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

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Final Report

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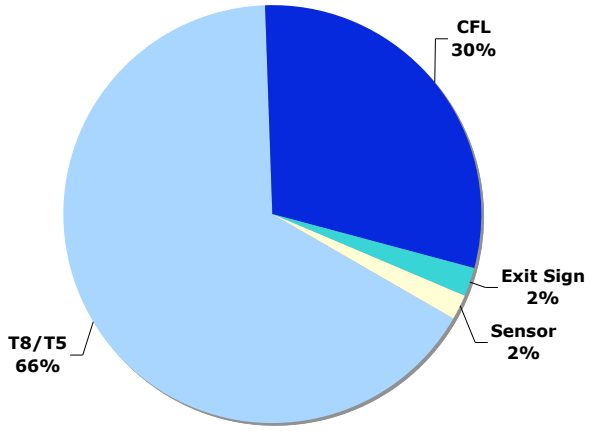
EXECUTIVE SUMMARY

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.

[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 net impacts

estimated in this evaluation are 52 percent of the original *ex ante* gross 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* net savings, while Table ES-4 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 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.