Energy and Demand Impacts Associated with a Partnership-Based Efficiency Program: Evaluation of the San Francisco Peak Energy Program (SFPEP)

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ABSTRACT

This paper details the effectiveness of a unique approach to achieving demand reduction goals in a geographically constrained area. The San Francisco Peak Energy Program (SFPEP) grew out of the need to reduce the electricity peak within the City of San Francisco. Aging power plants within the city slated for closure, along with transmission constraints, motivated the city to partner with PG&E to offer a program designed to reduce both summer and winter peak demand. Some of PG&E's existing statewide programs were modified to specifically fit the winter peaking needs of SFPEP. The resulting partnership included a portfolio of program elements aimed at both the *large commercial* sector – where most of the savings were expected to come from – and, several *hard-to-reach* market segments, including multi-family and single family housing, and a diverse small business base.

The energy and demand impacts of the partnership between PG&E and the San Francisco Office of Environment (SFE) were examined for four program elements. The evaluation employed end-use metering, on-site verifications, and participant telephone surveys to determine if adjustments to database-tracked energy and demand savings were required. The paper presents the analytic methods applied to the program data collected from the partners (SFE and PG&E), the participants, and the delivery contractors to produce ex-post adjustments to ex-ante savings estimates. Required adjustments at the unit level were then rolled up to the program level, and overall energy and demand savings estimated. An example of the analysis is provided for key measures in the Cash Rebates for Business and other program elements. A summary of the effects of these adjustments on peak demand reductions for the program provided.

While the stated summer and winter demand reduction target was a minimum 16 MW gross demand reduction, evaluation, measurement and verification (EM&V) activities indicate that about 71% of that goal was achieved in the summer, and about 76% in the winter – for the 2004 program year. However, several measures and community outreach efforts showed promise for future success. Two energy efficiency measures contributed particularly to the higher winter peak reductions. These were adjustable speed drives on HVAC equipment in the commercial sector and torchieres for residential lighting, both of which showed greater peak reduction coincident with the winter peak, than with summer peak. The use of occupancy sensors in parking garages also showed promise for future demand reductions in San Francisco.

Introduction

This paper highlights the findings and recommendations from an evaluation of a city-utility partnership in California. Both summer and winter peak energy resources are needed in San Francisco, due to the unique nature of loads within the city that cause winter peaks of similar magnitude to summer peaks. Thus, PEP has additional economic justification for measure savings beyond statewide programs that have a summer peak-only focus.

The SFPEP program evolved when PG&E together with SFE presented to the CPUC a proposal for the *San Francisco Energy Efficiency Pilot Program*. PG&E and SFE developed a program plan, and it was approved as SFPEP in October 2003. Updated energy savings targets were filed by PG&E in November of that year. SFPEP was formally rolled out in December 2003 at City Hall by the Mayor of San Francisco and the CEO of PG&E.

The primary goal of the program was to achieve peak load reduction coincident with the city's summer daytime peak and to achieve similar reductions in winter evening peaks *by 2005*. It was determined that for the City of San Francisco, the peak periods for program purposes would be as follows: 5-7 PM for winter, and 1-3 PM for summer. [1]

Demand-side resource potential was previously analyzed in the Electricity Resource Plan (ERP) conducted by the City of San Francisco.[2] The program had savings goals of 21.3 MW gross peak reduction in the summer and 16.1 MW during the winter peak, with the majority of the potential in the commercial sector.[3]

During the fall of 2004, a decision was reached to extend the program past the scheduled December 31 deadline. An extension was granted through February 2005, and a significant push was made to get eligible measures installed between December and February. This push resulted in a particularly high uptake in the installation of refrigeration measures as part of the Cash Rebates for Business program element. For the purposes of this evaluation, the program was closed February 28, 2005.[4]

The *primary objective* of the *impact evaluation* was to develop adjusted, reliable ex-post estimates of summer and winter peak energy savings. Program tracking records (ex-ante savings) were based on summer coincident peak savings only. The evaluation team thus measured winter load reductions for key measures, and provide and adjusted ex-ante numbers appropriately for coincidence with the winter peak that occurs in San Francisco. A *process evaluation* assessed the overall effectiveness of the SFE/PG&E partnership with respect to the statewide program approach, and reviewed implementation effectiveness of the five major program elements, using in-depth interviews, participant surveys, and data review to develop recommendations for program improvement. That effort is documented in a separate paper.

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[1] The project advisory committee (PAC) agreed that the longer summer peak period defined in many of PG&E's commercial rates were not directly applicable to the SFPEP program. Those rates did not include a winter peak period, and the summer period in the City encompassed a tighter daily period.

[2] *Choosing San Francisco's Energy Future*, San Francisco Public Utilities Commission, revised December 2002.

[3] Gross targets were developed jointly by SFE and PG&E. SFE is interested primarily in gross demand reductions in the City, regardless of whether they are savings net of free riders – due to nature of the target for reducing peak demand in the city in order to close the Potrero and Hunters Point power plants.

[4] It is the understanding of the evaluation team that 'bridge' funding was extended by PG&E through 2005 to support SFE's efforts to continue energy conservation and demand reduction efforts in the city that rely on the infrastructure and staffing developed for SFPEP.

Methodology

The impact evaluation was focused on four key program elements: Cash Rebates for Business (CRB), Standard Performance Contract (SPC), Single Family Direct Install (SF), and Multi-Family Rebate (MF).[5]

The evaluation method relied on developing program-specific adjustments to the ex-ante savings values. The approach is similar to the IPMVP Option A: *Partially Measured Retrofit Isolation*, in that it used partial short-term field measurement of energy use to verify or adjust ex-ante energy and demand savings estimates for measures installed. Some performance parameters were stipulated or based on secondary data. Engineering adjustments were made to specific measure savings and extrapolated to the population of installed measures for the program element. The review of program savings involved the following steps:

- Review of program participation data.
- Review of savings calculation methods and assumptions as contained in program documentation (PG&E Application Workpapers, PIP, and participation records) and reference sources (e.g., DEER database, statewide studies).
- Reconciliation of the savings calculation methods/assumptions with program savings estimates.
- Compilation of participation data and verification of methods and assumptions in a database.
- Identification of measure performance variables for supplemental analysis.
- Conducting on-site verification inspections and data collection.
- Conducting supplemental analyses of key variables as required to provide additional resolution in savings estimates (some of these data were developed through the participant survey conducted as part of the process evaluation).
- Developing adjustments to savings calculation methods based on analysis, including adjustments to measure counts, hours of operation, and coincidence with peak.
- Re-calculation of program savings by measure type, and market segment.
- Comparison of results with ex-ante savings values and recommending adjustments as necessary.

On-site data collection activities were used to verify measure installations and supplement the existing program tracking datasets and monthly reports. The on-site verification work also was used to confirm selected variables used in the savings calculation process.

An initial review of program participation revealed that the largest fraction of participation savings in the CRB program element were from lighting measures. Thus, the evaluation focused in-field data collection for CRB on confirming lighting performance variables, specifically through lighting run-time hour data logging. For the SPC program element, a high proportion of savings were attributed to HVAC and refrigeration measures.

[5] The programs elements are described in detail in *San Francisco Peak Energy Pilot Program 2003-2004 Energy Efficiency Programs R. 01-08-028 Implementation Plan - Attachment B*

On-Site Sampling Plans

The final sample sizes for each program element were based on the statistical requirements of the project and participant populations. Data logging was performed at a subset of the sites, with loggers remaining in place for a minimum of 3 weeks during the winter peak period, and again for 3-4 weeks during summer peak.

A portion of the on-site participants were also surveyed as part of the participant telephone survey. This *nested sample* was to be used to adjust ex-post savings estimates if a statistical correlation between the site-collected data and the phone data for the sample justified such an adjustment. This correlation turned out to only exist for runtime hours for business lighting measures in the CRB program.

The sample of CRB participants who received data logging was defined by the type of measure, the number of distinct measure types installed at a facility, and the participant business sector. Program records indicated that 71 different measures contributed to program savings, while 5 measures accounted for 75% of program savings.[6] Data logging efforts focused on two of these ubiquitous measures: high efficiency 4 ft T8 lamps and occupancy sensors on lighting fixtures. The occupancy sensors contributed 18% of CRB ex-ante savings estimates, and over half of all occupancy sensors installed occurred in parking garages, an application different from the office locations assumed in the utility workpapers and program records. The sample was refined to allow for representation of all business sectors participating in the CRB Program. Within each business sector, candidate sites were selected at random. This sample ensured that the largest contributors to program savings received a share of the analysis effort proportional to their contribution to overall program savings. Table 1 provides the summary of the ex-ante (recorded net) CRB program savings, by sector, and the resulting summer and winter sample of sites receiving data loggers.

Table 1. Distribution of Savings by Business Segment Used for Data Logging

Business Segment	Recorded Net kW Savings (Program records)	Percent of kW Savings	Recorded Net kWh Savings (Program records)	Percent of kWh Savings	Winter Logged Sites with Clean Data	Summer Logged Sites with Clean Data
Grocery	936	14%	8,098,008	21%	4	4
Hotel & Restaurants	1,271	18%	9,491,023	25%	9	5
Offices	2,934	43%	11,203,917	29%	10	13
All Others	1,062	15%	5,740,562	15%	16	12
Retail	676	10%	3,688,576	10%	8	6
Total	**6,880**	**100%**	**38,222,086**	**100%**	**47**	**40**

Verification of measure installation occurred at 182 participant business locations (in addition to the 50 sites receiving data logging plus verification). As with data logged sites, sites where verification visits occurred were based on business segment participation as defined by

[6] The other measures that made significant contributions to CRB savings were: strip curtains for walk-in coolers (18% of program savings), LED exit signs (4%), and door gaskets for walk-in coolers (2%).

NAICS codes. Table 2 shows how the 732 unique entities[7] that participated in the CRB Program were segmented into the 6 general business segments defined by the program, and the number of site verifications that occurred in each business segment. Specific sites were selected within each sector at random. A*ll measures* present at a chosen site were verified, including measures representing multiple applications submitted for that site.

Table 2. Distribution of Participants by Business Segment for On-Site Verifications

Business Segment	Participant Population	Percent of Population	Verification Only On-Sites
Offices	85	12%	22
Retail	132	18%	33
Hotels	40	5%	9
Restaurants	92	13%	24
Grocery	111	15%	27
All Others	272	37%	67
Total	**732**	**100%**	**182**

Data Collection Procedures

The on-site verification process involved on-site observation of installed measures and collection of key energy performance variables. In addition, selected end-use monitoring was employed for a sample of Cash Rebate for Business, SPC, and Torchiere Exchange customers. For measures that were listed in the database but not present onsite, efforts were made to determine if they were ever present, or the removal date and reason. The recording of measure information occurred on data collection instruments that included the following parameters:

- Presence and appropriate installation of the measures installed
- Quantity of measures installed
- Capacity of measures installed (e.g., amps, watts, tons)
- Daily operating schedules, seasonal variations in schedules, and control strategies
- A limited set of behavior and demographic questions.

For CRB projects, runtime-hour data logging was performed on lighting installations. The project team utilized portable battery operated HOBO on/off data loggers. The CRB lighting installation on/off data allowed the team to determine runtime profiles and annual operating hours for the lighting systems, by market segments analyzed. These data were used to determine the annual kWh energy savings of lighting measures installed under the program. For SPC projects where the team monitored demand and energy consumption on various HVAC VSD motor applications, the team used DENT power loggers.

Data logging for CRB and Torchiere installations occurred over two separate intervals: winter peak and summer peak. Roughly 80% of the sites logged in the winter were also logged in the summer. Where the same site was monitored for both periods, the same load was metered

[7] Based on program records received from PG&E in December 2004. Metering was initiated before final program records (through Feb 2005) were available.

(lighting circuit, etc.). The overlap between winter and summer data logging was not 100% because CRB and torchiere samples were adjusted in the summer to better reflect additional program data available through the end of the program. For SPC sites, all measures and sites logged in winter were identical to those logged during the summer period.

Data loggers were set at the time of the verification inspection and left in place for a minimum of three weeks for both summer and winter periods. Loggers were located to capture runtime hours for typical equipment in representative space-use types (e.g., office, restroom, conference room) or use (HVAC distribution fan, chilled water pump, etc.) in each building.

Data Analysis Procedures

Upon retrieval of the HOBO data loggers, data were downloaded and saved while still in the field. During the download process, each logger identification number was entered into a separate spreadsheet and verified against records established at the time the logger was initially placed. These data included the associated property name, location, market sector, measure code, space type, and the status of the data.

The data for each site were reviewed for gross errors.[8] Each of the HOBO data files with clean data was exported into Excel. The exported data yielded an hour-by-hour summary of the percent of time the light was "on" for both winter and summer activity. Once in Excel the data were trimmed and aligned so all data covered the same timeframe and included only full metering days.[9] After this process was completed, each Excel file contained approximately 800-900 data points, and the entire dataset contained approximately 85,000 data points. The various Excel logger files were aggregated into market sectors and each sector was analyzed separately. Then, hour and day type (weekday or weekend day) load shapes were developed for each market sector and for an aggregate program level view. A summary spreadsheet aggregated the data from these multiple market sector files in order to create a program level view.

The following steps were used for the analysis of the DENT logger data for the winter and summer peak period for the SPC Program. At the time of installation, the operation of the logger was verified by reviewing demand and energy readings while the corresponding motor was cycled between minimum and maximum load. We verified 80% of logger operations in this fashion. Upon retrieval of the SPC data loggers, data on the installation of each logger were verified against records established at the time the logger was initially placed. These data included the associated property name, location, market sector, and motor use. The data from each logger were downloaded to DENT software and exported to Excel. The data for each logger were reviewed for gross errors. We experienced only 1 logger failure out of 20 loggers installed. Once in Excel the data were trimmed and aligned so that data from all sites covered the same time frame and included only full metering days. This process yielded a 15-minute interval power profile for each motor logged. The last step involved developing operating profiles for each motor for both the winter and summer logging period and comparing these values with the week day load shapes for each site and an aggregate program level view. The HOBO and DENT loggers were active at the same time, yielding load curves for lighting and motor energy data that are aligned across market sectors and timeframes.

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[8] Errors included inadequate sensitivity to light intensity, such that on/off cycles appeared to not be properly recorded, and failure of datalogger memory.. In the end, data from 19% of the loggers was deemed unacceptable.

[9] The loggers were often launched and installed over the period of several days. Consequently, some of the data at the beginning and end of the logging period could not be used.

To determine if the kW and kWh savings values reconciled correctly with the PG&E workpapers for each measure, the team contacted PG&E program staff to verify calculation methods used in the program database. Workpaper methods were then compared with DEER update values and recent statewide studies for key measures in each sector.[10] As the final summer logger data were being collected, final program records were requested, so that any ex-post adjustments to savings estimates could be applied to the final measure counts associated with each program element (participation through 2/28/05).

One of the issues associated with this evaluation is how to combine the information collected from runtime loggers with the self-reported data from phone surveys and on-site verifications to obtain the most precise (i.e., the lowest variance) estimate of the hours of use for the population. The most direct approach would be to simply apply the results from the runtime loggers to the larger population, since it directly measures the hours of use. In most cases, this is indeed the best approach. However, for the situation where there is a relatively small number of runtime loggers nested in a larger sample of surveyed customers, a more precise approach is to combine the two measurements via a "ratio estimator." The ratio estimator is useful for cases where the ratio between two approaches has a lower variance than the two approaches used singularly. The statistical analysis considered both telephone survey self-reported data and self-reported data gathered during on-site verifications of measure installations.[11]

For most characteristics of an installed measure, the on-site inspection gives a trained, impartial, third party estimate of the characteristics. As such, it is generally assumed to give a value that is closer to the actual value than is found by using customer surveys. For hours of use, however, the on-site inspector does not have the ability to measure this information, and must rely upon the customer's self-reported hours of use. Therefore, comparing the results from the survey and the on-site inspection provides a limited insight into the actual hours of use.[12]

Findings

While the energy efficiency measures that contributed the greatest demand reduction to the SFPEP program were T8 retrofits, both the application of occupancy sensors in parking garages and the use of ASDs on HVAC equipment in office buildings made significant contributions to program goals. The on-site verification inspections of T8 retrofits found slightly more fixtures installed than are reported in the program tracking database for all commercial sectors participating in the CRB program element. However, since these differences were not statistically significant at the 90% level, it was not assumed that this difference applied to the population of participants.

Figure 1 shows the typical load profile for a T8 lighting retrofits installed by the program in the *office* market sector. T8 retrofits in *this market sector* accounted for over 13% of all CRB

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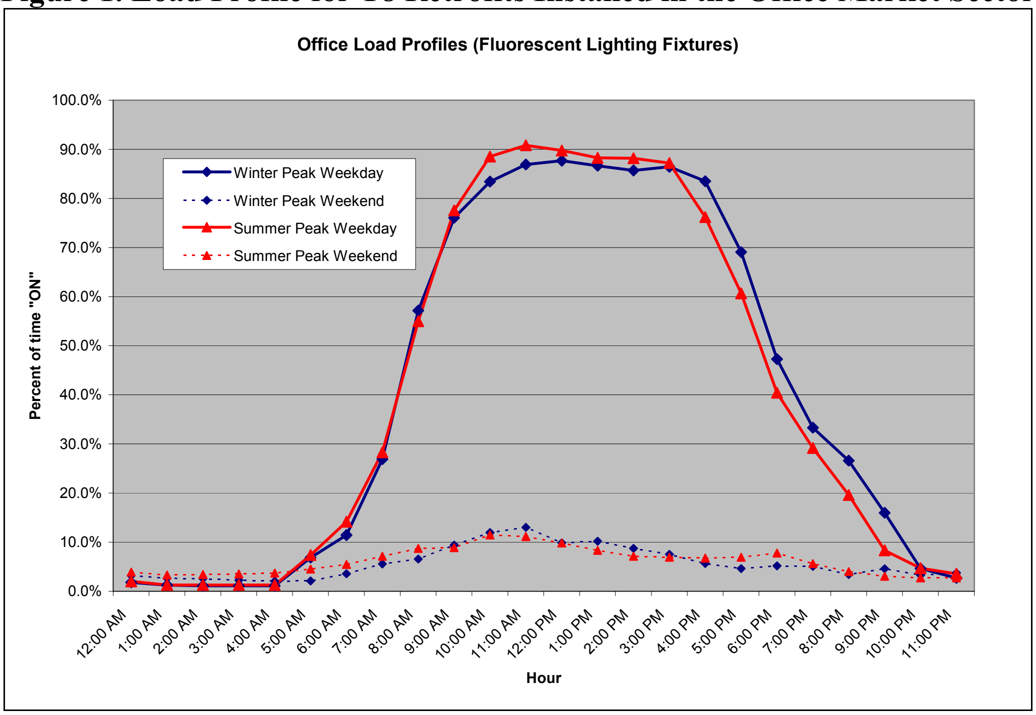
[10] DEER and Measure Cost Study Update Methods and Results, Itron, April 22, 2005.

[11] Detailed discussion of the statistical approach used to develop the ratio estimator are contained in the final report Measurement and Evaluation Study of San Francisco Peak Energy Program (SFPEP) Program Year 2003-2004 Final Report, by Summit Blue Consulting, March 2006.

[12] It is noted that in this evaluation, much more consistent data were gathered during the on-site verification surveys, than during the telephone surveys. One reason for this may be that when a trained individual is onsite, with a clipboard taking notes, the resident or business owner (who has been contacted in advance to schedule the on-site visit), may give more thought to the actual hours of use for the energy efficiency measure (particularly lighting measures), than if the same person responds to a telephone survey, when he or she is most likely answering questions with other issues on his or her mind.

program ex-ante savings. This figure provides the percentage of lighting circuits in the sample of office facilities that were 'on' at any given hour during a typical weekday and weekend day for both the winter and summer periods. This percentage 'on' corresponds to the aggregate demand created by the lighting systems monitored, and serves as a proxy for the demand created by the market sector broader population. This figure shows that the magnitude of the peak demand was similar for both summer and winter periods, and that the magnitude of the weekday peaks was similar for both winter and summer (roughly 90% of fixtures monitored being on during the summer peak period). Note that weekend demand is approximately 10% of weekday demand, and that winter and summer weekend curves overlap almost exactly.

Figure 1. Load Profile for T8 Retrofits Installed in the Office Market Sector



All sectors logged showed that winter peak and summer peak are virtually identical for commercial lighting retrofits, supporting evidence of a winter peak in San Francisco. In this case, the peak is of the same magnitude as a summer peak, and thus program (ex-ante) records based on summer peak coincidence are sufficient to quantify the winter peak effects.

The data gathered from the lighting loggers were then used to verify the annual operating hour assumptions used in the lighting workpaper that are the basis for CRB program ex-ante savings. These data indicate, that in most cases, there are statistically significant differences between the hours of use across market segments, with groceries having the longest hours (4,519), followed by retail (3,443). Note that the results for the "Other" segment has a relatively large distribution which spans the results found for offices, retail, and hotels[13]. The customer self-reported hours of use are very similar to the measured hours of use, with the ratio between the two generally being very close to one. Thus the ratio estimator used to adjust run-time hours had minimal impact on this measure.

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[13] There was only one hotel that had both logger data on T8s and self-reported data, thus there is no distribution associated with the measured hours of use.

After developing these comparisons, the evaluation team reviewed all data sources and developed the recommendations for hours of use to be used *specifically for adjusting the savings associated with 4' T8 lamps in San Francisco*. Recommended values are highlighted in Table 3. Note that in some cases the ratio estimator (calculated as discussed above) values are higher than the PG&E workpaper values, and in other cases lower. In all cases, the values are somewhat lower than the 2005 DEER update values. A couple of notes on these results:

- For the grocery sector, participation in SFPEP (and subsequent EM&V activities) involved stores that on average are much smaller than those in other parts of California. Thus operating hours for the stores tends to be less than for larger stores around the state.
- Similarly, for retail stores, much of the emphasis of the SFPEP program was to reach out to small business owners, who by nature in the urban setting of San Francisco tend to have shorter operating hours than larger retailers located in suburban shopping malls, who may make up a larger portion of the statewide estimates for run-time hours.

Table 3. Recommended Annual Hours of Use [Measure L290: 4' T8 Lamps]

Market Sector	Self-reported hours of use for participants with data loggers	Logger data for participants also self reporting	Self-reported average from verified population	Ratio estimated population hours of use	Logger data for all sector participants	2005 DEER Update Operating Hour Assumptions	PY 2004 / 2005 PG&E Lighting Work paper
Grocery	4,368	4,519	4,886	5,055	4,448	5,824	5,800
Hotel/Restaurant	N/A	N/A	5,200	N/A	5,662	6,776	5,050
Office	2,437	2,429	2,539	2,531	2,510	2,616	4,000
Other	3,285	3,091	3,342	3,145	2,524	3,673	2,537
Retail	3,383	3,443	3,678	3,744	3,820	4,117	4,450

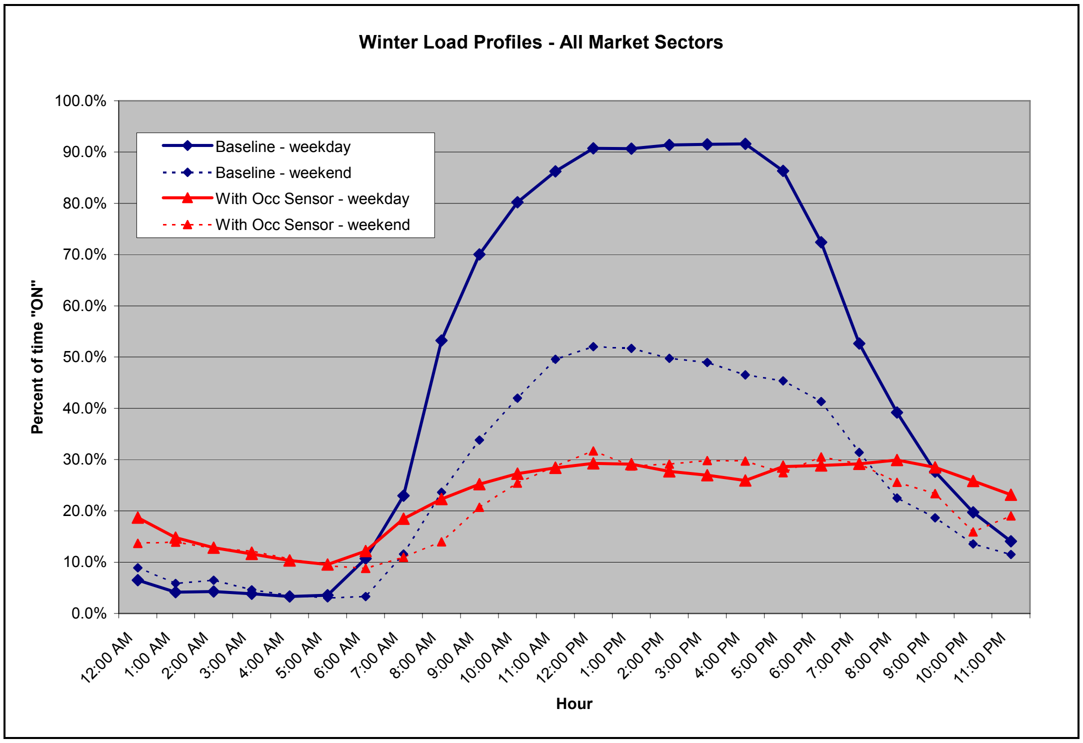
The load shapes and adjusted run-time hours were used to adjust the energy and demand savings associated with this particular measure. A similar analysis employing summer and winter datalogging was used to analyze the other measures in the CRB program element, and in the SPC and Single Family program elements.

Occupancy Sensor Analysis

Figure 2 shows the typical load profile for wall and ceiling mounted occupancy sensors installed across all market sectors. In general, occupancy sensors were placed on light fixtures that had also received an L290 measure retrofit. As such, the 'baseline' lighting run hours applied to the analysis are the same as the run hour estimates developed for L290 measures. This may underestimate baseline usage in garage facilities where many of the loggers were installed. Anecdotal evidence indicates that, at least in the parking garages, the lights may have been left on 24/7 before the installation of occupancy sensors.

Figure 2 provides the percent of lighting circuits in our sample that were 'on' at any given hour during a typical weekday and weekend day for the winter peak period. The percentage 'on' corresponds to the time when an area is occupied (and the lights are on) and represents the aggregate demand created by the lighting systems monitored. Because our sample of participants included over 50% of the sites where this measure was installed, it is likely that this analysis applies to the majority of program participants who installed occupancy sensors.

Figure 2. Load Profile for Occupancy Sensor Installations Across All Market Sectors



Savings from occupancy sensors were achieved in 2 ways. First was the reduction in demand achieved when through the replacement of T12 lamps with T8 lamps. A review of program records indicates that these savings were not recorded in the T8 retrofit measure savings report and accounted for 14 kW in net savings. The second means through which savings were achieved was through the activity of the controllers. These savings totaled approximately 131 kW and are based on the demand reduction that takes place when the base technology, an ES T12 lamp, would be shut off during periods of vacancy. The analysis shows that peak demand was reduced by about 60% during the weekday and 20% on weekends.

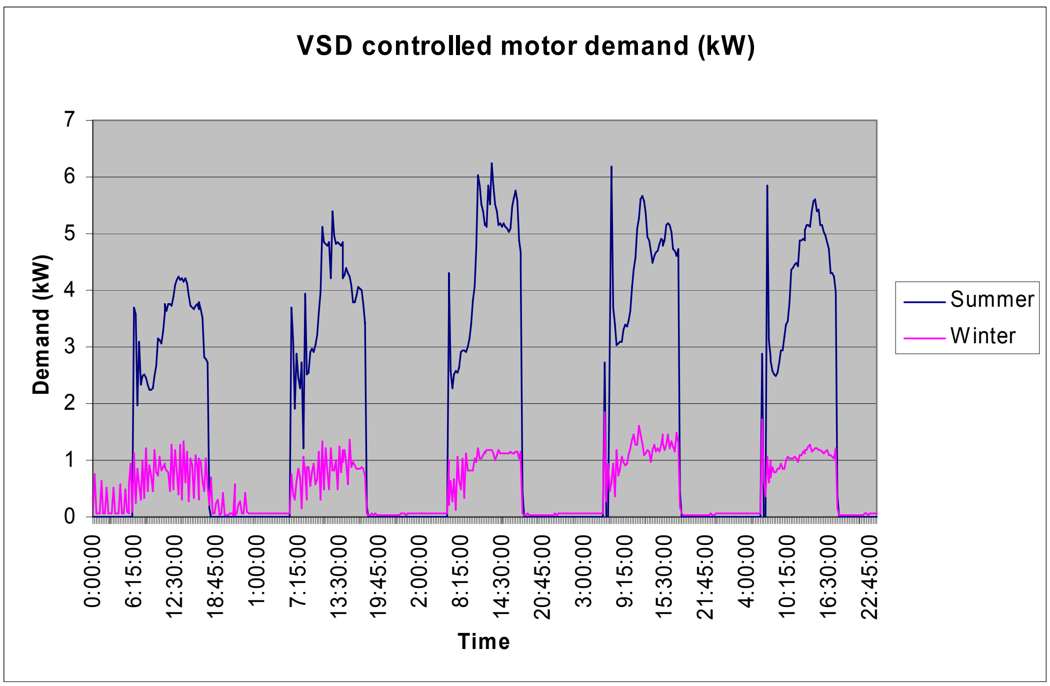
Seasonal Impacts of Adjustable Speed Drives

Adjustable speed drives played an important role in the program savings because of their ability to impact high use motor loads. To illustrate this, Figure 3 provides a load profile for a *typical* motor load for a one-week period for both the winter and summer logging periods. This motor, equipped with an ASD and supporting a chilled water cooling tower fan with a rated demand of 8.6 kW, yielded power and energy saving during both the winter and summer logging periods. This operating profile is typical of ASDs logged during the course of our research. Pre-installation baseline analysis provided by the SPC inspection contractor indicates that this motor operated on a similar load profile both summer and winter.

The data collection activities on adjustable speed drives tended to support the demand savings estimated in the M&V reports. Based on power data logged in the winter and summer, we found the sample generated approximately 106% of the demand savings that program records approved for the summer peak period. Similarly, we found that our sample generated about 96% of demand savings approved by program records for the winter peak period.

In reviewing final post-installation M&V reports for four projects, it was concluded that the ratio of winter to summer demand savings (kW) on process and HVAC ASD installations is 2.2:1. This indicates that using coincident summer peak as a proxy for coincidence with winter peak in San Francisco is not appropriate for this measure. Total SPC adjusted net coincident demand savings attributable to ASD installations are 212 kW in the summer, and 466 kW in the winter. It is important to note that many of the ASD applications studied in this report were also associated with installations of new variable speed chiller applications. These chillers were not addressed in this studied, however it is likely that the chillers delivered similar winter peak demand impacts, and should be the topic of future studies on the impact of variable speed HVAC devices on winter peak demand.

Figure 4. Operating Profile of Typical ASD Data Logger Sample



Similar analyses were applied to other key energy efficiency measures associated with each program element (including torchiere replacements, an activity added to the Single Family program element – that produced greater coincident demand savings in the winter due to the fact that winter peak demand in San Francisco occurs from 5-7PM when it is dark). In addition, review of program records uncovered some discrepancies in the way that refrigeration gaskets and strip curtain savings were estimated (primarily in the recording of linear feet). These discrepancies were corrected in the program records to accurately reflect the appropriate savings calculation method. For each program element appropriate adjustments to ex-ante savings were made to reflect field and survey data collected, or other corrections as noted in the analysis.

Summary

When adjustments were summed across all program elements, the summer and winter demand impacts indicate that the gross demand savings for the SFPEP program were as follows:

Table 4. Comparison of Program Goals, Ex-ante and Ex-post Demand Reduction Values

Program Element	GROSS MW (goals)	GROSS MW (ex-ante)	Summer GROSS MW (ex-post)	Winter GROSS MW (ex-post)	GROSS MWh (ex-ante)	GROSS MWh (ex-post)
Cash Rebates for Business	18.65	7.17	6.60	6.60	39,814	38,025
SPC	2.10	4.26	4.26	4.73	31,336	31,336
Single Family	0.15	0.26	0.29	0.54	2,012	2,277
Multi-Family	0.40	0.24	0.24	0.24	1,832	1,832
TOTAL	**21.32**	**11.93**	**11.40**	**12.11**	**74,994**	**73,470**

Ex-ante savings values are based on program records, and are cumulative through February of 2005 based on recorded measures installed and the workpaper-derived values for measure savings. Ex-ante values did not consider winter peak reductions, but were instead based on the statewide-accepted summer coincident peak values. Both the ex-ante demand reduction estimates and the ex-post numbers indicate the program did not meet its demand reduction goals for all program elements, but that specific measures and outreach approaches were effective at reducing coincident peak demand. By including specific measures that achieved higher coincident peak reduction in winter (specifically ASDs and torchieres), winter demand reductions exceeded summer reductions. Other local government programs that are focused on meeting local resource needs can benefit by looking for similar measures that are specific to their community's specific business and cultural requirements, including recognition of energy usage patterns that vary from system-wide patterns.

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