
	Community	**Grocery Store**	**HC/Hospital**	**Hotel/Motel**	**Indust. Proc./Mfg.**	**Institutional**	**Restaurant**	**Retail**	**Warehouse**	**Misc.**
Yes	29%	10%	37%	0%	0%	15%	45%	1%	100%	57%
No	71%	72%	15%	100%	100%	25%	55%	99%	0%	43%
Other	0%	0%	37%	0%	0%	0%	0%	0%	0%	0%
Don't Know	0%	17%	11%	0%	0%	60%	0%	0%	0%	0%
n	7	4	4	4	3	7	15	4	2	6

Table 3-9: Why Nonparticipant Sites Without Walk-Ins Will Not Install Strip Curtains

<SC5BB> Why not?									
	Community	**Grocery Store**	**HC/Hospital**	**Hotel/Motel**	**Indust. Proc./Mfg.**	**Institutional**	**Restaurant**	**Retail**	**Misc.**
Had not thought about it	0%	0%	0%	0%	0%	0%	0%	0%	0%
Too expensive	0%	0%	0%	0%	0%	0%	0%	0%	0%
Too much of a hassle	75%	0%	100%	23%	0%	0%	4%	9%	10%
They have doors/doors are enough	3%	50%	0%	53%	96%	0%	31%	91%	0%
Do not need/can't use	21%	50%	0%	23%	2%	100%	11%	0%	26%
moving/renting	0%	0%	0%	0%	2%	0%	9%	0%	0%
Other	0%	0%	0%	0%	0%	0%	46%	0%	63%
Don't Know	0%	0%	0%	0%	0%	0%	0%	0%	0%

3.6.3 Market Opportunities Assessment Findings and Recommendations

As stated at the beginning of this subsection, the decision to focus the market opportunities assessment on commercial lighting and strip curtains was determined through an examination of estimated savings potential from the 2006 and 2008 Energy Efficiency Potential Studies, the ex ante savings achieved by these measures in the 2004-2005 Express, and discussions with energy efficiency personnel. The market opportunities evaluation produced several findings regarding the remaining savings opportunities in commercial lighting and strip curtains and these findings were used to develop recommendations to take advantage of the energy efficiency market opportunities through the Express program.

Lighting

The following lists the results regarding market opportunities in commercial lighting, followed by recommendations made based on these findings:

- Substantial progress has been made in retrofitting T12 linear fluorescents to T8s and incandescents to CFLs, but significant savings potential remains.
- A significant fraction (40%) of the linear fluorescent lighting used in agriculture, community buildings, grocery stores, industrial processing and manufacturing, warehouses, and miscellaneous still includes standard efficiency measures. The linear fluorescents in these segments present the utilities with a significant market opportunity for savings.
- Over 40% of sites in agriculture, condominiums, construction, grocery stores, industrial processing and manufacturing, restaurants, retail and miscellaneous report that they use incandescent lamps, indicating that significant retrofit opportunities and energy savings potential remain for CFL lighting.
- Approximately 42% of nonparticipant sites have lighting equipment in use at their facilities that is more than 10 years old. These sites are likely to provide the utility programs with significant savings potential.
- While lighting has historically been a dominant source of energy efficiency savings for the Express program, opportunities remain to achieve energy efficiency savings from this end-use. Over time, however, savings from existing lighting measures (first-generation T8s and CFLs) will become saturated and the Express program will have to look to the installation of new, higher efficiency lighting measures (later-generation T8s and LEDs) and measures in other end-uses to garner additional savings.

Until the all potential savings from energy efficient lighting are completely saturated, IOUs should continue to encourage current and potential future Express participants to retrofit remaining T12 linear fluorescents and incandescent lamps with energy efficient lighting options. The utilities should specifically target its efforts to promote lighting retrofits through Express towards agriculture, community buildings, grocery stores, industrial processing and manufacturing, warehouses, and miscellaneous market segments to garner the remaining energy efficiency potential that remains with the retrofit of standard efficiency equipment and/or old lighting equipment.

Strip Curtains

The following bullets describe the findings of the market opportunities assessment of strip curtains followed by recommendations:

- Based on an engineering analysis conducted as part of the impact evaluation for the Express Program, the potential savings available from strip curtains is significantly less than was estimated in the ex ante workpapers. This engineering analysis was completed based upon onsites and self-report data, which indicated that the hours of open door time were 60% lower than assumed in the ex ante work papers, and that strip curtains were installed on more coolers than freezers, further reducing the per unit savings associated with the measure.
- More than 40% of the community, industrial processing and manufacturing, institutional, restaurants, retail, and miscellaneous segments responded that their site included walk-in refrigeration measures without strip curtains.

The most significant finding that reduced the energy savings estimate in the engineering analysis was that the open door time was 60% less than assumed in the ex ante work papers. This estimate was based on self reported responses of 15 customers. Because of the relatively small sample frame, we recommend conducting a more comprehensive impact evaluation, including monitoring open door time, before any decisions are made to eliminate the strip curtain measure from future program offerings. However, these findings do indicate that the IOUs should use caution with this measure and not rely too heavily on this measure in their portfolio. A comprehensive evaluation of these measures is currently underway as part of the 2006-08 program evaluations, which can be used to further decide on whether or not to continue to pursue potential energy savings from this measure in this or other programs, and to what extent.

4

Express Program Process Evaluation and Customer Behavior

This process evaluation reviews and assesses the implementation-related aspects of the Express Efficiency program:

- **Participant Satisfaction.** Assesses customer satisfaction on various dimensions of the program.
- **Sources of Awareness.** Examines sources of program awareness, discusses the influence of contractors and IOU representatives, analyzes awareness of the hard-to-reach market, and compares the 2002 through 2005 programs.
- **Participation Drivers.** Compares influence of various drivers on participants' decisions to purchase equipment.

4.1 Customer Satisfaction and Energy Savings Goals

Figure 4-1 and Figure 4-2 present participants' satisfaction with several aspects of the Express Efficiency program between 2002-03 and 2004-05. Some of the program attributes that were examined include satisfaction with the rebate amount, the application process, the contractor used to install the program qualifying equipment, the performance of the installed equipment, and the Express program overall.

The category of satisfied program participants (those who stated that they were "very satisfied" or "somewhat satisfied" with each of the program elements) has stayed relatively constant across the two most recent program cycles. While there are decreases in the percentages of very satisfied customers relative to somewhat satisfied customers between 2002-03 and 2004-05, the overall percentage of satisfied customers is not significantly different on a statistical basis for any of the program attributes studied. This is clear from Table 4-1, which presents the percentage of satisfied customers for the various program attributes along with the mean and standard deviations of the results across program cycles (the sum of the percentage of very satisfied and somewhat satisfied customers).

Figure 4-1: Participant Satisfaction 2002-2003

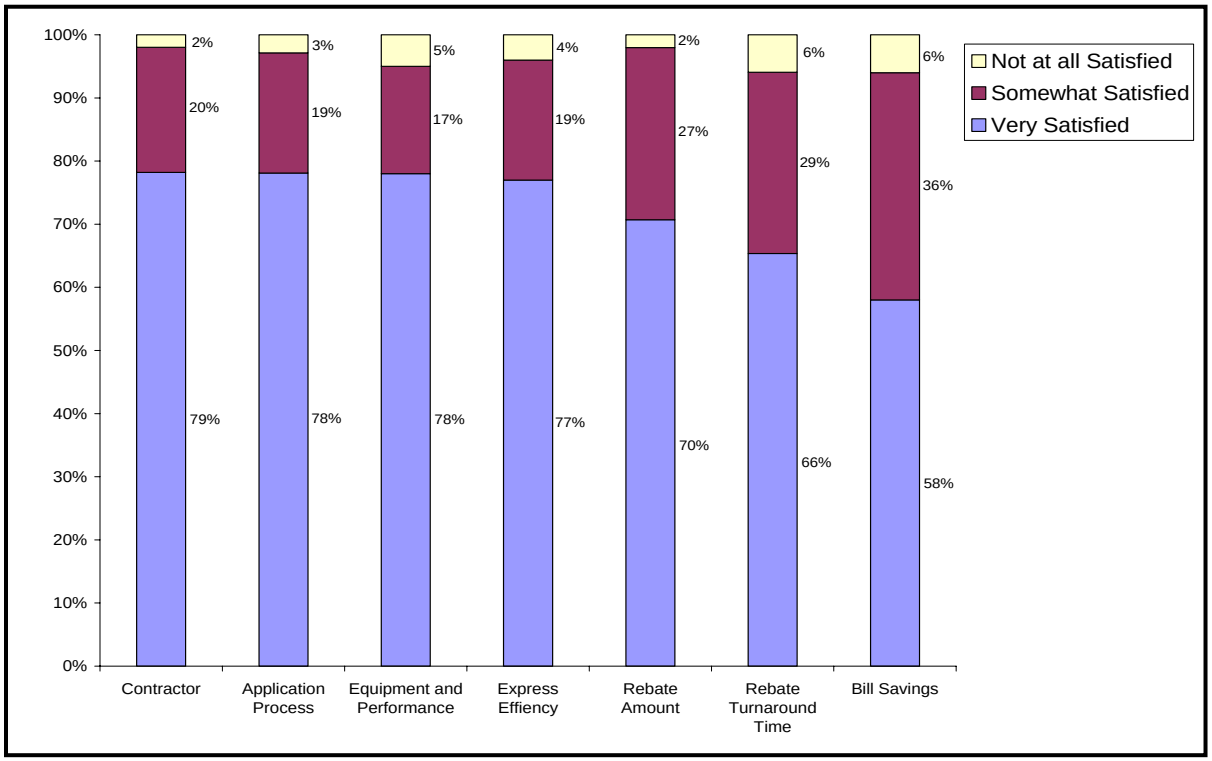


Figure 4-2: Participant Satisfaction 2004-2005

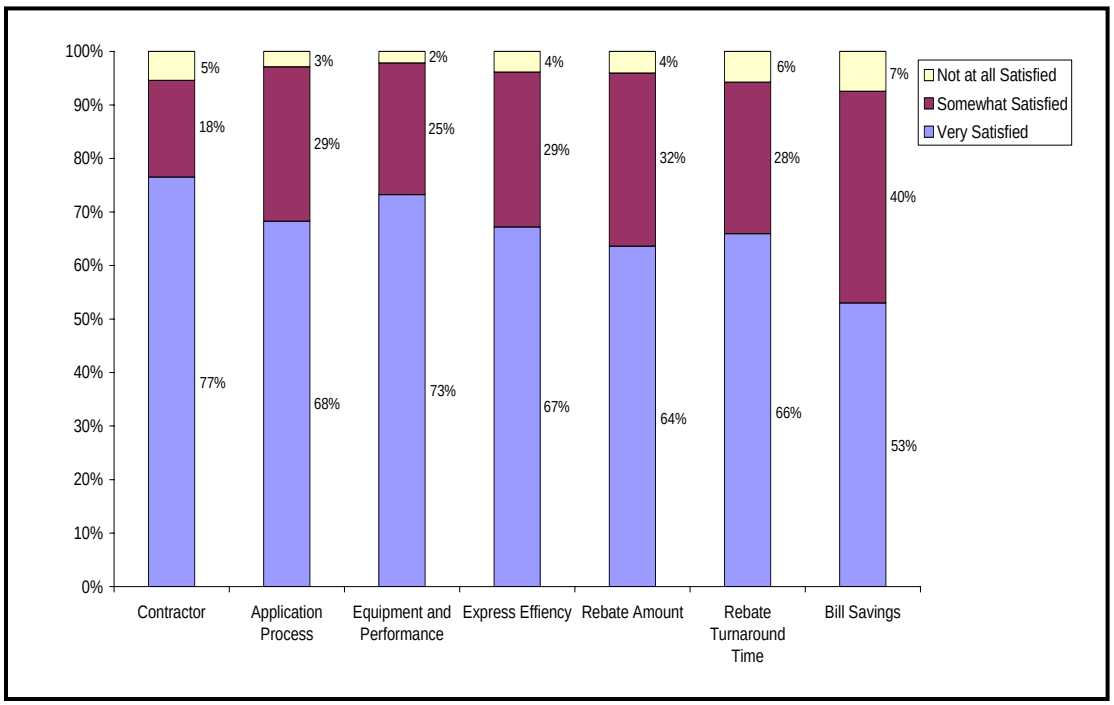


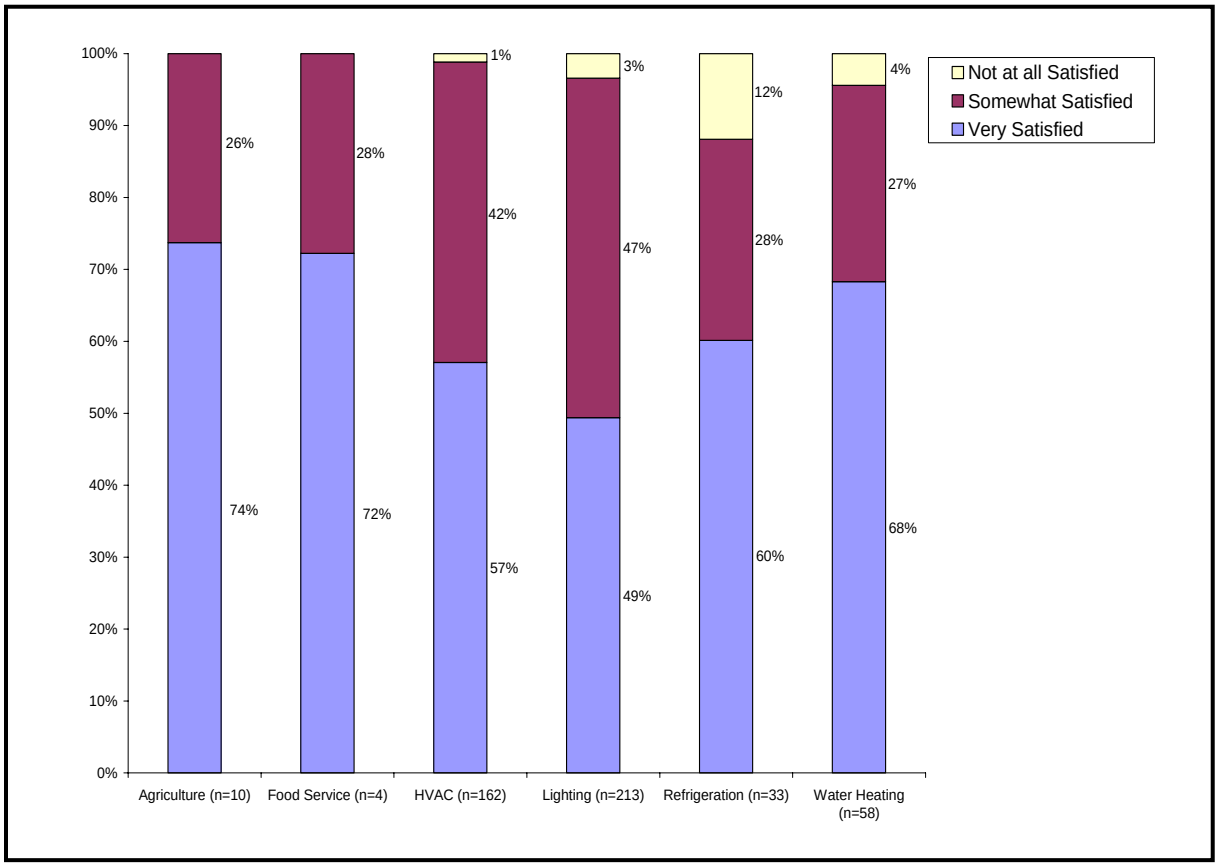
Table 4-1: Comparison of Satisfaction with Express Efficiency Program Attributes Across 2002-03 and 2004-05 Program Cycles

Prg. Cycle	% Satisfied	Contractr	Appl. Process	Equip. & Performance	Express Effic.	Rebate Amount	Rebate Turn Time	Bill Savings
02-03	% Sat.	99%	97%	95%	96%	97%	95%	94%
04-05	% Sat.	95%	97%	98%	96%	96%	94%	93%
Mean		97%	97%	97%	96%	97%	95%	94%
Standard Dev.		3%	0%	2%	0%	1%	1%	1%

While examining the results presented above, it is important to keep in mind that large customers were not the focus of the Express program during the 2002-03 program cycle though they comprised approximately 20% of the customer base during the 2004-05 program year. To examine how satisfaction with the Express program changed across the two program cycles with samples of participants that are more comparable, the percentage of satisfied participants was estimated for the 2004-05 program cycle excluding large customers from the sample. Removing the large customers from the sample had virtually no effect on the percentage of satisfied customers. This allows us to conclude that the change in the distribution of customer size did not have a significant impact on satisfaction with the Express program.

Figure 4-3 presents participant satisfaction with the rebate amount by end use. Participants who purchased agriculture, food service, and water heating equipment had higher proportions of customers who were very satisfied with the rebate amount received than customers who purchased HVAC, lighting, and refrigeration measures. Though the sample sizes are small, no surveyed participants who purchased agriculture or food service equipment were dissatisfied with the rebates received through the program. Customers who purchased refrigeration had the greatest level of dissatisfaction with the rebate amount.

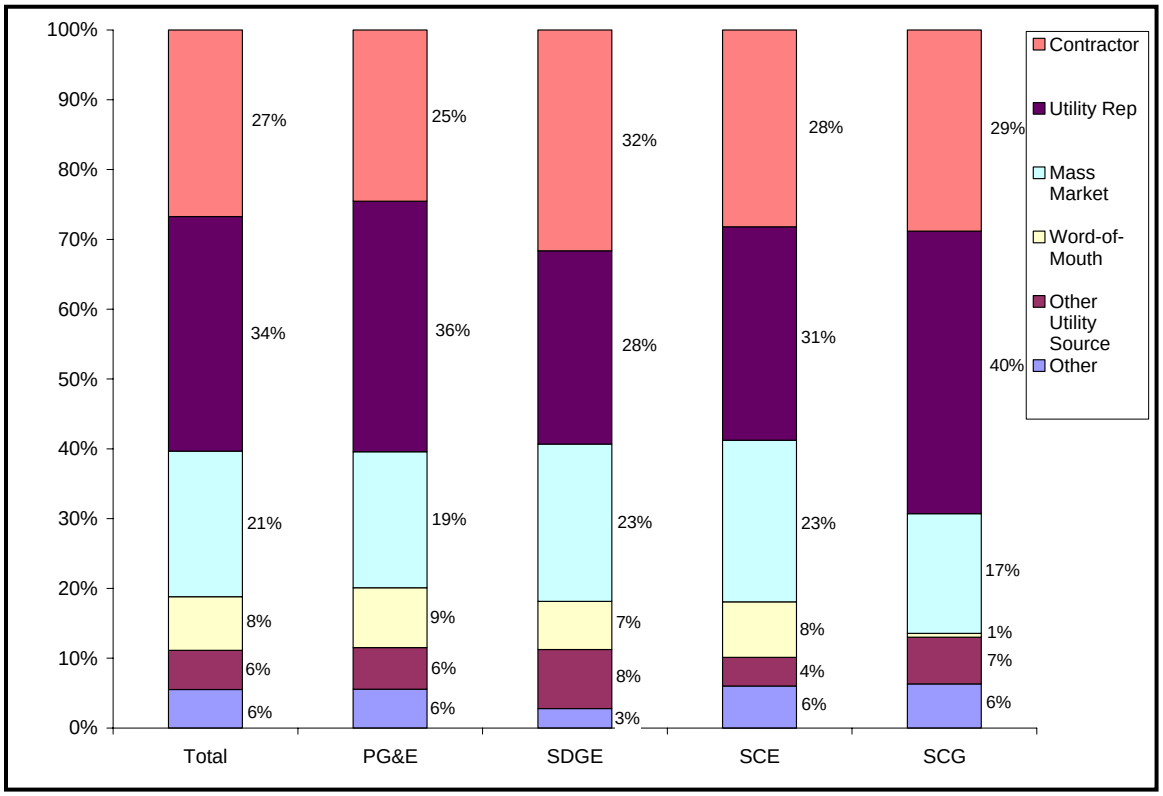
Figure 4-3: Participant Satisfaction with Rebate



4.2 Program Awareness Levels and Sources

Utility representatives were the biggest source of awareness for the sample of surveyed participants (34%), as Figure 4-4 shows. This is a significant increase from 2002-03 when only 18% of program awareness was a result of utility representatives. We affirmed the importance of utility representatives as a source of program awareness during program manager interviews, especially with SCG, as it relies heavily on utility reps to make potential participants aware of the benefits of the Express program. Contractors had been the greatest source of awareness during the previous program cycle. This is not surprising, since contractors have been and continue to be an essential component in driving program participation. Contractors are the second greatest awareness source overall and are the greatest source of awareness in the SDG&E service area. The mass market is the third largest source of awareness. Fewer people are learning about the program through word-of-mouth (6%) in the 2004-05 program years than in prior years (13% in 2002-03).

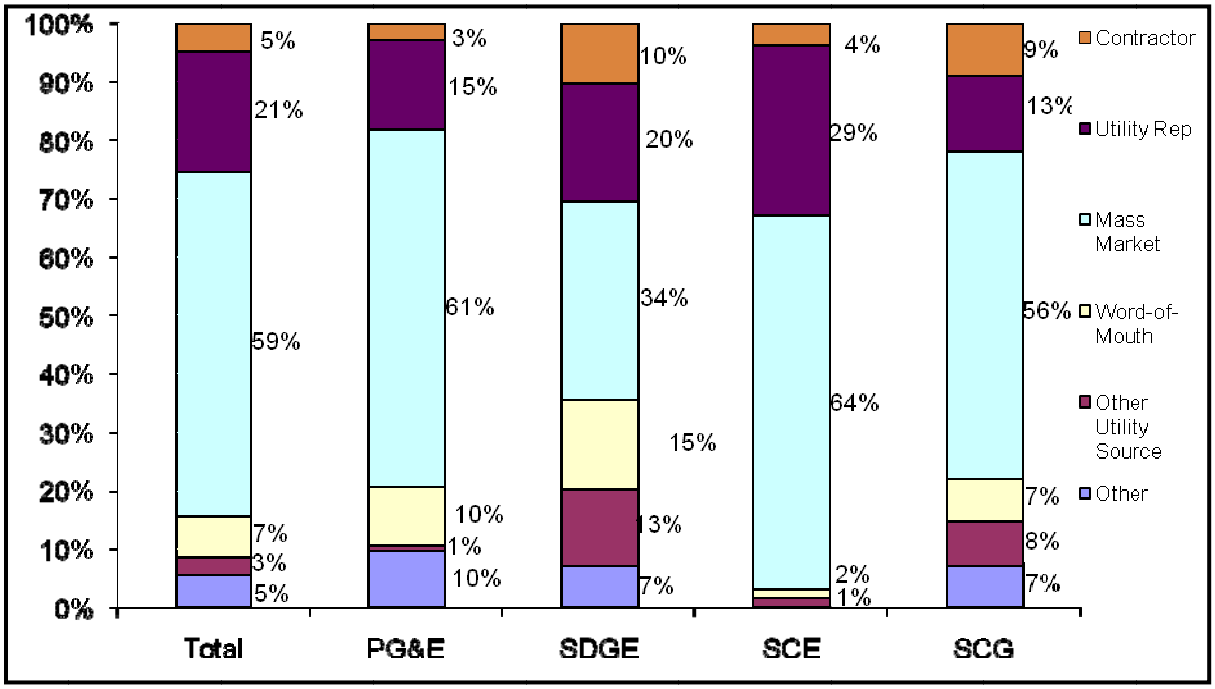
Figure 4-4: Sources of Program Awareness - Participants



Sources of program awareness for nonparticipants was also examined to see how they first became aware of the Express program and contrast this to how participants were made aware. Figure 4-5 shows that only 5% of the nonparticipant sample learned about the Express program through a contractor. More often, they learned about it through the mass market (59%). Comparing the sources of awareness between participants and nonparticipants indicates the effectiveness of contractors and utility representatives, relative to mass market channels. The biggest contrast is with contractors, where 27% of participants became aware compared to only 5% of nonparticipants. For utility representatives, 34% of participants became aware compared to only 21% of nonparticipants. However, for mass market channels, only 21% of participants became aware compared to 59% of nonparticipants. This difference highlights the importance keeping contractors informed of the program and encouraging IOU representatives to inform customers of the program. Over half of the participants in the program used a contractor to install their measure. So, the IOUs can benefit by making sure contractors are kept apprised of the program and the types of equipment that qualify. Nonparticipants seem to learn about Express more through the mass market than through contractors because they are not necessarily looking to purchase new equipment and may therefore not interact with sellers of equipment. However, this is also likely the case with customers that become aware of the program through utility representatives, who appear to be much more effective in getting customers to participate.

So, the IOUs should continue to have their representative discuss the program with their customers.

Figure 4-5: Sources of Program Awareness – Nonparticipants



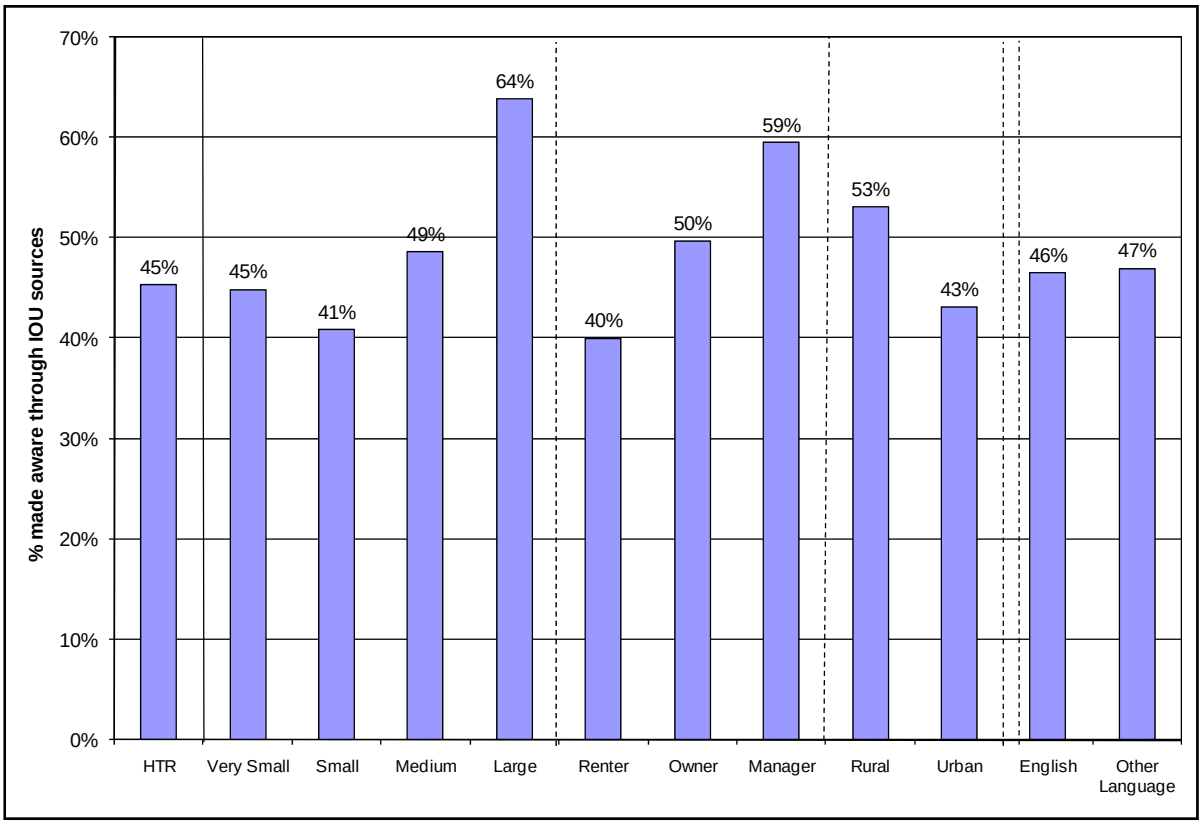
Person-to-person contact continues to be an important motivator for customers to participate in an energy efficiency program. As seen in Table 4-2, 62% of participants said their vendor was "very important" in deciding what equipment to install. This remained relatively constant from the previous program cycle where 63% of the sampled participants stated that their vendor was very important to their equipment decisions. Forty percent of customers said an IOU representative discussed Express Efficiency rebates with them (Table 4-3). This is a small decrease (2%) from the number of customers who said an IOU representative discussed the program with them during the previous program cycle. Consistent with Figure 4-4 above, SCG representatives were most active in informing their customers about the Express Efficiency program (52%). Utility representatives were most likely to speak with property managers regarding the Express program while they were least likely to speak with renters, very small, and medium customers.

Table 4-2: Vendor Importance

Table 4-3: Utility Representative Outreach

The CPUC directed utilities to contact hard-to-reach customers (i.e., small customers [<20kW], renters, rural customers, and customers who speak languages other than English) regarding the Express program and the rebates available for program qualifying equipment. Figure 4-7 shows IOU sources of awareness (i.e., IOU representative, brochures, bill inserts, IOU websites, audits, magazines, and seminars) across various segments, including those that fall into the HTR category.

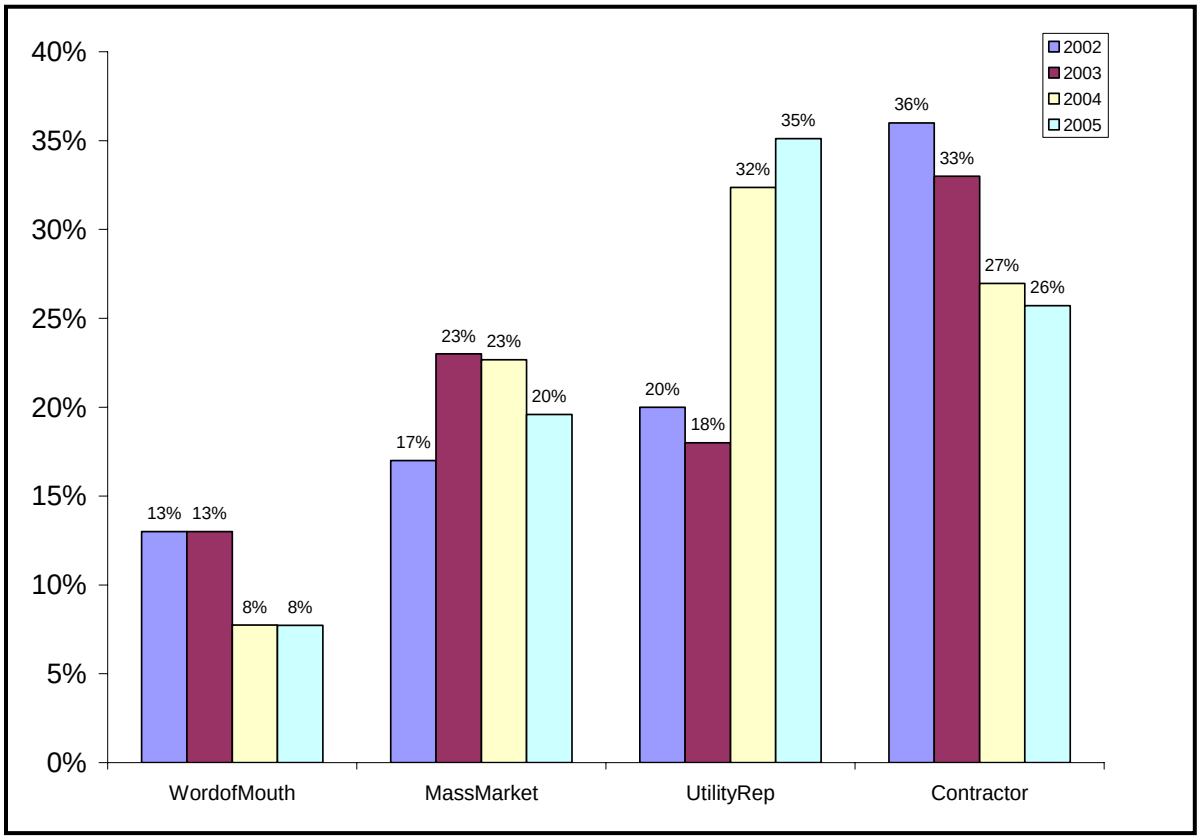
Figure 4-6: IOU Sources of Awareness - Hard to Reach Segments



Overall, the utilities have been successful at making HTR customers aware of the Express program. The percent of surveyed HTR customers made aware through IOU sources is equal to 45%. Relative to the previous program cycle, the IOUs increased awareness of very small (<20kW), rural, and non-English speaking customers (from 35% to 45% for very small customers, 27% to 53% for rural customers, and 40% to 47% for non-English speaking customers, respectively). Renters remain at 40% as the lowest reached category of HTR customers. IOUs made remarkable improvements in notifying rural customers of the program.

As shown in Figure 4-8, sources of program awareness changed significantly between 2003 and 2004. The greatest change is the increase in awareness from an IOU representative went from 18% in 2003 to 32% in 2004. In 2005, awareness due to IOU representatives increased further to 35%. This trend is apparent in Figure 4-4. There was also a 6% decrease in awareness from contractors between 2003 and 2004. Without the presence of rebates for upstream motors and HVAC, the decreasing trend of program awareness through contractors for the Express program is not surprising and can be explained by the change in the types of customers served by Express. Fewer customers learned of the program through word of mouth in 2004-05 compared to 2002-03. Awareness through the mass market also decreased in 2004 and 2005.

Figure 4-7: Major Sources of Awareness - 2002 through 2005

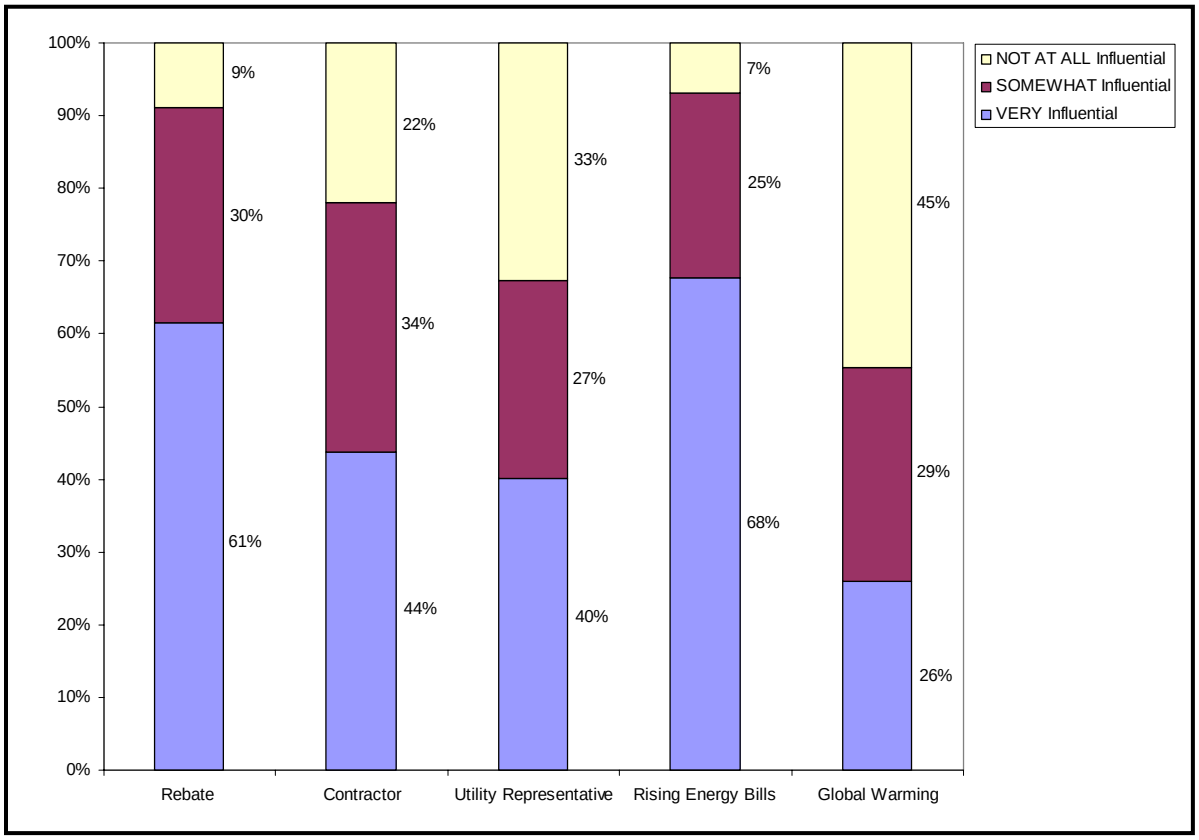


4.3 Participation Drivers

Is the Express Efficiency program continuing to provide customers with a stimulus to move towards energy efficient measures? This section uses participant survey responses to consider the factors that drive a customer to participate in the program. As seen in Figure 4-8, rising energy bills was very influential in a customer's decision to purchase equipment through the program. Rising energy bills was also the most influential factor in customers' decisions to purchase program-qualifying equipment in both 2002 and 2003. The rebate itself was the second most influential factor.

This process evaluation marks the first time Express customers were asked about the influence of global warming on their purchasing decisions. Based on the results of the survey, it is a somewhat or very influential factor for approximately half of the customers in the program.

Figure 4-8: Influential Factors on Decision to Purchase Equipment



4.3.1 Program Effects

Table 4-4 shows the influence that the Express program had on its customers to install different types of high efficiency measures. Just over 40% of surveyed participants stated that the program was very or somewhat influential on the efficiency of the equipment purchased. However, 57% of the surveyed customers stated that the program did not influence them to install the high efficiency measure. Upon first glance, it appears that the Express program has much less influence on participants' decisions to purchase high efficiency equipment than it had previously. In the 2002-03 program cycle, 91% of the surveyed participants stated that the program was influential on their decision to purchase high efficiency equipment and only 6% surveyed stated that it was not. It is possible that customers attribute the efficiency level of their equipment less with the influence of the Express program specifically since energy efficiency in general has become more of a concern. This does not necessarily mean that the Express program is not influential, but that due to its influence in particular and the influence of energy efficient programs overall, the market has moved towards energy efficient purchases.

Itron also examined the condition of participants' equipment to get a sense of whether they are replacing their equipment before it fails. Accelerated adoption is one way to measure the

effect of an energy efficiency program. Table 4-5 shows the operating condition of equipment for the major types of measures rebated by Express – HVAC, water heating, refrigeration, agriculture, and food service.[25]

Table 4-4: Program Influence

[redacted]

Table 4-5: Condition of Existing Equipment

How would you describe the condition of the equipment that was removed and replaced? Was it…	Total	Agriculture	Food Service	HVAC	Refrigeration	Water Heating
broken	22%	0%	0%	13%	42%	24%
poor condition	37%	10%	100%	36%	42%	35%
fair condition	20%	0%	0%	25%	10%	25%
good condition	20%	90%	0%	26%	7%	16%
n	694	5	1	337	298	53

Participants tended to replace refrigeration and water heating equipment when it was broken or in poor condition, while HVAC and agricultural equipment tended to be replaced when the old equipment was still in good condition (early replacement, however the agricultural sample size is only five). Overall, 20% of the old equipment was in good condition when replaced though a majority of the equipment replaced was either broken or in poor condition. These findings suggest that efficient HVAC and agricultural equipment purchases in particular, may have been accelerated due to the program rather than the condition of the existing equipment. While the data in Table 4-4 showed that most of the surveyed participants do not attribute the Express program as an influential factor in their decisions to purchase energy efficient measures, the data in Table 4-5 provide evidence that the Express program or something else, in some part, is influential in that it accelerates purchases of certain types of equipment. The program's influence on the timing of the installation is discussed next.

[25] Itron did not ask this question of sites that only installed lighting measures under the Express program.

4.3.2 Influence of the Rebate

We examined the timing of equipment purchases to determine whether the rebate encouraged the customer to adopt the measure sooner than they might have without the rebates. As shows in Table 4-6 below, lighting measures were least likely to be installed at the same time without the rebate suggesting that the rebate accelerated the purchase of energy efficient lighting. Water heating and food service equipment were most likely to be installed without the rebate likely because they were most frequently replaced when they were already broken or in poor condition.

Table 4-6: Rebate Influence on Timing of Measure Adoption

How influential was the Express program or Express program information in your decision to install this high efficiency equipment?	Total	CFL	T8	Other Lighting	HVAC	Water Heating	Refrigeration	Food Service
Very influential	28%	33%	23%	34%	17%	28%	31%	100%
Somewhat influential	14%	15%	17%	9%	14%	24%	14%	0%
Not at all influential	57%	52%	56%	56%	67%	44%	55%	0%
Don't know	2%	0%	4%	1%	2%	4%	0%	0%
n	387	92	48	105	87	25	29	1

Table 4-7 represents the level of efficiency the customer would have purchased if the rebate did not exist. Again, lighting measures were the most likely to be replaced by a less efficient measure while water heaters, agricultural equipment, and food service measures were most likely to be replaced by the same measure.

Table 4-7: Rebate Influence on Incremental Efficiency

4.4 Express Process Evaluation Recommendations

Itron recommends that the IOUs continue to market the Express program through vendors and IOU representatives using information workshops, printed brochures, fact sheets, and mailings. This process evaluation shows that customers tend to be moved to participate by person-to-person contact and less so by mass marketing. Participants tended to become aware by utility representatives (34%) and contractors (27%), and to a lesser extent mass market channels (21%); whereas the majority of nonparticipants became aware through mass market channels (59%), a lesser amount through utility representatives (21%) and very few through contractors (only 5%). This is an indication of the effectiveness of contractors and utility representatives, relative to mass market channels. Since mass media is less effective in driving participation, Express marketing managers could shift their marketing mix to better leverage contractors and their IOU representatives. Utility representatives were the biggest source of awareness for participants, and the majority of participants said their vendor was "very important" in deciding what equipment to install.

While a high level of satisfaction exists amongst participants of Express, there is still room for improvement with certain programmatic attributes, such as the application process. The percentage of customers very satisfied with the application process fell from 76% in the 2002-03 program cycle to 66% in 2004-05. Based on suggestions provided by vendors and distributors and the best practices benchmarking assessment, the application process and reservation processes would benefit from a conversion to an electronic system rather than use of hard copy applications.

The influence of the Express program should take into account how the program affects the timing of purchases of energy efficient equipment; therefore any analysis of free-ridership associated with the Express program should not rely solely on whether or not customers said they were influenced by the program. Based on customer responses to the question of how influential the Express program has been on their purchases of high efficiency equipment, it at first appears as if the program has far less influence than it had during the 2002-03 program cycle. Previously, 91% of the surveyed participants stated that they were influenced by Express to purchase rebated equipment, but in 2004-05 only 42% answered that they were influenced. However, the significance of the difference in these findings is reduced when we consider how the Express program has affected the timing of purchases. Only 39% of customers said that they would purchase the same equipment at the same time if no rebate were available. Also, HVAC and agricultural equipment tended to be replaced when the old equipment was still in good condition (early replacement) but only 25% would have waited longer than a year. The net-to-gross analysis presented in the impact evaluation of the Express and Upstream program not only examined whether or not

customers stated that they were influenced by the program, but it also takes into consideration how the timing of purchases were affected.

5

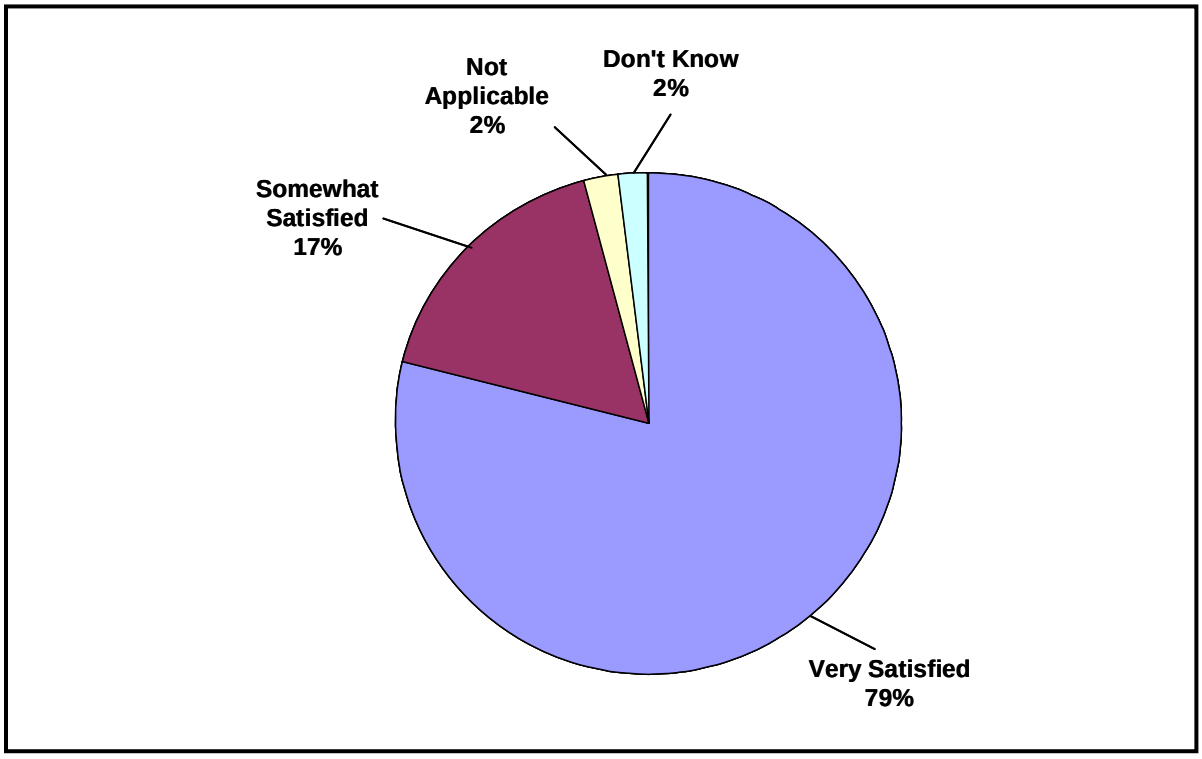
Upstream Program Process Evaluation and Customer Behavior

This section of the report describes results from end-use customer interviews regarding their satisfaction with the equipment they purchased from distributors who participated in the 2004-2005 Upstream Motors and HVAC Program. Results are then presented from the telephone surveys and in-depth interviews with motors and CAC distributors who participated in the program regarding awareness, participation drivers, influence, and effects (including participant spillover) of the program. Distributor and program staff suggestions are presented in detail for program enhancements and additional technologies for which the program could provide rebates.

5.1 Customer Satisfaction

End users of motors and central air conditioners rebated through the Upstream HVAC and Motors program were asked about their satisfaction with the equipment they purchased. Note that a majority of the end users were not aware that they had purchased rebated equipment since the Upstream HVAC and Motors program does not pay rebates directly to them. It is still relevant, however, to examine end user satisfaction since the Upstream program is designed to promote the use of energy efficient motors and split/packaged air conditioners by these users. Based on survey responses from Upstream-rebated CAC and motors purchasers, customers were overwhelmingly satisfied with the equipment they purchased. When asked to rate their satisfaction with the equipment purchased and its performance, over 75% were very satisfied, approximately 20% were somewhat satisfied, and no one was dissatisfied with their equipment purchase or its operation. Figure 5-1 shows that 95% of the customers were satisfied to some degree with their equipment and its performance.

Figure 5-1: End-User Satisfaction with CACs Rebated through Upstream Program



5.2 Program Awareness and Participation

The telephone surveys and in-depth interviews with representatives of central air conditioners (CAC) and motors distributors included questions to gauge how and when distributors became aware of the Upstream Motors and HVAC Program. The interviewers also queried distributors regarding when they first began participating in the program and whether they continued to participate through 2007.

5.2.1 Sources of Awareness

Among both CAC and motors distributors, program representatives were the most frequently cited source of awareness (as shown in Table 5-1). Not surprisingly, more than half of the CAC distributors and three out of four of the motor distributors learned about the Program through a program representative (57% and 75%, respectively). Twenty-nine percent of CAC distributors and 14% of motor distributors learned about the program through an "other" source, including colleagues at their respective companies.

Table 5-1: Sources of Program Awareness by Measure Category

Source of Awareness	Measure Category*	
	CAC	Motor
Program representative (IOU/implementer staff)	57%	75%
Equipment manufacturer	5%	6%
Contractor/equipment installer	-	4%
Equipment end-user	-	1%
Other	29%	14%
Don't know	-	4%
Number of Respondents	**21**	**71**

* Question allowed multiple responses; percentages may total >100%.

5.2.2 Timing of Awareness

Approximately 40% of CAC and motor distributors who participated in the program became aware of the program before the 2004-2005 program period (Table 5-2). By the onset of 2005, approximately 80% of motor distributors and nearly three quarters of participating CAC distributors were aware of the program.

Table 5-2: When Distributors First Became Aware of Program by Measure Category

Timing	Measure Category	
	CAC	Motor
Before 2004	43%	39%
During 2004	29%	45%
During 2005	19%	13%
Don't know	10%	3%
Total	**100%**	**100%**
Number of Respondents	**21**	**71**

5.2.3 Timing of Participation

Roughly one-third of participating motors and CAC distributors began participating in the Upstream Motors and HVAC Program prior to 2004, and nearly all of them first started participating before 2005 (Table 5-3). There are no statistically significant differences in timing of program participation between motors and CAC distributors.

Table 5-3: When Distributors First Started Participating in the Program by Measure Category

Timing	Measure Category	
	CAC	Motor
Before 2004	33%	37%
During 2004	33%	41%
During 2005	19%	20%
Other	5%	-
Don't know	10%	3%
Total	**100%**	**100%**
Number of Respondents	**21**	**71**

5.2.4 Current Participation (2007)

As shown in Table 5-4, many of the distributors who participated in the program during the 2004-2005 period continued participating in at least one IOU service territory through 2007. Most of the CAC distributors surveyed (86%) were still participating in the program during 2007, and more than 60% of the motor distributors continued into 2007 as well. The program experienced a very low rate of turnover among CAC distributors (14% no longer participating in 2007) and a significantly higher rate among motor distributors (39%).

Table 5-4: Current Participation in the Program by Measure Category

Current Participation	Measure Category	
	CAC	Motor
Still participating (in 2007)	86%*	61%
No longer participating	14%*	39%
Total	**100%**	**100%**
Number of Respondents	**21**	**71**

*Difference from motor distributors is statistically significant at the 90% level of confidence.

5.3 Participation Drivers

Both CAC and motor distributors reported that the main motivation for their participation in the program was the ability to obtain a rebate for the program-qualifying equipment. Table 5-5 shows that 99% of motor distributors and 67% of CAC distributors claimed that the rebate was a main reason that they participated in the program. Sixty-eight percent of motor distributors and 57% of CAC distributors participated to increase sales of energy efficient equipment. Twenty-four percent of CAC distributors and 7% motor distributors cited other reasons for participating. These "other" responses included that the program allows for

increased competitiveness in the market; expansion of the distributors' inventory with high-efficiency equipment; increased gross margin in some cases; and the fact that there are no costs associated with program participation.

Table 5-5: Reasons for Participating in the Program by Measure Category

Reason	Measure Category*	
	CAC	Motor
To get rebates	67%†	99%
To increase sales of efficient equipment	57%	68%
To sell only efficient equipment	5%	-
In response to contractor request/information	-	3%
In response to end-user request/information	5%	4%
Other	24%	7%
Don't know	-	1%
Number of Respondents	**21**	**71**

* Question allowed multiple responses; percentages may total >100%.

† Difference from motor distributors is statistically significant at the 90% level of confidence.

5.4 Program Influence

During the in-depth interviews with 17 of the largest CAC and motor distributors, researchers asked respondents to describe their impressions of the overall influence of the Upstream program and its rebates on sales of the equipment for which they received rebates through the program during the 2004-2005 period. Distributors who still participated in the program during the 2006-2007 period were asked the same question for the more recent program period.

5.4.1 Program Influence During 2004-2005

The larger motor distributors reported that the 2004-05 program and its rebates provided incentives for the dealer to stock and sell the NEMA Premium motors, and generally increased premium motor sales. One distributor mentioned that sales bonuses for premium motors are partially funded by the program rebates, providing incentives for staff to up-sell to premium motors. Another cited that the program provided the means to stock NEMA Premium motors "and proved that NEMA Premium motors were far easier to sell than (had been) anticipated once we had them in stock."

The larger central air conditioner distributors reported effects of the program and its rebates on equipment for which they received incentives. Distributors reported that the program increased stocking and/or sales of high-efficiency units. One distributor stated that, "before the rebate program, my salesmen mostly sold the lowest cost unit because that was the type we stocked. After the program took hold, we changed to stocking… 70% high-efficiency equipment." Another distributor reported that the program provided "incentive for sales staff to invest extra time to explain benefits of high-efficiency equipment to customers."

Overall, the majority of distributors claimed that the program had some affect on their stocking practices, increasing the inventory of program qualifying equipment. These findings support the benefits of the Upstream program in that it motivated vendors and distributors to begin stocking higher efficiency motors and CACs which in turn made their way into the marketplace. However, as is discussed in more detail below, approximately 24% of the participating CAC distributors and 51% of motor distributors believed that all of their rebated units would have been sold without the 2004-2005 rebates. Therefore, it may be that some respondents are assuming that sales would have been the same given what inventory they had, but are not considering that the program affected their inventory. Therefore, future NTFR analyses should include examining how stocking practices have changed as a result of the program, in addition to how sales were affected by the program.

5.4.2 Program Influence During 2006-2007

Researchers asked the large distributors who participated in the 2006-2007 program to describe their impressions of the overall influence of the Upstream program and its rebates on sales of the equipment for which they received rebates through the program during 2006 and 2007. Thirteen of the distributors who continued to participate in the program during the 2006-2007 program period were able to answer the question.

Several of the larger motor distributors reported that after participating in the 2004-2005 program, they had changed their stocking practices in anticipation of rebates through the 2006-2007 program. A few reported that after their participation in the 2004-2005 program, they would have continued to stock Premium motors even in absence of the program: "We were believers by then," reported one distributor's representative.

The larger CAC distributors reported that the 2006-2007 program really helped them focus on selling energy efficient CACs. In their own words:

- "[The program and its rebates] drove our sales team to really push for high-efficiency… and [they] used a payback calculator to show the monetary advantage of doing so."

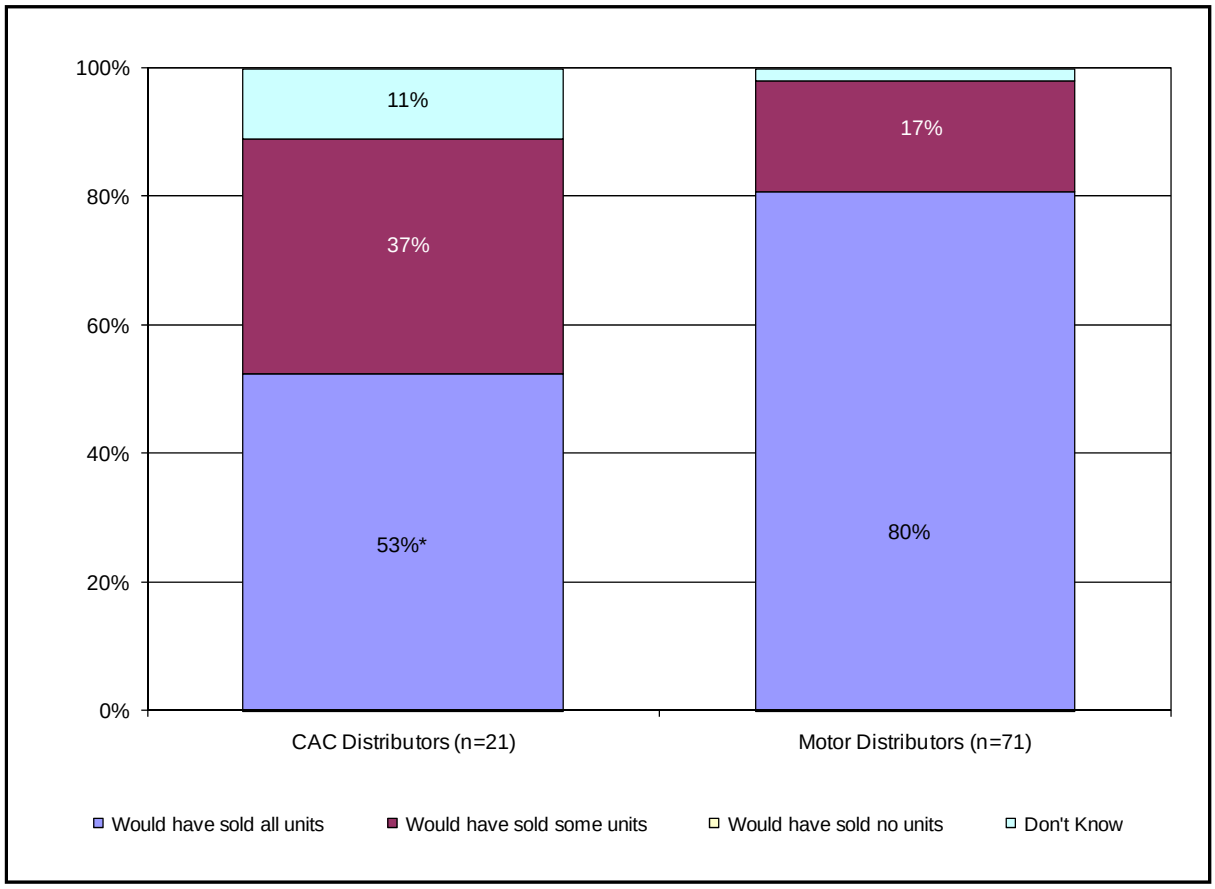
- "Inside sales people really focus on selling high-efficiency equipment largely because the program and rebates have incentivized them to do so."
- "The program had an extreme influence in that it was a key part of our marketing and strategy, and allowed stocking high-efficiency units at far greater levels than would have occurred absent the rebates."
- "The rebates solidified our commitment to expanding our offering of energy efficient equipment from manufacturer."

5.5 Program Effects

5.5.1 Program Effects during 2004-2005

CAC distributors felt that the 2004-2005 rebates had a stronger effect on their business than the motor distributors, as demonstrated in Figure 5-2. While approximately 24% of CAC distributors believed that all of their rebated units would have sold without the 2004-2005 rebates, 51% of the participating motor distributors attributed no increase in sales to the program. Forty-four percent believed that they would have sold some units without the program, while 1% believed that they would have sold no motors without the program incentives. Sixty-two percent of CAC distributors credited the program with increasing their sales volume somewhat, while only 5% reported that they would have sold none of their CACs in absence of the program.

Figure 5-2: Quantity of Rebated Measures That Would Have Been Sold Without 2004-2005 Rebates by Measure Category

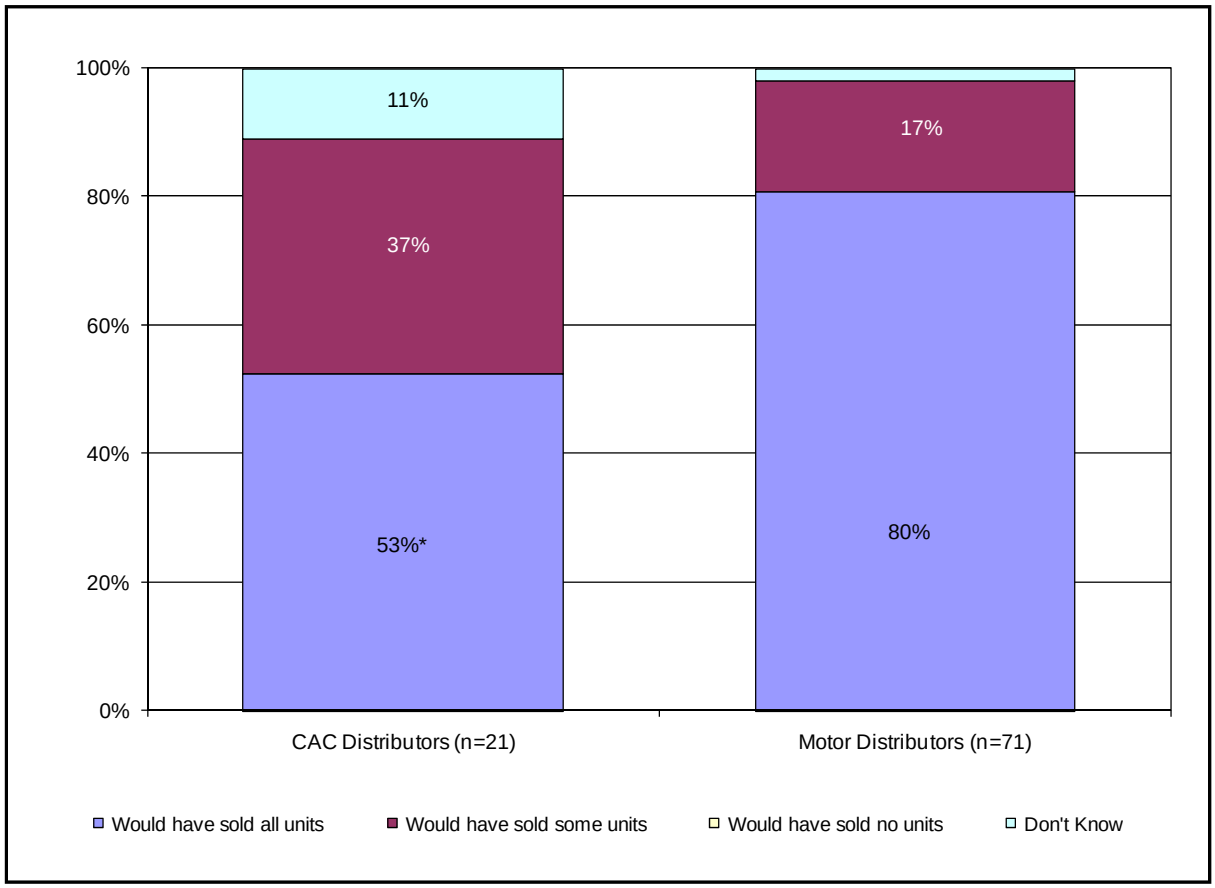


5.5.2 Program Effects During 2006-2007

Figure 5-3 shows that CAC distributors continue to attribute significantly more sales to the program than motor distributors: approximately 20% of CAC distributors believed that the rebates had no impact on the number of units they were able to sell, compared with 47% of motor distributors.

More than half of both CAC and motor distributors believed that only some of their units would have been sold without the 2006-2007 rebates (63% and 53%, respectively). All motor distributors believed that they would have sold at least some units, while only 5% of CAC distributors believed that they would not have sold any of the rebated units had the rebates not been available.

Figure 5-3: Quantity of Rebated Measures That Would Have Been Sold Without 2006-2007 Rebates by Measure Category



* Difference from motor distributors is statistically significant at the 90% level of confidence.

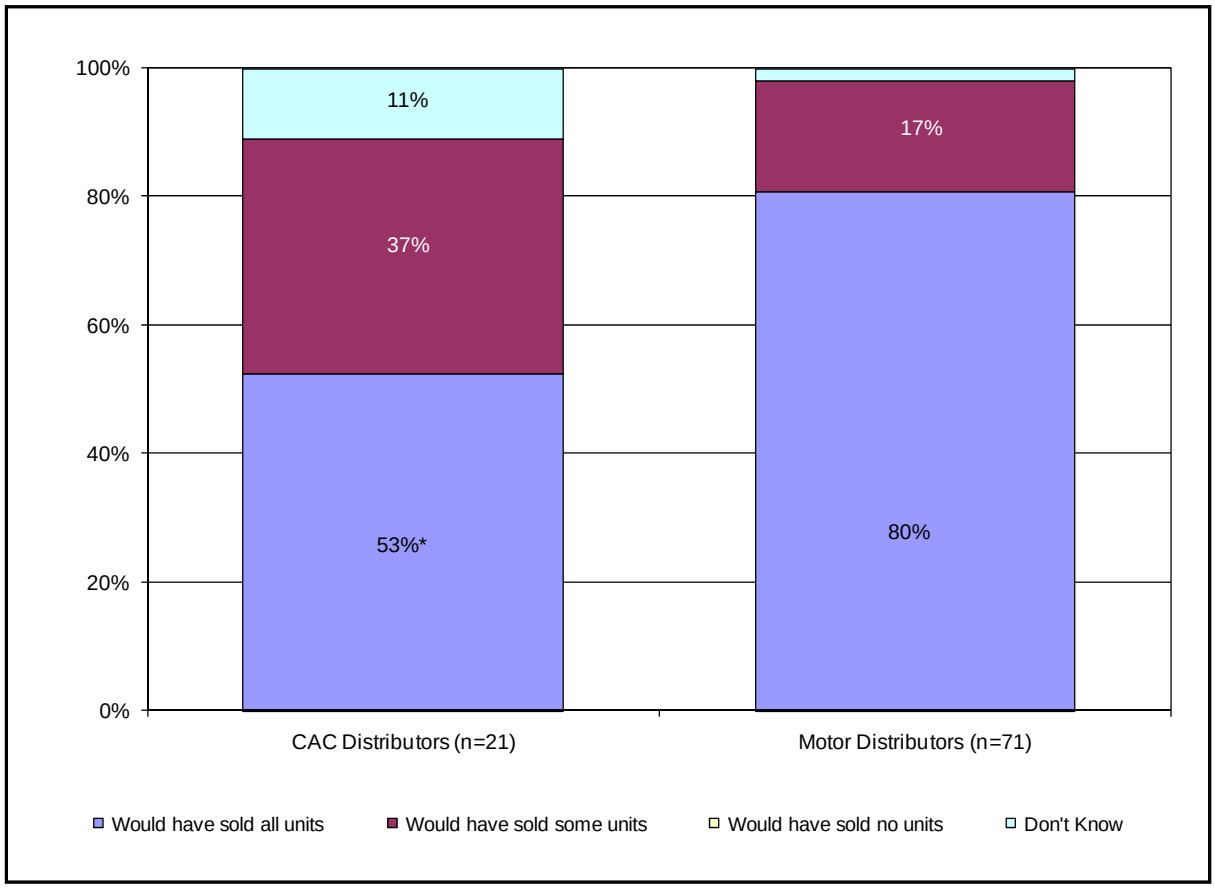
5.5.3 Spillover

Sales Effects

As shown in Figure 5-4, more than half of CAC and motor distributors reported that they would have sold all of the non-rebated units they sold during the 2004-2005 period if they had not participated in the program. A significantly greater percentage of motors distributors reported that they would have sold all of these units in absence of the program than CAC distributors (80% and 53%, respectively).

Thirty-seven percent of CAC distributors believed that they would have only sold some units in absence of the program, compared with approximately 17% of motor distributors. Neither group of distributors reported that they would have sold no units in absence of the 2004-2005 rebate program.

Figure 5-4: Equipment Sales Volume Difference for Non-Rebated Measures in Absence of 2004-2005 Rebates by Measure Category



* Difference from motor distributors is statistically significant at the 90% level of confidence.

Pricing Effects

***2004-2005*.** The majority of the CAC and motor distributors who participated in the 2004-2005 program reported that the 2005 program discounts did not allow for a reduction in prices for other equipment types (approximately 80% and 90%, respectively). Twenty percent of CAC distributors and 10% of motor distributors were able to reduce prices of some other type of equipment due to spillover from the 2004-2005 rebate program.

CAC distributors who reported that their participation in the program enabled them to reduce prices of other equipment types were able to do so among a variety of equipment types. These measure types included other CACs, motors, chillers/cooling VSDs/VFDs, and other types of equipment. Six percent of motor distributors reported that their participation in the 2004-2005 program enabled them to reduce the price of other equipment types, including (non-rebated) motors and VSDs/VFDs

***2006-2007*.** The majority of participating distributors reported that they did not reduce the price for other equipment types in 2006-2007 as a result of their participation in the program. Approximately 90% of motor distributors and 79% of CAC distributors reported that their participation in 2006-2007 did not enable them to reduce the prices of other equipment types.

5.6 Distributor and Program Staff Perspectives on Upstream Program

Evaluators elicited suggestions for program improvements from members of the IOUs' 2004-2005 Upstream Motors and HVAC Program staff during the in-depth interviews. The topic was touched upon during the CATI interviews with motors and HVAC distributors and explored in greater detail with the largest distributors during the in-depth interviews. This subsection presents distributor and program staff perspectives on potential enhancements to the Upstream Program.

5.6.1 Distributor Perspectives

During the in-depth interviews with representatives of the 17 largest distributors that participated in the 2004-2005 program, the researchers asked the distributors representatives for suggestions for improving the upstream rebate program.

Six of the nine larger CAC distributors' representatives had no suggestions for program improvements. The other three offered the following suggestions:

- Additional levels of rebates in between existing levels (to discourage distributors from stocking and selling along the lines of existing rebate levels).
- "Improve communication within the utilities: sometimes programs conflict with one another. For example, the utility account representative has called up large [property] owners telling them to go after the rebate (or a share of it), while the distributor is using the rebates to be competitive."
- Eliminate the reporting requirement for installation location. One representative felt that if they can provide information indicating that the CAC unit ended up somewhere in California, that level of detail should be sufficient.

Four of the large motor distributors had no suggestions for improving the program. The other four offered the following suggestions:

- Eliminate requirement for end-user information and allow distributors to report mechanical contractor information instead.
- Increase program marketing and offer more marketing pieces for distributors to use.

- Send a mailer from the IOUs to major industrial accounts advertising that specific motor distributors (program participants) offer discounts on NEMA Premium motors.
- Alter the online rebate application tool to enable distributors to share the program incentives with their customers. This distributor's representative felt that the online tool should be set up to allow partial rebate payout to distributor and partial payout to end-use customers.

5.6.2 Program Staff Perspectives

Program staff reported that some of the motors and large air conditioning units that were included in the 2004-2005 Express Efficiency Program were not included in the Upstream Program, which caused some confusion among trade allies. Additionally, some units did not meet the EER requirements for the Program despite having high IPLV, which also caused confusion and some frustration among distributors who focus on IPLV ratings to a greater extent than EER.[26]

In addition to this suggestion made by the IOUs, because some program staff shifted their focus for program incentives (from upstream to mid- and/or down-stream), interviewees made the following recommendations to improve the Upstream Program.

- **To encourage replacement of functional motors**, test installed motors for vibration (pending failure) and combinations of low efficiency/over-sizing.
- **Address the issue with current DEER methodology**. One IOU staff member felt that the current methodology does not correctly account for sizing, load, and operating hours of old units, nor does it account for all possible equipment end uses.

Program staff felt that the following measures should be added to the program:

- Air-cooled packaged chillers,
- Motor early replacement,
- Variable speed drives/variable frequency drives,
- Digital controls,
- Carbon dioxide sensors, and
- Mechanical/helical gear drive speed reducers.

[26] Note: the 2006/2008 program requirements have switched from qualification based on minimum EER and IPLV ratings to qualification based on minimum EER or IPLV ratings.

Distributors suggested adding large water-cooled chillers and efficient mini-split motors to the program's portfolio of rebated measures.

5.7 Upstream Process Evaluation Recommendations

Based upon this process evaluation and the suggestions for program enhancement by vendors and distributors as well as program staff, the following recommendations for the Upstream program are presented:

Continue IOU outreach to distributors as this is the most effective way distributors have learned about the program. Three-quarters of the participating motors distributors and 57% of the participating CAC distributors became aware of the program through an IOU representative. The IOUs should continue to hold frequent information sessions and workshops and regularly provide printed material to vendors to keep them apprised of any changes to the Upstream program. Through these outreach efforts, the utilities can inform vendors of changes in the types of equipment that qualify for rebates, the level of rebates offered for equipment, updates to the application materials they need to submit, and changes to the process by which rebates are paid out. Distributors can use this information to improve their services to final purchasers of CACs and motors.

The focus of the Upstream program should be on expanding vendor awareness of the ease of selling NEMA premium motors, especially to vendors who still think they are difficult to sell and do not stock them accordingly. As discussed in this evaluation, distributors found that selling energy efficient motors was not difficult once they had an incentive to stock them in their inventories. However, it is not clear that the general population of CAC and motors vendors have been made aware of the successes of Upstream program participants. This message should be carried to potential Upstream program participants to encourage them to also change their stocking practices, which will in turn lead to higher volumes of energy efficient equipment in the market.

The IOUs should develop a system to track the stocking practices and sales of successful Upstream program participants. Collection and dispersion of this type of information is essential to continuing success of the Upstream program. These data are what the utilities can use to inform potential program participants of the benefits of the Upstream program and provide them with additional motivation to participate. Historical data about the high levels of program satisfaction amongst end users who purchase equipment from program participants can also be used to recruit new participants to the Upstream program.

Future self report net-to-gross analysis approaches should examine not only the self reported effect of sales by the program, but also how stocking practices have changed. Approximately half of the Motors distributors and one quarter of the CAC distributors stated that they would have sold the same number of program qualifying equipment in the absence of the program. However, the majority of distributors claimed that the program had some affect on their stocking practices, increasing the inventory of program qualifying equipment. Therefore, it may be that some respondents are assuming that sales would have been the same given what inventory they had, but are not considering that the program affected their inventory.

6

Express Program Vendor and Distributor Assessment

This chapter presents results of interviews with 160 lighting vendors, 44 refrigeration vendors, Express program managers, and Express program participants regarding the role that vendors played in their equipment purchases. The subsections of this chapter address the following.

IOU outreach to vendors describes IOU marketing efforts to vendors, based on interviews with program managers.

Customer survey findings discusses vendor outreach to customers and their influence on customer decisions based on interviews with Express participants.

- **Market characterization results** presents business profiles of lighting and refrigeration vendors interviewed, characterizes their participation in Express, and describes their installation practices.
- **Lighting and refrigeration rebates** presents vendor opinions on the Express rebates and the rebate reservation process.
- **Other program participation** offers a qualitative assessment of the other programs in which these vendors are participating.
- **Process issues section** examines the application and reservation process and offers vendor suggestions for program enhancements.
- **Summary of findings** recaps the main findings on the role of vendors in the Express Efficiency program.

Recommendations are made to improve the Express program based on the findings from the vendor and distributor assessment.

6.1 IOU Outreach to Vendors

6.1.1 Vendor Involvement

Vendors, according to SCE, SDG&E, and PG&E, are and have been the main drivers of the Express Efficiency program over much of the program's lifespan. SCG has traditionally looked to its account executives, customer and industrial service technicians, and field representatives to inform customers about the program. In general, the utilities rely on vendors to act as intermediaries by approaching customers with their knowledge of the measures, informing them of their energy savings potential, and explaining to them that purchases of specific equipment can qualify them to receive rebates. Since the utilities recognize the role of vendors in the success of the program, they make sure to keep vendors abreast of the measures for which rebates are available by inviting them to presentations and information seminars related to the program. For example, PG&E program staff mentioned that it held vendor breakfasts periodically to foster relationships and inform them of the program. The main forms of communication with vendors included e-mails, letters, kickoff meetings, brochures, and tradeshows. The exception was SCG, who primarily relied on their own staff to inform customers of the program.

6.1.2 Program Marketing

Program marketing was not coordinated across utilities but was instead customized to serve the equipment interests of customers in each IOUs service territory. Each utility carried out its own campaign and often relied on similar tools; however, no statewide Express Efficiency program marketing materials were developed. All of the utilities relied on bill inserts and direct mail pieces to inform customers and vendors about the program. SCG mentioned that, in addition to these traditional means of communication, it spread the message about the program through Internet as well.

Account representatives at SCE were a main source of information about the program, as they would interact with customers on a regular basis. The program managers also mentioned vendors as a source of information and felt they played a large role in marketing the program for the utilities as well. SCG reaffirmed the beneficial role played by its account executives in marketing the program.

The program manager of SDG&E reported that much of its marketing was based on the production and distribution of fact sheets that would be distributed to vendors so they could in turn provide them to customers. According to SDG&E, "those who worked on getting this message out included our outreach teams, Account Executives, and Public Affairs – everyone who had contact with customers. We even had some of our service planners, who were doing things like re-wires for customers. We would provide them with rebate forms, rebate

applications, and fact sheets. Just because a customer may be doing a re-wire, doesn't mean they are not interested in doing something else down the line. Again, we approached getting our message out from a number of different angles."

Trade shows and presentations were also mentioned by the utilities as tools to market the program. SCG used its Energy Resource Center in Downey, California to distribute literature about the program and to hold seminars to educate vendors and customers about the program. SDG&E mentioned making presentations as well. Vendor breakfasts held by PG&E were also a way the utility informed individuals about the program in the hope that vendors would bring the information back to customers.

For the kickoff of the 2006-08 program cycle, PG&E conducted a mass mailing to all vendors in their trade ally database that were active in the last 10 years. It was the utility's way of informing vendors that the Express Efficiency program would be renamed, but will still cover the same measures, if not more.

6.2 Customer Survey Findings

This section presents results from interviews with Express Efficiency participants about the role of their contractor.

6.2.1 Vendor Outreach

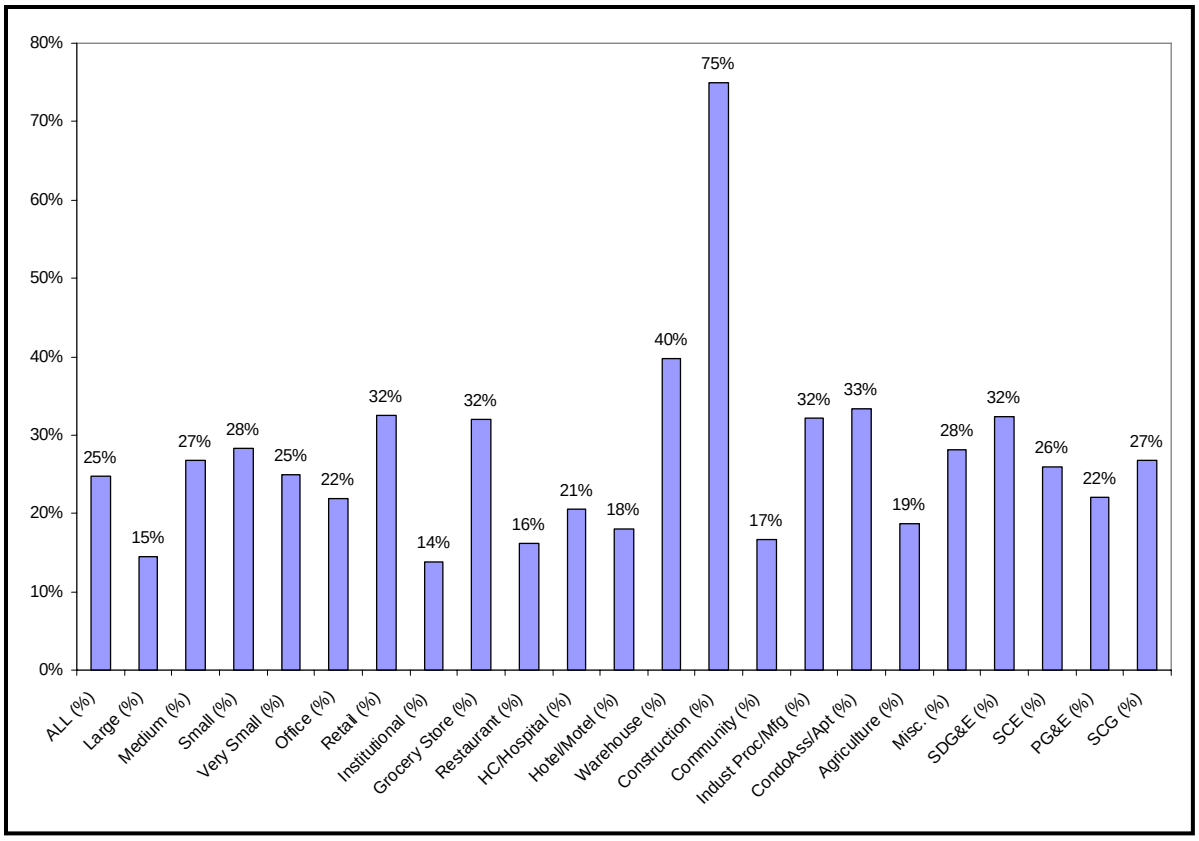
During the 2004-05 program cycle, 25% of surveyed customers first learned about the Express Efficiency program through a vendor. This was the second most common way for participants to be introduced to the program, after learning through a utility representative (32%). In 2003, vendors were the most common source of awareness (33% of surveyed participants stated that their vendor was responsible for first introducing them to the Express program). This change in the fraction of participants who learned about Express through utility representatives rather than vendors is partially explained by the change in the customer base served by the Express program. During the 2004-05 program, over 20% of the applications submitted to the Express program were from large customers. Many large customers have assigned utility representatives that they tend to communicate with regularly, and nearly half of these customers reported becoming aware of the program through their representative, as opposed to only 15% becoming aware from a contractor.

Figure 6-1 shows how vendor outreach varies across different customer segments (e.g., by size, industry group, IOU service territory, etc.). Warehouses and to an even larger degree, construction businesses were the business segments most likely to learn about the program through a vendor. Unlike past years, small businesses were more likely to learn about the

program through vendors than very small, medium, or large businesses. Medium sized customers learned about the program through vendors more than the other size categories in the previous program cycle. Customers of SDG&E were also more likely to learn about the program through vendors than customers of other utilities.

The main messages that participating businesses received from their sources of awareness were that the program will help to save energy and money through lower bills and rebates. Ninety-four percent of participants took these messages from the advertising and informational materials developed for the Express Efficiency Program. Only 2% of participants received the next most common message that the program provides a better product or better lighting.

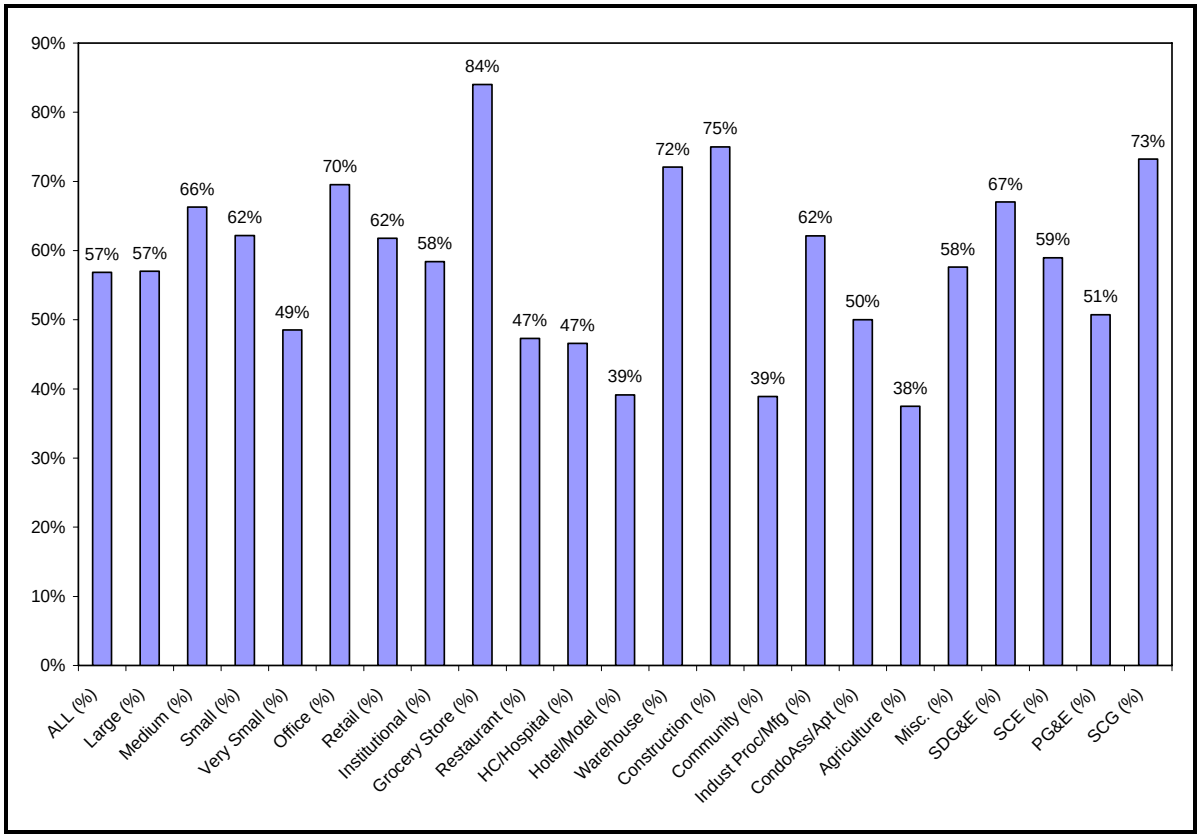
Figure 6-1: Contractor Outreach by Size, Business Type, and IOU



6.2.2 Use of Vendors

As shown in Figure 6-2, 57% of the participant population used a vendor to install their measures. Customer segments rely on contractors in different ways.

Figure 6-2: Use of Vendors by Size, Business Type, and IOU

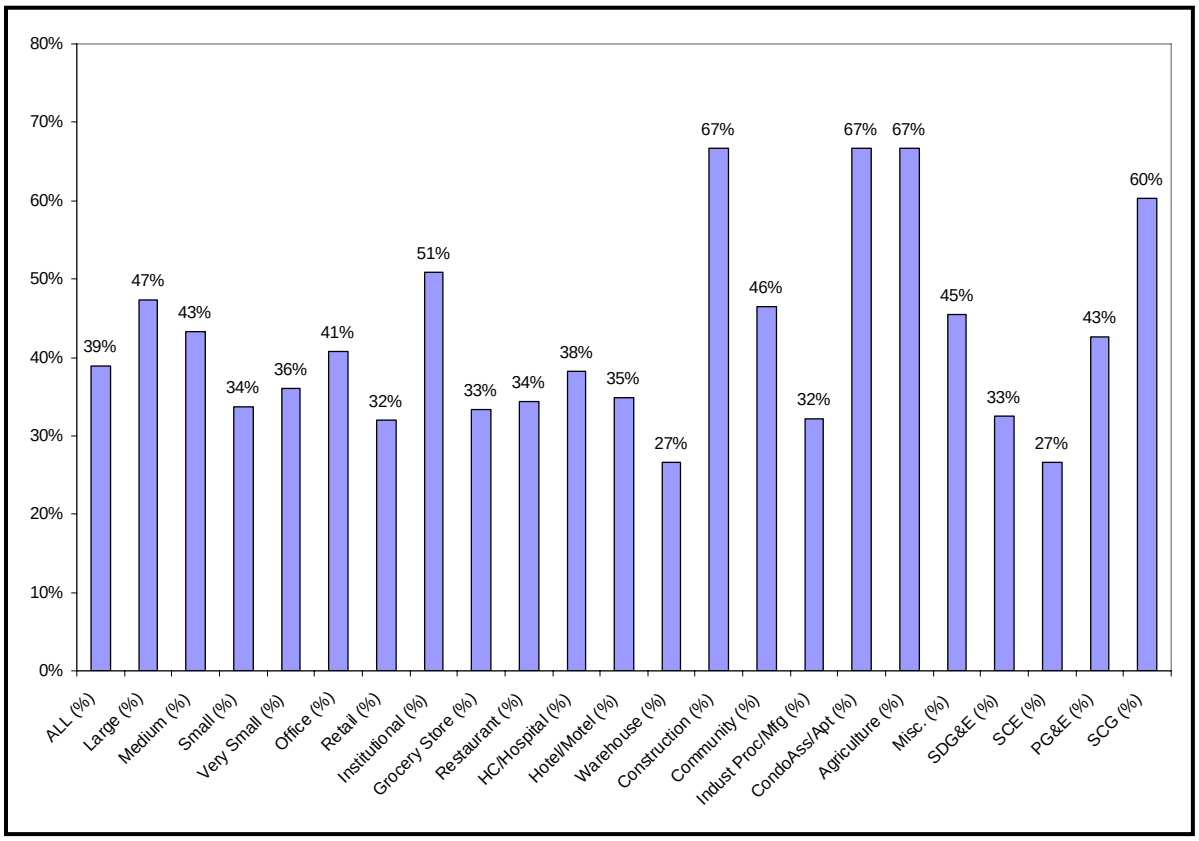


- **Business Size**. Medium and small business customers were the most likely to use contractors, while very small business customers (<20 kW) were most likely to complete projects themselves.
- **Business Type**. The extent to which a business relies on a contractor varied by business type. For example, hotel (39%), community building (39%), and agricultural (38%) customers did not heavily rely on vendors, probably because they tend to use in-house staff to maintain and replace equipment. By contrast, offices (70%), grocery stores (84%), warehouses (72%), and construction (75%) were more likely to hire vendors to install energy efficient products. This trend is expected due to the complexity of the equipment installed in these types of businesses.
- **Measure Type**. Customers who installed CFLs (41%) were less likely to hire a vendor than customers who installed other measures (67%), which is not surprising since CFLs are easy for a customer to install on their own.
- **IOU**. Surveyed PG&E customers were less likely to hire a vendor than customers in the other utilities (51% as opposed to 67% of SDG&E customers, 59% of SCE customers, and 73% of SCG customers). Since SCG is a gas utility and not affected by the self-installation rate of CFLs, it is not surprising that SCG customers use a vendor more than the other utilities.

- **Rural Versus Urban**. Urban customers (27%) were more likely to learn of the program through a contractor than their rural counterparts (21%), and were also more likely to use a vendor. This is a change from past years when rural customers were more likely to learn about the program through a vendor and more likely to use a vendor.

Thirty-nine percent of the participant population who hired a vendor had not used that vendor before. Participant segments varied in how likely they were to rely on a contractor that was new to them.

Figure 6-3: First Use of Vendors by Size, Business Type, and IOU



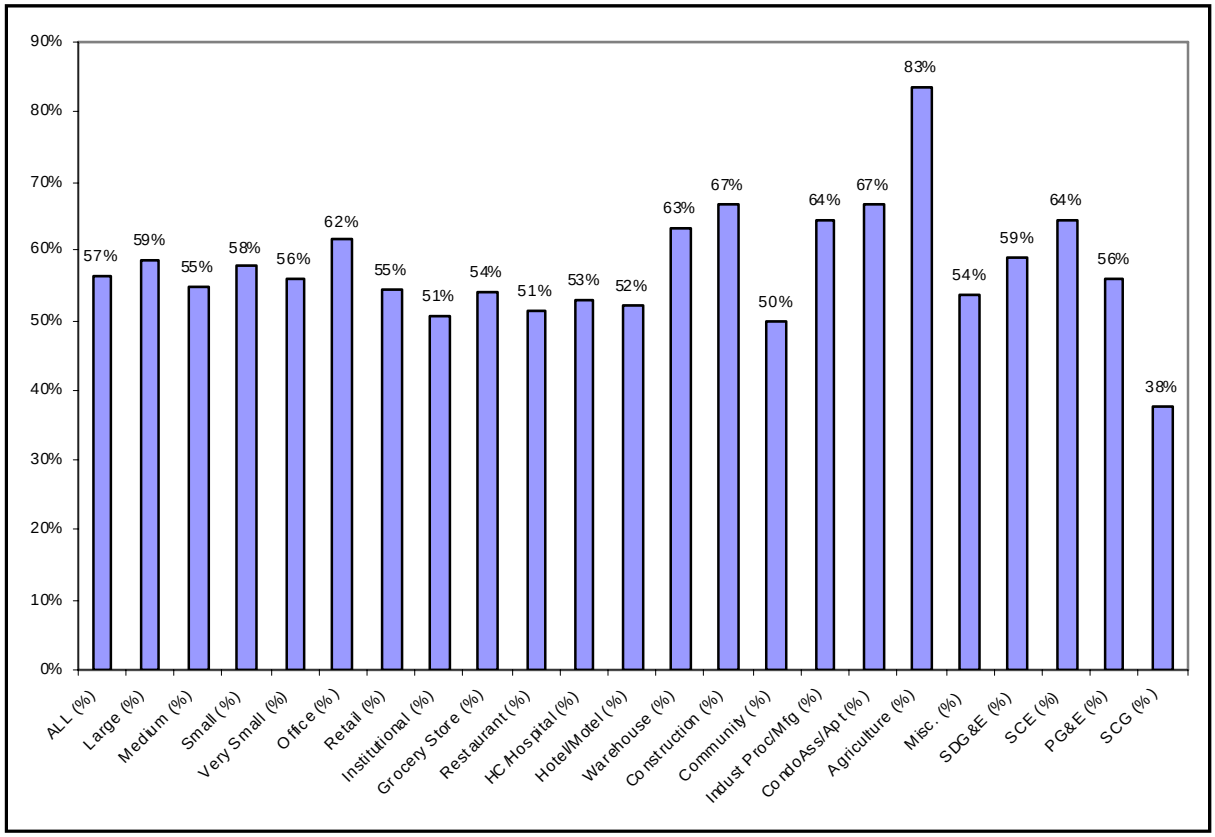
- **IOU**. Sixty percent of SCG customers used a vendor they had not used before. This is very high in comparison to SDG&E (33%), SCE (27%), and PG&E (43%).
- **Business Type**. Construction (67%), condominium associations (67%), and agricultural businesses (67%) were the highest users of new contractors.

6.2.3 Vendor Influence

Fifty-seven percent of the overall participant population who used a vendor said their vendor was very important in their decision to install energy efficient equipment. Contractor influence varied across different participant segments, but influenced at least 50% of each segment with the exception of SCG (see

Figure 6-4). This is not a surprising result given that SCG relies more heavily on utility representatives to inform customers about the Express program.

Figure 6-4: Influence of Vendors by Size, Business Type, and IOU



- **Business Type**. A very high percentage of agricultural (83%) customers said their vendor's input was very important. Since production processes are critical to these customers, their participation likely depends on their perceptions of vendors' reliability. As a result, it is not surprising that agricultural participants rate the importance of their vendors very high. Condominium associations (67%) and construction (67%) businesses also said their vendor input was very important, as did most other market segments.

- **Measure Type**. There is little difference in the percentage of participants who purchased CFLs (57%) compared to those who purchased other measures (56%) in rating the importance of the vendor's recommendation.

Overall, customers were very satisfied with their vendors. Seventy-six percent were very satisfied and 18% were somewhat satisfied. The satisfaction of different participant segments varies.[27] Small size business customers (85%) and non-hard-to-reach customers (73%) were more satisfied with their vendors than other customer segments. This finding differs from prior evaluations that showed large size business and rural customers were most satisfied with their contractor. Poor quality work was the most common reason for dissatisfaction with a vendor, closely followed by the job taking too long to complete.[28]

In short, vendors play an important part in the Express market. Almost one-fourth of participants learned about the program through a 3rd party vendor and more than 50% of participants used a vendor to install their measures. Of those participants who used a vendor, over half said their vendor played an important role in their decision to purchase the rebated equipment. Almost all participants using vendors also stated that they were very satisfied with their vendor.

6.3 Market Characterization and Influence

6.3.1 Vendor Interview Results

This section presents process-oriented results from interviews with 55 participating lighting vendors, 105 nonparticipating lighting vendors, eight participating refrigeration vendors, and 36 nonparticipating refrigeration vendors. The importance of vendors in moving the commercial market cannot be overemphasized, as small and medium size business customers rely heavily on vendors to replace equipment. The focus in this section is lighting and refrigeration vendors. Both participating and nonparticipating lighting and refrigeration vendors were surveyed to gain insight into the current program process and what changes should be made to encourage more participation through the vendors. Compact fluorescents and T8s are the major focus points for lighting because these are the lighting measures whose installation resulted in the largest energy savings. The intent was to learn about participating vendors' experience with the program, not to conduct supply-side baseline research.

[27] Appendix Exhibit H (Contractor Satisfaction)

[28] Appendix Exhibit H (Reasons for Dissatisfaction)

Itron interviewed vendors who participated in the 2004-2005 Express Efficiency program in addition to vendors who sell the same measures but were not participants of the program. An integrated database of vendors who participated in the Express Efficiency program in 2004-2005 served as the sample frame for the participant lighting and refrigeration vendor interviews, while a sample of all lighting and refrigeration contractors who have not used the program served as the sample frame for nonparticipant lighting and refrigeration vendors. This sample was obtained from USAdata.com, a third party data source.

6.3.2 Participant Lighting Vendor Profile

This section profiles the 55 lighting vendors that were interviewed regarding what their businesses look like, how they participate in the program, and what their CFL installation practices are. The 55 vendors interviewed varied greatly in size in terms of revenue and number of employees, but the typical profile is a multimillion-dollar vendor that sells energy efficient lighting products directly to end users.

- **Type of Business.** Respondents described themselves as electrical contractors (31%), lighting distributors (27%), electrical vendors (11%), energy service companies (9%), lighting manufacturers, and lighting management companies (4%).
- **Type of Market.** Nearly 70% of vendors' business focused on the commercial/industrial sector. Sixty-two percent of the vendors sold the majority of their lighting equipment directly to the end user while the remaining vendors sold the majority of their lighting equipment to contactors and developers.
- **Products.** Most vendors sell an array of lighting products and such as T8/electronic ballasts, CFLs, reflectors, occupancy sensors, LEDs, exit signs, T5 fixture conversions, and lighting controls. A few vendors also sell HVAC, refrigeration, motors, food service equipment, water heating equipment, and/or appliances. Vendors that sell CFLs range anywhere from selling 30 CFLs per year to 100,000 CFLs per year. The average number of CFLs sold by a CFL vendor is 10,666 while the median number of CFLs sold is 3,000. T8 vendors sell anywhere from 8 to over 30,000 T8s through the program. Also, vendors that install T8 systems indicated that 65% of their T8 retrofits are second generation or higher (generally about 10% more efficient that standard T8s).
- **Geographic Territory.** Twenty-one of the vendors interviewed were located in PG&E territory. Twenty-four vendors were located in the SCE service territory. Twenty-four were also located in SDG&E's territory. Ten of these vendors were located in two or more of the utility territories.
- **Revenue.** The average revenue was over $11.5 million. Slightly more than half of the reported revenues were under $1 million. The highest sales were $320 million.

- **Employees.** Half of the vendors employ less than 10 people. By far, the three largest participating vendors employ 300, 450, and 1000 people.

6.3.3 Nonparticipant Lighting Vendor Profile

This section profiles the 105 nonparticipating lighting vendors and discusses the markets they operate in and the products they sell. It also covers why they chose not to participate in the program.

- **Type of Business.** Eighty-seven percent of nonparticipants describe themselves as contractors. Eight percent consider themselves installers. The remaining nonparticipants are vendors, distributors, or something else.
- **Type of Market.** All nonparticipating sites sell at least 50% of their equipment to commercial sites. The commercial segment of their businesses average out to 83% of total sales.
- **Products.** At least 30% of every vendor's sales were directly related to lighting equipment. Overall, they averaged 52% of their sales from lighting. Nearly all nonparticipating sites sell and/or install linear fluorescent lighting (98%), exit signs (91%), and compact fluorescent lighting (92%). A handful of nonparticipating vendors sell motors (21%), pumping equipment (14%), and agricultural equipment (10%). Very few of these vendors sell HVAC, refrigeration, or food service measures (all less than 4%).
- **Geographic Territory.** Thirty-seven of these nonparticipants are located in PG&E territory, 40 are located in SCE territory, and 28 are located in SDG&E. While these are the locations of the businesses, over half of these vendors conduct business in other utility districts as well.
- **Revenue.** Two-thirds of the vendors have sales under $1 million. The remaining vendors make up to $48 million in revenue. The average total sales are just over $3 million.
- **Employees.** Approximately two-thirds of the nonparticipant vendors employ 10 or fewer people, which coincides with the number of businesses with smaller sales. The largest three employers have 250, 300, and 350 employees.

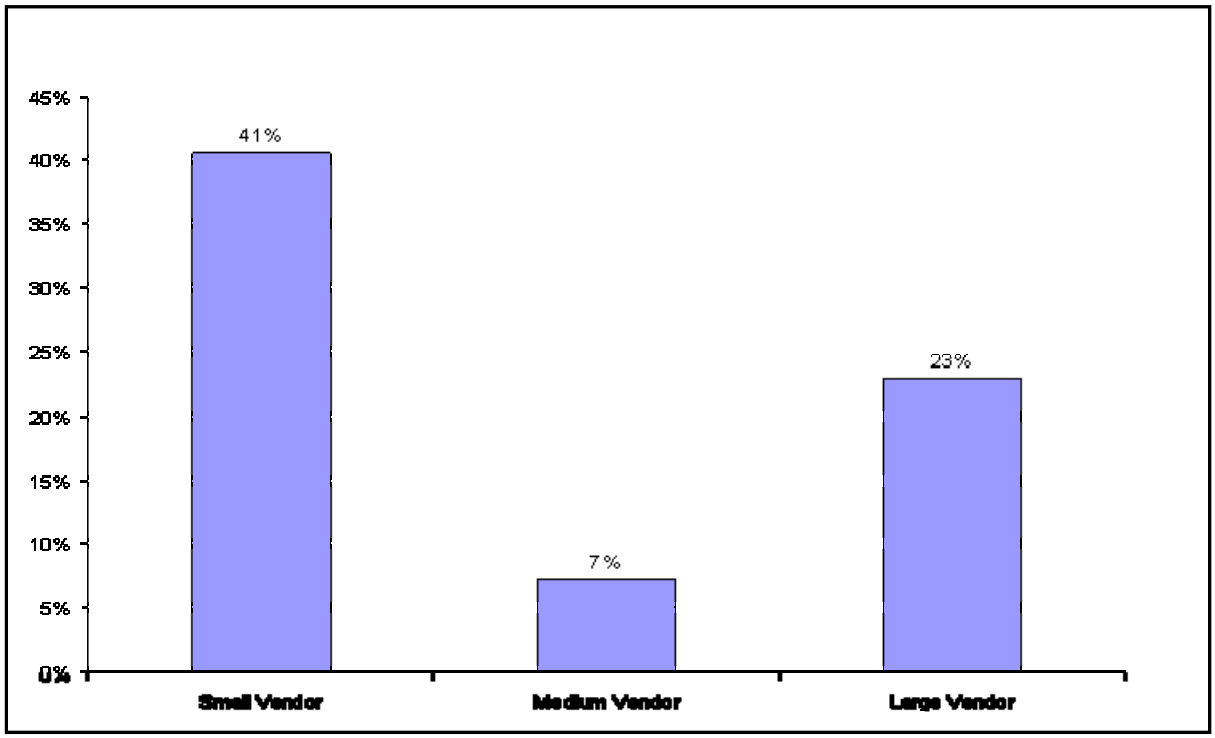
6.3.4 Express Participation

Overall, records show that vendors sell about 27% of their CFLs (weighted based on the size of the company) through the Express Efficiency program based on the total number of bulbs they claimed to sell through the program and the total number of CFL bulbs they claimed to sell overall. This is down from 47% during the 2002-2003 program years. The weighted

average percent of T8 retrofits funded through the Express Efficiency program is 62%. This is substantially higher than the 22% sold through Express in the 2002-2003 program years suggesting that the current rebate levels are more appealing to vendors and/or customers. The unweighted *median* is 25% of CFLs and 58% of T8 sales are rebated through Express, which is consistent with the weighted sales data.

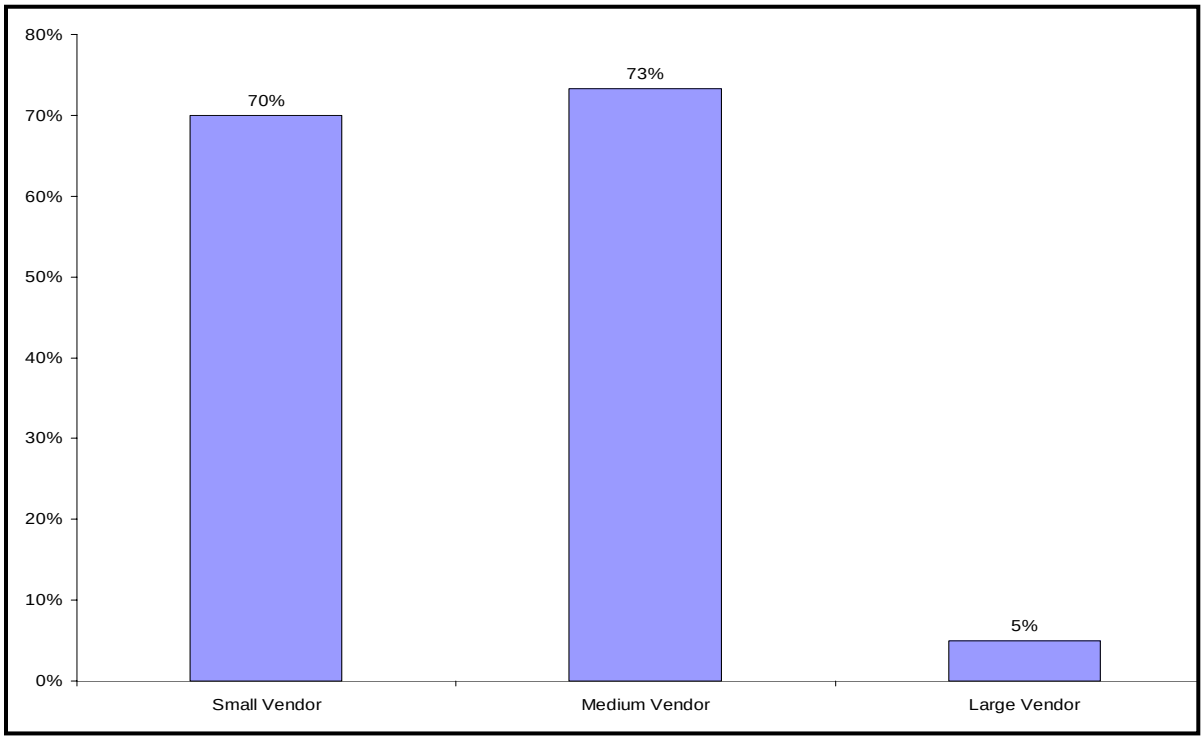
Small vendors (those whose yearly revenue is under $500,000) sell the highest percentage (41%) of their CFLs through the Express program in comparison to medium sized vendors (between $500,000 and $5,000,000 in revenue) and large vendors (over $5,000,000 in revenue).

Figure 6-5: Express CFL Volume by Vendor Size



Small and medium size vendors both sell over 70% of their T8s through the Express program, while large size vendors sell only 5% of their T8s through the program.

Figure 6-6: Express T-8 Volume by Vendor Size



6.3.5 CFL Installation Practices

During the 2002-2003 Express program evaluation, it was found that 92% of the installed CFLs were integral. During the 2004-2005 program years, an average of 79% of participating vendors CFL sales were integral. The potential implication is that integral CFLs have a lot shorter life expectancy than the modular ballast.

An additional concern with CFL installations is the potential for bulbs being rebated that are not installed, but instead left behind for certain reasons (e.g., as replacements for failures). Although there is likely some future savings that will be achieved from these lamps, the net present value of these savings is less than those associated with lamps that are installed. Furthermore, customers and their vendors should only be applying for rebates for installed lamps. Thirty-percent of participating CFL installers are telling us that they leave extra lamps while 44% of nonparticipant CFL installers leave extra lamps. These vendors tend to leave roughly 15% extra lamps (i.e., 15% of total job size).

A third concern is that the program doesn't require pre-installation inspections. The program eligibility requirements are that CFLs are installed to replace existing incandescent bulbs.

On average, 28% of the CFLs installed by vendors replaced existing CFLs.[29] This is up from 11% during the 2002-2003 program years, suggesting that more people are using the program to replace existing CFLs.

When asked the main reason why customers still purchase incandescent bulbs over CFLs, expense and quality of light tied at 35% in the participating vendors' opinions. The color of the light (24%) and the attractiveness of the bulb (15%) were the other main reasons why their customers still have not switched out their bulbs. Interestingly, nonparticipants said that their customers still prefer incandescent bulbs due mainly to the poor light quality (25%) and color of the light (34%). Only 12% said that their customers do not buy the bulbs due to the expense. In this case, the vendors who offer rebates believe that their customers are more cost aware than the nonparticipating vendors.

During the 2004-2005 program years, 43% of participating vendors sell CFLs to hotel/motels while only 11% of nonparticipating vendors sell CFLs to hotel/motels. Fifty-four percent of nonparticipating vendors sell CFLs to offices while only 30% of participating vendors sell CFLs to offices. Other inconsistencies between CFL customers exist for hospitals, community service/municipalities, industrial processing companies, and condominium associations/apartment management. These inconsistencies suggest that vendors target certain building types that might otherwise not install CFLs.

In 2007, about 20% of the vendors said that the businesses who typically buy CFLs changed. Of these vendors, both the participants and nonparticipants agree that they are selling to more offices and warehouses. On the other hand, they are both selling to fewer colleges/universities. While participating vendors are selling to fewer restaurants, health care, hospitals, and hotel/motels, nonparticipating vendors are selling to more of these types of businesses.

Of all the vendors surveyed, the most CFLs sold were manufactured by Sylvania and Philips. Westinghouse and General Electric bulbs are the next most common bulbs sold by the vendors interviewed.

Participating vendors promote the sale of CFLs using several methods. The most common method is through a simple recommendation when a customer is replacing lighting and/or buying new equipment. Many vendors (especially medium sized vendors) perform lighting audits for their customers and recommend CFLs at that time. Some vendors promote door-to-door and concentrate on current customers. The large vendors also advertise their CFLs to increase sales through the program.

[29] It is important to note that this is a percentage of all bulbs installed, not just rebated CFLs.

6.3.6 T8 Installation Practices

Fifty-seven percent of participants and 75% of nonparticipating vendors say that some of their customers still have T12 lighting. This suggests that the nonparticipating vendors are more likely to have customers who have not yet updated their linear fluorescent lighting. For both participating vendors and nonparticipating vendors, the small vendors most frequently agreed that their customers still have T12 lighting installed. Ninety-three percent of participating vendors usually recommend to their T12 customers that they should retrofit to T8s. Seventy-three percent of nonparticipating vendors usually recommend a T8 retrofit. Participating vendors have performed retrofits on 63% of their customers with T12s while nonparticipating vendors have performed retrofits on only 36% of their T12 customers. This is likely because the participating vendors have an easier time selling equipment with a rebate than selling it full price like the nonparticipating vendors. Vendors blame the expense of the T8s for some T12 customer's lack of interest in retrofitting to T8s. Some vendors also think that their customers lack knowledge of the benefits of retrofitting. Of the T8s sold, the participants say that approximately 63% of their T8 installations are second generation or higher while the nonparticipating vendors say that 56% of T8 installations are second generation or higher. Interestingly, 30% of nonparticipating vendors were unaware of the generation of their T8s while only 7% of participating vendors were unaware. This displays that nonparticipating vendors are likely not as knowledgeable of efficiency equipment as participating vendors. Of the T8 retrofits completed by the participating vendors, 58% received a rebate through the Express Efficiency Program.

6.3.7 Delamping

Seventy-eight percent of the T8 jobs completed by participating vendors in 2004 and 2005 involved delamping.[30] This has increased significantly since 2002-2003 program years when only 26% of the T8 jobs involved delamping. Of the participating vendors, over half of all lighting vendors performed at least one delamping job in 2004 or 2005. Buildings that market actors reported for frequently delamping included offices, warehouses, and industrial buildings.

On the other hand, only thirty-six percent of non-participating vendors performed a delamping job during those years. Buildings that nonparticipants reported as frequently delamping include offices, retail, grocery stores, restaurants, and industrial buildings. Both

[30] Included in the definition of delamping is reducing the number of lamps per fixture during a T12 to T8 retrofit. For example, retrofitting a 4 lamp T12 fixture to a 3 lamp T8 fixture would count as a both a T8 retrofit and a one lamp delamping in the IOU program tracking systems.

participants and non-participants say that the majority of their delamping jobs occur in conjunction with a T12 to T8 retrofit.

6.3.8 Participant Refrigeration Vendor Profile

While only eight refrigeration participant vendors were surveyed, they contributed to 17.3% of the total net kWh savings for refrigeration measures. The following information characterizes these eight participant vendors.

- **Type of Business**. Participant respondents included two distributors, two installers, two manufacturers, one vendor, and one wholesaler.
- **Type of Market.** Half of the participant vendors are independent vendors. Three are national chains and one is a regional chain. The majority of the refrigeration vendors sell equipment directly to the end users. Some sell equipment to other contractors or developers. Participating vendors sell the majority of their refrigeration equipment to restaurants followed by agricultural facilities. Some vendors sell equipment to large and small grocery stores, hospitals, hotels, warehouses, schools, and bars.
- **Products.** Some refrigeration vendors sell other types of equipment in addition to refrigeration equipment. Half of them sell food service equipment and a few of them sell HVAC, motors, lighting, appliances, pumping, and/or agricultural equipment. Half of them only sell refrigeration equipment. All vendors sell numerous refrigeration products. Seven out of eight sell strip curtains and auto closers for coolers and freezers. Most vendors sell walk-ins, night covers, door gaskets, and anti-sweat heat controllers. When asked which equipment makes up the majority of their sales, five out of eight participants said strip curtains. Fifty-percent said that walk-ins and preparation areas make up most of their sales. Others sell self-contained vertical cases, multi-deck display cases, glass doors for display cases, door gaskets, auto closers, and multiplex compressor systems.
- **Geographic Territory.** Six of the vendors are located in the SDG&E service territory, one is located in PG&E territory, and one is located in SDG&E, PG&E, and SCE. The majority of the vendors are located in SDG&E because the vendors listed from PG&E and SCE were not as accurate. One participating vendor located in SDG&E also conducts business in PG&E and SCE territories.
- **Revenue.** Six vendors were unable to provide information regarding their yearly revenue; however, the two that provided a response have revenues of $1 million and $3 million.
- **Employees.** The number of employees ranges from 3 to 75. The second largest company has 30 employees. Overall, the average is 25.

6.3.9 Nonparticipant Refrigeration Vendor Profile

We surveyed 36 nonparticipant refrigeration vendors. The following information characterizes these vendors.

- **Type of Business.** The vast majority of nonparticipants (81%) call themselves contractors while a few refer to themselves as vendors, manufacturers, wholesalers, or repair services.
- **Type of Market.** All 36 nonparticipants are independent vendors. The vast majority of the nonparticipant vendors sell their equipment directly to the end users. A few sell some equipment to contractors and developers. Nonparticipant vendors sell equipment mainly to agricultural sites, grocery stores, and warehouse.
- **Products.** Forty-two percent of nonparticipant refrigeration vendors only sell refrigeration equipment. Over half of the vendors sell food service equipment and motors and many sell HVAC. A few install lighting, water heating, appliances, pumps, and agricultural equipment. All vendors install a variety of refrigeration equipment. Strip curtains, door gaskets, insulate bare suction pipes, condensers, and evaporative fan coolers are among the most common refrigeration equipment sold.
- **Geographic Territory.** Eighteen of the nonparticipant vendors are located in PG&E, seventeen are located in SCE and one is located in SDG&E. Forty percent of the vendors also do business with SMUD.
- **Revenue.** The nonparticipant vendors' sales range anywhere from $40,000 to $10,000,000 with a mean of just under $2,500,000.
- **Employees.** The number of employees ranges from 1 to 150. Overall, the average is about 12.

6.4 Rebates

This section presents vendor opinions on the Express rebates and the rebate reservation process for both lighting and refrigeration. It will also discuss the nonparticipating vendors' reasons for not using the Express program.

6.4.1 Vendor Opinions on Rebate Structure

When the participating vendors were asked if they would promote and sell as many of the previously rebated equipment, even if the rebate program was terminated, 64% of lighting vendors said yes. Sixty-three percent of refrigeration vendors also said yes. This indicates that these vendors do not think that the rebates will affect their sales. Their reasoning included the product being of good quality and that businesses are moving toward energy

efficiency regardless of the rebates. One refrigeration vendor mentioned that when refrigeration needs to be replaced, it needs to be replaced regardless of the rebate. Some vendors said that they would use other programs if there was no longer a rebate through the Express program, and another vendor stated that they would move their customer focus to a regional group who has available rebates. The remaining 36% of lighting vendors and 37% of refrigeration vendors, who believe their sales would decrease without the rebate, say that the rebate is the selling point and that customers do not want to pay the high costs upfront. They believe that the payback period is too long without the program. One lighting vendor suggested that the utility's rebates add to the credibility of the product making it easier to market and sell.

Vendor Opinions on Program Rebates

Vendors were asked their opinions about what changes they think will make the rebate program better. Suggestions included speeding up and simplifying the process and the amount of paperwork to receive the rebate.

Participating and nonparticipating vendors were specifically asked their opinions about increasing the sales of the following measures through the program:

- **Compact Fluorescents.** Participating vendors' most common suggestion was to increase the rebate and/or lower the price. They also made suggestions regarding the function and color such as "if you came out with one that dims properly and lasts" customers would be more likely to purchase CFLs. While nonparticipating vendors agreed with the participants on those suggestions, they also suggested that customers receive better education on the products either through the IOUs and/or through commercials and ads. Only 48% of nonparticipating vendors have heard of the Express Efficiency rebate program suggesting that they need to be educated on the program.
- **Metal Halides.** Similar to CFLs, participating and nonparticipating vendors' main concern was cost and the size of the rebate. Nonparticipating vendors also think that people need more education, including information on the energy savings. Many vendors believe that people are turned away from using metal halides due to their appearance and design.
- **Occupancy Sensors.** Again, both participants and nonparticipants agree that occupancy sensors cost too much. In addition, it seems that both groups need better education on the rebates available because it was suggested by participants and nonparticipants to make a rebate available for this measure. There also seems to be concern over the function of this measure. Many vendors have stated that occupancy

sensors are too difficult to override, do not pick up motion appropriately, and cause CFLs to burn out too quickly.

- **T5s.** Other than lowering the cost and/or increasing the rebate, the only other suggestion participating vendors said was to create a better program for recycling old fixtures and lamps. Nonparticipating vendors want the utilities to provide a better education on the savings available by installing T5s. They think that providing a savings chart would be an easy way to display the effectiveness of installing T5s.
- **T8s.** Once again, participants and nonparticipants agree that lowering the cost or increasing the rebate would be the most effective way to increase sales. Both groups also suggested more education on the products' energy efficiency capabilities would be beneficial. Nonparticipants also pointed out that most customers do not know the difference between T12s and the higher generation T8s.
- **Strip Curtains.** Vendors think that increasing the rebate and providing literature to their customers would be an effective way to encourage more participation for strip curtains. One vendor suggested that the utilities provide details on how much the energy efficient product will save the customer.
- **Door Gaskets.** Vendors suggest more education on and advertising for the availability of the rebates. The vendors who did not say that door gaskets are out of their scope think that most customers are interested in them. Vendors do not think that door gaskets have a high enough rebate especially in comparison with other measures.
- **Night Covers.** According to one vendor this measure is a time consuming and expensive. Vendors agree that an increased rebate would increase sales for this measure.
- **LED Lighting.** Most vendors do not think that customers know about the rebates for LED lighting. Nor do they know of any advertising for this product. Other vendors think that the cost is too much and an increased rebate would increase sales.

Vendor Opinions on the Reservation Process

Vendors were asked about their satisfaction with the reservation process that allows participants to have their rebate pre-approved before installing the measures. On a scale of 1 to 10 with 10 being extremely satisfied and 1 being extremely dissatisfied, the reservation process was rated a 7. Large vendors were the most satisfied with the reservation process. To improve the reservation process, many vendors have suggested making more funds available for reservation while one vendor suggested doing away with the reservation process and making it first come, first serve. Other vendors suggested that the utilities get electronic reservation processes. This would greatly simplify the reservation process, pleasing the

vendors. Seventy-three percent of the vendors would prefer to apply online. The third common suggestion is to allow longer time periods for the installation process.

6.5 Other Program Participation

One third of participant lighting vendors also participate in other programs. These programs include the Single Family rebate program, Non-Residential Audit program, SPC, and the Multi-Family rebate program. Only 8% of non-participant lighting vendors participated in other programs including the Non-Residential Audit program and SPC.

Twelve percent of participating refrigeration vendors also participated in other programs while eleven percent of non-participating refrigeration vendors participated in other programs. Like the lighting participants, these programs included the Single Family rebate program, Non-Residential Audit program, SPC, and the Multi-Family rebate program.

6.6 Process Issues

6.6.1 Application and Reservation Process

Vendor interviews focused on satisfaction with the application process and the reservation system.

- **Determining Eligibility.** While many vendors research the requirements for eligibility for the program other vendors rely on either the utility or the customer to determine their own eligibility. For the vendors who do their own research, they generally need to see a copy of the utility bill from the customer and they are able to determine if the customer is able to participate by noting the rate schedule and location. One vendor even said that they have a "quoting system for getting the rebate." Other vendors said that it is hard to determine eligibility and would like more help from the utilities. Suggestions included: providing "easier forms" and providing an easier way to determine if the property has participated in an incentive program in the past. One vendor suggested providing an "online questionnaire" detailing the information needed to determine eligibility. Another vendor suggested listing the rebates and programs that a site is eligible for on their utility bill.
- **Application Process.** The majority of vendors are more satisfied then dissatisfied with the types of equipment eligible for rebates. One participant suggested more rebates for daylight harvesting and fourth generation products. On a scale of 1-10 with 1 being extremely dissatisfied and 10 being extremely satisfied fifty-three percent of participating vendors rated the application process and paperwork as being an 8 or above. Sixteen percent rated the process as a 1 or 2 and the remaining 31% of

vendors were somewhere in between. Dissatisfaction primarily stemmed from fund availability, an excess of paperwork, and communication with the utilities. Several participating vendors suggested receiving information via email, online applications and submittals, and better response times from the customer service agents. The participant responses regarding the utility's process for keeping vendors informed about changes further illustrates this point showing that more vendors are dissatisfied with this process than satisfied. This suggests that communication needs to be worked on for future years of the program. Overall, vendors are least satisfied with the rebate turn around time. Only 30% of vendors rated their satisfaction as an 8 or higher while 45% rated their satisfaction as a 1 or 2. One participating vendor suggested a website feature allowing the vendor to track the status of the rebate. Vendors suggested that turn around time be between 2 weeks and 30 days.

- **Reservation System.** On the same 1 to 10 scale, 35% of vendors scored their satisfaction with the reservation process as an 8 or above. Only 5% scored their satisfaction as a 1 or 2. This suggests that most participants were indifferent to the reservation process possibly because not all vendors used the reservation system. Many vendors have requested that the reservation system be completely automated online. Another suggestion is allowing more time to complete the installation after the funds are reserved.

6.6.2 Vendor Suggestions for Program Enhancements

During the last Express Efficiency evaluation, vendors suggested an electronic application submission. Seventy-three percent of surveyed participants prefer to submit applications electronically as opposed to a hard copy through the mail. Vendors had a variety of suggestions for improving the process of participating in Express Efficiency.

- **Speed Up Application and Payment Process**. Like previous program years, vendors suggest speeding up the application process. The turn around time for receiving the rebate was the most frequent issue with the process. In addition to the electronic applications, one vendor also suggested a website that shows the updated status of the rebate.
- **More Knowledgeable Staff**. Vendors want staff with more knowledge about the programs and more follow up on outstanding questions.
- **Easily Accessible Information**. Vendors suggested providing more information about the program online or through other methods to enable them to determine eligibility and spread the word about the availability of the rebates.

6.6.3 Additional Technologies to Rebate

Vendors would like to see several technologies included in the program. Vendors mentioned rebates for the following:

- Daylight harvesting rebates, and
- Fourth generation linear fluorescent lighting.

6.7 Express Program Recommendations from Vendor/Distributor Assessment

The following recommendations come out of the vendor/distributor assessment of the Express program:

Continue to leverage vendors to market the program. Fifty-seven percent of participants used a vendor to install their measures, and the majority of participants who used a vendor said their vendor was very important in their decision to install energy efficient equipment. They have historically been the main drivers of the Express program and we anticipate that they will continue in this role.

Increase outreach efforts to nonparticipating vendors. As mentioned above, vendors are a key delivery mechanism for the program. However, over half of the nonparticipating vendors were unaware of the Express Efficiency rebate program, suggesting the need for more outreach and education regarding the program.

Implement an inspection process and better educate vendors in a manner that will discourage vendors from rebating ineligible CFLs, which include those that are left behind as additional uninstalled lamps, or that are replacing existing CFLs. Thirty-percent of participating CFL installers leave behind uninstalled lamps (roughly 15% of total job size). Furthermore, 28% of the CFLs installed by vendors replaced existing CFLs (up from 11% in 2002-03). IOU staff needs to better educate participating vendors, and program materials need to be clear, that CFLs not installed (left as extras) or CFLs replacing existing CFLs should not eligible for a rebate under the program qualifying guidelines. Although energy savings may possibly result in the future if these CFLs are eventually installed, current program guidelines indicate that only installed CFLs should be rebated. If in the future, uninstalled CFLs are eligible for the program, approaches should be considered on how to develop savings for these measures, as no (or reduced) first year savings would be present.

Inspections are used by the IOUs to verify and potentially adjust rebate applications amounts when ineligible measures are found. Post inspections can be used to identify vendors that are

leaving behind additional lamps that are being left in storage. Implementing pre-inspections will identify vendors replacing CFLs with CFLs, in addition to making other replacements that are not program qualifying. Although the nature of the Express program may make it difficult to implement pre-inspections, these inspections could be based on a random sample of customers who utilize the Express program reservation system to state their intent to participate in the program.

Develop an online application and automate the reservation system to speed up the application and payment processes. Based on the process evaluation overall, we recommend not only creating an online application system but also to implement an electronic reservation process. This would greatly simplify the reservation process and would simplify participation for their vendors and their customers. Seventy-three percent of the vendors would prefer to apply online.

While Express program managers stated they keep vendors apprised of program activities, they need to continue to improve their modes of communication regarding the Express program. Vendor and distributor survey results showed more dissatisfaction than satisfaction with regard to their communication with the utilities, suggesting room for improvement for the utilities. Several participating vendors suggested receiving information via email, online applications and submittals, and better response times from the customer service agents.

Continue to rebate delamping at current incentive levels. Rebates for delamping increased in 2004-05 compared to 2002 and 2003, which lead to significant increases in delamping activities. Seventy-eight percent of the T8 jobs completed by participating vendors in 2004 and 2005 involved delamping, compared to only 26% in 2002-03.

7

Upstream Vendor and Distributor Assessment

7.1 IOU Outreach to Distributors

This section of the report describes IOU marketing efforts to CAC and motors distributors based on interviews with IOU program managers. Because the 2004-2005 program was delivered upstream, the program's success is largely tied to the success of its distributor marketing and recruitment efforts. PG&E employed a somewhat different marketing approach than the southern California investor owned electric utilities.

7.1.1 PG&E

PG&E's primary program marketing and recruitment efforts focused on motors and HVAC equipment distributors. Distributors were divided among three program implementation staff members based primarily on geographic area. The staff kept a contact log that was synchronized and shared periodically, so that staff members were up to date on key issues whenever they would contact a distributor. Distributors were identified as primary, secondary, or tertiary based on the potential volume of high-efficiency equipment sales, and contacts were prioritized on that basis.

PG&E staff contacted all distributors on a regular basis via phone and email. PG&E had email addresses for all participating distributors on file, and regular emails went out to these contacts. The emails included budget details, concerns about lack of participation, and so on. Critical emails were always followed by phone calls.

Staff also conducted face-to-face visits with high-level representatives of primary and secondary distribution firms. These presentations served not only as a marketing and recruitment vehicle but also helped to identify market barriers to distributors selling premium efficiency equipment and assist the utility in designing intervention strategies to address those barriers. Primary HVAC contacts included EB Ward, Trane, Specialty A/C Products, US Air, York, and Lennox. The primary contacts for motors were Electric Motor Shop, Industrial Electric Company, Stanley, Koffler, Kaman, Applied Industrial Technologies, and Motion Industries.

In addition to reaching out to distributors in PG&E's service territory, implementation staff also contacted manufacturers to make them aware of the program and encourage them to promote the program as a sales tool to their distributors. For interested manufacturers and distributors, program staff conducted joint presentations – a handful of key manufacturers (e.g., the motors manufacturer Baldor) took advantage of this opportunity to promote high-efficiency equipment with several of their major distributors.

7.1.2 SDG&E and SCE

SDG&E and SCE implementation staff identified lists of distributor and manufacturer contacts through industry associations, prior rebate program participation, targeted direct marketing, trade shows, manufacturer relationships and other sources. IOU staff made some calls to the distributors, but reported that the program implementer (Energy Solutions) did most of the program recruitment and marketing.

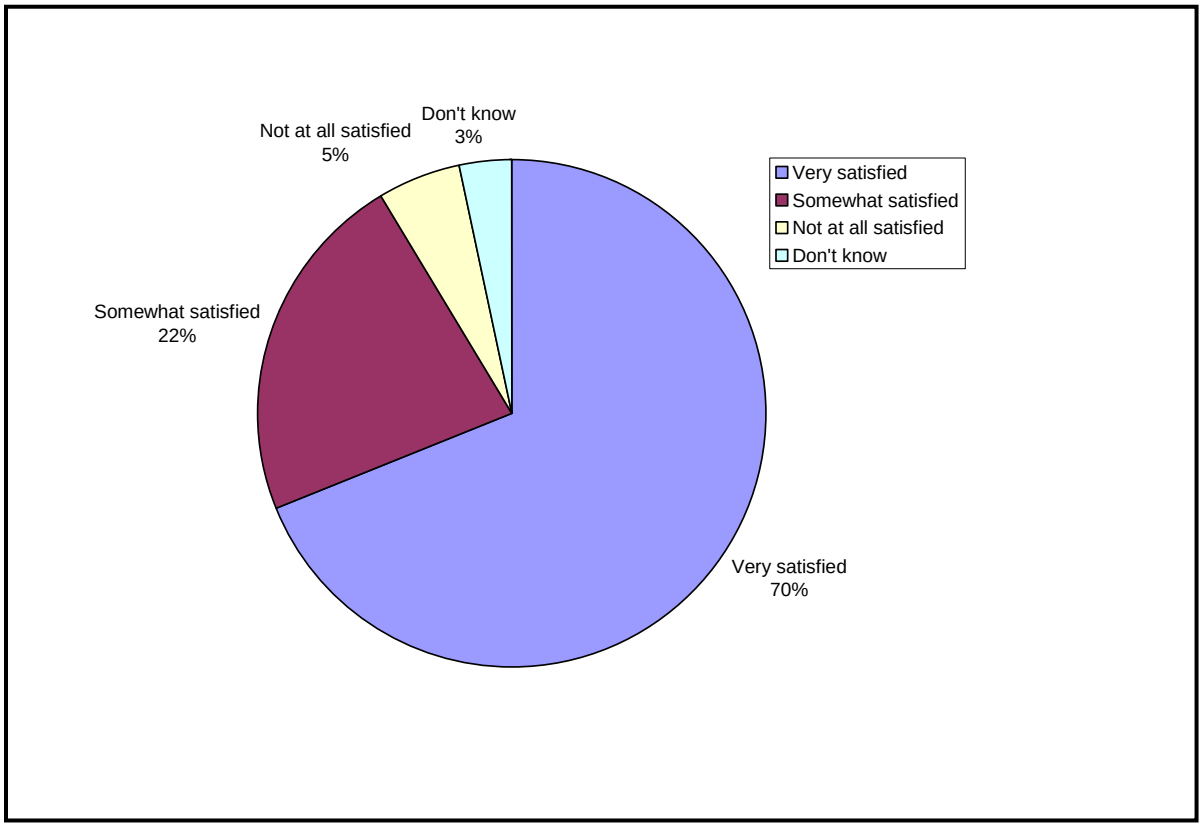
7.2 Customer Survey Findings

This section presents selected results from interviews with end users about the role of their contractors who sold them equipment rebated through the Upstream program. These interviews were conducted with purchasers of both motors and split/packaged A/Cs.

7.2.1 Satisfaction with Vendor

Virtually all sampled end users of Upstream-rebated equipment were satisfied with their contractor. As Figure 7-3 shows, 70% of sampled end users were very satisfied and 22% were somewhat satisfied with the equipment suggestions of their contractor. Only five percent of all surveyed stated that they were not at all satisfied with their contractor, with another 3% responding that they did not know how satisfied they were or were not. When the 5% of end users were asked why they were dissatisfied, various reasons were given. Reasons provided by motors end users included poor quality of work, slowness of work, work that was started was not completed, and unsatisfactory knowledge of the trade. End users who had Upstream-rebated central air conditioners installed stated that they were dissatisfied because the job was too large for the contractor to handle, poor work quality, and slowness of work. Overall, the fraction of end users that were dissatisfied is far outweighed by their positive views of contractors who received rebates through the Upstream program.

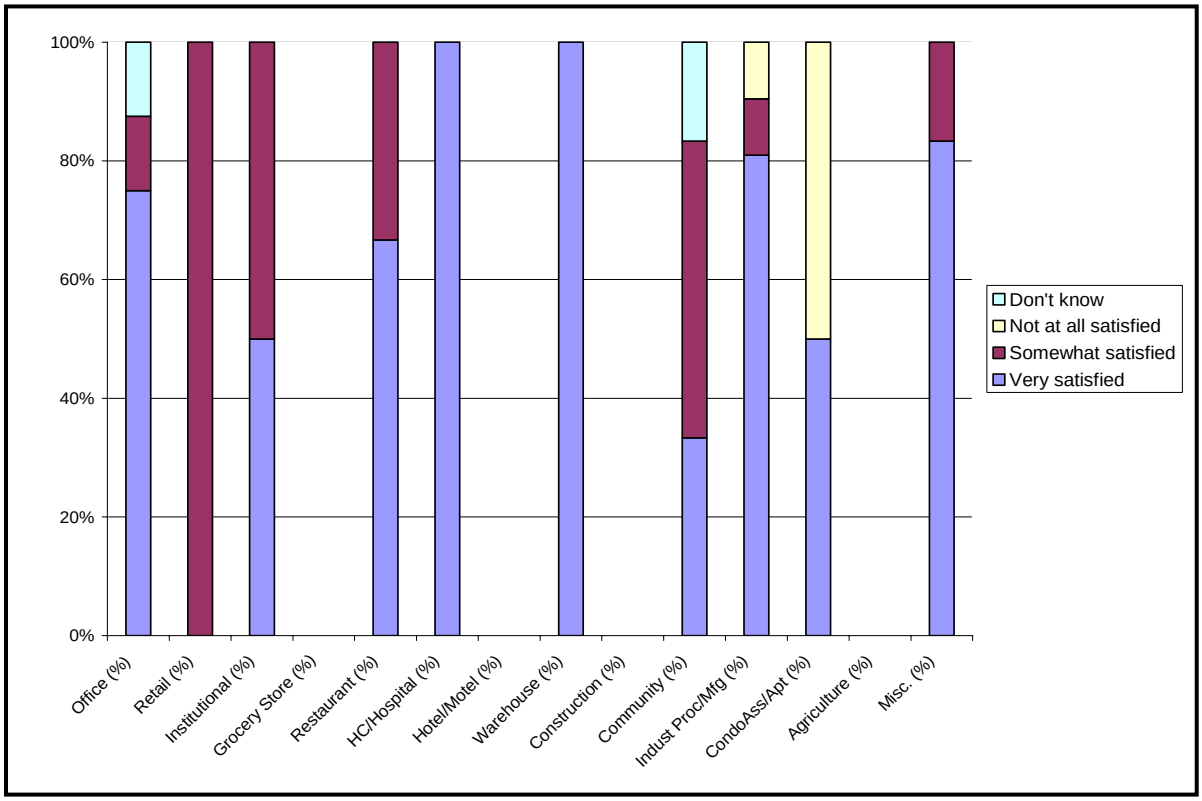
Figure 7-1: Upstream Program End User Satisfaction with Contractor



When examining the degree of satisfaction with vendors by business type in Figure 7-2, warehouses and health care/hospital facilities sampled were very satisfied with their vendors and their equipment recommendations, with approximately two-thirds of restaurants claiming they were very satisfied. Note that these results are based on a sample of 58 end users, of which only one is classified as a warehouse, two are health care/hospital facilities, and three are restaurants. With such small sample sizes, satisfaction regarding vendors by business type should not be taken as definitive and is instead provided here for illustrative purposes only.

The business type that was least satisfied with its vendors was apartment/condominium associations (a total of six were sampled). As Figure 7-2 shows, no responses were recorded from grocery stores, hotel/motels, agriculture, and construction business types regarding their satisfaction with their vendors and their equipment recommendations.

Figure 7-2: Upstream Program End User Satisfaction of Contractor by Business Type

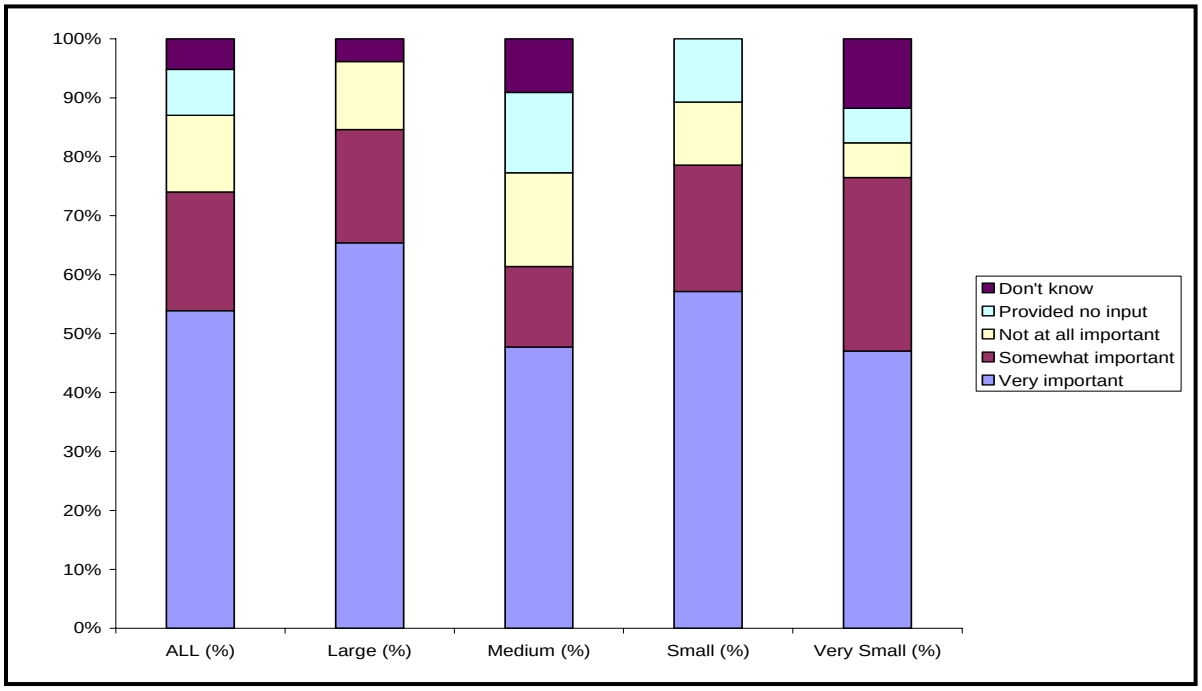


7.2.2 Vendor Influence

Questions regarding the influence of Upstream program vendors was answered by a total of 154 end users who could be classified by business size.[31] As Figure 7-3 shows, 54% of the Upstream program end user population surveyed stated that their contractor was important in their decision regarding the specific type of energy efficient equipment to install. Contractor influence vary slightly across different business size segments, with 47% of both very small and medium size businesses claiming they were very influenced by their contractor, and 57% of small businesses were very influenced. Large size businesses had the highest proportion of end users that were very influenced by the equipment suggestions made by their contractor.

[31] Note that the question regarding vendor influence was answered by a total of 154 end users who purchased equipment from contractors who participated in the Upstream program, but only 115 were classified into business size groups.

Figure 7-3: Upstream Program End-User Influence of Contractor by Business Size



7.3 Distributor Profiles

This section profiles the 21 participating CAC distributors and the 71 participating motor distributors interviewed in support of this study, detailing the sizes of their businesses as well as the types of equipment and services they offer.

7.3.1 Motor Distributors

There was a great deal of variation in the size of motor distribution firms participating in the Upstream program during 2004 and 2005. Respondents reported that their 2007 sales within California ranged from 12 to 200,000 motors. Sixty-two percent of motor distributors reported their sales within California increased between 2005 and 2007, 10% reported that sales stayed the same, and 14% reported that sales in California decreased during that period (the remainder did not know).

Table 7-1 demonstrates the products and services offered by motor distributors that participated in the 2004-2005 Upstream program. As shown in the table, all of the participating distributors sell motors directly to end users. Other common products and services include motor sales to contractors and sales of variable frequency drives (VFDs). Less than half of the distributors sell directly to residential end users, and these sales account for approximately 20% of the total sales among companies who sell to residential end users.

These data suggest that non-residential customers are the focus of motors sales by distributors, as this customer segment relies heavily on the use of motors for its activities. Residential customers make direct motors purchases far more infrequently, therefore it makes sense for distributors to continue to concentrate on the commercial and industrial proportion of the motors market as they have been.

Table 7-1: Motor Distributor Products and Services (SC3)

Product/Service	% of Respondents
Motor sales to end users (all sectors)	100%
Variable frequency drive (VFD) sales	97%
Motor sales to contractors	89%
Motor sales to end users - residential	37%
Motor repair or rewinding	37%
Motor installation	28%
Number of Respondents	**71**

Participating distributors reported that an average of 92% of their 2007 nonresidential equipment sales were to companies within the state of California. The majority report that this percentage had not changed substantially since 2005 (59%), but 32% reported that it has increased over time.[32] Approximately 50% (on average) of participating distributors' their revenues are from new motors sales versus motor repair/rewinding or sales of other equipment types.

Participating distributors who sell to end users sold an average of 66% of new motor sales directly to facility owners and managers during 2007. The percentage of sales to facility owners and managers ranged from 10% to 100% of the distributor's business. Participating distributors sold an average 29% of their new motor sales to electrical and mechanical engineers in 2007. This percent of new motor sales ranged from 1% to 100%. Of all participating motor distributors, approximately 16% sold new motors to Original Equipment Manufacturers (OEMs) during 2007.

[32] Six percent report that their sales to California companies have decreased since 2005, and another 3% did not know.

Most motors sold by participating distributors in 2007 were general purpose or A/C induction motors. These motors accounted for an average of 77% of four motor types sold, while definite or special purpose A/C induction motors accounted for an average of 18% of sales. DC and other types accounted for an average of 11% of sales.

7.3.2 CAC Distributors

The 21 central air conditioner (CAC) distributors who participated in the 2004-2005 program reported that they sold between 950 and 750,000 cooling tons of CACs in California in 2007.

Table 7-2 demonstrates the products and services offered by CAC distributors that participated in the 2004-2005 Upstream program. As shown in the table, all participating CAC distributors sell HVAC equipment to contractors, while 57% of them also sell HVAC equipment to end users. One-third of distributors repair HVAC equipment and 19% install HVAC equipment. Most CAC distributors (90%) also sell variable frequency drives.

Table 7-2: CAC Distributor Products/Services

Product/Service	% of Respondents
Sell HVAC equipment to contractors	100%
Sell HVAC equipment to end users	57%
Install HVAC equipment	19%
Repair HVAC equipment	33%
Sell variable frequency drives	90%
Number of Respondents	**21**

When asked if they sold equipment to residential end users, nineteen percent replied that they do. An average of 46% of total sales of HVAC equipment go to residential end users, with a maximum of 60% of a distributor's sales going to residential end users.

In 2007, 94% of all sales directly to nonresidential facilities by participating distributors were purchased by California companies. According to 48% of these distributors, this percentage has not changed since 2005. While 29% reported that sales directly to California non-residential facilities had increased over this period, approximately 10% have seen a decrease in these sales.[33]

Participating CAC distributors reported that an average 84% of their revenues are from new HVAC equipment sales. The minimum percentage of a distributor's revenue from new

[33] Fourteen percent report that they did not know if their sales to California companies had increased, decreased, or stayed the same since 2005.

equipment sales in 2007 was 25%, with many distributors' reporting that all new equipment sales constituted all of their 2007 revenue.

Distributors who sell HVAC equipment to end users sold an average of 13% of their equipment directly to facility owners and managers in 2007. The maximum percentage was 35% in 2007.

Distributors who sell HVAC equipment to contractors sold an average of 87% of their equipment directly to the contractors themselves in 2007. The minimum percentage was 65% in 2007.

7.4 Rebates

This section presents distributor representatives' opinions on the advantages and disadvantages of providing upstream incentives to the distributors rather than midstream or downstream rebates to contractors or end users.

7.4.1 Motor Distributors

Motor distributors reported that the main advantage of providing upstream incentives is that the distributors are better suited and more willing to handle the paperwork required to apply for the incentives than downstream contractors and customers. The distributors experience economies of scale with regard to the rebate application process from multiple motor sales and installations relative to motor end users. Motor distributors also highlighted an increase in energy efficient motors reaching the market due to offering a limited selection of higher efficiency equipment to end users (rather than a broader selection including less-efficient equipment). Since distributors earn incentives by stocking energy efficient equipment, they are more likely to do so, and therefore the options available to the end-user or contractor are proportionally more efficient.

The distributors' representatives also felt that they are more capable of communicating an increase in demand for energy efficient products to manufacturers than end users and are capable of using the incentives to promote energy efficiency through classes, workshops, or a lower priced motor. The only disadvantage, according to motor distributors' representatives, is that some distributors feel it is risky to share lower prices at the point of sale because of a lack of certainty that they will ultimately receive their rebates.

7.4.2 CAC Distributors

According to CAC distributors, the main advantage of upstream rebates rather than downstream rebates to contractors or customers is that distributors are better suited to

capitalize on the incentive and therefore more capable of passing the savings onto the contractor or end user. Distributors believe that this streamlining of the process helps mitigate the trouble borne by downstream customers of filling out rebate forms; the administrative burden is proportionally less significant for distributors than for contractors and customers. The only disadvantage cited by CAC distributors is that the incentives are limited to the most efficient equipment types only.

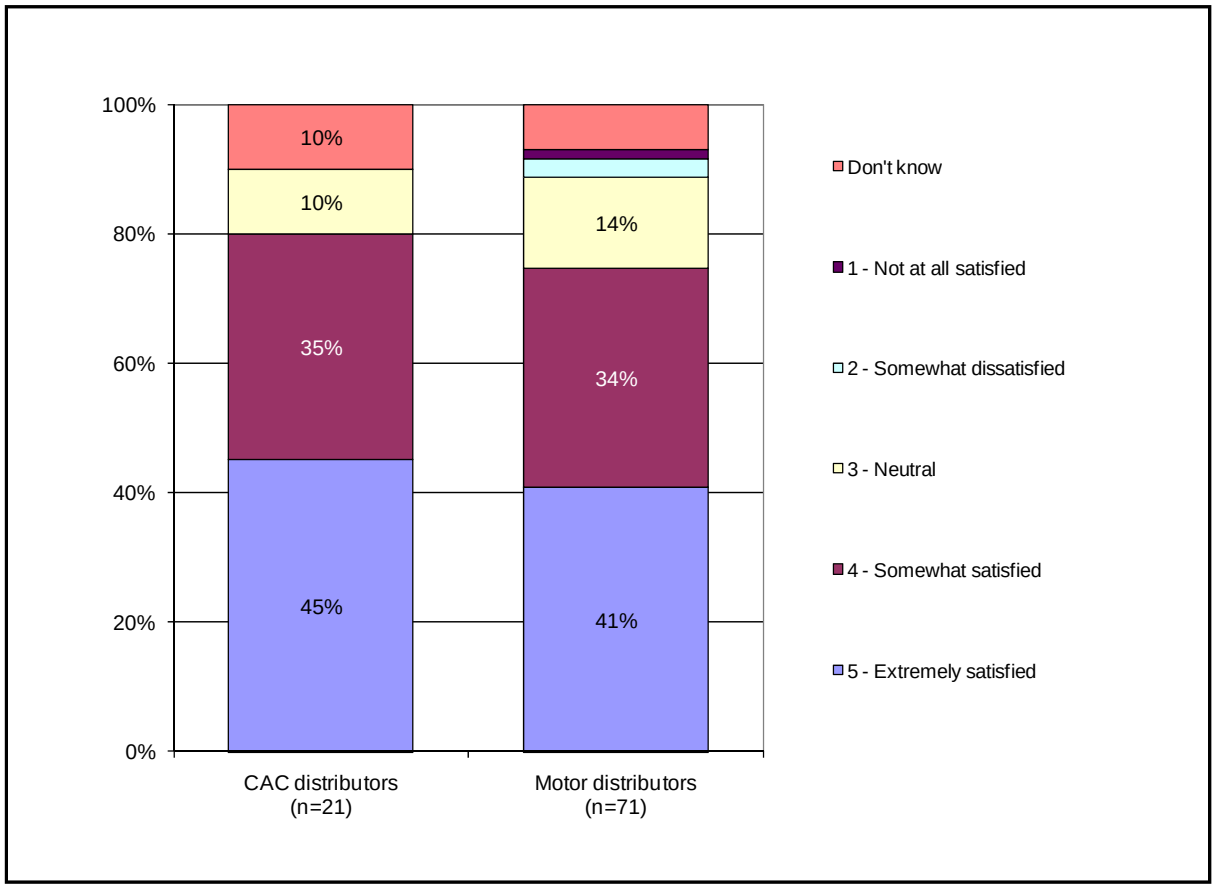
7.5 Program Satisfaction

During the in-depth interviews and CATI surveys, researchers asked representatives of CAC and motor distributors that participated in the 2004-2005 program to provide feedback on their satisfaction with the program enrollment process, rebate applications, online rebate application process, rebate amounts, rebate processing time, program staff, day-to-day operations of the program, and the program overall. The results are given in this section of the report.

7.5.1 Program Enrollment Process

Larger distributors were asked to rate their satisfaction with the program enrollment process on a scale of one to five with one meaning "not at all satisfied" and five meaning "extremely satisfied." Almost every distributor responded with a four or five, as Figure 7-4 shows. Sixty-three percent of the participating large motor distributors responded that they were extremely satisfied, and the remainder responded with a rating of four. One-third of participating large CAC distributors did not know what their satisfaction level was, while 44% provided a rating of five (extremely satisfied) and an additional 22 provided a rating of four.

Figure 7-4: Large Distributor Satisfaction with Program Enrollment Process by Distributor Type (Among Large Distributors)



7.5.2 Rebate Applications

Appropriateness of Information Requested on Application Form

Approximately 90% of large CAC distributors and three-fourths of large motor distributors reported that the level of information requested on the program's rebate applications in 2004-2005 was appropriate. One-quarter of the large motor distributors felt that the level of information was not appropriate, and that there are unnecessary or burdensome aspects of the applications. Large motor distributors mentioned that the different formatting requirements and the collection of the serial numbers was challenging. In addition, some mechanical contractors did not want to give out customer information, and some applications were rejected because they did not have a physical address (remote locations such as in the oil and gas industry).

Obtaining End User Contact Information

Most CAC distributors reportedly rely on the installation contractors to obtain customer (end user) contact information for entry into the online application forms. This can be in the form of an invoice, a bid, or is a requirement at time of purchase. In other cases, site information is required to place an order.

Most motor distributors get this information directly from the end user at the point of sale or when the order is taken. In some cases, this information was received from a contractor who completed the installations.

Fifty-six percent of large motor and large CAC distributors felt that the process of obtaining customer information from contractors was easy. Thirty-three percent of large CAC distributors felt that the process was either difficult or very difficult.[34] Twenty-two percent of large motor distributors felt that the process was difficult or very difficult, and the remaining 11% of large motor distributors could not say.

Large CAC distributors who felt that the process of obtaining customer information from contractors was difficult faced a variety of issues. The most common issue was the difficulty in verifying where the product had been installed. Weather-related construction delays and larger projects with multiple buildings are two reasons why verification could be difficult. Some contractors felt that customer information could be used to cut out the intermediary, while other contractors were too busy to give customer information to distributors. The only difficulty explained by large motor distributors was that mechanical contractors did not want to give out information.

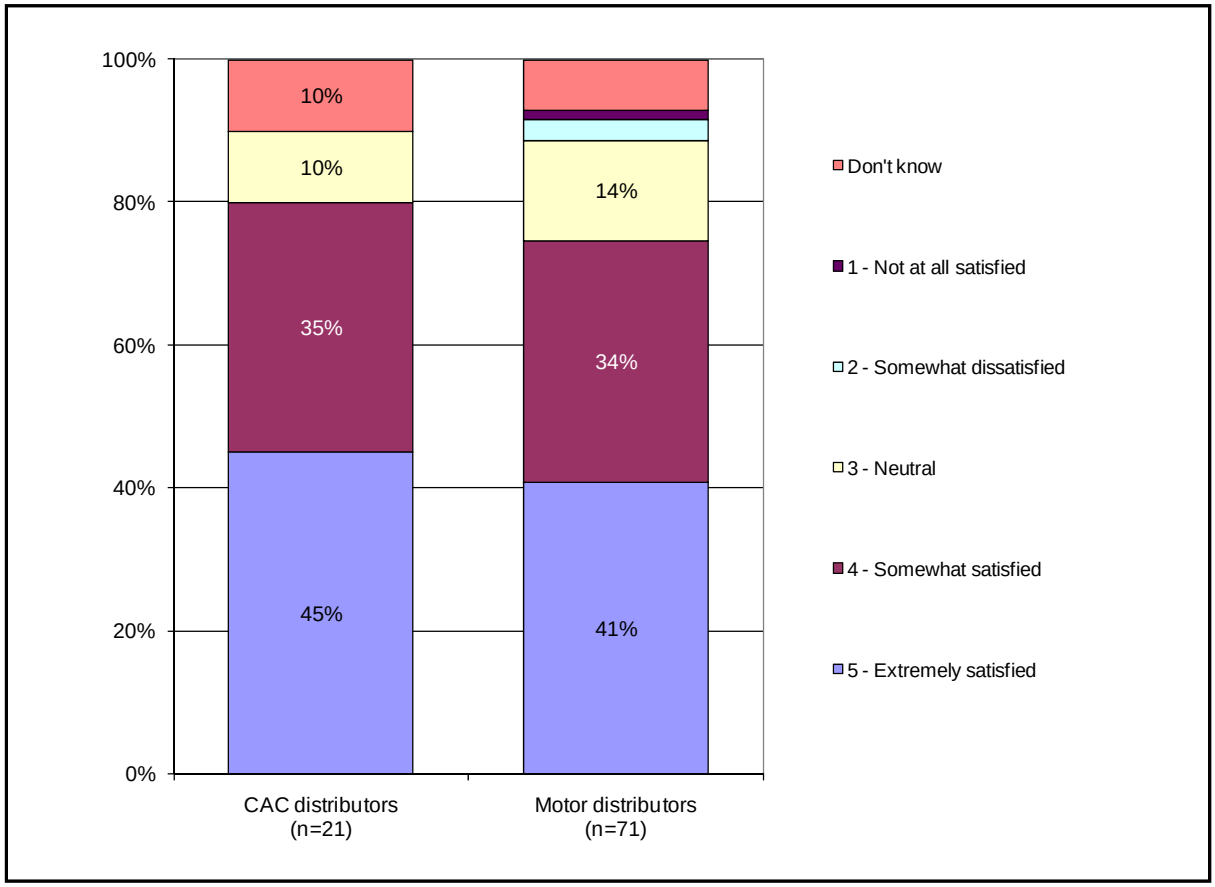
7.5.3 Online Rebate Application Process

Larger distributors were asked to rate their satisfaction with the online rebate application process on a scale of one to five with one meaning "not at all satisfied" and five meaning "extremely satisfied." Figure 7-5 shows that large CAC distributors were generally satisfied with the online rebate application process. Most CAC distributors rated the process a four or five (33% and 22%, respectively) and only 22% were neutral about the process (rating of three). Data collected through an online rebate application process helps to improve the accuracy of program evaluation, therefore it is recommended that the California IOUs' continue to use online rebate application process and refine the process as necessary.

[34] Eleven percent of large CAC distributors felt that the process varied from easy to difficult.

While 13% of large motor distributors were somewhat unsatisfied with the process, rating it a two out of five, most regarded the process as favorable. Roughly half of the large participating motor distributors responded with a four (13%) or a five (38%) as did the CAC distributors (22% extremely satisfied and 33% somewhat satisfied).

Figure 7-5: Large Distributor Satisfaction with Online Rebate Application Process by Distributor Type (Among Large Distributors)



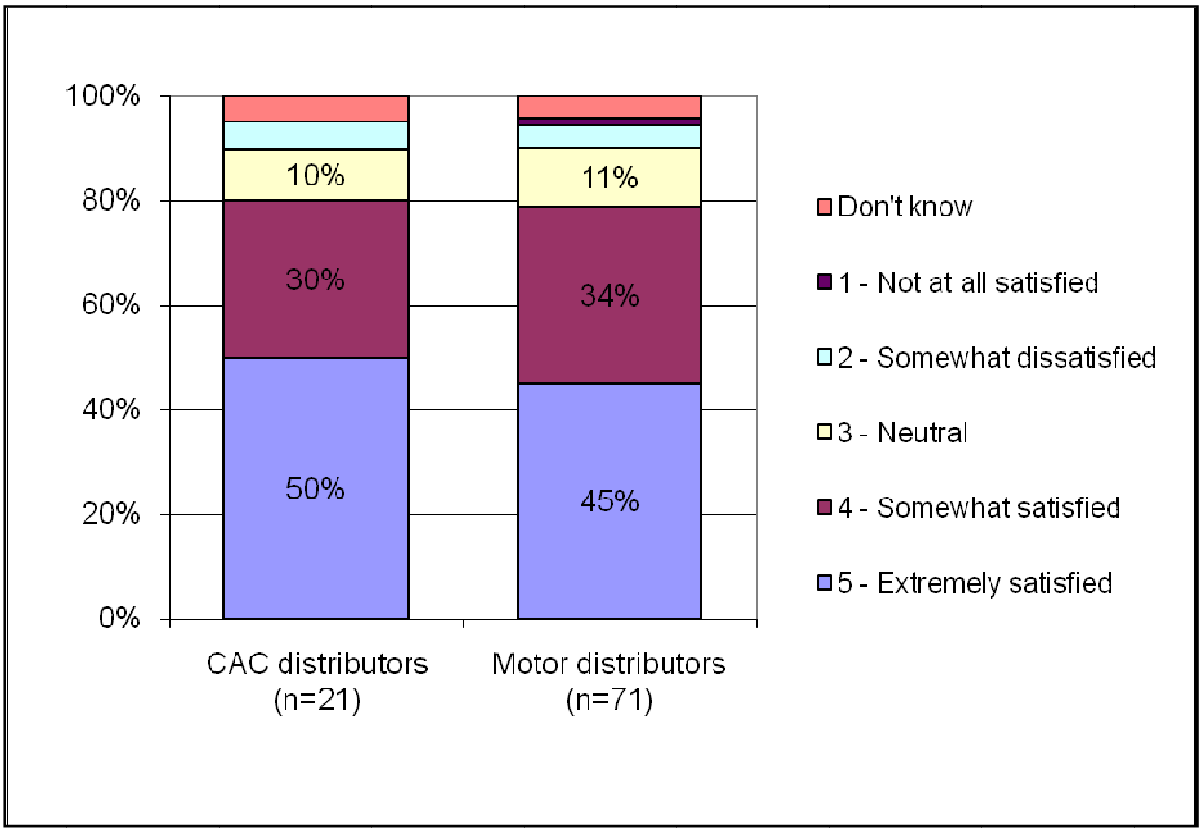
Respondents who rated the online rebate application process a two or one (not at all satisfied) gave the following suggestions for improvement:

- The online process needed to be streamlined.
- Energy Solutions database should recognize military addresses.
- The file formatting requirements changed suddenly to require serial numbers, which had not been recorded for a number of installations. If file formatting requirements need to change, participants should be given ample warning.
- The database of premium efficient models should be updated more frequently.

7.5.4 Rebate Amounts

All participating distributors interviewed in support of this study were asked to rate their satisfaction with the program's rebate amounts on a scale of one to five with one meaning "not at all satisfied" and five meaning "extremely satisfied." Figure 7-6 illustrates that approximately 80% of participating CAC and motors distributors rated their satisfaction with the rebate amount as either a four or five. Half of the remaining CAC distributors and 11% of motor distributors felt neutral about the rebate amount, while very small percentages of each were dissatisfied.[35] These results support the current levels at which the rebates are set since a majority of the recipients are satisfied.

Figure 7-6: Distributor Satisfaction with Rebate Amount by Distributor Type (Among All Distributors)



Almost all participating distributors were equally satisfied with rebates among all sizes of equipment and all efficiency categories. While 22% of CAC distributors were more satisfied with rebates for some sizes or efficiencies than others, no responding motor distributor felt

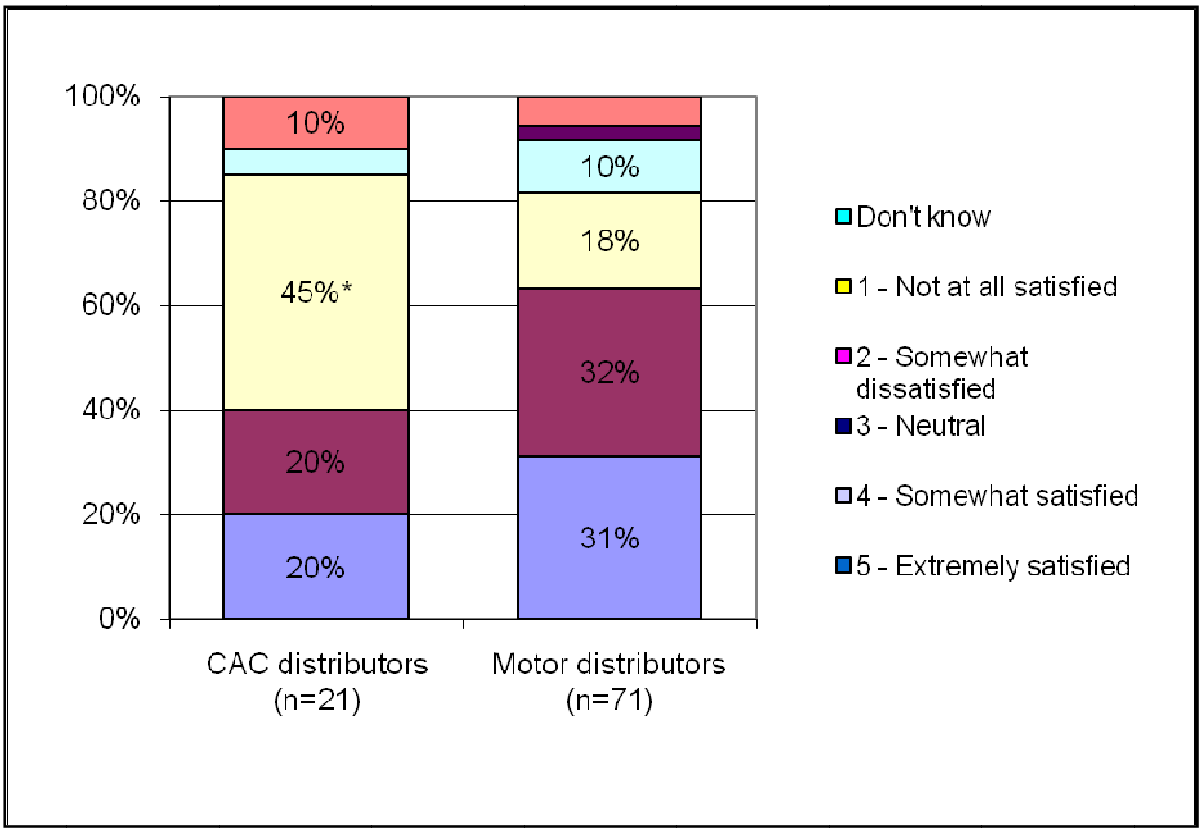
[35] Roughly 5% of CAC and motor distributors did not know how they felt about the rebate amount.

that the rebates were allocated inappropriately among different sizes or efficiencies of their equipment.

7.5.5 Rebate Processing Time

All participating distributors interviewed in support of this study were asked to rate their satisfaction with the processing time for program rebates on the same scale as described above. Approximately 40% of CAC distributors reported that they were satisfied (four or five), compared with approximately 63% of motors distributors.

Figure 7-7: Distributor Satisfaction with Processing Time of Rebate Applications by Distributor Type (Among All Distributors)



* Difference from motor distributors is statistically significant at the 90% level of confidence.

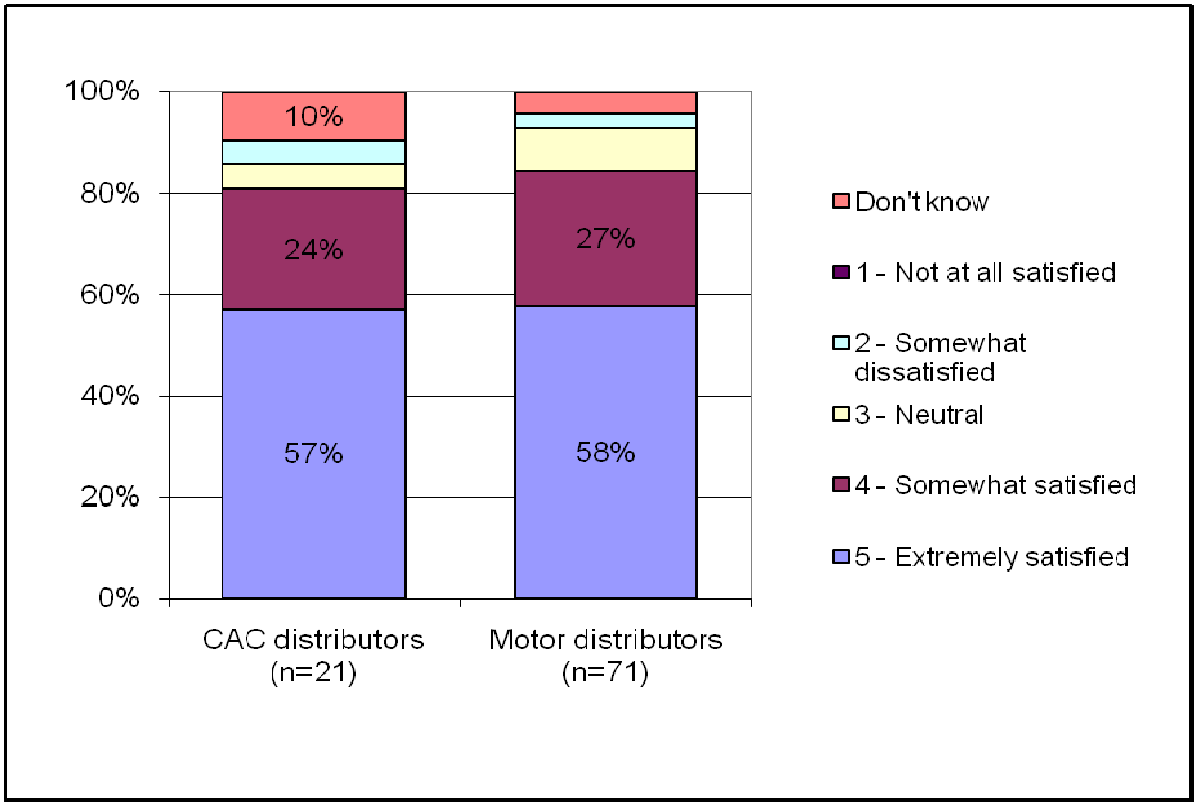
Fifty-six percent of CAC distributors and 56% of motor distributors reported their satisfaction with rebate processing times differed by the IOU providing the rebate. Many of the respondents who were less than satisfied with the processing times had specific issues with Southern California Edison. Concerns included long processing times relative to other utilities, unqualified personnel, and unresponsiveness as major reasons that distributors were unsatisfied with SCE's rebate application processing time.

According to almost all distributors, satisfaction with rebate processing time for PG&E's 2006-2007 program was equal to, or better than, the processing time for PG&E's 2004-2005 program. Fifty-eight percent of motor distributors reported that their satisfaction increased between the two program periods and 35% claimed that they were equally satisfied. More than two-thirds of CAC distributors (71%) were more satisfied with the processing time of the 2006-2007 rebate applications compared with 2004-2005 and 24% were equally satisfied.

7.5.6 Program Staff

More than 80% of distributors reported that they were satisfied with the utility program manager and other staff involved in the program (as shown in Figure 7-8). Twenty-four percent of CAC distributors ranked their satisfaction a four out of five on the same one-to-five scale described above. Twenty-seven percent of motor distributors ranked their satisfaction a four out of five on the same scale. Approximately 90% of distributors were equally satisfied with program staff across the three the IOUs.

Figure 7-8: Distributor Satisfaction with Utility Program Manager and Other Staff Involved in the Program by Distributor Type (Among All Distributors)



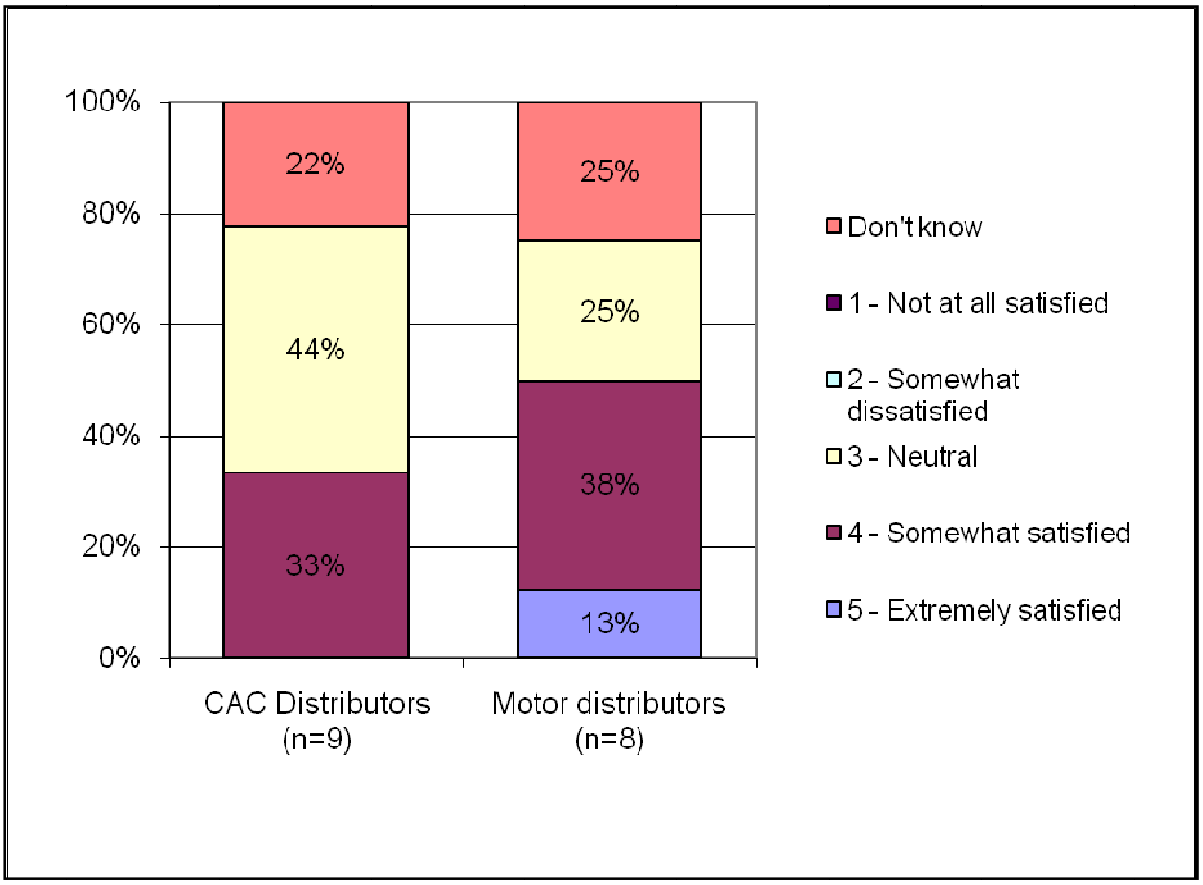
Most distributors who participated in both the 2004-2005 and 2006-2007 rebate program with PG&E maintained the same level of satisfaction with the program manager. Eighty-six percent of CAC distributors did not change their feelings, while 14% became more satisfied

with the program during 2006-2007. Almost one-third of motors distributors reported increased satisfaction with the utility program manager in the 2006-2007 program period versus 2004-2005 (30%).

7.5.7 Day-to-Day Operations of the Program

When the larger distributors were asked to indicate their satisfaction with the day-to-day operations of the program on the same scale as described above, none of the CAC distributors and only one of the motors distributors reported that they were "very satisfied" (rating of 5). None of the distributors provided ratings less than 3 (neutral).

Figure 7-9: Distributor Satisfaction with Day-to-Day Operations of the Program by Distributor Type (Among Large Distributors)

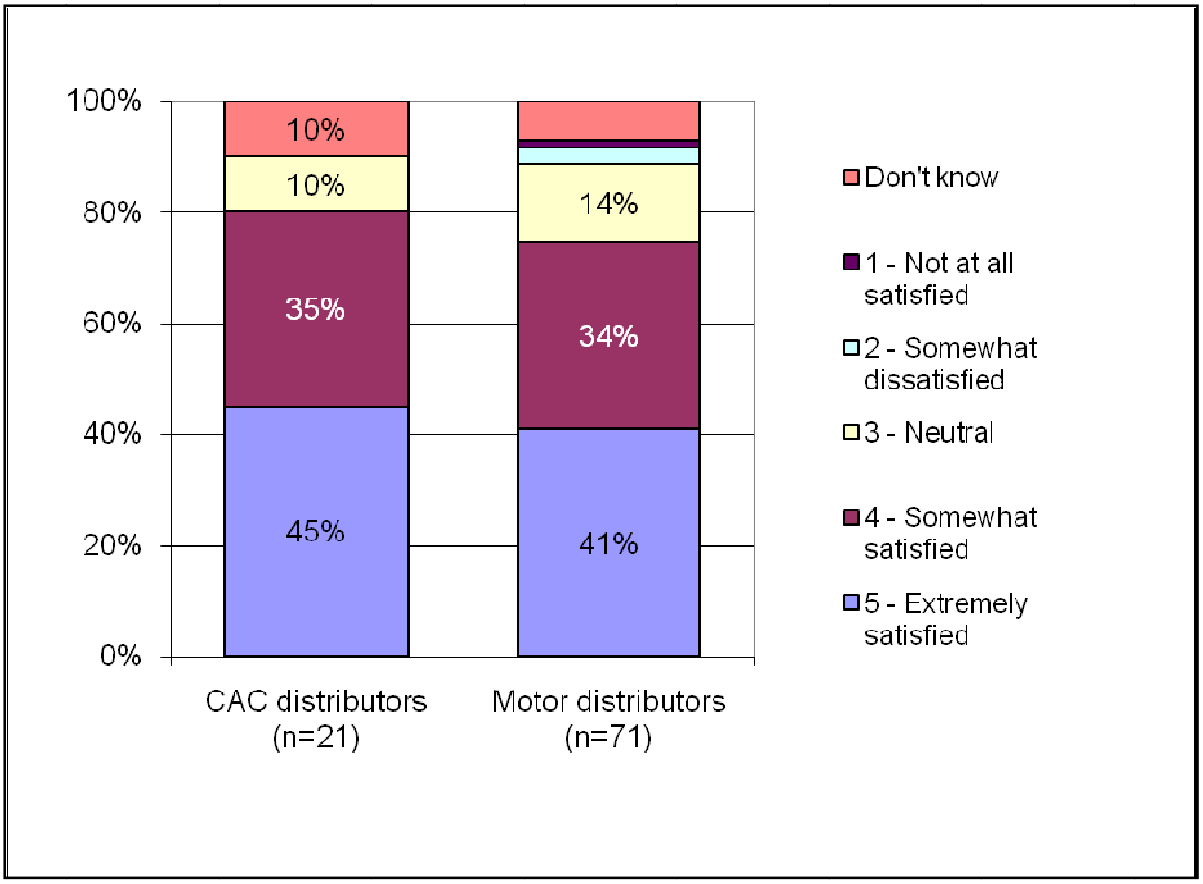


7.5.8 Overall Satisfaction

The evaluators asked all participating distributors interviewed in support of this study to rate their satisfaction with the overall program on a scale of one to five with one meaning "not at all satisfied" and five meaning "extremely satisfied." Figure 7-10 shows that roughly 75% of

distributors provided a rating of four or five, indicating high levels of general satisfaction with the program.

Figure 7-10: Distributor Level of Satisfaction in General with the 2004-2005 Program (Among All Distributors)



7.6 Cross Program Participation of Vendors

Forty-four percent of the large CAC distributors had participated in a program similar to the 2004-2005 Upstream program in the past. Other programs that large CAC distributors mentioned include the following:

- PG&E's Pilot CAC Program in 2001-2002,
- Other PG&E programs (*no specific program names cited*),
- SDG&E programs,
- SCE programs,
- LADWP programs,
- SMUD programs,

- Modesto Irrigation District programs,
- Turlock Irrigation District programs, and
- City of Santa Rosa Water Department programs.

Sixty-three percent of the large motor distributors reported that they participated in comparable programs previously. Other programs that these distributors had participated in include the following:

- PG&E's Express Efficiency program,
- PG&E's VFD rebate program,
- Other PG&E programs (no other specific program names cited),
- SMUD programs,
- SCE programs,
- SDG&E programs, and
- Roseville Electric programs.

7.7 Upstream Recommendations from Vendor/Distributor Assessment

Based upon the findings from the vendor/distributor assessment of the Upstream program, a few salient recommendations are made to further enhance its operation:

The IOUs should continue to focus on delivering CAC and motors measures upstream. Historical data from the past two program cycles show that end-user downstream rebates were less successful than upstream rebates in terms of moving energy efficient CACs and motors in the marketplace. As the longitudinal assessment presented in Section 3 showed, participation in 2004-05 was significantly higher than in 2002 and 2003. There were over 15,000 CAC and nearly 2,000 motors applications in 2004-05 compared to just over 1,000 CAC and under 100 motors applications in 2002-03. These data provide support for the continuation of the upstream programmatic form. Furthermore, satisfaction is very high among distributors, with 79% reporting they are very satisfied, and no distributors claiming dissatisfaction.

Use of an online rebate application process is essential to the accurate evaluation of the Upstream program and it should therefore continue, regardless of whether Upstream participants find the process difficult. A majority of large program participants actually felt that the process of obtaining customer information from contractors was easy. However, 33% of large CAC distributors and 22% of large motor distributors felt that the application

process of obtaining customer information was difficult or very difficult. Large CAC distributors who felt that the process of obtaining customer information from contractors was difficult faced a variety of issues. The most common issue was the difficulty in verifying where the product had been installed. Weather-related construction delays and larger projects with multiple buildings are two reasons why verification could be difficult. However, accurate data that tracks the ultimate purchaser of the rebated CACs and motors and the location(s) at which they are installed is vital to the accurate estimation of ex post energy savings from the program.

Revisit the online application process periodically to ensure it is streamlined, up-to-date, and asking for relevant information. Approximately 90% of large CAC distributors and three-fourths of large motor distributors reported that the level of information requested on the program's rebate applications in 2004-2005 was appropriate. However, one-quarter of the large motor distributors felt that the level of information was not appropriate, and that there are unnecessary or burdensome aspects of the applications. Large motor distributors mentioned that the different formatting requirements and the collection of the serial numbers was challenging. The IOUs should make sure to streamline the application and standardize the way in which information can be entered. The following suggestions and observations were made by program participants:

- The online process needed to be streamlined.
- Energy Solutions database did not recognize military addresses.
- The file formatting requirements changed suddenly to require serial numbers, which had not been recorded for a number of installations.

The IOUs should keep vendors informed of program changes to the Upstream program. The continued success of the Upstream program relies upon frequent and ongoing IOU outreach to distributors regarding revisions to rebates offered, types of equipment considered program eligible, and benefits of the installation of energy efficient equipment that can be passed down to end users they deal with. Keeping vendors informed of the program benefits will help to encourage continued participation in the Upstream program.

8

Best Practices Benchmarking Assessment

8.1 Best Practices Assessment Overview

As part of this evaluation, Itron conducted a best practices benchmarking assessment of the 2004-2005 California Statewide Express Efficiency and Upstream HVAC and Motors programs. The study defines a "best practice" as one that, when compared to other business practices that are used to address a similar business process, produces superior cost effective results. This assessment is based upon the findings presented in the nonresidential lighting and nonresidential HVAC Best Practices Reports that were completed as a part of Itron's National Energy Efficiency Best Practices Study.[36] The National Best Practices Study successfully developed and implemented a method to identify and communicate excellent programmatic practices nationwide through a comprehensive database of energy efficiency best practices by program area. It supports broadening the skills and capabilities of energy efficiency practitioners by making a database of best practices available as a resource to enhance the design, implementation, and management of energy efficiency programs.

Data gathered concerning the best practices of the Express and Upstream programs (from annual energy efficiency filings, program workbooks and narratives, past program evaluations, program tracking databases, and interviews with program managers) were compared to the practices described in the applicable reports completed as part of the National Energy Efficiency Best Practices Study. Based upon this comparison, the research team conducted a gap analysis to assess which practices are and are not being implemented in these programs. The results of this analysis are presented in the subsections below.

The study defines a "best practice" as one that, when compared to other business practices that are used to address a similar business process, produces superior results. Outcomes of

[36] Quantum Consulting, 2004. National Energy Efficiency Best Practices Study. Though the Express Efficiency Program rebates more than lighting measures, most of the energy savings from the program stem from lighting. For this reason, the Express Program aligns best with the programs covered by the nonresidential lighting report (Volume NR1-Nonresidential Lighting Best Practices Report). Additionally, the best practices report that aligns best with the Upstream HVAC and Motors Program is Volume NR2-Nonresidential HVAC Best Practices Report. All of the best practices reports covering both residential and nonresidential program areas can be found at http://www.eebestpractices.com

an energy efficiency program are, to some degree, a function of changeable program components, which are program theory and design, program management, program implementation, and program evaluation. Table 8-1 presents the salient best practice areas covered within each of the four program components. These are the four components into which best practices are categorized by in the National Best Practices Study.

Table 8-1: Energy Efficiency Program Components Defined in the National Energy Efficiency Best Practices Study

Program Theory and Design	Program Management
Structure Policies and Procedures	Project Management Reporting and Tracking Quality Control and Verification
Program Implementation	**Program Evaluation**
Participation Process Marketing and Outreach	Evaluation and Adaptability

Not surprisingly, the 2002 California Statewide Express Efficiency Program was included as one of the six studies reviewed for the Nonresidential Lighting Best Practices Report.[37] It was included in this group because lighting measures are responsible for the bulk of the energy savings derived from the program, even though this program provides rebates for other end use measures. Additionally, the HVAC component of the 2002 Express Efficiency Program was reviewed for the Nonresidential HVAC Best Practices Report.[38] This component of the Express program is what evolved into the 2004-05 Statewide Upstream HVAC and Motors Program that is evaluated in this report.

The 2004-05 Express program remains the same in many ways; the installation of energy efficient lighting continues to account for a large fraction of the energy savings and the program continues to be driven by vendors. Since the evaluation of the Express program with the National Best Practices Study, however, a significant programmatic change has occurred. Beginning with the 2004-05 program cycle, the Express program was split into two programs – the Express Efficiency program and the Upstream HVAC and Motors program. The split of the old Express program appears to have been welcomed by the utilities, customers, and vendors alike.

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[37] Quantum Consulting, 2004. National Energy Efficiency Best Practices Study. Volume NR1 – Nonresidential Lighting Best Practices Report. Submitted to California Best Practices Project Advisory Committee, Pacific Gas and Electric Company.

[38] Quantum Consulting, 2004. National Energy Efficiency Best Practices Study. Volume NR2 – Nonresidential HVAC Best Practices Report. Submitted to California Best Practices Project Advisory Committee, Pacific Gas and Electric Company.

The current Express program focuses on getting program qualifying energy efficient measures installed in small and medium commercial customer locations. The program relies heavily on vendors to inform and recruit customers, but the rebates are intended to be received by the customers. In the Upstream program, the rebates offered for program qualifying HVAC equipment and motors are intended for distributors and manufacturers in an effort to increase the market penetration of premium efficiency air conditioning and motors through stocking and selling practices of the vendors.

The remainder of the best practices benchmarking assessment is organized with a review of the 2004-05 Express Efficiency program first, followed by a review of the 2004-05 Upstream HVAC and Motors program. In order to maintain consistency across the assessments, the section subheadings included in each program's benchmarking assessment are the same.

8.2 Express Program Best Practices Benchmarking Assessment

8.2.1 Express Program Theory and Design

The program theory and design component of the Nonresidential Lighting Best Practices Report describes best practices associated with the development of program structure, as well as the presentation of the programs' policies and procedures.

Structure

The descriptions of the 2004-05 Express Efficiency program design, goals, and objectives included in each of the utility's program implementation plans (PIPs) and their annual energy efficiency program filings, makes clear that this program has a successfully developed design and structure. The program theory for the Express program has been refined over the years as this is a mature program operated statewide by the California IOUs.[39] The Express program is described as one that provides prescriptive rebates to small and medium nonresidential customers for the installation of program qualifying energy efficient equipment. Since smaller commercial customers may not be as familiar with the incentives available through programs such as Express, the IOUs have taken the time to develop relationships with contractors and vendors to encourage them to carry the message to their customers. During in-depth interviews with program managers, they revealed the importance of vendors to the success of the program. The Express program has been in operation for several years, thereby allowing the IOUs to refine their program theory.

[39] Even with mature programs such as the Express program, it is important to periodically conduct process assessments to ensure that the program achieves energy efficiency savings as market conditions change.

Policies and Procedures

Another benefit of operating for a number of years is that the program managers from each of the IOUs have gained experience working in collaboration to develop the policies and procedures under which Express Efficiency operates. During program manager interviews, several of them reported that they benefited from working as a group to develop and routinely revise the policies and procedures because it fostered information sharing across utilities, which in turn strengthened the statewide program. It also helped to ensure consistency of the program statewide and allowed the program managers to provide clear operating guidelines to customers and program participants. In addition, the applications were developed to be simple, straightforward, and consistent across the California IOUs. This high level of coordination allowed each of the program managers to bring their areas of expertise to the policies and procedures development process and work together to form a product useful to all of the IOUs in their program operations.

8.2.2 Express Program Management

Best practices included in the program management component of the Nonresidential Lighting Best Practices Report covers project management, reporting and tracking of program data and accomplishments, and quality control and verification of measure installations. Each of these best practice areas, as they relate to nonresidential lighting programs, is discussed below.

Project Management

The use of electronic project management tools was emphasized as a project management best practice that yields superior results when incorporated into energy efficiency program. The benefits associated with the use of such tools include streamlining participation for program participants and contractors, improving utility turnaround time of rebates, and simplified project tracking status. In fact, as stated in the Nonresidential Lighting Best Practices Report, "prescriptive programs offer great potential for automated project management due to their standardized incentives and discrete measure lists. Automated implementation processes can improve the efficiency of the participation time by reducing turn-around time."[40] A few of the programs reviewed in the study have even "pioneered innovative ways to use information technology to manage projects by electronically linking

[40] Quantum Consulting, 2004. National Energy Efficiency Best Practices Study. Volume NR1 – Nonresidential Lighting Best Practices Report. Submitted to California Best Practices Project Advisory Committee, Pacific Gas and Electric Company, page NR1-25.

program administrators and the lighting contractors that implement projects at customer facilities."[41]

While the utilities have made use of electronic program tracking databases, the Express program does not accept electronic applications from customers applying for rebates. They (or more often, their hired contractors) must fill out an application for a rebate and submit it by mail. Since the Express program was designed to serve smaller commercial customers, such as restaurants, motels, and grocery stores, reliance on hard copy applications may make sense since computers and access to the Internet may be more limited than in larger commercial and industrial settings. However, in today's world, computers are prevalent in most business settings, small or large. The Express program would benefit from an electronic application process as it would simplify application processing and remove the need to manually enter data into program tracking databases from hard copy applications.

The IOUs have traditionally relied upon vendors to market the Express program to their customers. Therefore, strong relationships with vendors are key to the success of the program as vendors directly interact with targeted customers more regularly. In fact, when a customer participates in the program, the contractor tends to be far more involved in the program process. The vendor may be the one who fills out the rebate application and mails the paperwork in to the utility, since the vendor is likely more familiar with the types of measures that qualify for an Express Efficiency rebate as well as the overall participation process.

With regard to the Express program, the IOUs do recognize the importance of keeping vendors abreast of the equipment for which rebates are available. By inviting them to presentation and information seminars related to the program, they are also able to inform contractors of any program changes. During program manager interviews, the research team learned that PG&E hosted vendor breakfasts during which they provided information about the Express program and SCG held Express Efficiency seminars and training at its Energy Conference Center in Downey, California. Other forms of communication with vendors regarding the Express program include e-mails, tradeshows, and distribution of fact sheets.

Reporting and Tracking

Reporting and tracking of key indicators, such as energy savings, total rebates paid, hard-to-reach accomplishments, and measure types installed, was reported as a best practice that all of the programs reviewed in the nonresidential lighting report performed. With the exception of pre-existing wattages, the Express program tracks virtually all of the indicators of program

[41] Ibid, page NR1-25.

progress. The process of reporting and tracking Express Efficiency accomplishments is relatively streamlined since the utilities also utilize the practice of standardized project reporting. Each month, the IOUs release standardized monthly program workbooks and accompanying narratives about the Express program. These reports are similar across each of the utilities in their presentation of information, such as energy, demand, and therm savings, as well as accomplishments towards hard-to-reach goals. They also report on information regarding expenditures and rebates paid to date. The other benefit of standardized reporting is that it enables program managers to extract data regarding their programs without reliance on database specialists or IT staff.

The program evaluation and measurements of energy savings could be enhanced if the program prescribes the collection of pre-existing wattage information from participants. This was a best practice discussed in the national best practices study, but was not adopted by most of the programs reviewed. The lack of pre-existing wattage information is likely due to the program design of many of the nonresidential lighting programs which have eliminated the requirement to pre-qualify for the program. The terms and conditions of receiving a rebate allow customers to, after the fact, fill out an application and provide supporting documentation thus affecting the utilities' ability to collect pre-wattage information.

Each utility makes their applications available for print from their websites and are relatively simple to complete. Information from these applications are then entered into program tracking databases in order to maintain records of the program's operation and progress towards meeting its energy savings goals. The program managers have, over the years, worked together to develop the applications together to make them uniform in terms of the program qualifying measures and their associated rebates. As mentioned in the subsection on program management above, the program would benefit from developing an online application process – it would also reduce time spent on data entry from hard copy applications.

Customers (and their contractors) benefit from the use of a reservation system for the Express program. Rebate dollars can be reserved by calling the sponsoring utility before the measure is installed, as long as the installation occurs within a specified amount of time. This helps customers to ensure that rebate dollars will be available before they commit to the purchase of new equipment. The Express program should develop an online reservation system instead of one that requires a phone call to the sponsoring utility.

The databases used for the Express program during the 2004-2005 program cycle do not integrate with cross-program energy efficiency program information systems, which were recommended in the National Best Practices Study. The utilities each maintain their own database, even though Express Efficiency is a statewide program. In addition, data about vendors who have participated or continue to participate in the Express program are tracked

to different degrees by the utilities. Many of the vendors will travel throughout California to install program qualifying measures – therefore it would be useful if the utilities coordinated their vendor databases, especially of those who install measures in different service territories.

During program manager interviews, PG&E informed the research team that it maintains a comprehensive trade ally database with close to 14,000 people at the time our interview with them took place (March 2006).

Quality Control and Verification

Conducting on-site post-installation inspections discourages vendors from failing to install all rebated measures (as opposed to simply dropping off the measures at the participant's location). The degree of on-site verification of measure installation needs to be balanced to ensure cost-effectiveness while encouraging proper installation. This is especially important for programs, such as Express Efficiency, that include high-volume, screw-in CFL measures. The Best Practices study recommends random inspections of 10 to 20 percent for lower incentive prescriptive programs and a higher fraction for direct installation programs. The sample of on-site inspections should be increased as conditions warrant. Based on our examination of the Express program, we found that this best practice has been put in place and therefore no additional post-installation inspection of sites is recommended. The Express program should, however, continue to conduct random on-site inspections as it has been doing to date.

PG&E and SCE randomly selected 20% of participating sites for inspection; however 100% of the sites receiving rebates in excess of $2,000 (for SCE) or $2,500 (for PG&E) are inspected. SCG inspected virtually all participating sites as did SDG&E (with the exception of hotels and motels). All sites are inspected by the Sempra utilities to reduce the incidence of dropped shipments of rebated equipment that in the end may be put in storage and not installed. None of the utilities conducted pre-installation inspections. This would be a benefit, but may not be possible since the application process may start after an energy efficiency program qualifying measures are installed.

The utilities each gather information about the location of the participating site, as well as the rebated measures purchased, the quantity purchased of each measure, and the rebate amount paid. However, some problems exist with this system. The actual participant's site information may not be tracked if a vendor or distributor fills out the application and receives the rebate directly when they install equipment at a customer's site. The incentive may be passed down to the customer through the contractor, but the tracking system may not have the actual participant's site information.

The applications and background information available to customers makes available certain specifications about program qualifying equipment. The application forms include information, such as wattages for CFLs, in an effort to ensure that customers who submit applications do so for equipment that meets the energy efficiency specifications of the program.

Two of the best practices described in the Nonresidential Lighting Best Practices Report but that are not included in the Express program are the inspection of the first job completed by new vendors and pre-installation inspections. Because of the number of vendors involved in the installation of measures through the Express program, it would not be feasible or cost-effective to inspect the first job of each new vendor who installs equipment for customers participating in the Express program. The program instead relies upon random on-site inspections in the hope that they capture a representative sample of the population of jobs completed. Pre-installation inspections are not carried out because, as explained earlier, this practice does not complement the program theory of Express, which is to allow customers to simply install prescribed program qualifying equipment, and receive rebates in return. By requiring inspections beforehand, the program requirements become more burdensome and may reduce participation by the targeted customers.

8.2.3 Express Program Implementation

The program implementation component describes the nonresidential lighting program best practices associated with the process by which the program enlists participants and the marketing and outreach efforts taken by the utilities to engage vendors as well as potential customers.

Participation Process

As stated in the Nonresidential Lighting Best Practices Report, "a tradeoff exists between the program goals of simplicity (making participation easy for customers and contractors) and accountability (ensuring funds are paid only for proper installations and savings are calculated accurately)."[42] Program applications should be self-explanatory while at the same time should provide enough information to ensure the validity of the installation as well as the resulting energy savings. The Express program has the advantage of a long historical development. Therefore has been able to refine its program participation process over many program cycles. To participate in Express Efficiency, a customer can simply install (or have installed) program qualifying measures, and fill out and submit the one-page Express application (sent along with equipment proof of purchase). Rebates, which are defined on

[42] Ibid, page NR1-34.

the application for each type of measure, are paid out within 4 to 6 weeks. Random inspections are conducted after equipment installation and the customers may be visited by an inspector to ensure the measure was installed properly. The simplicity of the participation process has resulted in a program that has successfully led to sizable energy and demand savings. The small and medium nonresidential customer group has been penetrated through this program because it provides prescribed rebates and requires no pre-inspection. These features make the program attractive to customers, while only having a slightly negative impact on the utilities' ability to account fully for all program savings.

The Nonresidential Lighting Best Practices Report makes clear that incentive levels clearly drive participation levels. As stated in the report, utilities should "use high incentive levels, as appropriate, in segments and for program designs that require high penetration rates to be cost-effective" and "set base rebate levels appropriately through the year instead of relying on short-term promotions." The utilities have benefited from their past experience with different rebate tactics to affect program participation. As a result, this best practice was adopted into the Express program. For example, through program manager interviews, the research team learned that rebate levels offered by the utilities were, largely, consistent and unchanged over the program cycle except for delamping and greenhouse heat curtains. The program managers agreed that delamping had large energy savings potential and in response, they revised the rebate offered for delamping high bay lighting from $75 to $100. In addition, the rebate for greenhouse heat curtains was deemed to be high and was therefore revised downward from $0.40 per square foot to $0.20 per square foot.

Some of the best practices regarding the participation process that are not included in the Express program include offers of low-cost or no-cost financing to offset high capital costs incurred by small businesses when they purchase program qualifying equipment and electronic application processing.

Marketing and Outreach

Marketing activities across IOUs were not coordinated, nor did they need to be; instead each utility focused on the eligible measures that were most popular in its service territory. The manner in which each of the utilities accomplished this is by working through mass media channels to inform vendors and their small and medium commercial customers about the program. Each utility carried out its own campaign and relied upon similar marketing tools such as brochures, fact sheets, bill inserts, and direct mail pieces sent to customers and vendors about the program. Trade shows, vendor breakfasts, and presentations used to spread the word about the program to contractors, who in turn informed their customers. It was noted in the Nonresidential Lighting Best Practices Study that, though the California IOUs relied upon mass media to market the Express program, this form of outreach did not appear to drive customers to actually participate. Instead, contractors were the key marketers

of the Express program. The utilities' marketing, however, provided greater credibility to vendors when they discussed the Express program with their customers.

8.2.4 Express Program Evaluation

The Nonresidential Lighting Best Practices Report describes a number of best practices concerning program evaluation, all with the purpose of creating a meaningful feedback loop to improve program design, operation, and accomplishments. The key best practices focus on the routine evaluation of program tracking databases, program process, measures lives of the equipment with the greatest energy saving potential, hard-to-reach accomplishments, on-site inspection procedures, and energy and demand impacts. The Express program has adopted these best practices, evidenced by its process and impact evaluations for each program cycle over the past decade. Recent evaluations of the Express program have emphasized verification activities, as well as process and marketing assessments. The latest evaluation report has expanded the scope of the evaluation to include a more rigorous impact evaluation, as was common in the evaluations of the Express program during the 1990s.[43] It is clear from this study, that the Express program has successfully incorporated most of the program evaluation best practices discussed in the national study. The recommendations that would benefit the Express program further include: the implementation of an electronic application and rebate reservation system and inspections of a random sample of sites prior to installation of rebated equipment to gather information regarding existing equipment (in order to improve estimates of energy savings from the program).

8.3 Upstream Program Best Practices Benchmarking Assessment

8.3.1 Upstream Program Theory and Design

The program theory and design component of the benchmarking assessment describes the best practices associated with the development of program structure that the Upstream HVAC and Motors Program have adopted. It also presents the program's policies and procedures as they relate to the best practices found for the premiere set of nonresidential HVAC programs.

Structure

Though the Upstream HVAC and Motors program originated in the 2004-2005 program cycle, it had existed as a component of the California Statewide Express Efficiency Program in previous years. In the early years of the Express program (pre-2002), some of the IOUs

[43] Ibid, page NR1-44.

provided upstream incentives to HVAC and motors distributors along with a multitude of end-user rebates for energy efficient lighting, refrigeration, and other equipment. By 2002, the Express program focused primarily on end-user incentives and moved away from paying upstream rebates. The creation of the Upstream HVAC and Motors Program in 2004 served as a way for the utilities to return their focus back towards upstream rebates for the high efficiency HVAC equipment and motors.

The Upstream program has a defined program structure, which is to change HVAC and motor distributors' stocking practices by encouraging them to maintain sufficient inventories of these types of high efficiency equipment. Well-stocked inventories help the California electric utilities ensure that high efficiency HVAC and motors are available at the time the customer is making the buying decision, typically upon failure of existing equipment. In fact, the Express program, along with the other HVAC programs reviewed in the National Best Practices Study, was designed to reduce "various barriers related to information and search costs, product unavailability and overcoming the higher initial cost of efficient products through rebates."[44] Rebates of half to two-thirds the incremental costs for HVAC and motors equipment are paid to distributor participants upon proof that a qualifying model has been delivered with the expectation that these rebates will be passed down to the end users of the equipment.

Policies and Procedures

The Upstream program was implemented by a single outside program contractor called Energy Solutions during the 2004-05 program cycle. Energy Solutions was responsible for the application process, but also the implementation and maintenance of a distributor database, which interacted with an online rebate database to allow program managers to view large amounts of data in an organized manner.

The benefits of using one implementation contractor across the utilities that are running the Upstream program is the level of consistency in the policies, procedures, and application submission processes followed to recruit and rebate program participants. In fact, during program manager interviews, it was noted that there was a synergy in the program between the three electric IOUs since it was being run consistently. Energy Solutions used a web-based paperless application process that was centralized, making the processing of these applications for rebates much simpler. A benefit for distributors who work in multiple

[44] Quantum Consulting, 2004. National Energy Efficiency Best Practices Study. Volume NR2 – Nonresidential HVAC Best Practices Report. Submitted to California Best Practices Project Advisory Committee, Pacific Gas and Electric Company.

electric service territories is that they do not have to drastically alter the way they apply for rebates based on the utility to which they are submitting their applications.

8.3.2 Upstream Program Management

Best practices included in the program management component of the Nonresidential HVAC Best Practices Report covers project management, reporting and tracking of program data and accomplishments, and quality control and verification of measure installations. Each of these best practice areas as they relate to the Upstream program are discussed below.

Project Management

According to the Nonresidential HVAC Best Practices Report, the management structure of successful HVAC programs includes individuals who have "sufficient skill…to cope with the entire spectrum of the HVAC market, from manufacturer to installer."[45] It is important that every level of the supply chain is understood in order to ensure smooth operation of the program, however a major focus on attracting distributors is essential, as they are the ones who directly receive rebates from the IOUs. The Best Practices Report makes no statement about which approach to managing programs is best, but instead notes that different approaches have been successfully utilized by electric utilities to operate their HVAC programs. Most of the programs reviewed in the best practices study were managed entirely in-house by the utilities (Avista Rooftop HVAC Maintenance Program, the 2002 California Express Efficiency Program, Florida Power and Light C/I HVAC Program, and others). Reliance on outsourced management, however, proved useful for the New England Efficiency Partnership's Cool Choice Program which relied heavily on outside contractors for technical services. The California IOUs followed the lead of the NEEP Program when using a third-party implementer, Energy Solutions, to operate the Upstream program.

Use of a single contractor to operate the Upstream program helped to keep the program consistent across the California electric IOUs, which greatly benefited the operation of the program. Energy Solutions was responsible for the creation, implementation and maintenance of a distributor database which interacted with an online database. The database provided the utilities with the ability to determine which distributors were installing equipment in locations at a detailed level. Although each of the utilities tracked their information to determine their program accomplishments and whether they were reaching their goals, centralizing the system of distributor approval for program participation and rebate application submittals ensured that the utilities would receive data collected in a consistent way.

[45] Ibid, page NR2-19.

Reporting and Tracking

Since the Upstream program was offered by the three California electric IOUs, there was some degree of variation in the level of sophistication of the data reporting and tracking by utility. Energy Solutions worked with each of the utilities, however, and helped to remove inconsistencies in information tracking that might have otherwise existed across each of the IOU's Express programs. The tracking of these data are used to monitor the commitment of funds towards rebate payments and to efficiently calculate program accomplishments for regulatory reporting purposes. Use of web-based application submittals also helped to streamline reporting and tracking of data for the Upstream program since data do not have to be entered from hard copy applications. This was an issue with the Express program during the 2004-05 program cycle that was eliminated for the Upstream program by Energy Solutions' use of paperless applications.

SDG&E was able to link its Upstream program database directly to the database maintained by Energy Solutions, thereby allowing quick payment of rebates to distributors. SCE's Upstream program manager noted that there were some firewall issues between SCE and Energy Solutions at first, which reduced rebate-processing time. As the program continued, the firewall issue was addressed.

One issue that did arise with tracking on rebates for the Upstream program is that many of the distributors who participated in the program did not have the staff available to take the time and use the online application tool. According to one program manager, it was difficult to get distributors to use the tool on a consistent basis. They often did not have the staff dedicated or trained to apply for Upstream program rebates.

Quality Control and Verification

Prior to the 2004-05 program year, the tracking of installations of HVAC and motors equipment was as good as the Express program's quality control. Because the Upstream program started its own tracking in 2004-05, there were some initial problems with duplicate applications from some distributors. Based on program manager interviews, these seemed to have been genuine errors rather than intentional fraud. Due to the processing of duplicate applications, improvements were made to the online application tool to enable additional cross-checks for errors and possible duplicates.

Another practice that greatly benefited the quality control and verification of the statewide Upstream program was the 100% rebate inspection policy carried out by the utilities. In some cases this confused the end-users since rebates were not directly paid to them.

8.3.3 Upstream Program Implementation

The program implementation component describes the nonresidential HVAC program best practices associated with the process by which the program enlists participants and the marketing and outreach efforts taken by the utilities to engage vendors as well as potential customers.

Participation Process

The Upstream HVAC and Motors Program, as it operated during the 2004-2005 program cycle, paid special attention to the midstream distributors in the HVAC and motors markets. These were the individuals who would directly receive rebates for changing their stocking practices.

The process of operation for the Upstream program began with distributors going to the program website, downloading the distributor participation agreement, and mailing it to Energy Solutions. This helped to ensure that only distributors, and not contractors, were participating in the program. It also gave the utilities recourse if distributors did not follow the rules of the program. Energy Solutions then followed up with the distributors in order to verify their identities and then provided them with a login and password for the online rebate page. Distributors would then enter measure model numbers and contact information for where the equipment was installed. The online system was able to track model and customer information that was previously entered to ensure that distributors were not entering duplicate information.

Distributor participation in the program induced higher competition for premium efficiency equipment. If a distributor is caught cheating once, he or she was not allowed to participate in the program. This would prevent a distributor from effectively competing in the market, which provided a clear incentive not to cheat. In fact, according to PG&E's program manager, no one was removed from its program in 2004-05.

One difficulty with providing rebates upstream is that the program managers were not assured that these rebates are being passed downstream to end users. In fact, during program manager interviews, one of the program managers stated that he had a "gut feeling" that some of the distributors were not passing the rebates on to customers. However, those distributors who did use the rebate as a successful sales tool were more successful at penetrating the market.

Marketing and Outreach

A common theme among all of the Nonresidential HVAC programs reviewed for the Best Practices study is the "significant role of supply-side players in promoting and implementing" programs.[46] Most of the programs utilized traditional communication approaches such as utility bill inserts and newsletters. However, across the board the most common communication channel used was the vendor and distributor community. The Upstream program relied upon distributors to carry the message to end users regarding high efficiency AC equipment and premium efficiency motors. For this reason, the marketing of the Upstream program focused on distributors and manufacturers via high-level face-to-face presentations to CEOs/Presidents, sales managers, and sales staff.

HVAC-related presentations were made to some of the major HVAC companies involved in the program; included EB Ward, Trane, Specialty AC Products, US Air, York, and Lennox. Motors presentations were made to Electric Motor Shop, Industrial Electric Company, Stanley, Koffler, Kaman, Applied Industrial Technologies, and Motion Industries.

The program also used multiple phone and email contacts, as well as brochures and two-page handouts. In fact, during the program manager interviews, the PG&E Express program manager stated that he had email addresses for of their participating distributors. Information would be sent via e-mail about the program including budget details, concerns, issues with lack of participation, etc. The critical emails from PG&E were followed up by phone calls.

8.3.4 Upstream Program Evaluation

The Nonresidential HVAC Best Practices Report describes a number of best practices concerning program evaluation, all with the purpose of modifying program designs and to better report program impacts to the managers of the program. Some of these best practices include review of distributor installation practices as they relate to HVAC equipment and motors, review algorithms used to calculate project savings, perform market assessments, and conduct evaluations routinely to capture the dynamic nature of AC and motors markets.

The Upstream program existed as a component of the Express Efficiency program, and therefore has been evaluated on a fairly consistent basis. In fact, evaluations of the Express program have occurred with each program cycle. Since the rebates paid to distributors for HVAC and motors equipment has been developed into its own program, it will be more thoroughly evaluated as a stand-alone program.

[46] Ibid, page NR2-26.

8.4 Best Practices Benchmarking Assessment Recommendations

An electronic application process would benefit the Express program by not only simplifying application processing, but it would also remove the need to manually enter data into program tracking databases from hard copy applications. Electronic applications can also be formatted so that the information entered is standardized and can be streamlined to make repeated data entry easier on program participants. This helps reduce errors in data interpretation and data quality assurance by the IOUs and program managers. There may also be a benefit to creating an online reservation system instead of one that requires a phone call to the sponsoring utility. If the utilities choose to implement an electronic application process, past, current, and potential program participants should be offered training and workshops to improve the success of this type of programmatic change.

The IOUs should continue their coordination of policies, procedures, qualifying measures, and rebate amounts for both Express and Upstream programs. The high level of coordination allowed each of the program managers to bring their areas of expertise to the policies and procedures development process and work together to form a product useful to all of the IOUs in their program operations.

Both Express and Upstream program managers should conduct random pre-installation inspections to improve the evaluation and measurement of energy savings. Pre-installation inspections would help to provide accurate pre-program conditions of participating sites and would allow for more precise estimates of energy savings from the program. It would also benefit the programs by reducing the number of installations that are not program qualifying replacements, such as replacing CFLs with CFLs in the case of the Express program.

The IOUs offering the Express and Upstream programs should consider offering low-cost or no-cost financing options to offset high capital costs incurred by small businesses when they purchase program qualifying equipment and electronic application processing. Financing options were recommended in the National Best Practices Study as a way to provide added incentive to potential program participants.

Support Upstream program participants on the electronic application process. One issue that arose during the vendor and distributor assessment for the Upstream program is that many of the distributors who participated in the program did not have the trained staff available to take the time and use the online application tool. The IOUs should provide some support to assist program participants in filling out online applications (e.g., phone hotline).