Evaluation of the SDG&E 2004-05 Small Business Energy Efficiency Program

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Final Report

Volume 1 of 1

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Acknowledgements

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EXECUTIVE SUMMARY

SBEE PROGRAM BACKGROUND

The San Diego Gas and Electric (SDG&E) Small Business Energy Efficiency (SBEE) program targets the very small (< 20 kW), hard-to-reach nonresidential customers to increase the adoptions of selected energy efficient measures. Customers in this market segment do contribute to the public goods fund but historically have had low participation rates in other rebate programs that require the customer to pay at least a portion of the measure cost. To address this issue, the SBEE Program installs energy efficiency measures at no cost for eligible customers within this target group. Customers are first given a complete energy assessment of the facility from which a set of recommended measures is developed. Following this, a separate contractor visits the facility and installs the measures identified in the initial audit.

During the 2004-2005 period there were 1,572 participants in the 2004-05 SBEE Program. Figure ES-1 below shows the contribution of each measure type to the total *ex post* net energy savings from the program. T8/T5s and CFLs account for 96 percent of the total *ex post* net savings, with savings of 66 percent and 30 percent respectively. It should also be noted that although CFLs only represent 11 percent of the total number of measures installed, they account for 30 percent of overall net savings.

Figure ES-1: Share of Energy Savings by Measure
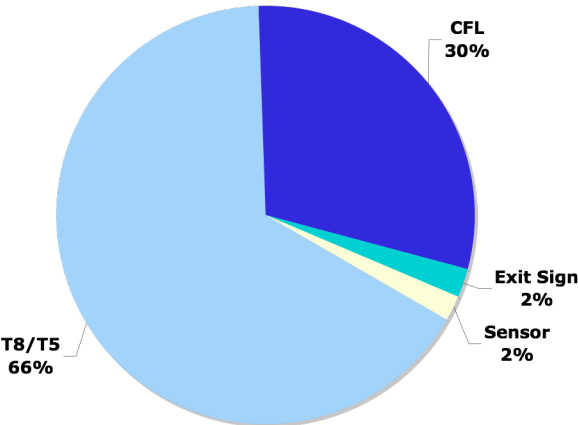
EVALUATION OVERVIEW

The 2004-2005 SBEE program evaluation has three primary objectives:

1. **Measure and Verify Energy Savings.** The evaluation verified the gross *ex ante* energy savings and gross *ex ante* demand reductions claimed by the program by conducting a thorough review of participant records and the program-tracking database. In addition, the key components of the savings calculations were reviewed and revised to provide net *ex post* energy savings consistent with the California Public Utilities Commission (CPUC) reporting instructions. Specific tasks include a billing analysis to determine the net *ex post* impacts, an engineering analysis of operating hours and equipment effective useful life (EUL), and a self-report free ridership analysis used to produce *ex post* net realization rates and report net savings consistent with CPUC's reporting requirements.

2. **Process Evaluation.** The second objective was to evaluate the program implementation process. This was done through interviews with utility program staff and the implementation contractor in addition to phone surveys of participating and nonparticipating customers. In addition, some of the survey questions are identical to those used in the Express Efficiency evaluation so that responses can be compared. Differences in responses between SBEE and Express Efficiency participants may help support the underlying SBEE program theory.

3. **Measure Customer Satisfaction and Program Influence.** Through the data collection process, the evaluation identified program strengths so that these can be emphasized in future program years. In addition, the evaluation also looked for areas where the program delivery could be improved so that the program can be refined in future years to better meet the needs of the target population. The evaluation also focused on determining the degree to which the program is influencing customer decisions regarding which energy efficient measures they choose to install.

From the basic underlying program theory elements, the participant survey was developed to collect information on the following key issues:

- Awareness of other efficiency programs available to the customer

- The importance of utility sponsorship of the SBEE program

- The degree that the program is able to successfully recruit businesses that rent rather than own their building

- Customer plans to install measures in absence of the program

- The share of customers that speak languages other than English

- The degree that SBEE customers rent their buildings and have little or no influence over equipment changes that will affect energy use.

In addition to the program theory issues, the survey was also used to collect process-related information, such as satisfaction with their new equipment and the program participation processes.

The evaluation was conducted in two stages. The first stage was primarily process oriented and was designed to provide feedback to the program while it is still being implemented. The major evaluation tasks for this phase included completing half of the scheduled participant surveys (150 completes) and on-site audits (50 audits). Preliminary work on savings verification, including an analysis of operating hours, equipment effective useful life and self-reported free ridership are also included in the first evaluation phase. These results were presented to SDG&E in an Interim Evaluation Report in February 2005. The second evaluation phase included an additional round of surveys (150 participants, 100 nonparticipants, 50 on-site audits). The second phase also included an analysis of the operating hours and EUL values for the major lighting measures covered by the program. This information was used in a billing analysis to determine the net realized impacts for the program. The combined results from both evaluation phases are presented in this report. The analysis tasks and sample sizes are also consistent with those in the EM&V Plan approved by the CPUC for this evaluation.

NET IMPACT ANALYSIS

The information from the engineering analysis and the on-site verifications was incorporated into a net billing model to determine *ex post* net program impacts for the 2004-05 SBEE program. For this model, we utilized the entire population of participants from 2004-05 and matched them to the population of nonparticipants based on industry type (NAICS code) and usage.

To estimate the billing model, several data screens were used to create a dataset with complete billing data and to rule out potential outlier observations that might have undue influence over the model. Specifically, the data screens were designed to remove those observations that had incomplete billing data or did not have sufficient post-installation billing data to estimate annual impacts. In addition, those observations that had disproportionately large estimated savings relative to overall usage were dropped from the analysis, as the large savings (greater than 50 percent of pre-period usage) are likely reflecting errors in the usage data rather than actual impacts given the types of measures promoted by this program.

The number of observations dropped from each of these screens for participants and nonparticipants is shown in Table ES-1. Note that for many of these observations, multiple screening criteria apply. For reporting purposes, Table ES-1 shows the dropped observations in sequential order. For example, 486 participants are dropped because they do not have sufficient post-period data (6 months or more), as listed in the "Late Installation" row. Some of these 486 may also have been ruled out due to the other criteria lower in the table, but for simplicity they are all assigned to the "Late Installation" screening criterion.

One observation was removed as an outlier based on the results of some preliminary runs of the regression model. This single observation resulted in the coefficient estimate for T8/T5s to change by more than 10 percent. When this observation was reviewed individually, we found that it was much larger than average in terms of usage, with a pre-installation kWh usage of 53,120 kWh that was the more than twice the average of 24,475 kWh for the participant sample. The savings for this customer was also significantly greater, with a total savings of 18,748 kWh relative to the sample average of 4,087 kWh. The total savings from this observation represents only 1 percent of the total savings from the sample. When the disproportionate influence of this one observation was removed, the model behaved much more in line with expectations.

Table ES-1: Observations Dropped Due to Screening Criteria

Type	Part	NonPart
Population	1,413	182,442
Late Installation	486	0
Missing usage data (pre-period)	18	96,286
Missing Usage Data (post-period)	92	20,772
Post usage twice as much as pre-period usage	7	2,340
Post usage half as much as pre-period usage	19	2,171
Savings greater than pre-period usage	53	0
Savings greater than half of pre-period usage and less than equal to pre-period usage	148	0
High variance in pre-period usage	76	11,849
High variance in post-period usage	31	4,166
Missing industry code	0	1,813
Missing cooling degree day data	1	9,490
Missing heating degree day data	0	0
Annual usage greater than maximum of participants	0	3,484
Outlier	1	0
Screened Observations	932	152,371
Regression Observations	481	30,071

Using data for both participants and nonparticipants, a Statistically Adjusted Engineering (SAE) billing model is estimated using ordinary least squares regression (OLS). In addition to measure savings, the model also includes variables for pre-installation kWh usage, changes in weather, business type, and categorical variables based on kWh usage.

The basic form for the net billing model is as follows:

$$kWh_{i,post} = \beta' Eng + \beta' kWh_{i,pre} + \beta'(kWh_{i,pre} UsageCat) + \beta' Business_i + \beta' Weather + \varepsilon_i$$

$Where:$

Eng = Ex ante savings estimates adjusted using evaluation findings on verification and operating hours

$kWh_{i,post}$ = Energy usage during the program post – period for customer i

$kWh_{i,pre}$ = Energy usage during the pre – program period

$kWh_{i,pre} UsageCat$ = Energy usage during the pre – program period interacted with kWh usage category

$Business$ = Variables indicating business type

$Weather$ = Change in Heating Degree Days and Cooling Degree Days by climate zones

ε_i = Random error term assumed normally distributed

β = Coefficients to be estimated

The pre-installation usage is interacted with an indicator variable based on annual kWh usage. The various usage categories are defined below in Table ES-2.

Table ES-2: Annual Usage Categories Used in Billing Model

Usage Category	Annual kWh Range	
	Min	Max
1	2,935	7,718
2	7,718	10,356
3	10,356	12,994
4	12,994	15,632
5	15,632	18,270
6	18,270	26,161
7	26,161	34,052
8	34,052	41,944
9	41,944	49,835
10	49,835	125,415

All of the savings variables use the *ex ante* savings values that have been adjusted using the verification rates that were determined from the on-site audits. In addition, the savings estimates for both CFLs and T8/T5s have been adjusted to account for the lower operating hours (relative to the initial operating hour assumptions) based on the on-site verification survey data.

Because both participants and nonparticipants are included in the sample, the coefficient estimates on the savings variables can be interpreted as net realization rates since the model accounts for baseline activity that will include at least some installation of measures covered by the SBEE program. In addition, the savings variables are the *ex ante* gross savings values that have been adjusted using the evaluation findings for operating hours and the verification results. The combination of these adjustments and the inclusion of nonparticipants in the sample results in the coefficient estimates that reflect the *ex post* net realization rates. Any difference from 1.0 for the resulting coefficient estimates will be reflecting free ridership and/or additional adjustments to realized savings that are not accounted for by the operating hour or verification adjustments. Consequently, the coefficient estimates can be used as an estimate of the *ex post* net realization rate.

Table ES-3 shows the estimation results from the final net billing model specification. The model fits the data well overall as evidenced by the high R-squared value and the statistically significant F statistic. A high R-squared is common when lag variables are used in regression models, and the high t-value for the pre-usage kWh variables also indicates that the lag usage is the predominant driver for this model.

The pre-installation kWh variable and the various interaction variables between pre-installation kWh and usage category are mostly significant at the 10 percent level, although the significance and magnitude of the interaction term decreases as the usage category increases. Variables in the industry groupings generally had a positive and significant effect, which allows the model to adjust overall usage based on industry type. Finally, changes in heating degree days had a positive and significant effect on post-period usage. Changes in cooling degree days had a negative influence but the coefficient estimate was not significantly different from zero.

The highlighted variables in Table ES-3 are the coefficients for the savings impacts variables. As expected, all the savings variables have negative coefficients. However, only the T8/T5 coefficient is statistically different from zero. The estimate for T8/T5s has the correct sign and is significantly different from zero at the less than 1 percent level of significance.

The fact that the coefficient estimate is less than 1.0 for the T8/T5 group is reflecting several effects.[1] First, since nonparticipants are included in the sample the coefficient estimate incorporates any free ridership. The coefficient estimate implies a maximum free ridership rate of about 7 percent assuming that the entire difference from 1.0 is attributable to free ridership and assuming no spillover. This is consistent with the *ex ante* net-gross-ratio assumption of 0.96 and the self report results that found a free ridership of 4 percent for these measures.

A second effect captured in the T8/T5 coefficient is any inaccuracies in the *ex ante* savings values. From our review of the initial savings calculations, the *ex ante* values were calculated assuming a 2-lamp fixture. Based on conversations with SBEE program staff, there is a mix of 2-lamp, 3-lamp, and 4-lamp fixtures being installed. While we recommend that an *ex ante* impact that reflects an average value for these fixtures be used in future years to account for different numbers of lamps, this does not appear to be having a large effect on the overall realized savings.

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[1] Note that the coefficient estimate for T8/T5 is also not significantly different from 1.0. Nevertheless, we believe that the discussion above is informative.

Table ES-3: Net Billing Regression Model Results

Model Statistics	Value
Observations	30,552
Variables	23
F Statistic	53,066.1
F Statistic Level of Significance	< 1%
Adjusted R-Squared	0.9756

Parameter Estimates	Coefficient	Standard Error	T Value	Level of Significance
Savings-T8/T5s	-0.93	0.13	-7.15	< 1%
Savings-CFLs	-0.17	0.23	-0.75	45%
Savings-Exit Signs	-0.78	1.10	-0.70	48%
Savings-Sensors	-0.13	3.76	-0.03	97%
Savings-Hard-wired CFLs	-0.75	17.11	-0.04	96%
Pre Usage	1.00	0.00	377.68	< 1%
Pre Usage*Pre Usage Category 1	-0.06	0.03	-1.98	5%
Pre Usage*Pre Usage Category 2	-0.04	0.02	-1.85	6%
Pre Usage*Pre Usage Category 3	-0.03	0.01	-1.71	9%
Pre Usage*Pre Usage Category 4	-0.03	0.01	-2.15	3%
Pre Usage*Pre Usage Category 5	-0.02	0.01	-1.73	8%
Pre Usage*Pre Usage Category 6	-0.01	0.01	-1.44	15%
Pre Usage*Pre Usage Category 7	-0.01	0.00	-1.48	14%
Pre Usage*Pre Usage Category 8	0.00	0.00	-1.23	22%
Pre Usage*Pre Usage Category 9	-0.01	0.00	-1.58	11%
Business-Agriculture, Construction, and Manufacturing	788.44	219.61	3.59	0%
Business-Retail and Wholesale Trade and Transportation	479.76	216.76	2.21	3%
Business-Services	479.54	209.97	2.28	2%
Business-Education and Health Services	402.94	220.56	1.83	7%
Business-Food, Arts, and Entertainment	182.67	228.36	0.80	42%
Business-Other Services	279.74	214.72	1.30	19%
Weather-Change in cooling degree days (post-pre)	-0.41	0.58	-0.71	48%
Weather-Change in heating degree days (post-pre)	0.52	0.23	2.23	3%

Table ES-4 below summarizes the impact adjustments recommended by measure that take into account the results of the billing analysis, verification, and self-reported free ridership. The final *ex post* net realization rate is the product of all the adjustment factors shown in the table. In those cases where no adjustment is being recommended, an adjustment factor of 1 is used.

T8/T5

Table ES 4 shows the various adjustment factors used to determine the *ex post* net realization rates for T8s and T5s. Since the billing regression used savings estimates that had been adjusted for verification and operating hours prior to being input into the model, these adjustments need to be the original *ex ante* gross impacts to be consistent. In addition to the operating hour and verification adjustments, the coefficient estimate from the billing model is used to adjust for free ridership and any additional savings adjustments to realized savings that are not otherwise captured in the model.

The combined effect of these adjustments is an *ex post* net realization rate of 0.52, as shown in the far right column of Table ES-4. Again, the *ex post* net realization rate is the product of all the adjustment factors shown in the table for this measure. Using this rate, the realized <u>net</u> impacts

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estimated in this evaluation are 52 percent of the original *ex ante* <u>gross</u> impacts assumed by the SBEE program. The majority of the change between the *ex ante* and *ex post* impacts is due to the lower operating hours. Once an adjustment is made for operating hours, the resulting net impacts are generally consistent with the *ex ante* net-to-gross ratio for these measures.

As with any estimate, there is some uncertainty inherent in the *ex post* net realization rate calculation. From the billing model, the final realization rate for the T8/T5s has a standard error of 0.1293, and using this to construct a 90 percent confidence interval around the coefficient estimate results in an error band of +/- 23 percent. Since the billing regression is the primary source of uncertainty in the net realization rate for this measure, the 23 percent can be used as a measure of uncertainty in the net realized impacts for T8/T5s.

CFL

For CFLs, a similar process was used to determine the final net impacts. Since the billing regression results were not significant for CFLs, we use the 10 percent self-report free ridership rate as the estimate of free ridership. The CFL impacts are also adjusted for lower operating hours and the verification rate based on the evaluation findings. The combined effect of these adjustments is shown in Table ES 4 and results in an *ex post* net realization rate of 0.36. The 0.36 adjustment is applied to the *ex ante* gross savings to determine the *ex post* net savings for this measure. As with the T8/T5s, the lower operating hours is the primary cause of the reduction and once an adjustment for hours is made the *ex post* net realized impacts are generally consistent with the original *ex ante* net-to-gross ratio.

Given that the *ex post* net realization for CFLs relies on self-reported free ridership, it is not possible to determine a statistical error bound as the weighting schemes used were somewhat arbitrarily determined in the evaluation. Changes in the weighting of these questions (also arbitrarily determined) resulted in the free ridership estimate ranging from to 7 to 15 percent. This does not account for any additional errors that may have been introduced due to any response bias in these survey questions. For these reasons, the CFL *ex post* net realization rate has a relatively high level of uncertainty.

Exit Signs / Sensors

Finally, for Exit Signs and Sensors the *ex post* impacts were very close to the original *ex ante* net impacts assumed for the program. For both measures, there were no definitive results from the billing model and the measures were not addressed in the self-report analysis or the operating hours verification. To determine *ex post* net impacts, we use the *ex ante* net-to-gross ratio of 0.96 and adjust savings for the verification rates. For Sensors, this resulted in an *ex post* net realization rate of 0.96, which is the same as the *ex ante* net-to-gross ratio assumption. For Exit Signs, the *ex ante* net-to-gross ratio is adjusted by the verification rate of 0.96 to get an *ex post* net realization rate of 0.92.

The uncertainty in the *ex post* net realization rate for Exit Signs and Sensors is due primarily to the uncertainty associated with the original *ex ante* savings values and *ex ante* net-to-gross ratios assumed for these measures. Unfortunately, there were relatively few installations (relative to T8/T5s and CFLs) and due to the low savings contribution from Exit Signs and Sensors, our

limited evaluation resources were focused on improving the savings estimates for the other measures that comprised the majority of the savings.

Table ES-4: *Ex Post* Net Realization Rates for kWh Impacts

Measure	Self-Report Free-Ridership (1-FR)	*Ex Ante* NTG Ratio	Operating Hours	Verification	Billing Analysis Realization Rate	*Ex Post* Net Realization Rate
T8/T5	--	--	0.58	0.96	0.93	0.52
CFL	0.90	--	0.44	0.92	1	0.36
Exit Sign	--	0.96	1	0.96	1	0.92
Sensor	--	0.96	1	1	1	0.96

2004-2005 SBEE Cumulative kWh Impacts

Using the adjustments factors above, the *ex post* net savings numbers are shown below in Table ES-5. The largest reductions from the original *ex ante* gross impacts are in the T8/T5 and CFL categories and also comprise the majority of the savings. These savings from the original planning estimates are largely due to the reduced operating hour adjustment based on the on-site verification results.

Note that Table ES-5 shows the change in the *ex ante* and *ex post* <u>net</u> savings, while Table ES-4 shows the change from *ex ante* <u>gross</u> impacts to *ex post* <u>net</u> impacts. For example, with the T8/T5 measure group the *ex post* net impacts are 52 percent of *ex ante* gross impacts (as shown in Table ES-4), or a reduction of 48 percent from gross to net. The change from *ex ante* net savings to *ex post* net savings is slightly less at a 46 percent reduction (as shown in Table ES-5).

Table ES-5: Change in *Ex Ante* and *Ex Post* Net kWh Impacts

Measure	Units Installed	SDG&E Gross Savings (kWh)	SDG&E Net Savings (kWh)	Evaluation Net Savings (kWh)	Difference between Evaluation & SDG&E Net Savings (%)
T8/T5	115,168	5,383,458	5,168,120	2,777,963	-46
CFL	14,316	3,427,286	3,290,195	1,249,964	-62
Exit Sign	351	109,745	105,355	101,141	-4
Sensor	921	81,736	78,467	78,467	0
Total	130,756	9,002,226	8,642,137	4,207,536	-51

2004-2005 SBEE Cumulative kW Impacts

A similar calculation was performed to determine net kW impacts, with the resulting adjustment factors shown in Table ES-6. As with the kWh impacts, the kW impacts are adjusted to account for verification, free ridership, and the *ex post* net realization rate is the product of the adjustment factors shown in Table ES-6. Changes to the coincident diversity factor based on the operating hours and load profile information obtained during the on-site verifications. For the coincident diversity factor for CFLs, for example, we used the 0.573 and divided it by the original value of 0.81 to get the current adjustment factor of 0.71. We did not find a significant difference in the coincident diversity factor for T8s from the *ex ante* value so no adjustment is made for the T8/T5 measure group.

The same issues relating to uncertainty discussed with the kWh impacts also apply to the *ex post* kW impacts. For the T8 and T5, there is uncertainty regarding the survey responses used for the self-report free ridership due to the weighting scheme and the potential for response bias with these types of questions.

Table ES-6: *Ex Post* Net Realization Rates for kW Impacts

Measure	Self-Report Free-Ridership (1-FR)	*Ex Ante* NTG Ratio	Verification	Coincident Adjustment Factor	*Ex Post* Net Realization Rate
T8/T5	0.96	--	0.96	1	0.92
CFL	0.90	--	0.92	0.71	0.59
Exit Sign	--	0.96	0.96	1	0.92
Sensor	--	0.96	1	1	0.96

The factors shown above were used to calculate the *ex post* kW impacts, as shown in Table ES-7. The only major change from the *ex ante* impacts is for CFLs due to lower coincident diversity factor derived from the on-site audit load shapes. As with the kWh impact tables, Table ES-7 shows the change from *ex ante* and *ex post* net impacts while Tables ES-6 shows the adjustment from *ex ante* gross impacts to *ex post* net impacts.

Table ES-7: Changes in *Ex Ante* and *Ex Post* Net kW Impacts

Measure	Units Installed	SDG&E Gross Savings (kW)	SDG&E Net Savings (kW)	Evaluation Net Savings (kW)	Difference between Evaluation & SDG&E Net Savings (%)
T8/T5	115,168	1,069	1,026	985	-4
CFL	14,316	685	658	403	-39
Exit Sign	351	11	10	10	-4
Sensor	921	66	63	63	0
Total	130,756	1,831	1,757	1,461	-17

CONCLUSIONS AND RECOMMENDATIONS

Based on the results presented in this report, we draw the following conclusions for the 2004-05 SBEE program evaluation.

- **Participation satisfaction with the SBEE program is very high.** In general, participants are very satisfied with both the program and the audit process, with the vast majority of respondents rating these at an 8 or higher on a 10 point scale. In addition, participants also expressed high levels of satisfaction with the equipment installed through the program. SBEE participants also expressed greater satisfaction with the program overall, and with the performance of the equipment installed, than did the 2003 Statewide Express Efficiency program participants.

- **Most measures were verified as installed.** Through the on-site audits we were able to verify the installation of most of the measures installed through the program. For the sites we visited, 96 percent of all the measures were verified. CFL lamps had a slightly lower verification rate at 92 percent, which is still relatively high. Among the CFLs that were missing, 4 percent had failed, 3 percent had been removed, and 1 percent placed in

storage. These results are very much in line with the 2003 Express Efficiency evaluation results, where 97 percent of the lighting measures were verified (with 6 percent failed, 1 percent removed, and 2 percent in storage.)

- **Participation barriers for renters are being overcome by the SBEE program.** Renters comprise 82 percent of SBEE participants, which is much higher than that observed for SDG&E's territory in 2003 for the Express Efficiency program. Participant survey responses indicate that common barriers such as concern over bill savings, availability of financing, and the potential hassle of obtaining a utility rebate are more pronounced for renters than building owners in the program. The fact that so many renters are participating in the program despite these concerns indicates that the current SBEE program has been very effective in addressing these issues.

- **Renters may have more influence over building energy decisions than originally assumed.** While most of the participants in the program rent their facilities, they still have a high level of involvement in the equipment decisions at the facility. From the participant survey, 41 percent of the respondents indicated that they were very active in these decisions while an additional 28 percent were somewhat active. Most renters (77 percent) also characterized themselves as at least somewhat knowledgeable about the equipment options available to them for reducing their energy bills. Finally, a majority of respondents (60 percent) also disagreed with the statement that it was not worth investing in energy efficiency because they did not own the building.

- **SDG&E program sponsorship is important.** From the participant survey, 79 percent of respondents said that having SDG&E sponsor the program was very important and about half (48 percent) first became aware of the program when they were initially approached for the audit. In addition, 90 percent of the participants indicated that their program participation caused them to be more likely to install other energy efficient measures in the future.

Based on these conclusions, we offer the following recommendations for the SBEE program.

- **Continue with the current program implementation method.** The process evaluation showed that the key elements of the program theory were supported through the existing program delivery method. Customer satisfaction is also high for all program elements. As long as this can be maintained and net savings are achieved cost-effectively, we see no reason why the current program design should be modified.

- *Ex ante* **impacts should reflect 2-lamp, 3-lamp, and 4-lamp T8 and T5 fixture installations.** The program currently assigns a per lamp impact derived from a 2-lamp fixture, which will overstate savings when applied to a 3-lamp or 4-lamp fixture although the effect of this on the final impacts is likely small. Using an average impact value that assumes a mix of 2-lamp, 3-lamp, and 4-lamp fixtures should alleviate this issue.

- **Operating hour assumptions need to be revised for T8/T5s and CFLs.** The current assumptions for annual operating hours are much higher than those derived from the verification on-site survey data and those found in comparable lighting logger studies.

Once a reduction in operating hours is made, the realized net impacts are consistent with the *ex ante* values. This result was confirmed in the billing analysis, where the net realization rate for the T8/T5 measure group was approximately the same as the *ex ante* net-to-gross ratio assumption once the adjustment for operating hours was made.

- **A separate study should be conducted to revise the operating hour assumptions used in the DEER database for small businesses.** A review of the DEER database revealed that in general the operating hours assigned for small businesses for T8/T5s and CFLs are higher than the results derived in the SBEE evaluation. However, the DEER database also delineates operating hours by business type and there is significant variation in operating hours across business categories. There was not a large enough sample of on-sites in the SBEE evaluation to produce separate operating hour estimates for each of the business types currently supported in the DEER database. We recommend a separate study be conducted to address this issue, as it appears that the current operating hour assumptions are generally too high for small business customers for T8/T5s and CFLs.

- **Coincident diversity factor should be modified for CFLs.** The results of on-site verifications also produced load shapes that show a lower coincident diversity factor than that currently assumed for the program. This results in significantly lower kW impacts than originally anticipated for this measure.

1. INTRODUCTION

SBEE PROGRAM BACKGROUND

The San Diego Gas and Electric (SDG&E) Small Business Energy Efficiency (SBEE) program targets the very small (< 20 kW), hard-to-reach nonresidential customers to increase the adoptions of selected energy efficient measures. Customers in this market segment do contribute to the public goods fund but historically have had low participation rates in other rebate programs that require the customer to pay at least a portion of the measure cost. To address this issue, the SBEE Program installs energy efficiency measures at no cost for eligible customers within this target group. Customers are first given a complete energy assessment of the facility from which a set of recommended measures is developed. Following this, a separate contractor visits the facility and installs the measures identified in the initial audit.

During the 2004-2005 period there were 1,572 participants in the 2004-05 SBEE Program. Figure 1 shows the distribution of participants across general business sectors based on SDG&E's NAICS code classification. Participants are fairly well distributed among the different industry sectors represented.

Figure 1: Business Sectors Participating in 2004 SBEE Program
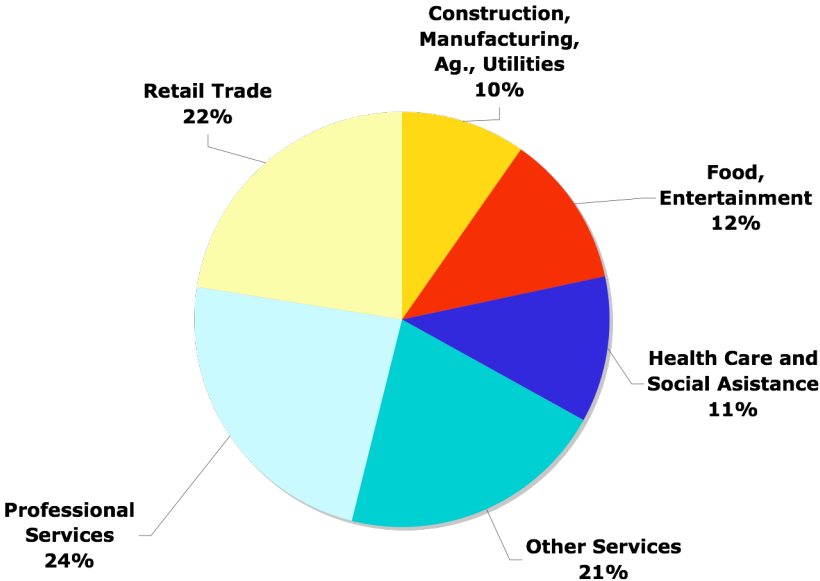
The distribution of measures installed through the program is shown in Figure 2. For 2004-05, there were a total of 130,756 measures installed through the program. The majority of the measures installed were T8s and T5s (88 percent), while most of the remainder (11 percent) were CFLs.

Figure 2: Measures Installed Through the SBEE Program
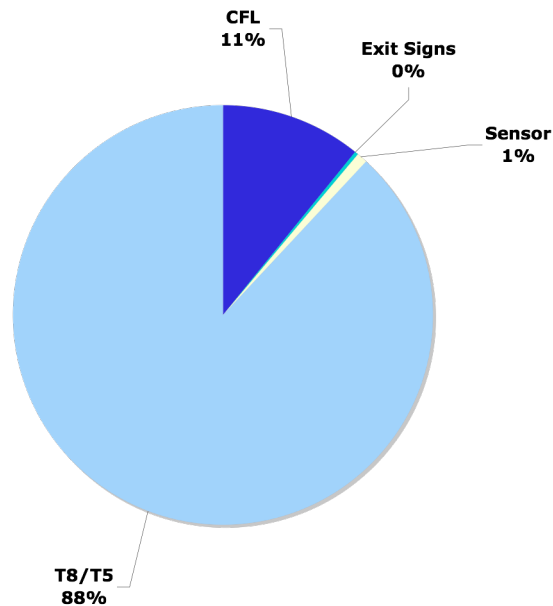
Figure 3 shows the contribution of each measure type to the total *ex post* net energy savings from the program. T8/T5s and CFLs account for 96 percent of the total *ex post* net savings, with savings of 66 percent and 30 percent respectively. It should also be noted that although CFLs only represent 11 percent of the total number of measures installed, they account for 30 percent of overall net savings.

Figure 3: Share of Energy Savings
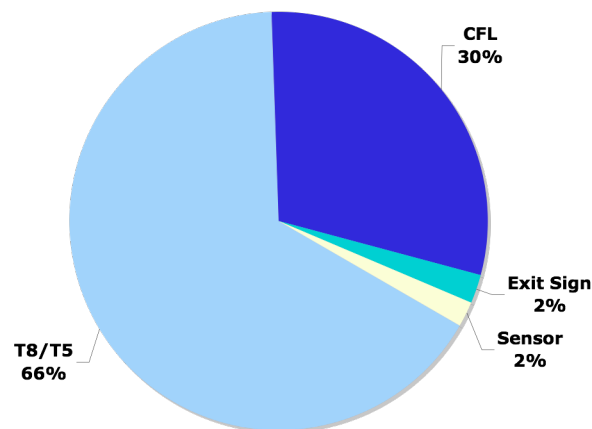
2. METHODOLOGY

EVALUATION OVERVIEW

The 2004-2005 SBEE program evaluation has three primary objectives:

1. **Measure and Verify Energy Savings.** The evaluation verified the gross *ex ante* energy savings and gross *ex ante* demand reductions claimed by the program by conducting a thorough review of participant records and the program-tracking database. In addition, the key components of the savings calculations were reviewed and revised to provide net *ex post* energy savings consistent with the CPUC's reporting instructions. Specific tasks include a billing analysis to determine the net *ex post* impacts, an engineering analysis of operating hours and equipment effective useful life (EUL), and a self-report free ridership analysis used to produce net realization rates and report net savings consistent with CPUC's reporting requirements.

2. **Process Evaluation.** The second objective was to evaluate the program implementation process. This was done through interviews with utility program staff and the implementation contractor in addition to phone surveys of participating and nonparticipating customers. In addition, some of the survey questions are identical to those used in the Express Efficiency evaluation so that responses can be compared. Differences in responses between SBEE and Express Efficiency participants may help support the underlying SBEE program theory.

3. **Measure Customer Satisfaction and Program Influence.** Through the data collection process, the evaluation identified program strengths so that these can be emphasized in future program years. In addition, the evaluation also looked for areas where the program delivery could be improved so that the program can be refined in future years to better meet the needs of the target population. The evaluation also focused on determining the degree to which the program is influencing customer decisions regarding which energy efficient measures they choose to install.

The evaluation was conducted in two stages. The first stage was primarily process oriented and was designed to provide feedback to the program while it is still being implemented. The major evaluation tasks for this phase included completing half of the scheduled participant surveys (150 completes) and on-site audits (50 audits). Preliminary work on savings verification, including an analysis of operating hours, equipment effective useful life and self-reported free ridership are also included in the first evaluation phase. These results were presented to SDG&E in an Interim Evaluation Report in February 2005. The second evaluation phase included an additional round of surveys (150 participants, 100 nonparticipants, 50 on-site audits). The second phase also included an analysis of the operating hours and EUL values for the major lighting measures covered by the program. This information was used in a billing analysis to determine the net realized impacts for the program. The combined results from both evaluation phases are presented in this report. The analysis tasks and sample sizes are also consistent with those in the original EM&V Plan approved by the CPUC for this evaluation.

Additional detail on each of the evaluation analysis methods is presented later in the report.

The remainder of this report is organized as follows. The *Analysis and Results* section discusses the analysis methods and major findings of the evaluation. This includes the results of the participant and nonparticipant phone surveys, the on-site verifications, the engineering analysis, and the net billing model. Evaluation conclusions and recommendations are summarized at the end of this section. The participant and nonparticipant phone survey instruments are included as an appendix to this report following the *Analysis and Results* section.

3. ANALYSIS AND RESULTS

PROGRAM THEORY AND SURVEY DESIGN

To develop the participant survey instrument, we interviewed SBEE program staff to obtain information on program theory and important implementation issues that should be addressed by the evaluation. During these interviews, we were able to identify the following key assumptions underlying the SBEE program theory:

- The small businesses targeted by the SBEE Program typically do not participate in other efficiency programs such as Express Efficiency. These other programs usually provide financial incentives for efficiency measures but require customers to pay part of the installation cost.

- Many small businesses rent their buildings and these customers have generally been more difficult to reach with energy conservation programs. Renters may not be making the decisions relating to energy use and equipment installations on the premises. In addition, renters may not anticipate remaining at the same location long enough to benefit from energy efficiency investments. General barriers such as lack of financing or concerns about actual bill savings also tend to be greater for renters than with building owners.

- Cost for installing energy efficiency technologies is prohibitive for these customers and therefore the program measures need to be provided at no cost to the customer.

- For the reasons listed above, these customers tend to be less aware of the energy efficient measures they can install to reduce their energy use.

- Non-English speakers comprise a significant part of the target population, which may pose an additional barrier to participation.

- Customers are sometimes suspicious of the types of assistance offered by the SBEE program and therefore utility sponsorship is important for gaining customer trust.

From these program theory elements, the participant survey was developed to collect information on the following key issues:

- Awareness of other efficiency programs available to the customer

- The importance of utility sponsorship of the SBEE program

- The degree that the program is able to successfully recruit businesses that rent rather than own their building

- Customer plans to install measures in absence of the program

- The share of customers that speak languages other than English

- The degree that SBEE customers rent their buildings and have little or no influence over equipment changes that will affect energy use.

In addition to the program theory issues, the survey was also used to collect process-related information, such as satisfaction with their new equipment and the program participation processes. The survey was also used to conduct a phone verification of the measures installed and to recruit participants for the on-site audits.

Quantum Consulting fielded the participant survey and obtained 150 completed surveys in December 2004 and an additional 150 completes during the second survey phase in December 2005. The final survey sample had 300 completes from a participant population of 1,572 over the 2004-05 period. Participants were randomly selected from this population and the sample was not stratified. The survey took about 15 minutes to complete on average.

For the participant survey, we wanted to achieve a "90/10" relative precision level, meaning that for any particular question we would be 90 percent confident that the sample responses were within 10 percent of the true population value. With a 2004-05 participant population of 1,572, achieving a relative precision goal of "90/10" requires a sample size of about 65 under the most conservative sampling assumptions. Our final participant survey sample of 300 easily exceeds this criterion.

With all survey questions, there is the potential for false response bias if the questions are not answered accurately. We have attempted to minimize this by using survey questions that have been tested in other evaluations as well as by pre-testing both the participant and nonparticipant surveys. Nevertheless, the potential for bias exists for those questions where respondents may not accurately recall their program participation experience. An additional source of bias occurs when respondents intentionally give false information in order to provide responses that appear more socially desirable (such as claiming that they will install energy efficiency equipment in the future due to the program).

Other than using survey questions that have been tested in other evaluations, we did not attempt to correct for any of these potential biases in the survey results. For some questions relating to free-ridership, we have asked a series of related questions that are designed to identify those respondents providing consistent responses, which should help reduce any response bias.

PARTICIPANT SURVEY RESULTS

The following tables show the key results combined from both waves of the participant survey. Additional survey results on free-ridership, installation verification, and the importance of utility sponsorship are provided in the *Savings Verification* section of this report.

Firmographic Information

The following tables provide firmographic information for the 2004-05 SBEE participants. Table 1 shows the building size for the participants included in the survey sample. Most respondent businesses occupy a fairly small businesses space of 2,500 square feet or less with 63 percent of participants in this category. With an additional 20 percent in the 2,500 to 5,000

square foot range, the vast majority of participants (83 percent) have business space of less than 5,000 square feet, which is consistent with the small business category targeted by the SBEE Program.

Table 1: Building Size

F1. Can you estimate the total square footage of your facility at this location?	Total (%)
Less than 2,500 square feet	63
2,500 but less than 5,000 square feet	20
5,000 but less than 10,000 square feet	6
10,000 but less than 20,000 square feet	4
20,000 but less than 50,000 square feet	2
Over 100,000 square feet	0
Refused	0
Don't know	4
Sample Size	300

Table 2 shows the number of employees for each business and these results mirror the square footage results shown in the previous table. Most participating businesses have 5 or fewer employees (61 percent), and 83 percent have 10 or fewer employees.

Table 2: Number of Employees

F5. Which of the following categories describes the number of employees your firm has at this location?	Total (%)
1 to 5	61
6 to 10	22
11 to 20	13
21 to 50	3
51 to 100	0
Refused	1
Don't know	0
Sample Size	300

Business type for the participants we surveyed is shown in Table 3, and these responses indicate that the program is reaching a wide variety of business types. The most common types include office (25 percent) and retail non-food (29 percent), while personal services and health care/hospital also relatively common business types at 14 and 11 percent respectively.

Table 3: Business Type

F15. What is the main activity at your business?	Total (%)
Retail (non-food)	29
Office	25
Personal Service	14
Health care/hospital	11
Industrial Process/ Manufacturing/Assembly	8
Restaurant	4
Community Service/Church/ Temple/Municipality	4
School	1
Grocery store	1
Warehouse	1
Condo Assoc/Apartment Management	1
Convenience store	0
Agriculture	0
Sample Size	300

Table 4 shows how often a language other than English is spoken at participating businesses. Just under half (46 percent) indicate that a second language is spoken. (Subsequent questions indicated that Spanish is the most common second language, with 83 percent of the response.) The results of the Express Efficiency evaluation in 2003 also shows that 53 percent of SDG&E participants in that program also spoke a second language. These results suggest that while language may be an important issue for the target population, the SBEE program is not necessarily more successful in addressing these issues than Express Efficiency program.

Table 4: Language

L5. Is a language other than English spoken at your business?	Total (%)
No	53
Yes	46
Refused	0
Don't know	0
Sample Size	300

Table 5 shows building ownership status for program participants. As expected, most of these small businesses (82 percent) rent rather than own their building. This result is significantly different than that observed for Express Efficiency. In 2003, 53 percent of all very small (< 20 kW) Express participants were renters, and for SDG&E Express participants overall, only 39 percent were renters (including all customer sizes). This shows that the SBEE is clearly overcoming barriers to participation for renters, and as discussed below this is likely due to the program being able to address multiple barriers (i.e., hassle factor, equipment first cost, financing, split incentives, concerns over bill savings, etc) that are common or more pronounced for renters relative to building owners.

Table 5: Building Ownership

R5. Does your business own or lease the facility?	Total (%)
Lease / rent	82
Own	17
Don't know	1
Other	0
Sample Size	300

Table 6 shows the role that participants play in making lighting and climate control equipment decisions for their building. A surprising number of businesses say that they play an active role in these decisions, with 41 percent indicating that they are very active and 28 percent at least somewhat active. This is an encouraging result, as it suggests that even though most businesses are leasing their facility, they still have a role in the equipment choices that affect their electricity bills. This lessens to some degree the common "split incentives" barrier for businesses that lease their buildings, where the tenant pays the energy bill but is assumed to have little or no influence on equipment decisions that might reduce energy use. As a consequence, this result contradicts one of the program theory elements that suggests that renters are not involved in energy management decisions since they do not own the building they occupy.

Table 6: Role in Energy Decisions

R1. How active a role does your business take in making lighting and climate control equipment purchase decisions at this facility?	Total (%)
Very active	41
Somewhat active	28
Slightly active	16
Not at all active	13
Don't know	2
Sample Size	300

Table 7 shows participants' knowledge of energy efficient products prior to participating in the program. Although respondents are generally unaware of the efficiency programs, they do indicate that they are at least somewhat aware of energy efficient products that are available to them. Furthermore, renters indicated a higher level of awareness than respondents that owned their builders. This contradicts the common assumption that renters do not have the incentive to learn about equipment options that may help reduce their energy bills, as 77 percent of renters indicated that they were at least somewhat knowledgeable of their options in this area.

The 2002 Statewide Express Efficiency Evaluation asked the identical question of both program participants and nonparticipants, and found the self-reported knowledge to be higher, 5.47 and 5.51 respectively, compared with an average response of 5.09 for the SBEE program. This helps

support the hypothesis that the SBEE program is targeting customers that are not generally as knowledgeable about energy efficient products.[2]

Table 7: Knowledge of Energy Efficient Products

PE33. Before participating in the SBEE program, how knowledgeable were you about energy efficient products and how they will perform?	Total (%)	Renter (%)	Owner (%)
Very knowledgeable	15	16	13
Somewhat knowledgeable	62	61	59
Not at all knowledgeable	22	22	22
Don't know	1	1	6
Mean	5.09	5.12	4.97
Sample Size	208	174	32

Note: Respondents provided a rating on a 1 to 10 scale and response categories were created post-survey. Ratings of 8-10 were coded as "Very knoledgeable", 4-7 as "Somewhat knowledgeable", and 1-3 as "Not at all knowledgeable".

Participation Process

Table 8 shows the awareness levels among participants for energy efficiency programs other than the SBEE program. In general, awareness levels are low, with 77 percent not aware of other programs. An additional 11 percent were generally aware that there were rebate programs available but did not mention a specific program. These results are consistent with the program theory that the target businesses are generally unaware (or uninterested) in the various efficiency program options that are available. This finding is further supported by the 2002 Statewide Express Efficiency, which found 38 percent of the general population of nonresidential customers to be aware of energy efficiency program, which is significantly higher than the 25 percent among SBEE participants[3].

Table 8: Energy Efficiency Program Awareness

A30. Are you aware of other programs or resources provided by SDG&E that are designed to promote energy efficiency for businesses like yours?	Total (%)
Not aware of any other programs	77
Rebate (unspecified)	11
Don't know	5
Business Energy Audits	3
Other	2
Express Efficiency	2
Refused	0
Sample Size	300

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[2] *2002 Statewide Express Efficiency Program Measurement and Evaluation Study*, page 6-11.

[3] *2002 Statewide Express Efficiency Program Measurement and Evaluation Study*, page 6-2.

Table 9 shows the source of awareness among participants of the SBEE program. About half of the participants first became aware of the program through the audit process, which confirms the low levels of awareness for efficiency programs shown in the previous table. Additional sources of awareness include word of mouth and flyers or mail, but these have much less of an impact than the initial audit process.

Table 9: Source of Awareness

A25. How did you become aware of the Small Business Energy Efficiency program?	Total (%)
From the technician that did the audit	48
Other businesses / word of mouth	13
Flyer/mail	8
Phone solicitation	7
Someone came by (not specific)	7
Don't know	6
SDG&E Rep came by	6
Landlord	3
Other	1
Sample Size	300

Table 10 shows the reasons for participating in the program. Not surprisingly, responses related to saving money on electricity bills and receiving free lighting equipment comprise the largest share of these responses. The replacement of old or broken equipment was mentioned by 15 percent of the participants, which was a reason also mentioned by field staff during our program interviews.

Table 10: Reasons for Participation

A45. Why did your company participate in the Small Business Energy Efficiency program?	Total (%)
Saving money on electric bills	67
To receive free lighting / equipment	33
Replacing old or broken equipment	15
Acquiring the latest technology	13
Conserve energy	13
Energy crisis	8
Helping protect the environment	4
Don't know	3
The program was sponsored by SDG&E	2
Other	2
To learn how to reduce energy costs	2
Recommended by utility representative	1
Recommended by contractors	1
Landlord	1
Previous experience with SDG&E program	0
Part of a broader facility remodeling	0
Recommended by other business/friend	0
Participation in previous years	0
To understand how energy costs are determined	0
A competing business participated	0
Refused	0
Sample Size	300

Note: Participants were allowed to select multiple responses resulting in a total greater than 100 percent.

Satisfaction

The following tables show satisfaction with the various SBEE program elements. Table 11 shows participant satisfaction with the program overall. In general, participant satisfaction is extremely high with 85 percent indicating that they were very satisfied with the program and the remaining 14 percent at least somewhat satisfied with the program. Satisfaction levels were slightly lower (but still very high) for the audit process, with 70 percent very satisfied and 17 percent somewhat satisfied. A few respondents (5 percent) were not at all satisfied with the audit process (reasons for dissatisfaction are discussed below). As shown in the far right column, almost all participants (86 percent) were very satisfied with the equipment installation process.

Satisfaction with the SBEE program is also higher than that reported for the 2003 Statewide Express Efficiency Program. Overall, 77 percent of Express participants reported being very satisfied with the program, with 76 percent among the very small participants (<20 kW, which is the SBEE target market).[4]

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[4] *2003 Statewide Express Efficiency Program Measurement and Evaluation Study*, page 3-7.

Table 11: Program Satisfaction

Satisfaction Level	Program Overall (%)	Audit Process (%)	Installation Process (%)
Very satisfied	85	70	86
Somewhat satisfied	14	17	11
Not at all satisfied	0	5	2
Don't know	1	8	1
Sample Size	300	300	300

For those participants that expressed some dissatisfaction with the audit process (by ranking it lower in satisfaction than the installation process), an additional question was asked to find out the specific cause of the dissatisfaction. The reasons provided are shown in Table 12. For the most, participants were dissatisfied by the amount of time it took or that the audit provided incomplete information. Note that 28 percent of these respondents said they did not know why they rated their satisfaction with the audit lower than the satisfaction with the installation process, which suggests that the level of dissatisfaction for these respondents is relatively mild.

Table 12: Reasons for Dissatisfaction with Audit Process

SAT34. You gave a lower rating for the audit process than for the installation process, what was it about the audit that caused you to rate it lower?	Total (%)
Don't know	28
Too much time	22
Don't remember audit	17
Incomplete information from audit	11
Other	9
Did not understand audit	7
No savings	4
Messy contractor on job	2
Refused	0
Sample Size	46

Table 13 provides additional information on satisfaction with the lighting equipment installed. Across all categories, satisfaction levels were extremely high, with 85 percent very satisfied with the CFLs installed and 93 percent very satisfied with their new T5s or T8s. SBEE participants were also more satisfied with their equipment and its performance than the 2003 Express Efficiency participants. Overall, 78 percent of Express participants reported being very satisfied with the program with 78 percent among the very small participants (<20 kW, which is the SBEE target market).[5]

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[5] *2003 Statewide Express Efficiency Program Measurement and Evaluation Study*, page 3-7.

Table 13: Satisfaction with Equipment

A20_SAT. How satisfied have you been with the performance of the equipment you purchased?	CFL (%)	T8 or T5 (%)	Exit Sign (%)	Sensor (%)
Very Satisfied	85	93	95	79
Somewhat Satisfied	11	5	5	12
Not at all Satisfied	3	1	0	10
Don't know	1	0	0	0
Sample Size	187	260	22	42

Future Purchase Intentions

The program also has a positive influence on possible future measure installations, as shown in Table 14 and the following tables. Almost all respondents indicated that they were now more likely to install energy efficient products due to their experience participating in the SBEE program. This suggests there may be some participant spillover impacts resulting from the program. However, questions relating to stated future intentions have the potential to be biased in favor of the program as some respondents may be providing answers that they believe are more socially desirable rather than reporting their true future intentions. Consequently, these results may overestimate the positive influence of the SBEE program on future equipment installations.

The issue of false response bias due to respondents skewing their answers to appear more socially acceptable also applies to the following tables that relate to the potential influence of the SBEE program on future purchases.

Table 14: Influence of SBEE Program on Future Measure Installations

PE11. Are you more or less likely to install energy-efficient products as a result of your experience with the program?	Total (%)
More likely	90
Less likely	1
Neither more or less	7
Don't know	2
Sample Size	300

Table 15 shows the responses to a similar question focusing on CFL replacements. Of those 190 participants that had CFLs installed through the SBEE program, 87 percent indicated that they intend to use CFLs in the future for replacements as these bulbs burn out.

Table 15: Future CFL Replacement Intentions

PE13. When your CFLs burn out or fail, will you replace them with CFLs or incandescent lamps?	Total (%)
CFLs	87
Incandescent	5
Both	2
Other	1
Don't know	6
Sample Size	190

Table 16 shows the importance of the free installation on future CFL installations. For those customers receiving CFLs through the program and planning to install them in the future, 61 percent also indicated that they would continue to use CFLs even if SDG&E did not pay for them. While these types of stated preference questions are notoriously imprecise for determining exact installation rates, the generally high positive response rate does indicate a positive influence of the program and suggests that the program is having some participant spillover effect.

Table 16: Effect of Rebate on Future CFL Replacement Intentions

PE14. What if SDG&E did not pay for any of the cost to install the CFLs? Would you still install CFLs?	Total (%)
Yes	61
No	32
Don't know	8
Sample Size	168

Table 17 provides additional evidence of the SBEE program's positive influence on future lighting installments.   Recall from Table 15 that 87 percent of participants that received CFLs planned to use CFLs in the future for routine lamp replacements. Of these, 97 percent said that the program was influential in determining that CFLs would be used, with 73 percent saying their experience with the SBEE program was very influential on this decision.

Table 17: Role of SBEE Program on Future CFL Replacement Intentions

PE15. How much did the program influence your plans to use CFLs in the future?	Total (%)
Very influential	73
Somewhat influential	24
Not at all influential	1
Don't know	2
Sample Size	168

Responses to the last two questions are compared in Table 18 to determine how consistent these responses are regarding program influence. As shown in the table, many of the respondents (47 percent) that indicated that they plan to purchase CFLs in the future also indicated that the SBEE

program was very influential on these purchase plans. This helps support the theory that the program is having a positive effect on these businesses in terms of encouraging future energy efficiency purchases.

Table 18: Program Influence and Future Purchase Intentions

	PE15. How much did the program influence your plans to use CFLs in the future?			
PE14. What if SDG&E did not pay for any of the cost to install the CFLs? Would you still install CFLs?	Very Influential (%)	Somewhat Influential (%)	Not at all Influential (%)	Don't Know (%)
Yes	43	17	1	1
No	27	4	1	1
Don't know	3	4	0	1
Sample Size	122	41	2	3

Market Barriers

Table 19 shows the results of multiple survey questions designed to obtain information on market barriers. Respondents were given a statement relating to a potential barrier to purchasing energy efficient equipment and respondents were asked to rate how much they agreed or disagreed using a 10-point scale. For the most part, these questions had fairly uniform responses across categories. Respondents did not have strong agreement regarding the information needed to make energy efficient investments, with 29 percent agreeing completely and 33 percent disagreeing with that statement. Similarly, almost equal responses were given across categories for statements saying that there was too much time and hassle required to find a qualified contractor and that lack of financing prevented customers from making energy efficient investments.

There appeared to be slightly more agreement with statements related to the utility, with 49 percent of respondents disagreeing that getting a utility rebate was too much of a hassle. Similarly, 60 percent of the respondents disagreed with the statement that they would not invest in energy efficient equipment because they did not own the building. As with the renter issue discussed earlier, these results contradict the program assumptions that businesses that lease their facilities are not interested in making energy efficient investments to their buildings. There was also a higher level of agreement regarding bill savings, with almost two-thirds of the respondents agreeing with the statement related to lower than expected bill savings and its dampening effect on energy efficiency investments.

Table 19: Perceptions of Market Barriers

Participation Issue Questions	Agree Completely (%)	Agree Somewhat (%)	Disagree (%)	Don't Know (%)	Mean
PE35a. When considering a new energy efficiency investment, I am concerned that the actual bill savings will be less than what was estimated.	30	32	31	7	5.6
PE35b. I don't have the information I need to make an informed decision about energy efficient investments.	29	35	33	3	5.3
PE35c. There is too much time and hassle involved in selecting a qualified energy efficiency contractor.	22	28	39	11	4.8
PE35d. Lack of financing is a barrier to our organization making energy efficiency investments that we want to make.	30	31	35	4	5.1
PE35e. Getting a utility rebate is too much hassle.	20	24	49	7	4.1
PE35f. It's not worth investing because it's not my building.	20	18	60	2	3.8

Note: Respondents provided a rating on a 1 to 10 scale and response categories were created post-survey. Ratings of 8-10 were coded as "Agree Completely", 4-7 as "Agree Somewhat", and 1-3 as "Disagree".

Several of the attitudinal questions in the preceding questions had different responses between building owners and renters and Table 20 provides additional detail for these questions. Note that this table shows the percent for both groups that "Agree Completely" with each statement. As shown below, renters tend to be much more concerned that bill savings may not materialize than are building owners (33 percent of renters "Agree Completely" compared with 18 percent of participants that owned their building). Similarly, renters are more likely to agree that the availability of financing is an issue for them when considering energy efficiency investments. Renters were also slightly more likely to agree than owners that getting a utility rebate is too much of a hassle. Despite these concerns, there are large numbers of renters participating in the program, which indicates that the current SBEE program has been very effective in addressing these barriers.

Table 20: Comparison of Renter and Owner "Agree Completely" Responses

	"Agree Completely" Responses	
Participation Issue Questions	Renter (%)	Owner (%)
PE35a. When considering a new energy efficiency investment, I am concerned that the actual bill savings will be less than what was estimated.	33	18
PE35d. Lack of financing is a barrier to our organization making energy efficiency investments that we want to make.	31	22
PE35e. Getting a utility rebate is too much hassle.	21	18

Note: Respondents provided a rating on a 1 to 10 scale and response categories were created post-survey. Ratings of 8-10 were coded as "Agree Completely".

NONPARTICIPANT SURVEY RESULTS

In addition to the participant survey, a nonparticipant survey was fielded to collect information from 100 small business customers that had not participated in the program. The purpose of this survey was to understand attitudes and perceptions that nonparticipants have towards energy efficient technologies and energy conservation programs. This information is compared to the participant survey results to help guide future program efforts and to gain insights into program effectiveness.

The nonparticipant survey lasted about 15 minutes and was fielded by Quantum Consulting early in 2005. The survey sample was chosen to include a random sample of small business customers in the same industries as the current participants (based on NAICS code). Other than limiting the potential nonparticipant survey sample to those NAICS codes that were most prominent in the participant population, there was no stratification done for the nonparticipant survey sample.

Key findings from the nonparticipant survey are presented below.

Energy Conservation Activities and Future Intentions

Table 21 shows how many nonparticipants have replaced old equipment with high efficiency equipment similar to SBEE program measures. Of the four replacement options listed, replacement of incandescent bulbs with CFLs was the most common, with 23 percent of nonparticipants stating that they had installed them sometime since January 2002. Note that installations may have also been occurring prior to January 2002, but questions were limited to the previous three years to minimize the potential for response error.

Table 21: Nonparticipant High Efficiency Equipment Replacement

High Efficiency Equipment Replacement Questions	Yes (%)	No (%)	Don't Know (%)
E5_1. Since January 2002, have you replaced incandescent bulbs with compact fluorescent screw in or hardwired bulbs?	23	75	2
E5_2. Since January 2002, have you replaced long T12 fluorescent tube fixtures with slimmer, more energy efficient T8 or T5 fluorescent tube fixtures?	12	71	17
E5_3. Since January 2002, have you added lighting sensors?	8	92	0
E5_4. Since January 2002, have you replaced old exit signs with energy efficient LED exit signs?	9	88	3

Table 22 shows the amount of lighting replaced by CFLs for those nonparticipants that indicated that they had made a lighting change. Of those nonparticipants that stated they replaced their incandescent bulbs with CFLs, 26 percent replaced 100 percent of their bulbs with CFLs and 56 percent replaced at least 50 percent of their bulbs with CFLs.

Table 22: Nonparticipant CFL Replacement

CFL2. What percent of the incandescent bulbs at your business did the CFLs replace?	Total (%)
0%	4
1% - 25%	17
26% - 50%	17
51% - 75%	13
76% - 99%	17
100%	26
Don't know	13
Sample Size	23

Table 23 shows the various activities that nonparticipants did to conserve energy. As shown at the bottom of the table, 71 of the 100 respondents indicated that they were taking some action to try and reduce their energy usage. The most common energy saving activity was to turn off lights and office equipment when not being used, followed by setting thermostats to reduce heating and cooling loads.

Table 23: Nonparticipant Conservation Activities

CON5. What energy conservation actions have you taken since January 2002?	Total (%)
Turn off lights not being used	72
Turn off office equipment	49
Set thermostats lower when heating /higher when cooling	39
Set air conditioning thermostats to pre-cool during off peak	8
Turn off computer if out of the office more than a few minutes	7
Set computer to low power stand bye mode	7
Install additional energy efficient lighting	6
Use fans to cool	6
Maintenance of equipment	4
Use AC only when necessary	4
Timers on appliances	3
Trade in photocopiers for smaller more energy efficient ones	3
Schedule high electrical energy-use processes during off peak	1
Install separate switches for closet and office lights	1
Establish system to alert employees of expected high demand days	1
Turn off personal appliances	1
Wear comfortable clothes...Dress for warmer weather	1
Delamping	1
Monitor equipment	1
Sample Size	71

Note: Respondents were allowed multiple responses, resulting in a total greater than 100 percent.

Table 24 shows the different motivations that nonparticipants had for taking energy conservation actions. Not surprisingly, 90 percent of the nonparticipant respondents stated that the primary reason for trying to conserve energy was to lower energy costs.

Table 24: Nonparticipant Reasons for Energy Conservation Actions

CON30. What were the most important reasons that you took energy conservation actions to reduce your energy use?	Total (%)
Lower energy (operating) cost	90
Energy crisis / civic duty	10
There weren't any reasons	4
Help avoid blackouts	1
Other	1
Sample Size	71

Note: Respondents were allowed multiple responses, resulting in a total greater than 100 percent.

Nonparticipants indicated a high likelihood that they would adopt at least some energy efficient measures in the future. As shown in Table 25, 61 percent of nonparticipants indicated that they are very likely to consider replacing existing products with energy efficient products in the future and 30 percent said they were somewhat likely to install energy efficiency measures. These responses combined with the other survey questions relating to current conservation activities

indicate that there is a significant amount of interest in energy efficiency among the nonparticipant population.

Table 25: Nonparticipant Future Equipment Purchase Intentions

PE15. How likely will you be to actively consider energy-efficient products when installing or replacing energy-using products for your business in the future? Please give your rating on a scale from 1-10 where 10 means you are extremely likely to consider energy-efficient products.	Total (%)
Very likely	61
Somewhat likely	30
Not very likely	8
Don't know	1
Mean	7.63
Sample Size	100

Note: Respondents provided a rating on a 1 to 10 scale and response categories were created post-survey. Ratings of 8-10 were coded as "Very likely", 4-7 as "Somewhat likely, and 1-3 as "Not very likely".

Respondents that rated their likelihood to consider purchasing energy efficient products a 10 were then asked what energy efficient equipment they would likely install. Table 26 shows that of these respondents, about half (51 percent) would likely install efficient lighting. Installing more efficient HVAC systems and appliances or office equipment was also being considered by these respondents.

Table 26: Nonparticipant Future Energy Efficient Technology Purchases

PE12. What energy efficiency equipment are you more likely to install?	Total (%)
Lights	51
HVAC	23
Appliances/office equipment	21
Other	5
Don't know	23
Sample Size	39

Energy Efficiency Program Awareness and Market Barriers

Table 27 shows that almost half of the nonparticipants were aware of the SBEE program. Of those that were aware of the SBEE Program, 21 percent (10 percent of total respondents) were directly solicited by program contractors.

Table 27: Nonparticipant Awareness of the SBEE Program

Awareness Questions	Yes (%)	No (%)	Don't Know (%)	Sample Size
A1. Are you aware of SDG&E's Small Business Energy Efficiency Program?*	48	50	2	100
A3. Have you ever been approached by a contractor to have an energy audit done in order to participate in this program?	21	79	0	48

* 10% were aware of the SBEE program only after a program description was provided

Table 28 Shows the percentage of nonparticipants that were aware of SDG&E's Express Efficiency program. As can be seen in the table, half of the respondents were aware of the Express Efficiency program. 24 percent of those who were aware of the Express Efficiency (12 percent of all respondents) had also participated in the program.

Table 28: Nonparticipant Awareness of the SDG&E Express Efficiency Program

Awareness Questions	Yes (%)	No (%)	Don't Know (%)	Sample Size
A5. Are you aware of SDG&E's Express Efficiency rebate program?*	51	49	0	100
A15. Since January 2002, did your firm participate in SDG&E's Express Efficiency Rebate Program?**	24	74	2	51

* 15% of these respondents were aware of Express Efficiency only after a program description was provided

* *4% of the respondents participated in Express Efficiency at another location

Responses to several questions relating to market barriers are shown in Table 29. Overall, the respondents did not show a strong consensus on what were the major barriers to adopting energy efficient technologies. Of all of the barrier statements presented, confidence in the actual bill savings was the most important, with 78 percent of respondents either strongly or somewhat agreeing that this is a concern. Most respondents (71 percent) also either strongly or somewhat agreed with the statement that they did not have enough information to make informed decisions regarding energy efficient investments. Nonparticipants also had concerns regarding contractors, with 65 either strongly or somewhat agreeing that there was too much time and hassle involved with finding a qualified contractor to do the installation.

In contrast, significant numbers of nonparticipants disagreed with statements relating to the perceived hassle factor with utility rebates and investment decisions regarding the building. When asked about utility rebates, 42 percent of nonparticipants disagreed with the statement that there was too much hassle involved. Similarly, 52 percent of respondents disagreed with the statement that it was not worth investing in energy efficiency as they did not own the building.

Table 29: Nonparticipant Barriers To Energy Efficient Technologies

Market Barrier Questions	Agree Completely (%)	Agree Somewhat (%)	Disagree (%)	Don't know (%)	Mean
PE35A. When considering a new energy efficiency investment, I am concerned that the actual bill savings will be less than what was estimated.	30	48	18	4	5.99
PE35B. I don't have the information I need to make an informed decision about energy efficient investments.	30	41	29	0	5.51
PE35C. There is too much time and hassle involved in selecting a qualified energy efficiency contractor.	26	39	24	11	5.47
PE35D. Lack of financing is a barrier to our organization making energy efficiency investments that we want to make.	27	33	37	3	4.99
PE35E. Getting a utility rebate is too much hassle.	18	34	42	6	4.44
PE35F. It is not worth investing because it's not my building.*	20	26	52	1	4.13

* 1% refused to answer

Note: Respondents provided a rating on a 1 to 10 scale and response categories were created post-survey. Ratings of 8-10 were coded as "Agree Completely", 4-7 as "Agree Somewhat", and 1-3 as "Disagree".

SAVINGS VERIFICATION

This chapter presents results from the verification analysis based on the participant phone survey and on-site data. In addition to the verification results, annual hours of operation for CFL and T8/T5 measures are presented based on on-site participant self-report data. An estimate of the effective useful life for CFLs is also presented based on on-site data collection and the estimated hours of operation. Finally, the level of free ridership associated with the program is presented based on participant phone survey data.

Savings Calculation Verification

One of the first evaluation tasks was to review the documentation for the savings calculations for the measures covered by the SBEE program. We reviewed the "white papers" that were used to determine savings and found that the methods used were generally sound. We also reviewed the program tracking system and found that the correct per unit savings values were being assigned to each measure.

In our review of the savings estimates for T8s, we learned that the T8 savings values are assigned on a per lamp basis and that the original calculation assumes a 2-lamp fixture. Discussions with program staff indicate that many installations involve installing 3-lamp and 4-lamp T8 fixtures. When the savings value is assigned to fixtures with more than 2 lamps, the overall savings will be overstated. To avoid this in future program years, we recommend that an average impact value be developed that reflects a mix of 2-lamp, 3-lamp, and 4-lamp fixture installations.

Phone Survey Measure Installation Verification

The participant survey included questions designed to verify that the participants installed the measures specified in the program tracking database. The survey asked a sample of 302 participants if they recalled participating in SDG&E's Small Business Energy Efficiency program and the responses are shown in Table 30. Only one customer claimed they did not participate, and two others either did not know or refused to respond.

Table 30: Respondent Recollection of Program Participation

A5. Earlier this year did your business participate in SDG&E's Small Business Energy Efficiency program at this location?	CFL	T8 or T5	Exit Sign	Sensor	N
Yes, participated in SBEE as described	246	289	25	49	298
Yes, participated in SBEE, but at other location	1	0	0	0	1
No, did not participate	1	1	0	0	1
Refused	1	1	0	0	1
Don't know	1	1	0	0	1
Total	250	292	25	49	302

Participants were also asked if they had installed the equipment provided by the program. Of the 612 measures asked about in the survey, 10 percent of the measures were not verified by the respondents, as shown in Table 31. Most of these measures were CFLs, and these generally corresponded to installations that had a large number of T8s but only a few CFLs installed.

Table 31: Phone Survey Measure Verification (# Respondents)

A20. Was the Given Measure Installed Through SDG&E's SBEE Program?	Total	CFL	T8 or T5	Exit Sign	Sensor
Yes	83%	76%	90%	85%	86%
No	9%	17%	2%	12%	10%
Don't know	7%	7%	8%	4%	2%
Total	612	247	290	26	49

Table 32 provides the quantity of equipment that was installed that corresponds to the measure categories and customers responses provided in Table 31. Participants were unable to identify less than 2 percent of the measures during the phone survey. For CFLs, although 17 percent of the participants did not recall the measure being installed, this accounted for only 8 percent of the total number of CFLs installed through the program. This suggests that it is the smaller CFL installations that customers do not recall. Similarly, for exit signs, although 12 percent did not recall the measure being installed, this only represented 4 percent of the exit sign measures.

Table 32: Phone Survey Measure Verification (# Measures)

A20. Was the Given Measure Installed Through SDG&E's SBEE Program?	CFL	T8 or T5	Exit Sign	Sensor	Total
Yes	2,468	23,299	44	157	25,968
No	228	332	2	7	569
Don't know	132	2,120	5	4	2,261
Total	2,828	25,751	51	168	28,798

* Quantity of equipment

Table 33 shows the type of lamps that were replaced for those participants that had CFLs installed. In most cases, the new CFLs replaced incandescent lights, but for 11 percent the CFLs were used to replace existing CFLs. While these types of replacements should be minimized, it appears that this result is consistent with what was found in the Express Efficiency evaluation. For Express Efficiency, a survey of 40 lighting vendors found that existing CFLs were replaced about 11 percent of the time.[6] Among all participants, 18 percent said that CFLs replaced existing CFLs, and among the very small customers (< 20 kW), the CFL-to-CFL replacement rate was 15 percent.

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[6] See *2003 Statewide Express Efficiency Program Measurement and Evaluation Study* page 5-10 for discussion of the lighting vendor survey results.

Table 33: Type of Lamp Replaced by CFLs

A33. When the CFLs were installed, what kind of lamp did you replace?	Total (%)
Incandescent	78
CFL	11
Other	2
Don't know	10
Sample Size	190

On-Site Measure Installation Verification

On-site audits were completed for a sample of 101 sites and these sites were recruited from the sample of 300 participants completing the phone survey. Of these 101 sites, 51 sites were audited in 2005 and another 50 in 2006. These 101 sites cover 200 different equipment installations (combinations of measure type and site), and 8,254 individual pieces of equipment (e.g., lamps). Table 34 shows the distribution of the 8,254 measures and 101 sites that were audited, and the status of the rebated measures broken out into the four measure categories.

Overall, 96 percent of the measures were verified, only 1 percent was reported to have failed, and less than 1 percent were removed or placed in storage. CFLs exhibited the lowest verification rate, as expected, but it was still relatively high at 92 percent. Of the remaining 8 percent, 4 percent of the CFLs had failed, 3 percent had been removed and 1 percent were placed in storage. For the T8/T5 measures, 96 percent were verified as installed and only 1 percent had failed. Similarly, 100 percent of Occupancy Sensors and 96 percent of Exit Signs were verified as installed and operational.

Table 34: Measures Verified During On-Site Audits

Rebated Measures	Equipment Rebated		Equipment Verified		Equipment Failed		Equipment Removed		Equipment in Storage	
	Sites	Measure Quantity	Measure Quantity	Percent	Measure Quantity	Percent	Measure Quantity	Percent	Measure Quantity	Percent
CFLs	77	667	611	92%	25	4%	18	3%	9	1%
T8/T5s	100	7,524	7,260	96%	74	1%	8	0%	25	0%
Sensors	12	39	39	100%	0	0%	0	0%	0	0%
Exit Signs	11	24	23	96%	0	0%	0	0%	0	0%
TOTAL	101	8,254	7,933	96%	99	1%	26	0%	34	0%

ANNUAL OPERATING HOUR AND EFFECTIVE USEFUL LIFE ASSESSMENT

As part of the on-sites, the auditor collected detailed information regarding how the lighting measures operated at the facility. During each on-site, the auditor defined up to 6 unique lighting usage areas within the facility, and identified the number of CFLs and T8/T5s that were installed within each usage area. A usage area is defined as an area within the premise for which the lighting equipment behaves similarly with respect to when the lights come on and off and how frequently the lights are on during the "on" period. For each usage area, the auditor interviewed the facility representative to determine when the corresponding lighting measures are typically used, and what percent of the lights are typically on during that period. In addition, the auditor

performed a spot check on the operation of the lights, noting what percent of the lights were on at the time of the audit.

The following example should help clarify this process. Consider an office that is divided into five unique usage areas: windowed office areas, non-windowed office areas, conference rooms, bathrooms, and lobby/entrance. The lighting in the first four areas may all typically operate from 8 AM to 6 PM, and the lobby may operate 24 hours. Furthermore, the lighting in the windowed offices may typically be on 25 percent of the time during those hours, compared to 50 percent for non-windowed office areas, 20 percent for conference rooms, 10 percent for bathrooms, and 100 percent for the lobby. During the audit, the auditor will note the number of CFLs and T8/T5s in each area and the percent of lights that are on at the time.

To develop an estimate for the number of annual hours of operation, an hourly lighting schedule was done for each site, and for each usage area by daytype (weekday, Saturday and Sunday), and by measure (CFL and T8/T5). Next, a site-level lighting schedule was developed by daytype and measure by combining the individual usage area schedules and weighting them by the number of measures installed in the usage area.

Figure 4 provides an example of one retail site's CFL weekday lighting schedule. The participant had 36 CFLs installed in three different usage areas: (1) 22 in the retail area, (2) 10 in the storefront, and (3) 4 in the bathrooms. All 36 CFLs were generally used between 9:30 AM and 7 PM on weekdays; however 100 percent of the lamps in the retail and storefront were generally on during those hours, compared to only 10 percent of the bathroom lamps. One can see from the exhibit the importance of weighting the three usage area profiles by the number of lamps to properly account for the small number of CFLs in bathrooms, which are used only periodically.

Figure 4: Example of Weighting Usage Area Results to the Site Level
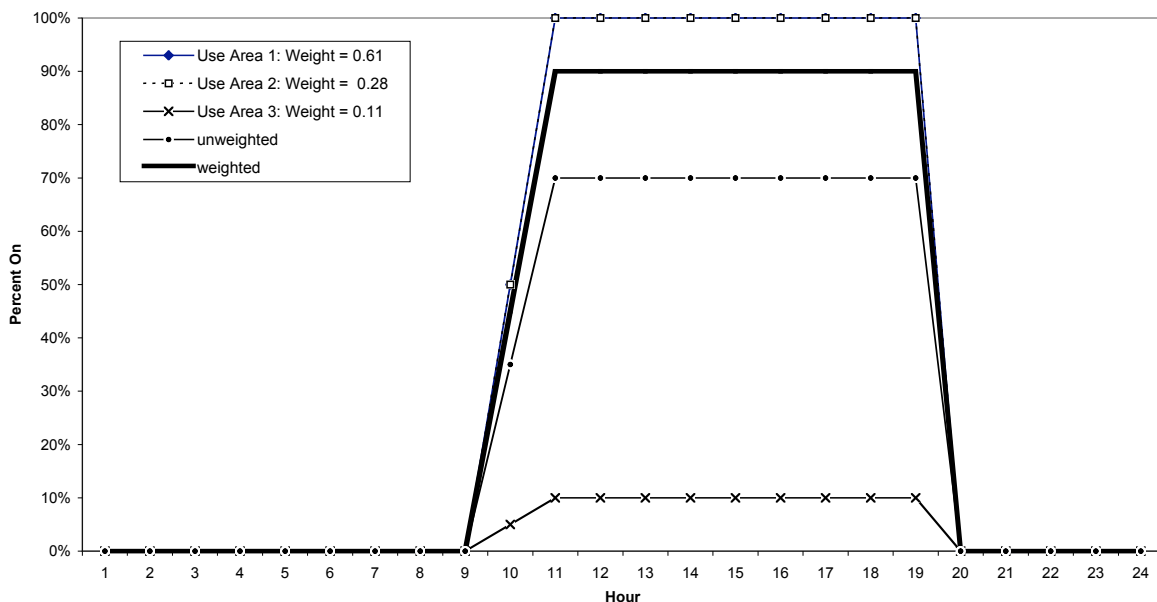
The next step was to combine the site level schedules into a single hourly profile by daytype and measure. This was done by weighting the site level schedules by the number of measures installed at each site. Figure 5 provides the resulting weekday profiles for both CFLs and T8/T5s.

Figure 5: Average Weekday Lighting Operation Schedule (T8/T5s and CFLs)
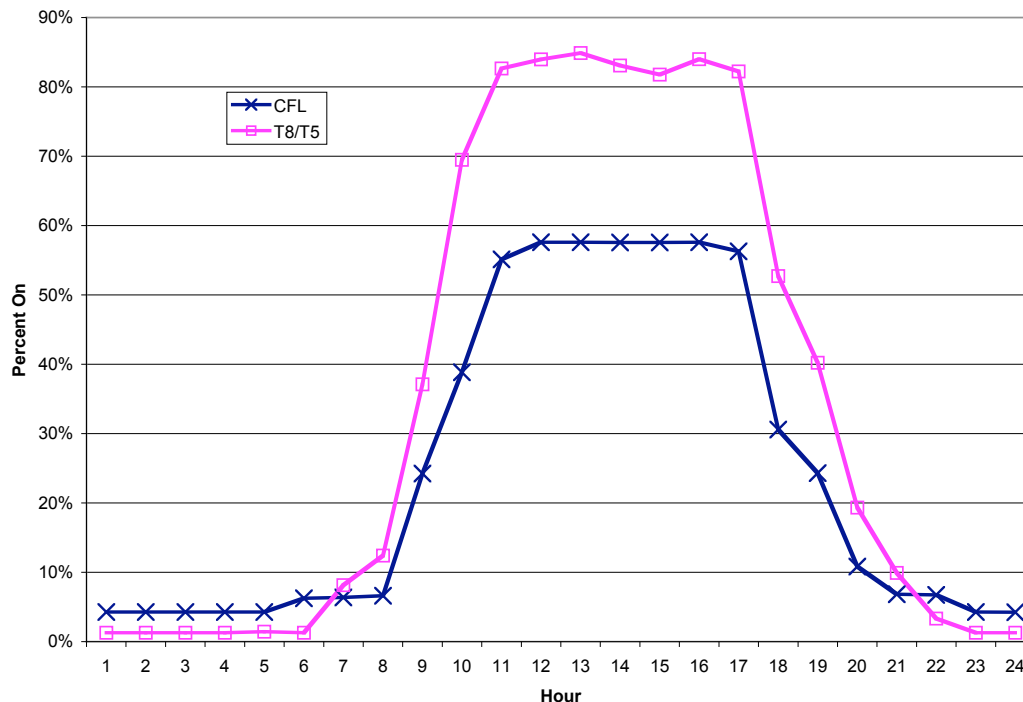
A validation procedure was performed to compare the auditor's spot check for the percent of measures operating to these weekday profiles. Overall, the auditor found that approximately 85 percent of the T8s and 46 percent of the CFLs were on at the time of the audit, in line with the weekday profiles presented above.

Using these profiles, we were able to determine the coincident diversity factor based on the percentage of lights operating from between noon and 5 PM. For T8/T5s, the coincident diversity factor was 0.83, which is approximately the same as the 0.81 coincident diversity factor used to calculate the *ex ante* kW savings estimates.

For CFLs, the coincident diversity factor was 0.57 based on the percentage of lights on during the noon to 5 PM period. This is significantly lower than the 0.81 factor assumed for the *ex ante* kW impacts. As shown in the net impacts discussion below, this lower factor is used directly to estimate the realized kW impacts for this program.

Table 35 provides the resulting annual operating hours associated with the final lighting profiles based on the on-site audit data. Shown are the number of hours by daytype and measure, along with the annual number of operating hours.

Table 35: Lighting Hours of Operation (T8/T5s and CFLs)

| | Stated Hours of Operation | | | |
| | T8/T5s | | CFLs | |
Day Type	Total Hours	Daily Average	Total Hours	Daily Average
Weekday	2,139	8.5	1,494	5.9
Saturday	251	4.8	204	3.9
Sunday/Holiday	181	3.0	174	2.9
Total	2,572	7.0	1,872	5.1

Clearly, there is a significant difference in the way in which CFLs and T8/T5s are used among these participants. Generally, T8/T5s are the predominant measure installed at a facility, with the average number of lamps being 75 T8/T5s per participant, compared to only 9 CFLs. Over a third have only three or fewer CFLs installed, and nearly half have five or fewer CFLs. From the on-sites, well over 40 percent of the participants had some CFLs installed in bathrooms or storage closets, which tend to be operated only periodically. Therefore, it is likely that CFLs were generally placed in lower use areas than T8/T5s.

A study was recently completed as part of the 2003 Express Efficiency Evaluation, which measured the annual operating hours of CFLs based on a sample of 60 sites using lighting loggers. This study found the average operating hours to be 2,709 overall, which is much more consistent with the T8/T5 result. This might be expected, as the Express Efficiency program was generally marketed by vendors that were performing CFL-only installations, likely in premises that were predominantly incandescent, or at least had a large number of existing incandescent bulbs. Therefore, it is likely that the CFLs rebated under the Express Efficiency program and the T8/T5s provided under the SBEE program were installed in fairly similar applications (i.e., as a primary lighting source).

In addition to the Express Efficiency Study, our evaluation team is currently conducting an evaluation of SCE's Nonresidential Hard-to-Reach program, which is very similar to the SBEE program in that it provides direct installs of the same measures to small businesses. As part of the SCE evaluation, lighting loggers were installed at 25 sites to collect data on operating hours for small businesses participating in the program. The preliminary lighting logger results show operating hours of 2,619 for T8/T5s and 1,941 for CFLs, both of which are within 4 percent of the results found for the SBEE evaluation.

Given the comparison of the SBEE evaluation results with other available studies, we place a high level of confidence on the operating hour results presented here for both T8/T5s and CFLs.

An additional objective of on-sites was to develop an estimate of the effective useful life (EUL) for CFLs installed under the program. As part of the on-sites conducted, the make and model of

the CFLs installed was collected. These data allowed us to determine the manufacturer's rated lifetime for 51 sites and corresponded to the installation of 452 CFLs. The average manufacturer's rated life among these integral CFLs was 8,027 hours.[7] Based on the 1,872 annual hours of operation discussed above, this would equate to an estimated effective useful life of 4.3 years for integral CFLs, based on the manufacturer's rated lifetime.

It is extremely important to note that because the EUL is a function of the annual operating hours, the EUL presented here should not be used in conjunction with different annual operating hour assumptions. If these results are to be used with a different annual operating hour assumption, the EUL should be set equal to 8,027 hours divided by the annual operating hours. For example, if 2,100 annual operating hours were used, then the resulting EUL would be 3.8 years.

SELF-REPORT FREE RIDERSHIP ANALYSIS

An assessment was performed to determine the influence the program has had on the participant's decision to install the measures covered by the SBEE program. As shown below in Table 36, 79 percent of the participants felt that the fact that SDG&E sponsored the program was very important in their decision to participate.

Table 36: Importance of SDG&E Program Sponsorship

REB1. In deciding to participate in the Small Business Energy Efficiency program, how important was it to you that SDG&E sponsored the program?	Total (%)
Very important	79
Somewhat important	15
Not at all important	6
Refused	0
Sample Size	300

Furthermore, as shown in Table 37, 61 percent of the participants also felt that the information provided by the program's technician was very important in helping them decide to install the new equipment provided by the program.

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[7] It is interesting to note that a recent evaluation of the Express Efficiency program found the average rated life to be 7,962 hours, based on 60 site installations. In addition, the current average rated lifetime for ENERGY STAR qualified CFLs is 8,000 hours.
Source: ENERGY STAR website: http://estar6.energystar.gov/index.cfm?c=cfls.pr_crit_cfls.

Table 37: Importance of Information Provided by Program Technician

REB2. The technician provided you information to help you understand energy costs and ways to manage them. How important was this information in helping you decide to install the new equipment provided by the program?	Total (%)
Very important	61
Somewhat important	27
Not at all important	7
Refused	1
Don't know	4
Sample Size	300

As shown in Table 38, only 17 percent of participants claim they were considering installing the measures that were provided by the program before being visited by the SDG&E technician. This is a strong indication that free ridership is low for the program. This finding is consistent for CFLs (18 percent) and T8/T5s (14 percent), but higher for Exit Signs (38 percent).

Table 38: Participants Considering Installing Equipment Prior to Participating

REB10. Before the SDG&E technician visited your facility, were you already considering installing the measure?	Total (%)	CFL (%)	T8 or T5 (%)	Exit Sign (%)	Sensor (%)
Yes	17	18	14	38	0
No	81	79	84	54	0
Don't know	2	2	3	8	0
Sample Size	259	170	231	13	0

Participants were asked what action they would have taken had the SBEE program not been available. Participants were asked this question separately for each type of measure they had installed under the program. Overall, only 17 percent of the participants claim they would have bought the same energy efficiency equipment in the absence of the program. Thirty-four percent claim they would not have purchased any equipment, and another 46 percent would have purchased standard equipment. Table 39 shows that these results are consistent across measures. Again, this is a strong indication that the program has influenced the majority of customers to adopt the measures installed under the program.

Table 39: Self-Reported Actions in Absence of the Program

REB50. What action would you have taken had the Small Business Energy Efficiency program not been available?	Total (%)	CFL (%)	T8 or T5 (%)	Exit Sign (%)	Sensor (%)
Bought no equipment	34	28	33	23	0
Bought the same energy efficient equipment	17	21	15	15	0
Bought standard equipment	46	45	50	46	0
Refused / don't know	4	6	2	15	0
Sample Size	259	170	231	13	0

The results shown in Table 40 show the survey results relating the possible timing of equipment installations if the SBEE program did not exist. Participants that claimed they would have purchased the same energy efficient equipment in the absence of the program were also asked if they would have purchased that equipment at the same time, within a year, or more than a year, if the program had not existed. Twenty-eight percent of all customers claim they would have waited more than a year later to adopt the measure if the program had not provided it. Participants were more likely to have waited to install T5/T8s (37 percent) and exit signs (50 percent) than CFLs (17 percent). Only 16 percent claim they would have purchased the measure at roughly the same time, again a strong indication of the influence of the program.

Table 40: Self-Reported Timing of Installation In Absence of Program

REB55. When would you have bought the measure if the program had not provided it?	Total (%)	CFL (%)	T8 or T5 (%)	Exit Sign (%)	Sensor (%)
At the same time	16	19	11	0	0
Within a year	51	58	46	50	0
More than a year later	28	17	37	50	0
Don't know	5	6	6	0	0
Sample Size	49	36	35	2	2

Of the information presented above, the most revealing questions regarding the program's influence were the customer's stated action in the absence of the program (both what they would have done and when they would have done it), as well as what they were considering doing at the time they were approached by the SDG&E technician. To assess the level of free ridership with the program, these three relevant survey questions were integrated and analyzed by technology. Table 41 below provides the integrated survey responses for CFLs installed under the program.[8] Clearly there is a strong relationship between what participants claim they would have installed under the program and what they were considering installing prior to being visited by the SDG&E technician.

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[8] Please note that results provided in Tables 12 and 13 are weighted by the number of measures installed to provide a more accurate program level assessment of free ridership.

As discussed previously, however, the responses to these questions may be reflecting some level of response bias if respondents do not correctly recall the timing of their decisions or if they are providing responses they perceive to be socially desirable rather than accurately reporting their experiences. While we asked multiple questions to limit these possibilities, we did not attempt any additional adjustments to correct for these potential biases. Consequently, these results should be interpreted with these potential biases in mind.

Only 19 percent of the CFL participants claim they would have purchased CFLs either now, or in the future. Of this 19 percent, only 5 percent say they would have installed the CFLs at the same time, and that they were already considering installing the CFLs before being visited by the SDG&E technician. Fourteen percent claim they would have installed the same equipment, but at a later date, and roughly half of these claim they were already considering installing the CFLs before being visited by the SDG&E technician. In developing a free ridership estimate, we assigned full and partial free ridership rates as follows:

- Those that claim they would have purchased the same equipment at the same time, and were already considering installing the equipment are full free riders.

- Those that claim they would have purchased the same equipment at the same time, but were not considering installing the equipment at the time the SDG&E technician visited their facility are partial free riders, at 50 percent.

- Those that claim they would have purchased the same equipment at a later time, and were already considering installing the equipment are partial free riders, at 50 percent.

- Those that claim they would have purchased the same equipment at a later time, but were not considering installing the equipment at the time the SDG&E technician visited their facility are partial free riders, at 25 percent.

- Those that claim they would have not have purchased equipment, or would have purchased standard equipment are net participants (no free ridership).

Based on this assessment, free ridership is estimated at 10 percent for CFL measures.

Table 41: Installation Intent and Timing Without Program (CFL Measures)

REB50/55. What type of equipment would you have purchased had the rebate not existed?	REB10. Before the SDG&E technician visited your facility, were you already considering installing the CFLs?	Percent of Total	N
None	Yes	0.9%	4
	No	25.2%	43
Standard Equipment	Yes	7.5%	8
	No	47.8%	68
Same Energy Efficient Equipment, Later	Yes	7.3%	12
	No	6.4%	14
Same Energy Efficient Equipment, Now	Yes	4.7%	6
	No	0.1%	1
Total		100.0%	156

* Percent is weighted by number of CFLs

N is number of participants

For the T8/T5 measures shown in Table 42, the program appears to be even more influential (there were not sufficient data to perform this analysis on exit signs or sensors). Only 11 percent of the participants claim they would have purchased T8/T5s either now, or in the future. Of this 11 percent, only 1 percent say they would have installed the T8/T5s at the same time, and that they were already considering installing the T8/T5s before being visited by the SDG&E technician. Ten percent claim they would have installed the same equipment, but at a later date, and roughly a quarter of these claim they were already considering installing the T8/T5s before being visited by the SDG&E technician. Using the same scoring algorithm discussed above for CFLs would result in a free ridership rate of only 4 percent for T8/T5s.

Table 42: Installation Intent and Timing Without Program (T8/T5 Measures)

REB50/55. What type of equipment would you have purchased had the rebate not existed?	REB10. Before the SDG&E technician visited your facility, were you already considering installing the T8s?	Percent of Total	N
None	Yes	3.5%	8
	No	32.2%	67
Standard Equipment	Yes	4.4%	12
	No	49.0%	102
Same Energy Efficient Equipment, Later	Yes	2.4%	9
	No	7.1%	19
Same Energy Efficient Equipment, Now	Yes	0.4%	2
	No	0.9%	2
Total		100.0%	221

* Percent is weighted by number of T8s
   N is number of participants

For the program overall (for which T8/T5s and CFLs comprise roughly 60 percent and 38 percent of the program's first year kWh savings, respectively), using the above would result in a free ridership rate of about 6 percent. Given that the program may have some participant spillover benefits, these results are in line with the current net-to-gross ratio of 0.96 being used by the program.

For the self-report free ridership estimates, the results are sensitive to the weights applied to the partial free ridership responses. We have used a weight of 50 percent for partial free riders and 25 percent for partial free riders that were not considering purchasing equipment prior to speaking with a SDG&E technician about the program. Any such weighting scheme is somewhat arbitrary and these weights were chosen as they are generally consistent with other evaluation studies (such as Express Efficiency) and seemed to be reasonable assumptions for this program.

To test how sensitive the results are to the partial free ridership weighting assumptions, we also calculated free ridership rates assuming using a lower weight for partial free riders. This weighting scheme applies a 50 percent reduction to the weights already assigned (25 percent for partial free riders and 12.5 percent for those that were not considering purchasing equipment prior to speaking with an SDG&E technician). With these lower rates, the estimated free ridership for T8/T5s falls from 4 percent to 2 percent. Similarly, for CFLs the rate falls from 10 percent to 7 percent.

A similar sensitivity test was done by increasing the weights 50 percent for partial free riders. To calculate a higher bound for the estimate, a weight of 75 percent was used for partial free riders and 37.5 percent for partial free riders that were not considering purchasing equipment prior to

speaking with an SDG&E technician. With this weighting increase, the estimated free ridership rate for T8/T5s increases from 4 percent to 6 percent. For CFLs, the free ridership rate increases from 10 percent to 15 percent.

The sensitivity analysis just discussed is summarized in Table 43. Although the weight ranges used for the sensitivity analysis are also arbitrarily chosen, they do provide useful information on how much the free ridership rates might vary under alternative assumptions. Note that these results do not account for any additional error that may be introduced by response bias previously discussed for these types of questions.

Table 43: Sensitivity Analysis for Self-Report Free Ridership Results

Free Ridership Weighting Scheme	T8/T5	CFL
Current Weighting (Partial FR weight = 50%, 25%)	4%	10%
Low Weighting (Partial FR weight = 25%, 12.5%)	2%	7%
High Weighting (Partial FR weight = 75%, 37.5%)	6%	15%

4. NET IMPACT ANALYSIS

The information from the engineering analysis and the on-site verifications was incorporated into a net billing model to determine *ex post* net program impacts for the 2004-05 SBEE program. For this model, we utilized the entire population of participants from 2004-05 and matched them to the population of nonparticipants based on industry type (NAICS code) and usage.

To estimate the billing model, several data screens were used to create a dataset with complete billing data and to rule out potential outlier observations that might have undue influence over the model. Specifically, the data screens were designed to remove those observations that had incomplete billing data or did not have sufficient post-installation billing data to estimate annual impacts. In addition, those observations that had disproportionately large estimated savings relative to overall usage were dropped from the analysis, as the large savings (greater than 50 percent of pre-period usage) are likely reflecting errors in the usage data rather than actual impacts given the types of measures promoted by this program.

The number of observations dropped from each of these screens for participants and nonparticipants is shown in Table 44. Note that for many of these observations, multiple screening criteria apply. For reporting purposes, Table 44 shows the dropped observations in sequential order. For example, 486 participants are dropped because they do not have sufficient post-period data (6 months or more), as listed in the "Late Installation" row. Some of these 486 may also have been ruled out due to the other criteria lower in the table, but for simplicity they are all assigned to the "Late Installation" screening criterion.

One observation was removed as an outlier based on the results of some preliminary runs of the regression model. This single observation resulted in the coefficient estimate for T8/T5s to change by more than 10 percent. When this observation was reviewed individually, we found that it was much larger than average in terms of usage, with a pre-installation kWh usage of 53,120 kWh that was the more than twice the average of 24,475 kWh for the participant sample. The savings for this customer was almost significantly greater, with a total savings of 18,748 kWh relative to the sample average of 4,087 kWh. The total savings from this observation represents only 1 percent of the total savings from the sample. When the disproportionate influence of this one observation was removed, the model behaved much more in line with expectations.

Table 44: Observations Dropped Due to Screening Criteria

Type	Part	NonPart
Population	1,413	182,442
Late Installation	486	0
Missing usage data (pre-period)	18	96,286
Missing Usage Data (post-period)	92	20,772
Post usage twice as much as pre-period usage	7	2,340
Post usage half as much as pre-period usage	19	2,171
Savings greater than pre-period usage	53	0
Savings greater than half of pre-period usage and less than equal to pre-period usage	148	0
High variance in pre-period usage	76	11,849
High variance in post-period usage	31	4,166
Missing industry code	0	1,813
Missing cooling degree day data	1	9,490
Missing heating degree day data	0	0
Annual usage greater than maximum of participants	0	3,484
Outlier	1	0
Screened Observations	932	152,371
Regression Observations	481	30,071

Using data for both participants and nonparticipants, a Statistically Adjusted Engineering (SAE) billing model is estimated using ordinary least squares regression (OLS). In addition to measure savings, the model also includes variables for pre-installation kWh usage, changes in weather, business type, and categorical variables based on kWh usage.

The basic form for the net billing model is as follows:

$$kWh_{i,post} = \beta' Eng + \beta' kWh_{i,pre} + \beta'(kWh_{i,pre} UsageCat) + \beta' Business_i + \beta' Weather + \varepsilon_i$$

$Where:$

Eng = $Ex\ ante\ savings\ estimates\ adjusted\ using\ evaluation\ findings\ on$
$verification\ and\ operating\ hours$

$kWh_{i,post}$ = $Energy\ usage\ during\ the\ program\ post-period\ for\ customer\ i$

$kWh_{i,pre}$ = $Energy\ usage\ during\ the\ pre-program\ period$

$kWh_{i,pre}UsageCat$ = $Energy\ usage\ during\ the\ pre-program\ period\ interacted\ with\ kWh\ usage\ category$

$Business$ = $Variables\ indicating\ business\ type$

$Weather$ = $Change\ in\ Heating\ Degree\ Days\ and\ Cooling\ Degree\ Days\ by\ climate\ zones$

ε_i = $Random\ error\ term\ assumed\ normally\ distributed$

β = $Coefficients\ to\ be\ estimated$

The pre-installation usage is interacted with an indicator variable based on annual kWh usage. The various usage categories are defined below in Table 45.

Table 45: Annual Usage Categories Used in Billing Model

Usage Category	Annual kWh Range	
	Min	Max
1	2,935	7,718
2	7,718	10,356
3	10,356	12,994
4	12,994	15,632
5	15,632	18,270
6	18,270	26,161
7	26,161	34,052
8	34,052	41,944
9	41,944	49,835
10	49,835	125,415

All of the savings variables use the *ex ante* savings values that have been adjusted using the verification rates that were determined from the on-site audits. In addition, the savings estimates for both CFLs and T8/T5s have been adjusted to account for the lower operating hours (relative to the initial operating hour assumptions) based on the on-site verification survey data.

Because both participants and nonparticipants are included in the sample, the coefficient estimates on the savings variables can be interpreted as net realization rates since the model accounts for baseline activity that will include at least some installation of measures covered by the SBEE program. In addition, as discussed above the savings variables are the *ex ante* gross savings values that have been adjusted using the evaluation findings for operating hours and the verification results. The combination of these adjustments and the inclusion of nonparticipants in the sample results in the coefficient estimates that reflect the *ex post* <u>net</u> realization rates. Any difference from 1.0 for the resulting coefficient estimates will be reflecting free ridership and/or additional adjustments to realized savings that are not accounted for by the operating hour or verification adjustments. Consequently, the coefficient estimates can be used as an estimate of the *ex post* net realization rate.

Table 46 shows the estimation results from the final net billing model specification. The model fits the data well overall as evidenced by the high R-square value and the statistically significant F statistic. A high R-square is common when lag variables are used in regression models, and the high t-value for the pre-usage kWh variables also indicates that the lag usage is the predominant driver for this model.

The pre-installation kWh variable and the various interaction variables between pre-installation kWh and usage category are mostly significant at the 10 percent level, although the significance and magnitude of the interaction term decreases as the usage category increases. Variables in the industry groupings generally had a positive and significant effect, which allows the model to adjust overall usage based on industry type. Finally, changes in heating degree days had a positive and significant effect on post-period usage. Changes in cooling degree days had a negative influence but the coefficient estimate was not significantly different from zero.

The highlighted variables in Table 46 are the coefficients for the savings impacts variables. As expected, all the savings variables have negative coefficients. However, only the T8/T5 coefficient is statistically different from zero. The estimate for T8/T5s has the correct sign and is significantly different from zero at the less than 1 percent level of significance.

The fact that the coefficient estimate is less than 1.0 for the T8/T5 group is reflecting several effects.[9] First, since nonparticipants are included in the sample the coefficient estimate incorporates any free ridership. The coefficient estimate implies a maximum free ridership rate of about 7 percent assuming that the entire difference from 1.0 is attributable to free ridership and assuming no spillover. This is consistent with the *ex ante* net-gross-ratio assumption of 0.96 and the self report results discussed earlier that found a free ridership of 4 percent for these measures. The primary difference, therefore, between the *ex ante* and *ex post* impacts is due to the lower operating hours.

A second effect captured in the T8/T5 coefficient is any inaccuracies in the *ex ante* savings values. As discussed previously, the *ex ante* values were calculated assuming a 2-lamp fixture. Based on conversations with SBEE program staff, there is a mix of 2-lamp, 3-lamp, and 4-lamp fixtures being installed. While we recommend that an *ex ante* impact that reflects an average value for these fixtures be used in future years to account for different numbers of lamps, this does not appear to be having a large effect on the overall realized savings.

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[9] Note that the coefficient estimate for T8/T5 is also not significantly different from 1.0. Nevertheless, we believe that the discussion above is informative.

Table 46: Net Billing Regression Model Results

Model Statistics	Value
Observations	30,552
Variables	23
F Statistic	53,066.1
F Statistic Level of Significance	< 1%
Adjusted R-Squared	0.9756

Parameter Estimates	Coefficient	Standard Error	T Value	Level of Significance
Savings-T8/T5s	-0.93	0.13	-7.15	< 1%
Savings-CFLs	-0.17	0.23	-0.75	45%
Savings-Exit Signs	-0.78	1.10	-0.70	48%
Savings-Sensors	-0.13	3.76	-0.03	97%
Savings-Hard-wired CFLs	-0.75	17.11	-0.04	96%
Pre Usage	1.00	0.00	377.68	< 1%
Pre Usage*Pre Usage Category 1	-0.06	0.03	-1.98	5%
Pre Usage*Pre Usage Category 2	-0.04	0.02	-1.85	6%
Pre Usage*Pre Usage Category 3	-0.03	0.01	-1.71	9%
Pre Usage*Pre Usage Category 4	-0.03	0.01	-2.15	3%
Pre Usage*Pre Usage Category 5	-0.02	0.01	-1.73	8%
Pre Usage*Pre Usage Category 6	-0.01	0.01	-1.44	15%
Pre Usage*Pre Usage Category 7	-0.01	0.00	-1.48	14%
Pre Usage*Pre Usage Category 8	0.00	0.00	-1.23	22%
Pre Usage*Pre Usage Category 9	-0.01	0.00	-1.58	11%
Business-Agriculture, Construction, and Manufacturing	788.44	219.61	3.59	0%
Business-Retail and Wholesale Trade and Transportation	479.76	216.76	2.21	3%
Business-Services	479.54	209.97	2.28	2%
Business-Education and Health Services	402.94	220.56	1.83	7%
Business-Food, Arts, and Entertainment	182.67	228.36	0.80	42%
Business-Other Services	279.74	214.72	1.30	19%
Weather-Change in cooling degree days (post-pre)	-0.41	0.58	-0.71	48%
Weather-Change in heating degree days (post-pre)	0.52	0.23	2.23	3%

Table 47 below summarizes the impact adjustments recommended by measure that take into account the results of the billing analysis, verification, and self-reported free ridership. The final *ex post* net realization rate is the product of all the adjustment factors shown in the table. In those cases where no adjustment is being recommended, an adjustment factor of 1 is used.

T8/T5

Table 47 shows the various adjustment factors used to determine the *ex post* net realization rates for T8s and T5s. Since the billing regression used savings estimates that had been adjusted for verification and operating hours prior to being input into the model, these adjustments need to be the original *ex ante* gross impacts to be consistent. In addition to the operating hour and verification adjustments, the coefficient estimate from the billing model is used to adjust for free ridership and any additional savings adjustments to realized savings that are not otherwise captured in the model.

The combined effect of these adjustments is an *ex post* net realization rate of 0.52, as shown in the far right column of Table 47. Again, the *ex post* net realization rate is the product of all the adjustment factors shown in the table for this measure. Using this rate, the realized <u>net</u> impacts

estimated in this evaluation are 52 percent of the original *ex ante* <u>gross</u> impacts assumed by the SBEE program. As discussed above, the majority of the change between the *ex ante* and *ex post* impacts is due to the lower operating hours. Once an adjustment is made for operating hours, the resulting net impacts are generally consistent with the *ex ante* net-to-gross ratio for these measures.

As with any estimate, there is some uncertainty inherent in the *ex post* net realization rate calculation. From the billing model, the final realization rate for the T8/T5s has a standard error of 0.1293, and using this to construct a 90 percent confidence interval around the coefficient estimate results in an error band of +/- 23 percent. Since the billing regression is the primary source of uncertainty in the *ex post* net realization rate for this measure, the 23 percent can be used as a measure of uncertainty in the net realized impacts for T8/T5s.

CFL

For CFLs, a similar process was used to determine the final net impacts. Since the billing regression results were not significant for CFLs, we use the 10 percent self-report free ridership rate as the estimate of free ridership. The CFL impacts are also adjusted for lower operating hours and the verification rate based on the evaluation findings. The combined effect of these adjustments is shown in Table 47 and results in an *ex post* net realization rate of 0.36. The 0.36 adjustment is applied to the *ex ante* gross savings to determine the *ex post* net savings for this measure. As with the T8/T5s, the lower operating hours is the primary cause of the reduction and once an adjustment for hours is made the *ex post* net realized impacts are generally consistent with the original *ex ante* net-to-gross ratio.

Given that the *ex post* net realization rate for CFLs relies on self-reported free ridership, it is not possible to determine a statistical error bound as the weighting schemes used were somewhat arbitrarily determined in the evaluation. As shown earlier, changes in the weighting of these questions (also arbitrarily determined) resulted in the free ridership estimate ranging from to 7 to 15 percent. This does not account for any additional errors that may have been introduced due to any response bias in these survey questions. For these reasons, the CFL *ex post* net realization rate has a relatively high level of uncertainty.

Exit Signs / Sensors

Finally, for Exit Signs and Sensors the *ex post* impacts were very close to the original *ex ante* net impacts assumed for the program. For both measures, there were no definitive results from the billing model and the measures were not addressed in the self-report analysis or the operating hours verification. To determine *ex post* net impacts, we use the *ex ante* net-to-gross ratio of 0.96 and adjust savings for the verification rates. For Sensors, this resulted in an *ex post* net realization rate of 0.96, which is the same as the *ex ante* net-to-gross ratio assumption. For Exit Signs, the *ex ante* net-to-gross ratio is adjusted by the verification rate of 0.96 to get an *ex post* net realization rate of 0.92.

The uncertainty in the *ex post* net realization rate for Exit Signs and Sensors is due primarily to the uncertainty associated with the original *ex ante* savings values and *ex ante* net-to-gross ratios assumed for these measures. Unfortunately, there were relatively few installations (relative to

T8/T5s and CFLs) and due to the low savings contribution from Exit Signs and Sensors, our limited evaluation resources were focused on improving the savings estimates for the other measures that comprised the majority of the savings.

Table 47: *Ex Post* Net Realization Rates for kWh Impacts

Measure	Self-Report Free-Ridership (1-FR)	*Ex Ante* NTG Ratio	Operating Hours	Verification	Billing Analysis Realization Rate	*Ex Post* Net Realization Rate
T8/T5	--	--	0.58	0.96	0.93	0.52
CFL	0.90	--	0.44	0.92	1	0.36
Exit Sign	--	0.96	1	0.96	1	0.92
Sensor	--	0.96	1	1	1	0.96

2004-2005 SBEE Cumulative kWh Impacts

Using the adjustments factors above, the *ex post* net savings numbers are shown below in Table 48. The largest reductions from the original *ex ante* gross impacts are in the T8/T5 and CFL categories and also comprise the majority of the savings. These savings from the original planning estimates are largely due to the reduced operating hour adjustment based on the on-site verification results.

Note that Table 48 shows the change in the *ex ante* and *ex post* net savings, while Table 47 shows the change from *ex ante* gross impacts to *ex post* net impacts. For example, with the T8/T5 measure group the *ex post* net impacts are 52 percent of *ex ante* gross impacts (as shown in Table 47), or a reduction of 48 percent from gross to net. The change from *ex ante* net savings to *ex post* net savings is slightly less at a 46 percent reduction (as shown in Table 48).

Table 48: Change in *Ex Ante* and *Ex Post* Net kWh Impacts

Measure	Units Installed	SDG&E Gross Savings (kWh)	SDG&E Net Savings (kWh)	Evaluation Net Savings (kWh)	Difference between Evaluation & SDG&E Net Savings (%)
T8/T5	115,168	5,383,458	5,168,120	2,777,963	-46
CFL	14,316	3,427,286	3,290,195	1,249,964	-62
Exit Sign	351	109,745	105,355	101,141	-4
Sensor	921	81,736	78,467	78,467	0
Total	130,756	9,002,226	8,642,137	4,207,536	-51

Table 49 shows how the *ex ante* per unit kWh impact values change for each measure based on the *ex post* evaluation results discussed above.

Table 49: Change in Ex Ante and Ex Post Net kWh Impacts By Measure

Measure Description	Units	Ex Ante kWh Net Impacts		Ex Post kWh Net Impacts	
		Per Unit	Total kWh	Per Unit	Total kWh
Install 2 4ft T-8 Lamp & Elec. Ballast convert 8ft	2,360	46.31	109,303	24.90	58,753
Install 2ft T-8/T-5 Lamp & Elec. Ballast	14	42.84	600	23.03	322
Install 2ft T-8/T-5 Lamp & LBO Elec. Ballast	156	54.37	8,482	29.23	4,559
Install 3ft T-8/T-5 Lamp & Elec. Ballast	4	53.04	212	28.51	114
Install 3ft T-8/T-5 Lamp & LBO Elec. Ballast	10	52.22	522	28.07	281
Install 4ft T-8/T-5 Lamp & LBO Elec. Ballast	112,624	44.83	5,049,000	24.10	2,713,934
Screw-in 14-26 watt CF Lamp	4,923	230.21	1,133,303	87.46	430,549
Screw-in 15 watt CF Lamp with Reflector	6,392	229.71	1,468,300	87.27	557,816
Screw-in 23 watt CF Lamp with Reflector	2,177	231.19	503,305	87.83	191,209
Screw-in 5-13 watt CF Lamp	91	182.52	16,609	69.34	6,310
Screw-in Par 38 20 watt CF Lamp	600	229.65	137,790	87.25	52,347
Screw-in R40 20 watt CF Lamp	131	231.19	30,286	87.83	11,506
Hardwired 14-26 watt CF Fixture	2	300.14	600	114.03	228
High Efficiency LED Exit Signs New Exit Sign	351	300.16	105,355	288.15	101,141
Wall or Ceiling Mounted Lighting Sensor	23	89.27	2,053	89.27	2,053
Wall-box Lighting Sensor	898	85.09	76,414	85.09	76,414
Total	130,756	---	8,642,137	---	4,207,536

2004-2005 SBEE Cumulative kW Impacts

A similar calculation was performed to determine net kW impacts, with the resulting adjustment factors shown in Table 50. As with the kWh impacts, the kW impacts are adjusted to account for verification, free ridership, and the *ex post* net realization rate is the product of the adjustment factors shown in Table 50. Changes to the coincident diversity factor based on the operating hours and load profile information obtained during the on-site verifications. For the coincident diversity factor for CFLs, for example, we used the 0.573 and divided it by the original value of 0.81 to get the current adjustment factor of 0.71. We did not find a significant difference in the coincident diversity factor for T8s from the *ex ante* value so no adjustment is made for the T8/T5 measure group.

The same issues relating to uncertainty discussed with the kWh impacts also apply to the *ex post* kW impacts. For the T8 and T5, there is uncertainty regarding the survey responses used for the self-report free ridership due to the weighting scheme and the potential for response bias with these types of questions.

Table 50: *Ex Post* Net Realization Rates for kW Impacts

Measure	Self-Report Free-Ridership (1-FR)	Ex Ante NTG Ratio	Verification	Coincident Adjustment Factor	Ex Post Net Realization Rate
T8/T5	0.96	--	0.96	1	0.92
CFL	0.90	--	0.92	0.71	0.59
Exit Sign	--	0.96	0.96	1	0.92
Sensor	--	0.96	1	1	0.96

The factors shown above were used to calculate the *ex post* kW impacts, as shown in Table 51. The only major change from the *ex ante* impacts is for CFLs due to lower coincident diversity factor derived from the on-sites audit load shapes. As with the kWh impact tables, Table 51

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shows the change from *ex ante* and *ex post* <u>net</u> impacts while Table 50 shows the adjustment from *ex ante* <u>gross</u> impacts to *ex post* <u>net</u> impacts.

Table 51: Changes in *Ex Ante* and *Ex Post* Net kW Impacts

Measure	Units Installed	SDG&E Gross Savings (kW)	SDG&E Net Savings (kW)	Evaluation Net Savings (kW)	Difference between Evaluation & SDG&E Net Savings (%)
T8/T5	115,168	1,069	1,026	985	-4
CFL	14,316	685	658	403	-39
Exit Sign	351	11	10	10	-4
Sensor	921	66	63	63	0
Total	130,756	1,831	1,757	1,461	-17

The following table shows how the *ex ante* per unit kW impact values change for each measure based on the *ex post* evaluation results discussed above.

Table 52: Changes in Ex Ante and Ex Post Net kW Impacts By Measure

Measure Description	Units	*Ex Ante* kW Net Impacts		*Ex Post* kW Net Impacts	
		Per Unit	Total kW	Per Unit	Total kW
Install 2 4ft T-8 Lamp & Elec. Ballast convert 8ft	2,360	0.0088	20.7	0.0084	19.9
Install 2ft T-8/T-5 Lamp & Elec. Ballast	14	0.0085	0.1	0.0082	0.1
Install 2ft T-8/T-5 Lamp & LBO Elec. Ballast	156	0.0108	1.7	0.0104	1.6
Install 3ft T-8/T-5 Lamp & Elec. Ballast	4	0.0106	0.0	0.0101	0.0
Install 3ft T-8/T-5 Lamp & LBO Elec. Ballast	10	0.0104	0.1	0.0100	0.1
Install 4ft T-8/T-5 Lamp & LBO Elec. Ballast	112,624	0.0089	1,003.3	0.0086	963.2
Screw-in 14-26 watt CF Lamp	4,923	0.0460	226.6	0.0282	138.8
Screw-in 15 watt CF Lamp with Reflector	6,392	0.0459	293.6	0.0281	179.8
Screw-in 23 watt CF Lamp with Reflector	2,177	0.0462	100.7	0.0283	61.6
Screw-in 5-13 watt CF Lamp	91	0.0365	3.3	0.0223	2.0
Screw-in Par 38 20 watt CF Lamp	600	0.0459	27.6	0.0281	16.9
Screw-in R40 20 watt CF Lamp	131	0.0462	6.1	0.0283	3.7
Hardwired 14-26 watt CF Fixture	2	0.0600	0.1	0.0368	0.1
High Efficiency LED Exit Signs New Exit Sign	351	0.0289	10.2	0.0278	9.8
Wall or Ceiling Mounted Lighting Sensor	23	0.0718	1.7	0.0718	1.7
Wall-box Lighting Sensor	898	0.0685	61.5	0.0685	61.5
Total	130,756	---	1,757	---	1,461

Finally, Table 53 presents the savings table required by the CPUC that shows the savings over time taking into account the expected useful life for each measure. Annual savings for measures installed as part of the 2004-05 SBEE program decreases over time once the equipment life is exceeded.

Table 53: CPUC Impact Table Showing Cumulative Energy and Demand Savings Over Time

Program ID*:	1340-04
Program Name:	San Diego Gas and Electric Small Business Efficiency program

Year	Calendar Year	Gross Program Projected MWh Savings	Net Evaluation Confirmed Program MWh Savings	Gross Program Projected Peak MW Savings	Evaluation Projected Peak MW Savings**	Gross Program Projected Therm Savings	Net Evaluation Confirmed Program Therm Savings
1	2004	3,664.4	1,673.5	0.7	0.6		
2	2005	9,002.2	4,207.5	1.8	1.5		
3	2006	9,002.2	4,207.5	1.8	1.5		
4	2007	9,002.2	4,207.5	1.8	1.5		
5	2008	9,002.2	3,794.0	1.8	1.3		
6	2009	9,002.2	3,151.2	1.8	1.1		
7	2010	9,002.2	2,957.6	1.8	1.1		
8	2011	9,002.2	2,957.6	1.8	1.1		
9	2012	7,400.6	2,953.0	1.5	1.1		
10	2013	5,493.2	2,879.1	1.1	1.0		
11	2014	5,493.2	2,879.1	1.1	1.0		
12	2015	5,493.2	2,879.1	1.1	1.0		
13	2016	5,493.2	2,879.1	1.1	1.0		
14	2017	5,493.2	2,879.1	1.1	1.0		
15	2018	5,493.2	2,879.1	1.1	1.0		
16	2019	5,493.2	2,879.1	1.1	1.0		
17	2020	3,430.4	1,792.5	0.7	0.6		
18	2021	0.0	0.0	0.0	0.0		
19	2022	0.0	0.0	0.0	0.0		
20	2023	0.0	0.0	0.0	0.0		
TOTAL	2004-2023	115,963.4	52,055.8	1.8*	1.5*		

5. CONCLUSIONS AND RECOMMENDATIONS

Based on the results presented in this report, we draw the following conclusions for the 2004-05 SBEE program evaluation.

- **Participation satisfaction with the SBEE program is very high.** In general, participants are very satisfied with both the program and the audit process, with the vast majority of respondents rating these at an 8 or higher on a 10 point scale. In addition, participants also expressed high levels of satisfaction with the equipment installed through the program. SBEE participants also expressed greater satisfaction with the program overall, and with the performance of the equipment installed, than did the 2003 Statewide Express Efficiency program participants.

- **Most measures were verified as installed.** Through the on-site audits we were able to verify the installation of most of the measures installed through the program. For the sites we visited, 96 percent of all the measures were verified. CFL lamps had a slightly lower verification rate at 92 percent, which is still relatively high. Among the CFLs that were missing, 4 percent had failed, 3 percent had been removed, and 1 percent placed in storage. These results are very much in line with the 2003 Express Efficiency evaluation results, where 97 percent of the lighting measures were verified (with 6 percent failed, 1 percent removed, and 2 percent in storage.)

- **Participation barriers for renters are being overcome by the SBEE program.** Renters comprise 82 percent of SBEE participants, which is much higher than that observed for SDG&E's territory in 2003 for the Express Efficiency program. Participant survey responses indicate that common barriers such as concern over bill savings, availability of financing, and the potential hassle of obtaining a utility rebate are more pronounced for renters than building owners in the program. The fact that so many renters are participating in the program despite these concerns indicates that the current SBEE program has been very effective in addressing these issues.

- **Renters may have more influence over building energy decisions than originally assumed.** While most of the participants in the program rent their facilities, they still have a high level of involvement in the equipment decisions at the facility. From the participant survey, 41 percent of the respondents indicated that they were very active in these decisions while an additional 28 percent were somewhat active. Most renters (77 percent) also characterized themselves as at least somewhat knowledgeable about the equipment options available to them for reducing their energy bills. Finally, a majority of respondents (60 percent) also disagreed with the statement that it was not worth investing in energy efficiency because they did not own the building.

- **SDG&E program sponsorship is important.** From the participant survey, 79 percent of respondents said that having SDG&E sponsor the program was very important and about half (48 percent) first became aware of the program when they were initially approached for the audit. In addition, 90 percent of the participants indicated that their program participation caused them to be more likely to install other energy efficient measures in the future.

Based on these conclusions, we offer the following recommendations for the SBEE program:

- **Continue with the current program implementation method.** The process evaluation showed that the key elements of the program theory were supported through the existing program delivery method. Customer satisfaction is also high for all program elements. As long as this can be maintained and net savings are achieved, we see no reason why the current program design should be modified.

- *Ex* **ante impacts should reflect 2-lamp, 3-lamp, and 4-lamp T8 and T5 fixture installations.** The program currently assigns a per lamp impact derived from a 2-lamp fixture, which will overstate savings when applied to a 3-lamp or 4-lamp fixture although the effect of this on the final impacts is likely small. Using an average impact value that assumes a mix of 2-lamp, 3-lamp, and 4-lamp fixtures should alleviate this issue.

- **Operating hour assumptions need to be revised for T8/T5s and CFLs.** The current assumptions for annual operating hours are much higher than those derived from the verification on-site survey data and those found in comparable studies. Once this adjustment is made, the realized net impacts are consistent with the *ex ante* values. This result was confirmed in the billing analysis, where the net realization rate for the T8/T5 measure group was approximately the same as the *ex ante* net-to-gross ratio assumption once the adjustment for operating hours was made.

- **A separate study should be conducted to revise the operating hour assumptions used in the DEER database for small businesses.** A review of the DEER database revealed that in general the operating hours assigned for small businesses for T8/T5s and CFLs are higher than the results derived in the SBEE evaluation. However, the DEER database also delineates operating hours by business type and there is significant variation in operating hours across business categories. There was not a large enough sample of on-sites in the SBEE evaluation to produce separate operating hour estimates for each of the business types currently supported in the DEER database. We recommend a separate study be conducted to address this issue, as it appears that the current operating hour assumptions are generally too high for small business customers for T8/T5s and CFLs.

- **Coincident diversity factor should be modified for CFLs.** The results of on-site verifications also produced load shapes that show a lower coincident diversity factor than that currently assumed for the program. This results in significantly lower kW impacts than originally anticipated for this measure.

APPENDIX: SURVEY INSTRUMENTS

SBEE PARTICIPANT SURVEY

Q1. Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting on behalf of San Diego Gas and Electric Company. This is not a sales call. May I please speak with [PROGRAM CONTACT]?

Our records show that your company received some energy-saving lighting equipment earlier this year through

SDG&E's Small Business Energy Efficiency Program. We are calling to do a follow-up study about your firm's participation in this program. This information will help SDG&E to determine the energy savings achieved through the program and improve its services to small business customers like you. This survey will take about 15 minutes and all answers will remain confidential.

I was told you're the person most knowledgeable about this lighting installation.

Is this correct?

May we speak with the person most knowledgeable about this lighting installation that may have worked with the SDG&E technician from Power Logic or American Lighting?

[IF NO PROGRAM CONTACT]

Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting on behalf of SDG&E. I need to speak with the person most knowledgeable about recent lighting equipment changes for your firm at this location.

[IF NEEDED] Our records show that your company received some energy-saving lighting equipment earlier this year through SDG&E's Small Business Energy Efficiency Program. We are calling to do a follow-up study about your firm's participation in this program. May we speak with the person most knowledgeable about this lighting installation? This survey will take about 15 minutes.

Screener

A5. Just to check, earlier this year did your business participate in SDG&E's Small Business Energy Efficiency program at this location? [IF NEEDED] This is an SDG&E program where your business received a free energy audit to identify opportunities for you to save on your energy bill and then later some free energy-saving lighting equipment was installed by a lighting technician.

1	Yes, participated in SBEE as described	A20
2	Yes, participated in SBEE, but at other location	A20
3	Yes, participated in SDG&E program, but don't recall that as the name	A15
4	NO, did NOT participate in SBEE program	A10
5	NO, did NOT receive free equipment, but did receive audit/recommendations	A10
77	Other (specify)	A10
88	Refused	A10
99	Don't know	A10

A10. Is it possible that someone else at your [SERV_ADDR] actually dealt with the equipment installation?

1	Someone else dealt with it	A5
2	Installed EE measures (but do not recall rebate or program)	T&T
3	Participated in program/have not installed EE measures yet	T&T
77	Other (SPECIFY) _____	T&T
88	Refused	T&T
99	Don't know	T&T

A15. OK, for the rest of the survey I'll be referring to your participation in program called Small Business Energy Efficiency.

A20. I'd like to confirm some information in SDG&E's database. Our records show that you had the following equipment installed through the Small Business Energy Efficiency Program. Is this correct?

NOTE: Verify measure and measure quantity. Note below any discrepancies in either measure description or measure quantity.

Quantity	Measure	
&M1	&MEAS1	
&M2	&MEAS2	
&M3	&MEAS3	
&M4	&MEAS4	
&M5	&MEAS5	
&M6	&MEAS6	
&M7	&MEAS7	
&M8	&MEAS8	
&M9	&MEAS9	
&M10	&MEAS10	

[ENTER IN NOTES IF THERE ARE DIFFERENCES]

Measure	
&DIFMEAS1	
&DIFMEAS2	
&DIFMEAS3	
&DIFMEAS4	
&DIFMEAS5	
&DIFMEAS6	
&DIFMEAS7	
&DIFMEAS8	

&DIFMEAS9	
&DIFMEAS10	

IF CFL_FLAG = 1, else skip to SAT 1

A33. When the CFLs were installed, what kind of lamp did you replace: incandescent or CFLs?

[ALLOW MULTIPLES]

1	Incandescent	A21
2	CFLs	A21
3	HID	A21
4	Mercury vapor	A21
5	Other [SPECIFY}	A21
88	Refused	A21
99	Don't Know	A21

A21. Were all <&M1/COUNTi> installed or were some of them placed in storage for later use?

1	All installed	A22
2	Some installed	A22
2	Some in storage	A22
3	All in storage	A22
88	Refused	A22
99	Don't Know	A22

IF A21 = 2

A22.   How many of <COUNTi> were installed?

A23. Why were they put in storage?

Ask for each Measure, repeat up to 3 measures:

SAT1. How satisfied have you been with the performance of the <&MEASn>. Would you say you are:

1	Very Satisfied	RET20
2	Somewhat Satisfied	RET20
3	Not at All Satisfied	RET20
88	Refused	RET20
99	Don't Know	RET20

If SAT1 = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

RET20. Have any of those <&Mn> <&MEASn> failed or been removed?

1	Yes	RET60
2	No	A25
88	Refused	A25
99	Don't Know	A25

DISPLAY THE TOTAL COUNT to aid interviewer. MAY NEED DIFFERENT TEXT IF QUANTITY = 1.

[READ:]Let's distinguish between equipment that has failed versus been removed for other reasons.

RET60. Overall, how many of the <&M1> <&MEASn> that were installed have FAILED ?

> **IF NEEDED**: If the CFL doesn't allow the lights to switch on, then it has failed. If it fails and it is replaced by something else, then it is still considered a failure.

0	None	RET70
HGONE	Enter number, from 1 to <COUNTi>	RET62
87	Answer as a percentage of <COUNTi>	RET62
88	Refused	RET70
99	Don't Know	RET70

IF MEASURE = CFL

RET62. Did you replace any of the failed CFLs?

1	Yes	RET64
2	No	RET70
88	Refused	RET70
99	Don't Know	RET70

IF MEASURE = CFL

RET64. Were they replaced with … [READ LIST]?

1	Incandescent bulbs	RET70
2	CFLs	RET70
3	Other – Specify	RET70
99	Don't Know/Unable to determine	RET70

RET70. Overall, how many of the <&M1> <&MEASn> that were installed have been removed for reasons other than the equipment failed?

> **IF NEEDED**: A lamp has been **removed** if it was taken out of its original location when it was still functional (for example: taking out a light during a remodel).

0	None	A25
HGONE	Enter number, from 1 to <COUNTi>	RET80d
87	Answer as a percentage of <COUNTi>	RET80d
88	Refused	A25
99	Don't Know	A25

RET80d. And can you recall why they were removed? Was it… [READ LIST]?

1	The color of the light	RET82
2	The brightness of the light	RET82
3	Savings not worth the effort	RET82
4	Remodeling disabled the installation	RET82
5	Type of business changed	RET82
6	Moved	RET82
7	Equipment upgrade	RET82
8	Other – RECORD VERBATIM	RET82
99	Don't Know/Unable to determine	RET82

IF MEASURE = CFL

RET82. Did you replace any of the removed CFLs?

1	Yes	RET84
2	No	A25
88	Refused	A25
99	Don't Know	A25

IF MEASURE = CFL

RET84. Were they replaced with …[READ LIST]?

1	Incandescent bulbs	A25
2	CFLs	A25
3	Other - SPECIFY	A25
99	Don't Know/Unable to determine	A25

PROGRAM AWARENESS AND PARTICIPATION

Let's talk about your decision to participate in the program.

A25. How did you first become aware of the Small Business Energy Efficiency program?

1	From the technician that did the audit	A30
2	Other businesses / word of mouth	A30
3	Other - SPECIFY	A30
99	Don't Know/Unable to determine	A30

A30. Besides the Small Business Energy Efficiency program, are you aware of OTHER programs or resources provided by SDG&E that are designed to promote energy efficiency for businesses like yours: [IF YES] What types of programs can you recall? [RECORD ALL MENTIONS]

1	Express Efficiency	A45
2	Business energy audits	A45
3	Rebate (unspecified)	A45
4	No, not aware of any programs	A45
77	Other programs (SPECIFY) _____	A45
88	Refused	A45
99	Don't know	A45

A45. Why did your company participate in the Small Business Energy Efficiency program? [DO NOT READ CATEGORIES; ACCEPT MULTIPLE S]

1	Acquiring the latest technology	PE11
2	Saving money on electric bills	PE11
3	To receive free lighting and other equipment	PE11
4	Replacing old or broken equipment	PE11
5	Because the program was sponsored by SDG&E	PE11
6	Energy crisis	PE11
7	Helping protect the environment	PE11
8	Previous experience with other SDG&E programs	PE11
9	Recommended by utility account reps	PE11
10	Recommended by contractors	PE11
11	Participation in previous years	PE11
12	Part of a broader facility remodeling/renovation	PE11
13	To understand more about how energy costs are determined	PE11
14	To learn more about ways to reduce energy costs	PE11
15	Recommended by neighboring business or friend	PE11
16	A competing business participated	PE11
77	Other (SPECIFY) _____	PE11
88	Refused	PE11

99	Don't know	PE11

PROGRAM EFFECTS

Now we would like to ask you some questions about your program experience.

PE11. Are you more or less likely to install energy-efficient products as a result of your experience with the program?

1	More likely	PE12
2	Less likely	PE13
3	Same	PE13
99	DK	PE13

IF PE11 = 1

PE12. What energy efficiency equipment are you more likely to install?

IF CFL_FLAG = 1

PE13. When your CFLs burn out or fail, will you replace them with CFLs or incandescent lamps?

1	CFLs	PE14
2	Incandescent	CON1
3	Both	CON1
4	Other	CON1
99	DK	CON1

PE14. What if SDG&E did not pay for any of the cost to install the CFLs? Would you still install CFLs?

1	Yes	PE15
2	No	PE15
99	DK	PE15

IF PE13 = 1

PE15. How much did the program influence your plans to use CFLs in the future? Was the program VERY, SOMEWHAT, or NOT AT ALL influential

1	VERY influential	CON1
2	SOMEWHAT influential	CON1
3	NOT AT ALL influential	PE15A

99	DK		CON1

IF PE15 = 3

PE15A. Why do you say that?

CON1. During the audit, you were given additional low cost and no cost suggestions for additional energy conservation and savings [IF NEEDED: such as routinely turning off lights or setting the thermostat higher when using the air conditioning], which ones did you implement?

1	Turn off office equipment such as PCs, monitors, printers and copiers when not in use.	CON6
2	Set thermostats lower when heating and higher when using the air conditioning	CON6
3	Schedule high electrical energy-use processes during off-peak periods.	CON6
4	Turn off any lights that are not being used, for example, unused offices and conference rooms	CON6
5	Install separate switches for closet and office lights	CON6
6	Replace yellowed diffusers on light fixtures	
7	Install additional energy efficient lighting	CON6
8	Repair broken windows	CON6
9	Caulk and weather-strip doors and windows	CON6
10	Reduce hot water temperature	CON6
11	(If available) Use dimmer switches to lower lights	CON6
12	Set air conditioning thermostats to pre-cool spaces at off-peak times	CON6
13	Establish a system to alert employees of expected high demand days including, but not limited to E-mail, voice mail, or public address announcement to all employees	CON6
14	Turn off your computer if you are out of the office for more than a few minutes	CON6
15	Set computer to low power stand bye mode	CON6
16	Turn off personal appliances, such as coffee pots and radios	CON6
17	Use e-mail to distribute documents instead of faxes and copiers	CON6
18	Wear comfortable business attire. Dress appropriately for warmer temperatures	CON6
19	Trade in photocopiers for smaller, more energy-efficient models	CON6
20	Other (SPECIFY)	CON6
21	None	PE25
22	DK	PE25

CON6. How influential was the technician's recommendations and your experience with the SBEE program in your decision to adopt?

1	VERY influential	PE25

2	SOMEWHAT influential	PE25
3	NOT AT ALL influential	PE25
99	DK	PE25

PE25. In percentage terms, how much do you think your energy bill has been reduced due to the new equipment and energy saving recommendations you received from the program?

1	Percentage	PE30

PE30. Using a scale from 1 to 10, where 1 means you aren't knowledgeable at all, and 10 means you are fully knowledgeable, how knowledgeable are you about energy efficiency products and how they'll perform?

#		PE33

PE33. How about your knowledge BEFORE participating in the SBEE program, using the same scale

#		PE35

PE35. Now I'd like to read a brief series of statements and I'd like you to tell me how well each statement describes your beliefs about energy efficient investments -- or if they even express your beliefs at all. We'll again use a 1-to-10 scale, where 1 means you DISAGREE with the statement, and 10 means you AGREE COMPLETELY with the statement. The first/next one is … [RANDOMIZE, READ AND OBTAIN A RATING FOR EACH. WHEN SEQUENCE COMPLETE, GO TO T5.]

1	When considering a new energy efficiency investment, I am concerned that the actual bill savings will be less than what was estimated.	REB1
2	I don't have the information I need to make an informed decision about energy efficient investments.	REB1
3	There is too much time and hassle involved in selecting a qualified energy efficiency contractor.	REB1
4	Lack of financing is a barrier to our organization making energy efficiency investments that we want to make.	REB1
5	Getting a utility rebate is too much hassle.	REB1
6	I need the owner's consent to make improvements.	REB1
7	I'm not at this location for long	REB1
8	It's not worth investing because it's not my building	REB1
99	DK/Refused	REB1

INFLUENCE

Let's talk about your participation in the program and what influenced you to install high efficiency equipment.

REB1. In deciding to participate in the Small Business Energy Efficiency program, how important was it to you that SDG&E sponsored the program? Would you say it was . . .

1	Very Important	REB2
2	Somewhat Important	REB2
3	Not at all Important	REB2
99	DK	REB2

REB2. The technician provided you information to help you understand energy costs and ways to manage them. How important was this information in helping you decide to install the new equipment provided by the program? Would you say it was?

1	Very Important	REB10
2	Somewhat Important	REB10
3	Not at all Important	REB10
99	DK	REB10

Now we'd like to ask some questions specifically about the {MEAS_DESC} that you installed.

REB10. Before the SDG&E technician visited your facility, were you already considering installing [&MEASn]

1	Yes	REB50
2	No	REB50
88	Ref	REB50
99	DK	REB50

REB50. Regarding the [MEASn], which of the following three statements best describes the actions you would have taken had the Small Business Energy Efficiency program not been available: **:**

1	We would have bought NO equipment	SAT1
2	We would have bought the SAME **energy efficient** equipment	REB55
3	We would have bought standard equipment	SAT1
88	Refused	SAT1
99	Don't know	SAT1

IF REB50 = 2

REB55. When would you have bought [MEAS1] if the program had not provided it:

1	At the same time	REB 65
2	Within a year	REB 65
3	More than a year	REB 60
88	Refused	REB 65
99	Don't know	REB 65

IF REB55 = 3

REB60. How many years would you have waited before buying [MEAS1] if they had not been provided through the program??

1	Number of Years	REB 65
88	Refused	REB 65
99	Don't know	REB 65

REB65. Would you have purchased the same number of [MEAS1] as were installed through the program?

1	Yes, would have installed the same number	SAT1
2	No	SAT1
88	Refused	SAT1
99	Don't know	SAT1

SATISFACTION

We'd like to get a sense of your satisfaction with the program. Please rate your satisfaction with these factors as VERY, SOMEWHAT or NOT AT ALL satisfied.

SAT1	Overall satisfaction with the SBEE program experience	
SAT30	Satisfaction with the **bill savings**	
SAT32	Satisfaction with the audit process	
SAT33	Satisfaction with the equipment installation process	

If rating for SAT32 < SAT33, ask:

SAT34. You gave a lower rating for the audit process than for the installation process, what was it about the audit that caused you to rate it lower?

If rating for SAT33 < SAT32 ask:

SAT35. You gave a lower rating for the installation process than for the audit process, what was it about the installation that caused you to rate it lower?

For any responses that indicate dissatisfaction (Score of 5 or less) ask

SAT44. Why do you say that?

SAT45. Other than what you already mentioned, were you at all dissatisfied with any other aspects of the program?

#		SAT50

SAT50. If yes: why?   [RECORD VERBATIM.]

RENTER BATTERY

R1. How active a role does your business take in making lighting and climate control equipment purchase decisions at this facility?   [READ LIST.

1	Very active	R5
2	Somewhat active	R5
3	Slightly active	R5
4	Not active at all	R5
99	DK/NA/refused	R5

R5. Does your business own or lease the facility?

1	Own	HR025
2	Lease/rent	R10
99	DK/NA/refused	R10

R10. How long is the term of your lease?

1	1 year	R15
2	2 years	R15
3	3 years	R15
4	4 years	R15
5	5 years	R15
6	6 years	R15
7	7 years	R15
8	8 years	R15
9	9 years	R15
10	10 years	R15

11	Greater than 10 years	R15
12	Month to month	R15
13	Other (Specify)	R15
99	DK/Refused	R15

R15. How familiar are you with the terms of your lease regarding energy costs and energy efficiency improvements to the facility you occupy? Would you say you are:

1	Not at all familiar	HR025
2	Somewhat familiar	HR025
3	Very familiar	HR025
99	DK/Refused	HR025

CFL OP HOURS

Now we'd like to talk about the hours that your business is open.

HR025. Are you typically open every day, Monday through Friday?

1	Yes	HR030
2	No	HR026
8	Refused	HR026
9	Don't Know	HR026

HR026. How many days are you closed Monday through Friday

1	1	HR030
2	2	HR030
3	3	HR030
4	4	HR030
5	5	HR030
8	Refused	HR030
9	Don't Know	HR030

HR030. During what weekday hours are your INDOOR LIGHTS currently on?

1	On 24 Hrs	HR040
2	Never On	HR040
3	On part of the day	HR030b
88	Refused	HR040
99	Don't know	HR040

HR030b. Monday through Friday, your indoor lights are on from:

&HR30F	Hours on FROM (use 24 hour format eg 0700)	HR030c
88	Refused	HR040
99	Don't know	HR040

HR030c Monday through Friday, your indoor lights are on until:

&HR30F	Hours on UNTIL (use 24 hour format eg 0700)	HR040
88	Refused	HR040
99	Don't know	HR040

HR040. How about Saturdays?

1	On 24 Hrs	HR050
2	Never on	HR050
3	On part of the day	HR040b
4	Same as weekday lighting schedule	HR050
5	Open by appointment	HR050
88	Refused	HR050
99	Don't know	HR050

HR040b. On Saturday your indoor lights are on from:

&HR40F	Hours on FROM (use 24 hour format eg 0700)	HR040c
88	Refused	HR050
99	Don't know	HR050

HR040c On Saturday your indoor lights are on until:

&HR40F	Hours on UNTIL (use 24 hour format eg 0700)	HR050
88	Refused	HR050
99	Don't know	HR050

HR050. And Sundays?

1	Never On	F1
2	On 24 Hrs	F1
3	On part of the day	HR050b
4	Same as Saturday lighting schedule	F1
5	Same as Weekday lighting schedule	F1

6	Open by appointment	F1
88	Refused	F1
99	Don't know	F1

HR050b. On Sunday your indoor lights are on from:

&HR50F	Hours on FROM (use 24 hour format eg 0700)	HR050c
88	Refused	F1
99	Don't know	F1

HR050c On Sunday your indoor lights are on until:

&HR50T	Hours on UNTIL (use 24 hour format eg 0700)	F1
88	Refused	F1
99	Don't know	F1

FIRMOGRAPHICS

F1. Can you estimate the total square footage of your facility at this [SERV_ADDR] to be …

1	Less than 2,500 square feet	F5
2	2,500 but less than 5,000 square feet	F5
3	5,000 but less than 10,000 square feet	F5
4	10,000 but less than 20,000 square feet	F5
5	20,000 but less than 50,000 square feet	F5
6	50,000 but less than 100,000 square feet	F5
7	Ag/Non-facility – Outdoors	F5
99	Don't know	F5

F5. Which of the following categories describes the number of employees your firm has at this[SERV_ADDR]?

1	1 to 5	F12
2	6 to 10	F12
3	11 to 20	F12
4	21 to 50	F12
5	51 to 100	F12
6	Or, over 100	F12
9	[DO NOT READ:] DK/NA/refused	F12

F12. How long has your business been at this location?

F15. What is the main activity at your business?

1	Office	L5
2	Retail (non-food)	L5
3	College/university	L5
4	School	L5
5	Grocery store	L5
6	Convenience store	L5
7	Restaurant	L5
8	Health care/hospital	L5
9	Hotel or motel	L5
10	Warehouse	L5
11	Personal Service	L5
12	Community Service/Church/Temple/Municipality	L5
13	Industrial Process/Manufacturing/Assembly	L5
14	Condo Assoc/Apartment Mgmt	L5
15	Agriculture	L5
77	Other (SPECIFY)	L5
99	DK/Refused	L5

L5. Is a language other than English spoken at your business?

1	Yes	L10
2	No	F10
88	Refused	F10
99	Don't know	F10

L10. Other than English, what language is primarily spoken at your business? [ACCEPT MULTIPLES]

1	Spanish	F10
2	Chinese	F10
3	Korean	F10
4	Vietnamese	F10
5	Japanese	F10

6	Indian	F10
77	Other (SPECIFY)	F10
88	Refused	F10
99	Don't know	F10

F10. How many locations does your firm have in California?

1	1	
2	2 to 4	
3	5 to 10	
4	11 to 25	
5	Over 25	
9	[DO NOT READ:] DK/NA/refused	

As you may know, the Small Business Energy Efficiency program is an important component of SDG&E's ongoing efforts to save energy and reduce emissions, and your participation is much appreciated. In order to improve this program's performance, SDG&E wants to make an accurate measurement of the energy savings associated with this program by collecting and analyzing information from selected customers.

Based on your answers to the previous questions, you are a perfect candidate for this project. If you agree to participate, Quantum Consulting, on behalf of SDG&E will visit your business and quickly verify the installations of the measures you received through the Small Business Energy Efficiency program are operating. The visit will take less than an hour.

Q11.   Are you interested in participating in this project?
         If no, TNT

Q12.   What is the main business activity at this facility?

SCHEDULING APPOINTMENT

Great, our technician Jerry Middleton will be the person contacting you to schedule an appointment to visit your business.

I5.   Are you the person we should contact to set up the appointment?

1	Yes	I15
2	No	I10
88	Refused	I10
99	DK	I10

I10.   What is the name and phone number of the person we should contact to set up the appointment?

I15.   Our technician will also need to meet a representative of your company at this facility. Do you have the name and the phone number of the manager or facilities staff he should meet at <ADDRESS>?

I20.   Can you give any directions that would help Jerry find your business?

Thank you very much for helping SDG&E to improve its energy saving efforts. If you have any additional questions regarding this effort that I am unable to answer today, please call Jerry Middleton of Quantum Consulting at 1.800.531.0188 or Mary Wold at SDG&E at (858) 636-6838.

SBEE NONPARTICIPANT SURVEY

Q1. Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting on behalf of San Diego Gas and Electric. May I please speak with [&PROGRAM_CONTACT]?

May I please speak with the person at this location who is most knowledgeable about decisions affecting your energy using equipment such as cooling and lighting systems?

1	No, this person no longer works here	Q2
2	No, this person is not available right now	appoint
4	Yes	E1
77	No, Other reason (specify)	T&T
88	Refused	T&T
99	Don't know	T&T

 [IF NEEDED:] This is a fact-finding survey only – we are NOT interested in selling anything, and responses will not be connected with your firm in any way. SDG&E, wants to better understand how businesses think about and manage their energy consumption.

[WHEN CORRECT RESPONDENT IS ON-LINE (REPEAT **AS NEEDED** WHEN CURRENT INDIVIDUAL IS BEST CONTACT):]

Q2. Hello, this is <INTERVIEWER NAME> calling from Quantum Consulting on behalf of SDG&E. I understand you are the person at this location who is most knowledgeable about decisions affecting the energy using equipment, such as cooling and lighting, at this location.

Today we're conducting a very important study on the needs and perceptions of firms like yours, how businesses like yours think about and manage their energy consumption. This survey should take no more than about 10 minutes, and it's an important opportunity to make sure your views are represented. We believe you'll find it quite interesting.

Our records show that the address for this business is [ADDRESS.] Is this correct?

IF NOT CORRECT: Could you please tell me the correct address for this business?

 [IF NEEDED:] Can I confirm that you're responsible for making energy-related decisions for your firm at [ADDRESS]?

[IF NEEDED:] This is a fact-finding survey only – we are NOT interested in selling anything, and responses will not be connected with your firm in any way. SDG&E wants to better understand how businesses think about and manage their energy consumption.

1	Current individual is best contact	E1
2	Transferred to best contact	Repeat Q2 w/best contact

3	Given best contact's name and number	Record for future contact
99	Don't know/refused	Thank & terminate

[IF NEEDED] SDG&E wants to better understand how businesses like yours think about and manage their energy consumption. Your input is very important to the utilities and to them.

77	There is no one here with information on that address/wrong address	T&T
1	Address correct/Continue	E1

HE Equipment

One way that businesses can reduce their energy use is to install more energy efficient equipment. Since one of the factors that influences energy use is the kind of lighting, cooling, and other equipment a business uses, we would now like to ask you about what kinds of equipment purchases you are considering, or have made since January 2002.

E1. What energy-consuming equipment would you consider purchasing if you wanted to save money on your energy bills? (RECORD RESPONSE ORDER)

1	Lighting		**E5**
2	HVAC		**E5**
3	Specific business equipment		**E5**
4	Windows/insulation/doors		**E5**
5	Water heater/Water saving devices		**E5**
6	Refrigeration		**E5**
7	Motors		**E5**

E5. Since January 2002, have you …?

[Provide interviewers with measure descriptions]

1	Replaced incandescent bulbs with Compact fluorescent screw-in or hardwired bulbs?		
2	Replaced long T-12 fluorescent tube fixtures, with slimmer, more energy efficient T8 or T5 fluorescent tube fixtures?		
3	Added Lighting sensors?		
4	Replaced old exit signs with energy efficient LED exit signs?		
88	Refused		E30
99	Don't Know		E30

If E5=1:

CFL1. How many CFLs did you install?

&num	Number		CFL2
88	Refused		CFL2
99	Don't Know		CFL2

CLF2. What percent of the incandescent bulbs at your business did the CFLs replace?

PROBE for customer's best Guess.

&num	Number		Sat1_1
88	Refused		Sat1_1
99	Don't Know		Sat1_1

SAT1_1. How satisfied have you been with the performance of the CFLs. Would you say you are:

1	Very Satisfied	RET20_1
2	Somewhat Satisfied	Sat1_1a
3	Not at All Satisfied	Sat1_1a
88	Refused	RET20_1
99	Don't Know	RET20_1

Sat1_1a. If SAT1 = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

RET20_1. Have any of those CFLs failed or been removed?

1	Yes	RET60_1
2	No	T1/E40
88	Refused	T1/E40
99	Don't Know	T1/E40

DISPLAY THE TOTAL COUNT to aid interviewer. MAY NEED DIFFERENT TEXT IF QUANTITY = 1.

[READ:]Let's distinguish between equipment that has failed versus been removed for other reasons.

RET60_1. Overall, how many of the <&CLF1> CFLs that were installed have FAILED ?

IF NEEDED: If the CFL doesn't allow the lights to switch on, then it has failed. If it fails and it is replaced by something else, then it is still considered a failure.

0	None	RET70_1
HGONE	Enter number, from 1 to <COUNTi>	RET62_1
87	Answer as a percentage of <COUNTi>	RET62_1
88	Refused	RET70_1
99	Don't Know	RET70_1

RET62_1. Did you replace any of the failed CFLs?

1	Yes	RET64_1
2	No	RET70_1
88	Refused	RET70_1
99	Don't Know	RET70_1

RET64_1. Were they replaced with … [READ LIST]?

1	Incandescent bulbs	RET70_1
2	CFLs	RET70_1
3	Other – Specify	RET70_1
99	Don't Know/Unable to determine	RET70_1

RET70_1. Overall, how many of the <&CFL1> CFLs that were installed have been removed for reasons other than the equipment failed?

IF NEEDED: A lamp has been **removed** if it was taken out of its original location when it was still functional (for example: taking out a light during a remodel).

0	None	T1/E40
HGONE	Enter number, from 1 to <COUNTi>	RET80d_1
87	Answer as a percentage of <COUNTi>	RET80d_1
88	Refused	T1/E40
99	Don't Know	T1/E40

RET80d_1. And can you recall why they were removed? Was it… [READ LIST]?

1	The color of the light	RET82_1
2	The brightness of the light	RET82_1
3	Savings not worth the effort	RET82_1
4	Remodeling disabled the installation	RET82_1

5	Type of business changed	RET82_1
6	Moved	RET82_1
7	Equipment upgrade	RET82_1
8	Other – RECORD VERBATIM	RET82_1
99	Don't Know/Unable to determine	RET82_1

RET82_1. Did you replace any of the removed CFLs?

1	Yes	RET84_1
2	No	T1/E40
88	Refused	T1/E40
99	Don't Know	T1/E40

RET84_1. Were they replaced with …[READ LIST]?

1	Incandescent bulbs	T1/E40
2	CFLs	T1/E40
3	Other - SPECIFY	T1/E40
99	Don't Know/Unable to determine	T1/E40

If E5=2:

T1. How many T8 or T5 fluorescent tube fixtures did you install? This would be the entire fixture, not the number of lamps.

&num	Number		**T2**
88	Refused		**T3**
99	Don't Know		**T3**

T2. How many lamps did each fixture have on average?

Choose only 1 through 4, whatever is most predominant.

1	1		**T3**
2	2		**T3**
3	3		**T3**
4	4		**T3**
77	other		**T3**
88	Refused		**T3**
99	Don't Know		**T3**

T3. What percent of the old T-12 fluorescent tube fixtures at your business did you replace with the slimmer T5 or T8 fixtures?

PROBE for customer's best Guess.

&num	Number		Sat1_2
88	Refused		Sat1_2
99	Don't Know		Sat1_2

SAT1_2. How satisfied have you been with the performance of the T8 or T5 fixtures? Would you say you are:

1	Very Satisfied	E40
2	Somewhat Satisfied	Sat1_2a
3	Not at All Satisfied	Sat1_2a
88	Refused	E40
99	Don't Know	E40

If SAT1_2a = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

E30. Have you considered changing lighting in the last 2 years?

1	Yes		**E35**
2	No		**E40**
88	Refused		**E40**
99	Don't Know		**E40**

IF E30=1

E35. Why did you decide not to change your lighting?

1	Not broken		**E40**
2	Too expensive		**E40**
3	Did not find right style		**E40**
99	Don't Know		**E40**

IF E5 = 1,2,3,4 else SKIP TO CON1

E40. Who was most influential in helping you make the decision to change lighting equipment? [Accept multiples]

1	Energy Equipment Contractors and Installers (e.g., lighting, HVAC)	Sat1_3

2	Energy Service Companies, often referred to as ESCOs	Sat1_3
3	Your electric utility (e.g., SDG&E)	Sat1_3
4	Equipment manufacturers	Sat1_3
5	Corporate decision	Sat1_3
6	Corporate management	Sat1_3
7	Made decision on my own	Sat1_3
8	In-house staff	Sat1_3
9	TV/radio/newspaper advertising	Sat1_3
77	Other _____	Sat1_3
99	[DON'T READ] Don't Know/ Refused	Sat1_3

IF E5=3

SAT1_3. How satisfied have you been with the performance of the lighting sensors? Would you say you are:

1	Very Satisfied	Sat1_4
2	Somewhat Satisfied	Sat1_3a
3	Not at All Satisfied	Sat1_3a
88	Refused	Sat1_4
99	Don't Know	Sat1_4

SAT1_3a : If SAT1_3 = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

IF E5=4

SAT1_4. How satisfied have you been with the performance of the LED exit signs? Would you say you are:

1	Very Satisfied	V1
2	Somewhat Satisfied	Sat1_4a
3	Not at All Satisfied	Sat1_4a
88	Refused	V1
99	Don't Know	V1

SAT1_4a : If SAT1_4 = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

V1. Did you use a contractor, engineering firm or other service provider to design or install the new lighting equipment?

1	Contractor	SAT40
2	Engineering firm	CON1
3	Energy services firm	CON1

4	General/other [SPECIFY:} _____	CON1
5	DID NOT USE external service provider	CON1
99	[DO NOT READ:] DK/NA	CON1

SAT40. Overall, how satisfied were you with the equipment installation process? Would you say that you are:

1	Very Satisfied	CON1
2	Somewhat Satisfied	Sat40a
3	Not at All Satisfied	Sat40a
88	Refused	CON1
99	Don't Know	CON1

SAT40a : If SAT40 = 2 or 3 then ask "Why did you say that?" Record answer verbatim.

Conservation

Next, I'm going to ask you about actions that your business may have taken to reduce or manage your energy use.

CON1. Other than installing new equipment, have you taken any energy conservation actions since January 2002 to reduce your overall energy use, such as routinely turning off lights or setting the thermostat higher when using the air conditioning? CON10-P923]

1	Yes	CON5
2	No	R1
88	Refused	R1
99	Don't know	R1

CON5. What energy conservation actions have you taken since January 2002? [SELECT ALL THAT APPLY] [DO NOT READ]

1	Turn off office equipment such as PCs, monitors, printers and copiers when not in not in use, at night and during the weekend	CON20
2	Set thermostats lower when heating and higher when using the air conditioning	CON20
3	Schedule high electrical energy-use processes during off-peak periods where feasible.	CON20
4	Turn off any lights that are not being used, for example, unused offices and conference rooms	CON20

5	Turn down the remaining lighting levels if you can	CON20
6	(If available) Use dimmer switches to lower lights	CON20
7	Set air conditioning thermostats to pre-cool spaces at off-peak times	CON20
8	Establish a system to alert employees of expected high demand days including, but not limited to E-mail, voice mail, or public address announcement to all employees	CON20
9	Reprogram EMS schedule	CON20
10	Turn off your computer if you are out of the office for more than a few minutes	CON20
11	Set computer to low power stand bye mode	CON20
12	Turn off personal appliances, such as coffee pots and radios	CON20
13	Use e-mail to distribute documents instead of faxes and copiers	CON20
14	Make copies double-sided	CON20
15	Wear comfortable business attire. Dress appropriately for warmer temperatures	CON20
16	Run backup generator at times of peak demand	CON20
17	Other (SPECIFY)	CON20

CON20. By roughly how much do you think the conservation actions you've taken have reduced your overall energy usage?

1	0 to 5 percent	CON30
2	6 to 10 percent	CON30
3	11 to 15 percent	CON30
4	16 to 20 percent	CON30
5	21 to 30 percent	CON30
6	More than 30 percent	CON30
88F	Refused	CON30
99	Don't know	CON30

CON30. What were the most important reasons that you took energy conservation actions to reduce your energy use? [ACCEPT MULTIPLES]

1	Lower energy (operating) cost	R1
2	Shift load to off-peak ours	R1
3	Help avoid blackouts	R1
4	None	R1
66	Energy crisis (general, including "civic duty" type responses)	R1
5	Other (Specify) ___	R1
88	Don't Know	R1
99	Proceed to next question	R1

Renter Battery

R1. How active a role does your business take in making lighting and climate control equipment purchase decisions at this facility?   [READ LIST.]

1	Very active – involved in all phases and have veto power	R5
2	Somewhat active – we approve decisions and provide some input And review	R5
3	Slightly active – we have a voice but it's not the dominant voice	R5
4	Not active at all – we're part of a larger firm	R5
5	Or, not active at all – our firm doesn't get involved in these issues	R5
99	DK/NA/refused	R5

R5. Does your business own or lease the facility?

1	Own	A1
2	Lease/rent	R10
99	DK/NA/refused	R10

IF R5 = 2

R10. How long is the term of your lease?

1	1 year	R15
2	2 years	R15
3	3 years	R15
4	4 years	R15
5	5 years	R15
6	6 years	R15
7	7 years	R15
8	8 years	R15
9	9 years	R15
10	10 years	R15
11	Greater than 10 years	R15
12	Month to month	R15
13	Other (Specify)	R15
99	DK/Refused	R15

IF R5 = 2

R15. How familiar are you with the terms of your lease regarding energy costs and energy efficiency improvements to the facility you occupy? Would you say you are:

1	Not at all familiar	A1
2	Somewhat familiar	A1
3	Very familiar	A1
99	DK/Refused	A1

Program Awareness and Participation

A1. Are you aware of SDG&E's Small Business Energy Efficiency program?

1	Yes	A3
2	No	A2
88	Refused	A2
99	Don't know	A2

\

A2. The Small Business Energy Efficiency is a program offered by SDG&E where a utility-affiliated contractor performs an energy audit of your building and then returns at a later date to install energy conservation measures such as high efficiency lighting for free. Before this survey, had you ever heard of SDG&E's Small Business Energy Efficiency Program?

1	Yes	A3
2	No	A5
88	Refused	A5
99	Don't know	A5

A3. Have you ever been approached by a contractor to have an energy audit done in order to participate in this program?

1	Yes	A4
2	No	A5
88	Refused	A5
99	Don't know	A5

If A3 = 1, ask

A4. Why did you choose NOT to have the audit done?

1	Not worth the hassle	A5
2	Did not believe savings claims	A5
3	Did not believe program was really free	A5
4	Did not want business disrupted	A5
5	Do not own building / Don't have authorization to make changes	A5

6	Did not trust auditor	A5
7	Other:_____	A5
88	Refused	A5
99	Don't know	A5

A5. Are you aware of SDG&E's Express Efficiency rebate program?

1	Yes	A15
2	No	A10
88	Refused	A10
99	Don't know	A10

A10. Express Efficiency is a program offered by your utility where business like yours receive a rebate for installing one or more energy-efficient products. Before this survey, had you ever heard of SDG&E's Express Efficiency Program?

1	Yes	A15
2	No	PE15
88	Refused	PE15
99	Don't know	PE15

A15. Since January 2002 did your firm participate in the SDG&E Express Efficiency rebate program at this location?

1	Yes, participated in Express Efficiency as described	PE15
2	Yes, participated in Express Efficiency, but at other location	PE15
3	Yes, participated in [UTILITY] program, but don't recall that as the name	PE15
4	NO, did NOT participate in Express Efficiency program	PE15
5	NO, did NOT receive rebate (but did participate in program)	PE15
77	Other (specify)	PE15
88	Refused	PE15
99	Don't know	PE15

PROGRAM EFFECTS

Next, I'd like to ask you about your knowledge and attitudes toward on energy efficiency and various sources of energy efficiency information.

PE15. How likely will you be to actively consider energy-efficient products when installing or replacing energy-using products for your business in the future? Please give me a rating from 1 to 10, where 10 means you're EXTREMELY likely to consider energy-using products.

#		PE30/PE12

IF PE11 = 1 0

PE12. What energy efficiency equipment are you more likely to install?

PE30. Using a scale from 1 to 10, where 1 means you aren't knowledgeable at all, and 10 means you are fully knowledgeable, please rate how knowledgeable you feel that you are about what energy efficiency products are available, and how they'll perform?

#		PE35

PE35. Now I'd like to read a brief series of statements and I'd like you to tell me how well each statement describes your beliefs about energy efficient investments -- or if they even express your beliefs at all. We'll again use a 1-to-10 scale, where 1 means you DISAGREE with the statement, and 10 means you AGREE COMPLETELY with the statement. The first/next one is … [RANDOMIZE, READ AND OBTAIN A RATING FOR EACH. WHEN SEQUENCE COMPLETE, GO TO T5.]

[T1-P923]

1	When considering a new energy efficiency investment, I am concerned that the actual bill savings will be less than what was estimated.	PE40
2	I don't have the information I need to make an informed decision about energy efficient investments.	PE40
3	There is too much time and hassle involved in selecting a qualified energy efficiency contractor.	PE40
4	Lack of financing is a barrier to our organization making energy efficiency investments that we want to make.	PE40
5	Getting a utility rebate is too much hassle.	PE40
8	It's not worth investing because it's not my building	PE40
99	DK/Refused	PE40

PE40. Information on energy efficiency can come from a number of different sources. How would you prefer to receive energy-related information? Please rate the following sources on a 1 to 10 scale, where 1 means NOT DESIRABLE and 10 means HIGHLY DESIRABLE.

#	Internet	PE50

#	Directly from contractor	PE50
#	At a community event or trade organization meeting	PE50
#	As part of an audit recommendation	PE50
#	Printed materials from [UTILITY]	PE50

PE50. Now I'd like you to indicate the likelihood of the following statements using a 1 to 10 scale, where 1 means EXTREMELY UNLIKELY and 10 means you EXTREMELY LIKELY. Using this scale, please indicate the likelihood of installing energy efficient lighting at your business under the following conditions. [OBTAIN RATING FOR EACH]

#	In the next year, my business will hire a lighting contractor to install energy efficient lighting	F1
#	My business will install energy efficiency lighting if a contractor approaches my business and offers to do the installation at a discounted price through an SDG&E rebate program.	F1
#	My business will install energy efficiency lighting if an SDG&E-affiliated contractor approaches me and offers to do the installation for free.	F1

Firmographics

F1. Can you estimate the total indoor square footage of your facility at this location to be …?

1	Less than 2,500 square feet	F5
2	2,500 but less than 5,000 square feet	F5
3	5,000 but less than 10,000 square feet	F5
4	10,000 but less than 20,000 square feet	F5
5	20,000 but less than 50,000 square feet	F5
6	50,000 but less than 100,000 square feet	F5
7	Ag/Non-facility – Outdoors	F5
99	Don't know	F5

F5. Which of the following categories describes the number of employees your firm has at this location?

1	1 to 5	F10
2	6 to 10	F10
3	11 to 20	F10
4	21 to 50	F10
5	51 to 100	F10
6	Or, over 100	F10

9	[DO NOT READ:] DK/NA/refused	F10

F10. How many locations does your firm have?

1	1	F12
2	2 to 4	F12
3	5 to 10	F12
4	11 to 25	F12
5	Over 25	F12
9	[DO NOT READ:] DK/NA/refused	F12

F12. How long has your business been at this location?

F15. What is the main activity at your business?

1	Office	L5
2	Retail (non-food)	L5
3	College/university	L5
4	School	L5
5	Grocery store	L5
6	Convenience store	L5
7	Restaurant	L5
8	Health care/hospital	L5
9	Hotel or motel	L5
10	Warehouse	L5
11	Personal Service	L5
12	Community Service/Church/Temple/Municipality	L5
13	Industrial Process/Manufacturing/Assembly	L5
14	Condo Assoc/Apartment Mgmt	L5
77	Other (SPECIFY)	L5
99	DK/Refused	L5

L5. Is a language other than English spoken at your business?

1	Yes	L10
2	No	END
88	Refused	END
99	Don't know	END

L10. Other than English, what language is primarily spoken at your business? [ACCEPT MULTIPLES]

1	Spanish	END
2	Chinese	END
3	Korean	END
4	Vietnamese	END
5	Japanese	END
6	Indian	END
77	Other (SPECIFY)	END
88	Refused	END
99	Don't know	END