1994 COMMERCIAL RETROFIT PROGRAM
EVALUATION OF LIGHTING TECHNOLOGIES

FINAL IMPACT EVALUATION REPORT

Submitted to

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Section 1

EXECUTIVE SUMMARY

This section presents a summary of the impact results for the commercial lighting technologies offered under the Pacific Gas & Electric Company (PG&E) 1994 Nonresidential Retrofit Programs. This evaluation covered both indoor and outdoor lighting technologies for the Retrofit Express (RE) and the Customized Incentives (Customized) programs. The results are presented in three sections: evaluation results summary (covering the numerical results of the study), major findings, and major recommendations.

1.1 Evaluation Summary

The evaluation results are summarized in terms of energy savings (MWh), demand savings (kW), and realization rates, the ratio of the evaluation results (ex post) to the program design estimates (ex ante). These results are presented on a gross and net basis (i.e., before and after accounting for free riders and spillover). Exhibit 1-1 presents the gross energy and demand savings results, together with the gross realization rates.

Exhibit 1-1
Summary of GROSS Evaluation Results
Commercial Indoor and Outdoor Lighting Applications

		Gross Impacts			
		Energy		Demand	
Program and Technology Group	**Number of Units Paid**	**(MWh)**	**Realization Rate**	**(kW)**	**Realization Rate**
Indoor Total	**2,826,393**	**277,688**	**0.99**	**62,389**	**1.19**
Outdoor Total	**16,363**	**18,058**	**0.87**	**782**	**6.31**
Indoor and Outdoor Total	**2,842,756**	**295,746**	**0.98**	**63,172**	**1.20**

These results illustrate the following key points about the gross commercial lighting impacts:

- The vast majority of the savings are from indoor lighting applications.

- The ex post gross impacts equaled the ex ante gross estimate for energy, and exceeded it for demand. This is primarily the result of higher operating factors (as determined by field inspections), in conjunction with the inclusion of the HVAC savings due to the more efficient lights, in the ex post impacts.

Exhibits 1-2 and 1-3 present the net energy and demand impact results, together with the net realization rates, at the same levels presented in Exhibit 1-1.

The net ex post energy impacts exceed the net ex ante design estimates by 39 percent for energy, and 73 percent for demand. To a certain extent, these results reflect the high gross realization rates, but they are really driven by the ex ante and ex post net-to-gross (NTG) ratios. The net to gross adjustments apply equally to energy and demand impacts, since they represent behavioral affects on the decision to purchase energy-efficient equipment. Thus the following points apply equally to Exhibits 1-2 and 1-3.

- The ex ante NTG ratio was between 0.70 and 0.77, depending upon the business segment and technology, averaging about 0.76.

- The ex post NTG ratio for combined indoor and outdoor lighting averaged 1.08.

- When 1.08 is divided by 0.77, it results in an average 40 percent increase in realized savings.

- Free ridership rates were low for these programs, contributing a 17 percent overall reduction in energy and demand impacts.

- Participant spillover rates offset the free ridership to a small extent, contributing an average of 3 percent increase in impacts

- Nonparticipant spillover effects were detected in this evaluation, contributing a an average 18 percent increase in estimated savings for the combined indoor and outdoor impacts measured for the combined lighting programs.

Exhibit 1-2
Summary of NET Evaluation ENERGY Results
Commercial Indoor and Outdoor Lighting Applications

Technology Group	Gross	NTG Adjustments			Net	
	Gross Impact	Free Ridership Adjustment (1-FR)	Participant Spillover Adjustment	Nonparticipant Spillover Adjsutment	Net Impact without NP Spillover Adjustment	Net Impact with NP Spillover Adjustment
	(MWh)	(Unitless)	(Unitless)	(Unitless)	(MWh)	(MWh)
Ex Ante						
Indoor Lighting	280,014	0.67	0.10		215,858	
Outdoor Lighting	20,738	0.67	0.10		15,958	
Indoor & Outdoor Lighting	300,752	0.67	0.10		230,783	
Ex Post						
Indoor Lighting	277,688	0.87	0.03	0.18	250,058	300,043
Outdoor Lighting	18,058	0.82	0.06	0.27	15,891	20,745
Indoor & Outdoor Lighting	295,746	0.87	0.03	0.18	267,059	320,778
Realization Rates (ex post/ex ante)						
Indoor Lighting	0.99	NA	NA	NA	1.16	1.39
Outdoor Lighting	0.87	NA	NA	NA	1.00	1.30
Indoor & Outdoor Lighting	0.98	NA	NA	NA	1.16	1.39

Exhibit 1-2 illustrates the following key points about the net commercial lighting energy impact results:

- The ex post net energy impact exceeded the ex ante net impact by 39 percent.
- A significant factor in the high ex post NTG ratio is nonparticipant spillover, which increased the NTG ratio by 18 percentage points. While this spillover effect is documented and believed to be appropriate, net realization rates without nonparticipant spillover are still 1.16.

Exhibit 1-3 presents the net demand savings results, together with the net realization rates, at the same levels presented in Exhibit 1-1.

Exhibit 1-3
Summary of NET Evaluation DEMAND Results
Commercial Indoor and Outdoor Lighting Applications

Technology Group	Gross	NTG Adjustments			Net	
	Gross Impact	Free Ridership Adjustment (1-FR)	Participant Spillover Adjustment	Nonparticipant Spillover Adjsutment	Net Impact without NP Spillover Adjustment	Net Impact with NP Spillover Adjustment
	(kW)	(Unitless)	(Unitless)	(Unitless)	(kW)	(kW)
Ex Ante						
Indoor Lighting	52,416	0.67	0.10		40,351	
Outdoor Lighting	124	0.67	0.10		92	
Indoor & Outdoor Lighting	52,540	0.67	0.10		40,443	
Ex Post						
Indoor Lighting	62,389	0.87	0.03	0.19	56,181	69,000
Outdoor Lighting	782	0.83	0.06	0.27	696	884
Indoor & Outdoor Lighting	63,172	0.87	0.03	0.18	57,044	69,884
Realization Rates (ex post/ex ante)						
Indoor Lighting	1.19	NA	NA	NA	1.39	1.71
Outdoor Lighting	6.31	NA	NA	NA	7.53	9.56
Indoor & Outdoor Lighting	1.20	NA	NA	NA	1.41	1.73

These results illustrate the following key points about the net commercial lighting demand impact results:

- The net ex post energy impacts exceed the net ex ante design estimates 73 percent for demand. Like the energy estimates, a significant factor in the high ex post NTG ratio is nonparticipant spillover, which increased the NTG ratio by 18 percentage points.

- These high savings estimates reflect not only the high NTG ratios, but the conservative ex ante design estimates. The high operating factors that the evaluation identified in the commercial sector, and the inclusion of the HVAC savings in the ex post evaluation impacts, contributed to the high net demand savings.

- The high realization rates for outdoor lighting demand are a result of the on-site inspections identifying outdoor lighting that was operating during the day, and thus on-peak. The ex ante projections assumed very little outdoor fixture on-peak operation, and thus claimed very small on-peak impact. This resulted in division of the small impact found during the evaluation by a very much smaller ex ante value, yielding high realization rates.

Detailed presentation and discussion of this data can be found in *Section 4*.

1.2 Major Findings

The key findings are best summarized as follows:

- Overall, PG&E's ex ante estimates for the commercial lighting technologies paid under the 1994 programs were conservative, resulting in net realization rates exceeding one.

- For many of the business types and technologies, hours of operation and operating factors exceeded the ex ante estimated values by a significant margin. This was the main factor contributing to many high gross realization rates.

- High NTG ratios combined with low program design NTG estimates to significantly increase net realized savings. This finding resulted from relatively low free ridership rates, in conjunction with significant participant and nonparticipant spillover.

- The high participation technologies of T8/electronic ballast, optical reflectors with delamping, and HID replacement of less efficient technologies yielded strong realized savings.

1.3 Major Recommendations

Trade on Established Information in Future Evaluations - This evaluation developed extensive observed and measured operating factor and operating hours information on the highest participation segments. There is no reason to believe that the operating factor and operating hours information developed in this evaluation will change significantly from year to year. QC recommends that PG&E develop an understanding with the California Public Utilities Commission (CPUC) on the validity and use of this information in subsequent evaluations, thus minimizing the need to replicate operating hours and operating factor data for sectors where this information is unlikely to change. This will allow PG&E and the CPUC to maximize return on money invested in future evaluations, resulting in better estimates for sectors that have yet to be definitively documented.

Other detailed recommendations concerning measures offered and the CPUC Protocols are covered in detail in *Section 5*.

Section 2

INTRODUCTION

This report covers the impact evaluation of the commercial lighting technologies offered under the Pacific Gas & Electric Company (PG&E) 1994 Nonresidential Retrofit Programs. These technologies are covered by two separate program options, the Retrofit Express (RE) Program and the Customized Incentive (Customized) Program. These programs are summarized below.

2.1 The Retrofit Express Program

The RE program offered fixed rebates to customers who installed specific gas or electric energy-efficiency equipment in their facilities. The program covered the most common energy saving measures, and spans lighting, air-conditioning, refrigeration, motors, agricultural applications, and food service. Customers were required to submit proof of purchase with these applications, in order to receive rebates. The program was marketed primarily to small- and medium-sized commercial, industrial, and agricultural customers. The maximum rebate amount, including all measure types, was $300,000 per account. No minimum amount was required to qualify for a rebate.

In the lighting end use , the program offered rebates on the following technologies:

- Halogen lamps replacing existing lamps
- Compact fluorescent lamps replacing incandescent lamps
- Compact fluorescent and LED lamps replacing incandescent lamps in exit signs
- Electronic ballasts replacing electromagnetic ballasts
- T8 lamps and electronic ballasts replacing T12 lamps and electromagnetic ballasts in various lengths and configurations
- High-intensity discharge (HID) fixtures replacing incandescent or mercury vapor fixtures
- Installation of occupancy sensors, bypass or delay timers, photocells, and time clock controls for lighting applications

2.2 The Customized Incentives Program

The Customized program offered financial incentives to customers who undertook large or complex projects that save gas or electricity. These customers were required to submit calculations for projected first-year energy savings with their applications and prior to installation of the project. The maximum incentive amount for the Customized program was $500,000 per account, and minimum qualifying incentive was $2,500 per project. The total incentive payment for kW, kWh, and therm savings was limited to 50% of direct project cost for retrofit of existing systems. Since the program also applied to expansion projects, the new systems incentive was limited to 100% of the incremental cost to make new processes or added systems energy efficient. Customers were paid 4 cents per kWh, and 20 cents per therm for first-year annual energy savings. A $200 per peak kW incentive, and a $50 per peak kW early completion (October 31, 1994) bonus for peak demand savings required that savings be achieved during the hours PG&E experiences high power demand.

As a result of program design, many of the measures installed were similar to or the same as those for the RE program, but were installed in larger and more complex projects.

2.3 Evaluation Overview

The impact evaluation described in this report covers all lighting measures installed at commercial accounts, as determined by the program participant database—Management Decision Support System (MDSS)—sector code, which were included under the RE and Customized programs, and for which rebates were paid during calendar year 1994.

The impact evaluation results in both gross and net impacts, and compares these estimates to the program earnings claims[1].

2.3.1 Objectives

The objectives of the evaluation were originally stated in the Request for Proposals (RFP), refined during the project initiation meeting, and documented in the evaluation research plan. These research objectives are as follows:

- Determine first-year gross energy and demand impacts for RE and Customized lighting technologies paid in 1994, by technology and business type, and overall impacts for the commercial sector

[1] PG&E Annual Summary Report on DSM Programs in 1994 and 1995.

- Investigate and explain differences between evaluation and program design estimates
- Assess free ridership rates, and investigate and explain differences between evaluation and program design estimates
- Assess spillover rates, and investigate and explain differences between evaluation and program design estimates
- Provide recommendations to strengthen the realized impact of the RE program
- Create a panel of participants for future monitoring of equipment retention in the commercial sector

This report covers the methodology and the gross and net impacts for the sector, divided into indoor and outdoor lighting effects.

Results are segmented by technology and building type. Technologies are defined by measures offered by the RE and Customized programs. Building segments for the commercial market sector, as defined by PG&E, are office, retail, college and university, schools, grocery, restaurant, health care, hotel / motel, and warehouse.

The difference between gross and net impacts is the behavior that affected customers' participation. Adjustments were made to the gross estimate of savings for customers that would have installed energy-efficient measures anyway, despite the program (free riders), and customers that installed energy efficient measures as a result of the presence of the program, resulting in savings that were beyond the program-related gross savings of the participants (spillover).

The evaluation investigated and, where possible, explains differences between program design estimates and evaluation results. This analysis resulted in recommendations for improving program design estimates (ex ante), which should, in turn, result in post-implementation evaluation savings (ex post) that are closer to ex ante estimated savings.

2.3.2 Timing

The 1994 Commercial Lighting Impact Evaluation began in December 1994, completed the planning stage in March 1995, executed data collection between late May and October 1995, and completed the analysis and reporting phase in January and February 1996. Analysis is based upon the post-installation period from September 1994 through September 1995. The pre-installation period varied depending upon the installation date, but ranges between October 1991 and September 1993.

2.3.3 Role of Protocols

This evaluation was conducted under the rules specified in the "Protocols and Procedures for the Verification of Cost, Benefits, and Shareholder Earnings from Demand Side Management Programs" (the Protocols), as adopted by California Public Utility Commission (CPUC) Decision 93-05-063, Revised January 1995 Pursuant to Decisions 94-10-063, 94-10-059, and 94-12-021. To the extent it was possible during an ongoing evaluation, many of the changes included in CPUC Decision 95-12-054[2] were incorporated into the evaluation.

The Protocols control most aspects of the evaluation. They specify the minimum sample sizes, the required precision, data collection techniques, certain minimum analysis approaches, and formats for documenting and reporting results to the CPUC. This evaluation has endeavored to meet all Protocol requirements, and where possible, enhance evaluation techniques or results to supply added value to the developed estimates.

2.4 Report Layout

This report presents the results of the above evaluation. It is divided into five sections, plus appendices. *Sections 1 and 2* are the *Executive Summary* and the *Introduction*. *Section 3* presents the *Methodology* of the evaluation. It is supported in detail by *Appendices A, B, C*, and *J*. *Section 4* presents detailed results and discussion and is supported by *Appendices K* and *L*. *Section 5* discusses and presents recommendations for improving the evaluation, the program measures, the program tracking, and the CPUC Protocols. The remainder of the appendices document the data collection efforts undertaken during the evaluation.

[2] California Public Utilities Commission Decision 93-05-063, Revised January 1995 Pursuant to Decisions 94-05-063, 94-10-059, 9412-021, and 95-12-054.

Section 3

METHODOLOGY

This methodology section begins with an overview of the evaluation approach. This is followed by a more detailed discussion of the specific engineering, billing regression, and net-to-gross (NTG) analysis approaches used in the evaluation. Additional detail on these three approaches is supplied in *Appendices B*, *C* and *J*, respectively.

3.1 Integrated Evaluation Approach

This overview of the integrated evaluation approach begins by presenting the data sources and sample design approach used for the evaluation of the 1994 Pacific Gas and Electric Company (PG&E) Commercial Lighting Technologies Evaluation. It is followed by an overview of how the engineering, billing, and NTG estimates are used together to derive the gross and net energy and demand impacts.

3.1.1 Existing Data

The PG&E Commercial Lighting Evaluation approach used all the data currently available, in particular PG&E's historical billing data, program participation data, or the Management Decision Support System (MDSS), paper copies of Retrofit Express (RE) and Customized Incentive (Customized) applications, other program-related data, and industry standards information.

- **Program Participant Tracking System** - The participant tracking system data, maintained in the PG&E MDSS, contains program project information, and technical information about measure installation. It also provides expected impact estimates based upon the ex ante engineering algorithms. This information is used to create sample designs for data collection and to leverage calibrated impact estimates from the telephone sample to the entire participant population.

- **Program Marketing Data** - PG&E program marketing data contain detailed descriptions of program marketing and application procedures, together with details on the measures offered. This data source also provides a general description of measures accepted by the program.

- **PG&E Billing Data -** The PG&E nonresidential billing database contains monthly energy-consumption information for all commercial customers in PG&E's service territory. It also contains demographic data for all customers, and the on-peak and off-peak monthly energy usage for customers who receive services on demand or time-of-use (TOU) rates. This information is used to calibrate the engineering estimates to actual pre- and post-installation energy usage.

- **Annual Summary Report on Demand Side Management Programs in 1994 and 1995[1] (Forecast Filing) -** This report documents the ex ante earnings claims, including specific information on the derivation of per-unit ex ante savings estimates and the assumptions that go into those estimates. This documentation often includes assumptions such as operating hours and operating factors, by fixture type. This document supplies the best information available on ex ante estimates and assumptions, thus facilitating knowledge-based comparisons to ex post estimates.
- **Industry Standards/Information -** In order to establish baseline levels and new equipment performance levels, industry standards information from organizations such as the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) and American National Standards Institute (ANSI) was used, together with information from manufacturers.
- **Copies of RE and Customized Paper Application Files -** QC requested and received complete copies of application files for a random 100 RE participants and all Customized participants. The RE files were used to verify the entries in the MDSS electronic files and to identify additional information that could be extracted from the file to improve the analysis. The Customized files were used to classify these participants into categories similar to the RE program, where possible, thus allowing maximum use of the statistical billing regression analysis.

3.1.2 Evaluation Surveys and Metered Data

For lighting in the RE and Customized programs, the impact analysis plan is based upon a nested sample design, with a core of lighting loggered sites supplying calibration for the on-site sample, and the on-site audit sample being leveraged with a larger, less expensive, telephone survey. Data between these samples are leveraged through "overlapping items" between the telephone and on-site instruments. The MDSS database program application information is used to leverage results to the entire participant population. This approach, as shown in Exhibit 3-1, results in the efficient use of all information to contribute to the final impact results[2].

[1] Advice Filing 1800-G-A / 1446-E-A.

[2] For a detailed description of the allocation of each of these sample types by technology and building type refer to Appendix A, pages A-1-A-18.

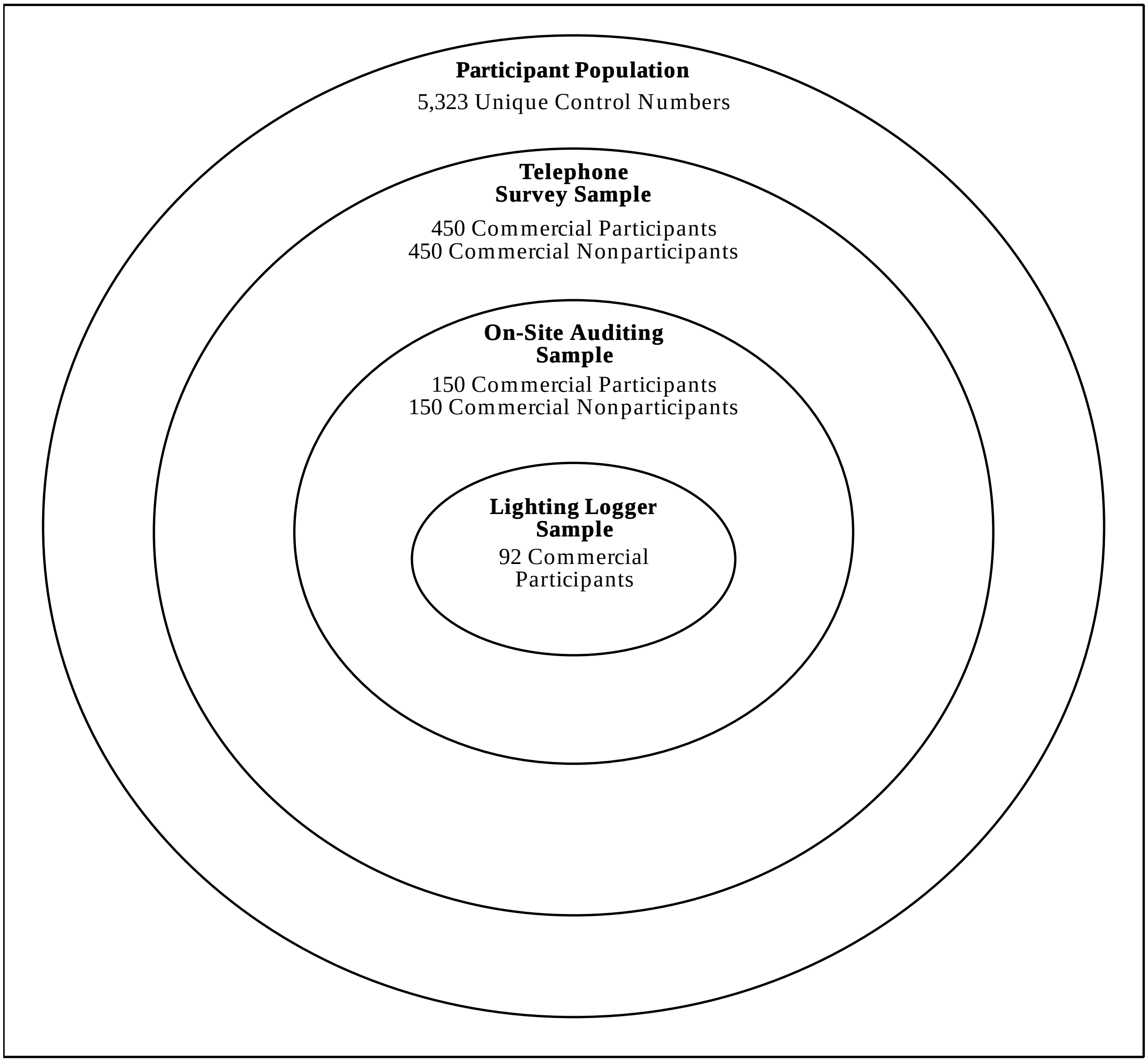
- The lighting logger data (represented by the innermost circle in Exhibit 3-1) supply the most accurate source of data for calibration of the engineering estimates. This metering, which uses lighting loggers, registers the time and date the monitored fixture is turned on or off, for periods up to two months in length. This information allows calibration of self-reported operating schedules collected during the telephone survey. In addition, it supplies operating information related to hours when facilities are closed, which cannot be collected during the on-site audit. When the lighting loggers are placed, one-time fixture operating wattage measurements (spot watt) are taken to confirm power consumption estimates of the operating fixtures. Loggers were placed in 92 commercial sites with an average of 2.60 loggers per site. Loggers were placed in every participant site where on-site inspections were completed and it was practical to place loggers and obtain reliable data.

- A relatively small on-site auditing sample (represented by the band around the innermost circle in Exhibit 3-1), is designed to support the telephone sample for the largest participation segments. This sample contributes equipment details that are site-specific, and better estimates of operating hours, operating factors, equipment efficiency, lamp burn-out rates, missed opportunities, and other technical factors that are difficult to collect over the telephone. The on-site sample itself is not designed to be statistically representative, but rather to support the estimate of detailed engineering parameters collected within the highest projected impact.

- A significantly larger telephone survey sample (represented in Exhibit 3-1 by the second band from the center), is designed to be representative of the participant population in terms of technology and business type. The telephone survey supplies information on participant decision-making, energy-related changes at each site for the billing period covered by the billing analysis, and data for estimating the NTG adjustments. The comparison group telephone surveys supply information on trends in baseline equipment changes, including lighting retrofits outside the program, changes in square footage, and other trends.

- The participant population (represented by the outermost circle in Exhibit 3-1), is based upon information in the MDSS, and provides information needed to generalize estimated per-unit impact estimates for the telephone-surveyed sample to the entire population of program participants. Using the population to leverage impact estimates corrects for potential bias in the sample selection process, especially in terms of the actual distribution of installed measures.

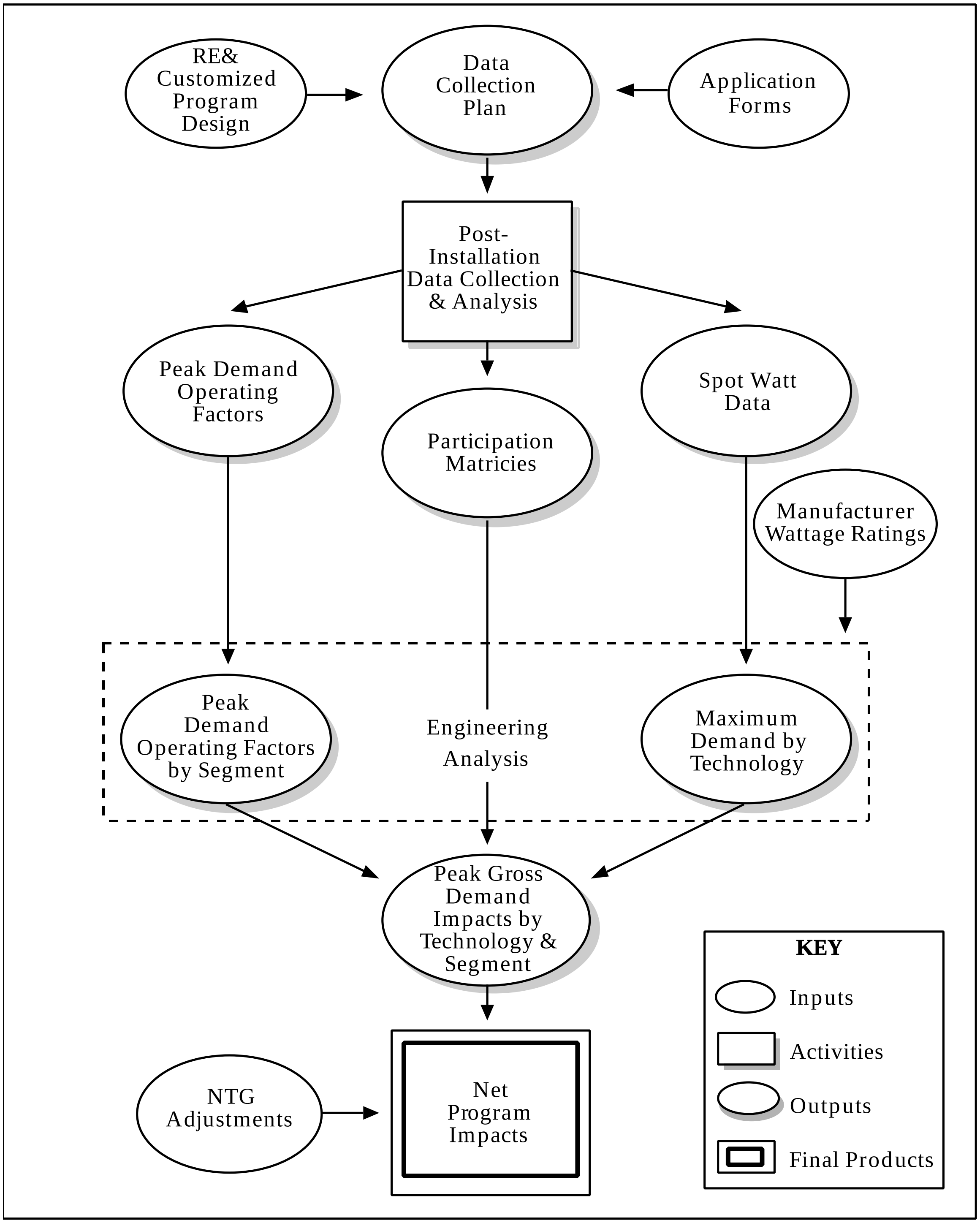
Exhibit 3-1
Nested Sample Design Approach



3.1.3 Demand Estimates

Demand estimates for the 1994 Commercial Lighting Evaluation are based upon engineering models calibrated to on-site data, metered data, and industry standards. As illustrated in Exhibit 3-2, the demand estimate method contains the following elements:

Exhibit 3-2
Method for Estimating Demand Impacts



- The program application and design data are used to create the data collection plan, which guides the data collection efforts of the evaluation (*Appendix A*, pages A1-A18).

- Post-Installation data collection efforts are targeted in a manner to produce the most efficient estimates.

  - The sample design begins with the development of participation matrices that indicate the larger and, therefore, more important segments.

  - Operating factors derived from lighting logger data and weekday operating factors, collected based upon the number of lamps operating at the time of each on-site audit, are inputs to the engineering calibration. In addition, data collected from the comparison group on-site audit sample, including burned-out lamp rates and existing equipment saturation, are used to calibrate engineering savings estimates (*Appendix B,* page 12).

  - Smaller impact segments do not justify the collection of independent samples of primary data. For these segments, estimates are transferred from a similar segment, or industry standard test results—reported by the manufacturer—are used.

- Estimates of gross demand impacts are the product of the engineering analysis by technology and segment. These impact estimates are based upon the assumption that single fixtures operate according to observed operating factors for installed equipment and each building schedule.

- Program impacts are estimated by combining per-unit demand with the number of units installed, according to the participation matrices, to form the evaluation demand estimates for each segment. These results yield the estimated gross peak-demand impact for the program. They are presented as first-year impacts, accounting for the short-term effect of relamping burned-out lamps.

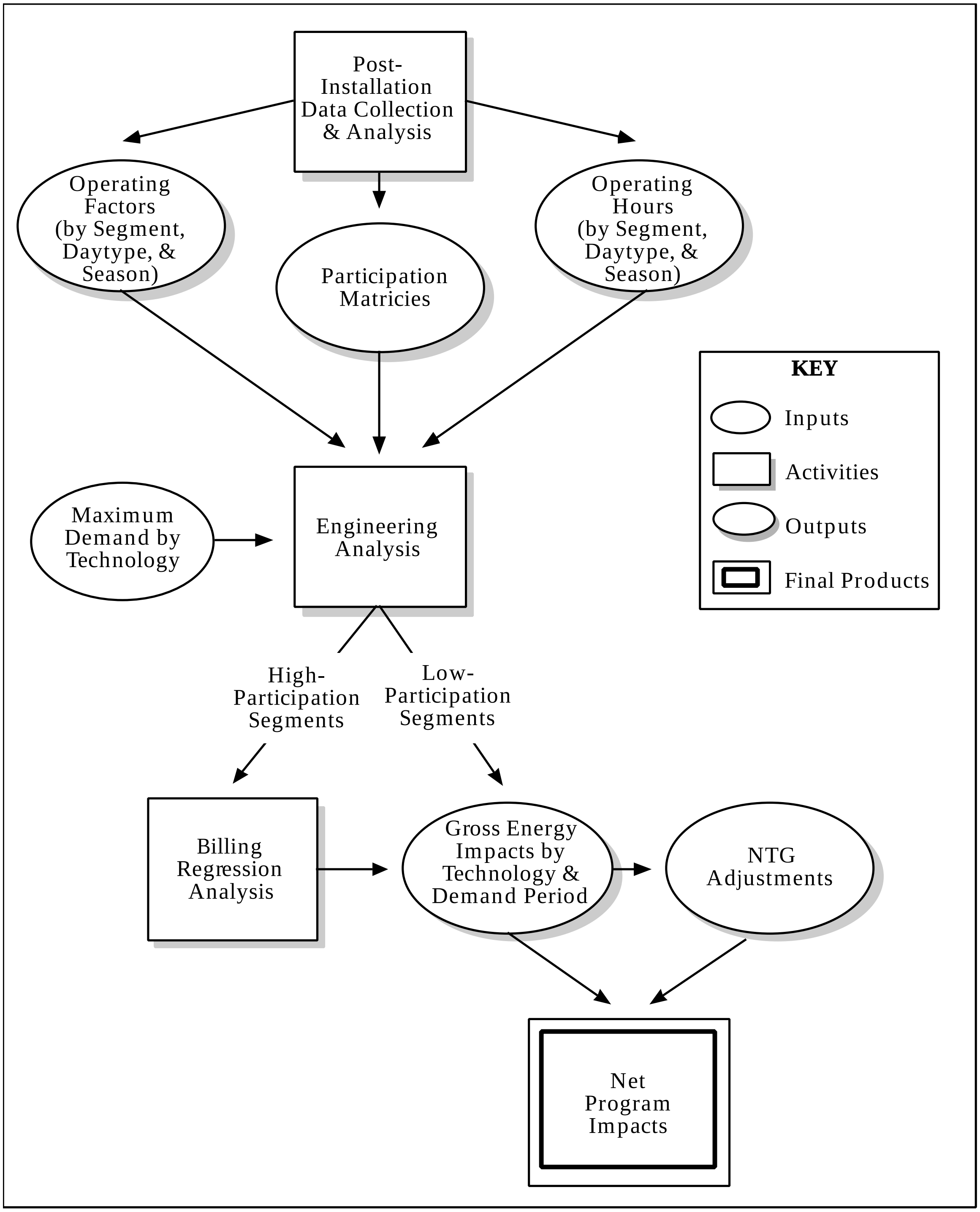
- The NTG adjustments for behavioral effects of participants and nonparticipants account for free riders (participants who would have adopted similar program measures anyway), and spillover (reductions in energy consumption or demand caused by the presence of the program) (*Appendix J*).

3.1.4 Energy Estimates

The energy impact estimates for the 1994 Commercial Lighting Evaluation are derived using engineering methods and statistically adjusted engineering (SAE) estimates. As illustrated in Exhibit 3-3, the energy impact method is comprised of the following elements:

- The post-installation inspection data supply crucial lighting logger and spot kW data used to develop segment operating hours and operating factors, which are used with the participation data to create engineering estimates.

Exhibit 3-3
Method for Estimating Energy Impacts



- The per-unit engineering estimates are derived by analyzing the change in fixture connected loads in conjunction with customer operating schedules and fixture operating factors. Lighting logger data, instantaneous post-installation demand measurements, and on-site audit data are used to calibrate the engineering estimates. Additional data collected during comparison group on-site audits concerning burned-out/nonoperating lamps and operating factors (percentage of lights operating at any time) are used to adjust the engineering per-unit savings estimates (*Appendix B*, pages B-25 through B-31).

- The per-unit engineering energy impacts are developed for each program segment. These represent savings that will be achieved, assuming that single fixtures operate according to observed on-site operating factors and calibrated operating schedules established during evaluation data collection.

  - The per-unit engineering energy impacts, combined with the units installed, form the input to the billing regression analysis for segments with sufficient participation (high-participation segments in Exhibit 3-3), or SAE analysis. In the SAE analysis, the engineering estimates are compared to billing data using regression analyses, in order to adjust for behavioral factors of occupants and other unaccounted for effects. The output for these segments are SAE estimates of savings.

  - For segments with participation levels too small to support statistical analysis (low-participation segments in Exhibit 3-3), the calibrated engineering estimates are used as the evaluation estimate. These results are presented as first-year impacts, accounting for the short-term effect of relamping burned-out lamps. Calibrated engineering estimates were used in outdoor lighting estimates and the other (miscellaneous) measures because regression analysis could not identify a statistically significant effect.

  - The two sets of results described above are combined to represent the evaluation estimate of program savings.

- Two approaches are used to calculate program net effects. One approach attempts to measure net effects directly in the SAE analysis, while the second approach models customers' decisions in the lighting market. The NTG adjustments compensate for free riders (participants who would have adopted similar program measures anyway), and spillover (reductions in energy consumption or demand caused by the presence of the program).

3.2 Engineering Analysis

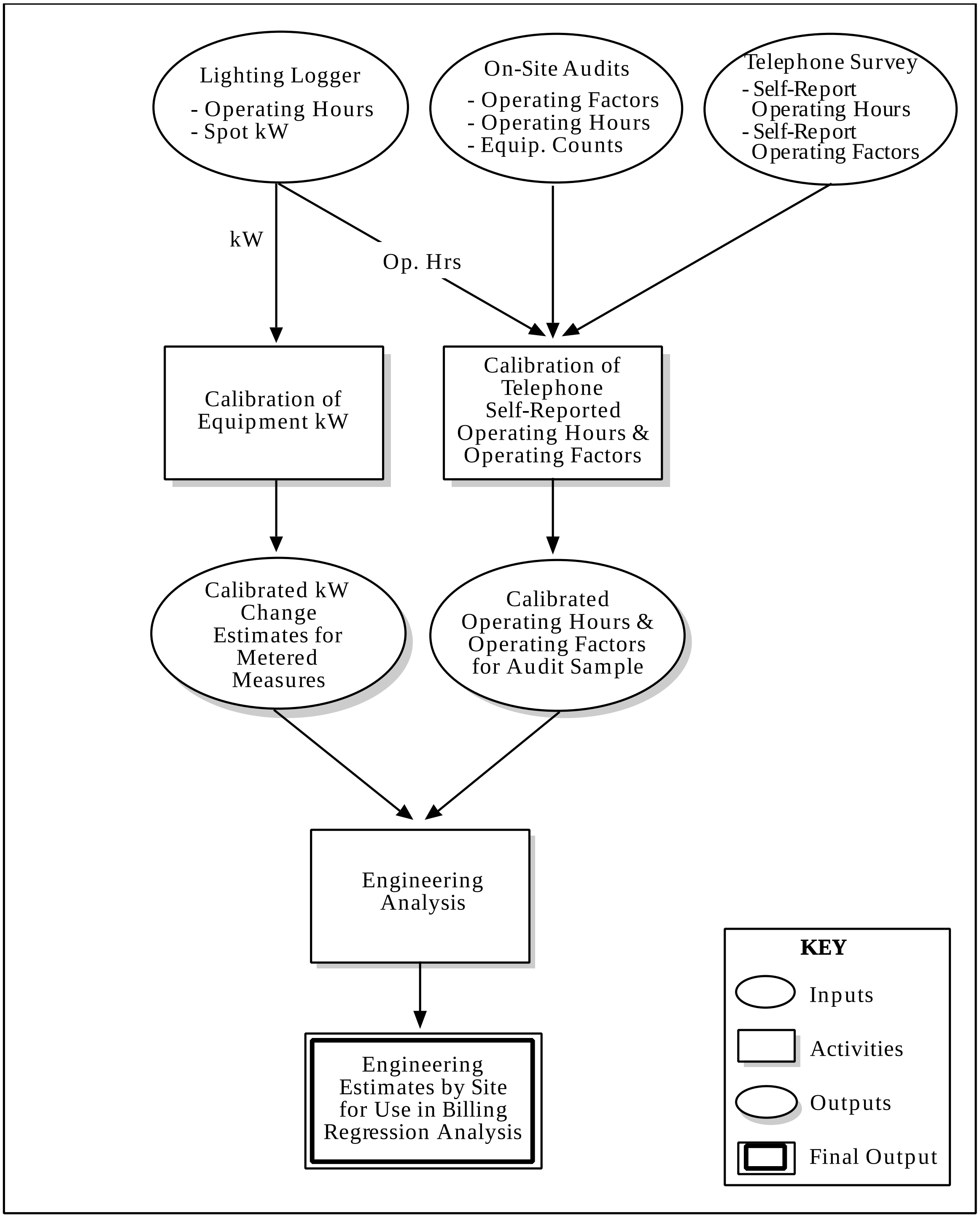
The engineering analysis combines information from telephone surveys with detailed on-site audit data to supply reliable engineering estimates. These estimates are used as "proxies" for actual building energy consumption, verified using statistical analysis. The primary value of good engineering proxies is that they reduce the standard error of billing regression estimates. Exhibit 3-4 provides an overview of the entire engineering estimation process.

Exhibit 3-4 illustrates the following features of the integrated impact analysis:

- Lighting logger data are used to:
  - Calibrate self reported building operating schedules
  - Determine whether buildings are operating at the peak hour
  - Estimate operating factors for "off" and weekend periods, since direct count information is not available from on-site audits
- On-site data and telephone surveys allow calibration of initial engineering estimates of savings by adjusting post-kW, operating hours, and operating factors to reflect actual operation for the surveyed sample.
- Calibrated per-unit engineering estimates are used in conjunction with the number of fixtures installed from the program application to estimate the impact for each site included in the telephone survey sample.
- Finally, engineering estimates either serve as input to the statistical models or as final results from the calibrated models.

The details of all of the above steps are described in *Appendix B, Engineering Detailed Computational Methods.*

Exhibit 3-4
Derivation of Engineering Estimates for Use in Billing Regression Analysis



3.2.1 Engineering Demand Model[3]

The data described earlier are used to develop the inputs to the "load decomposition" demand impact algorithm presented in Exhibit 3-5. The strength of this model is that the key factors affecting gross demand impacts—impacts for operating hours, operating factor, HVAC adjustment factor, and diversity factor—are estimated separately, then combined to estimate overall demand impacts for each action taken by each program participant. This allows clear identification of factors controlling differences in consumption between segments, or between program design and evaluation estimates.

Exhibit 3-5
Engineering Estimates of Gross Demand Impacts

$$kW_{sav,j} = (\Delta UOL_j * U * OF_p * 0.001) + AC_{sav}$$

where

$kW_{sav,j}$	=	Peak demand savings for action "j" (kW)
ΔUOL_j	=	Estimated per-unit gross demand impact for action j
U	=	Number of units installed
OF_p	=	Operating at time of system peak, which is $[(Of_o \times DF) + ((Of_c \times (1-DF))]$
AC_{sav}	=	Air conditioning savings at time of system peak resulting from lighting reduction
OF_o	=	Operating factor when the facility is open
OF_c	=	Operating factor when the facility is closed
DF	=	Diversity factor at time of system peak

Each of the parameters listed in Exhibit 3-5 are developed as follows:

- The change in Unit Operating Load (ΔUOL_j) is derived by calibrating manufacturers' data with pre- and post-installation spot kW data collected during on-site audits. These data, collected by technology type, are gathered in fixture groups large enough to minimize measurement error. Differences between various

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[3] The energy and demand engineering models are discussed in more detail in Appendix B, pages B-1-B-25.

manufacturers of ballasts and lamps are averaged to develop measure-specific UOLs.

- The number of units (U) of each measure type installed is verified during the post-installation on-site audit. The on-site audits also include random inspections of fixtures to confirm that newly-installed ballasts meet program specifications.

- The facility open operating factor (OF_O) is derived from lamp counts and questions asked during on-site audits. It compensates for partial operation of retrofitted lighting at sites when the facility is open. The OF, which measures the percentage of lamps operating, should not be confused with the diversity factor discussed below, which compensates for whether a site is operating at peak.

- The facility closed operating factor (OF_C) is derived from logger data, representing the percentage of fixtures operating during the hours that a facility is closed.

- Air-conditioning savings (AC_{sav}) are the credit for reduced heat load resulting from the installation of more efficient lighting. Cooling credits and heating debits are computed using an approach that compensates for changes in lighting load based upon local heating and cooling degree days.[4] Note that heating is not an issue in estimating peak demand impacts, since PG&E's peak occurs during the summer.

- The diversity factor (DF) is the percentage of participants in any one segment operating at the time of system peak. This factor compensates for non-operating facilities at the time of system peak.

The engineering model for energy, which is based upon the same decomposition of load concept, is described below. The approach that is described in this next section illustrates a generalized approach to estimating annual lighting impacts. Actual energy impacts were generated in a fashion that is related more closely to the approach described above for demand impacts: on an hourly basis, for all hours in a year.

3.2.2 Engineering Energy Model

The model used to calculate annual energy impacts is similar to the demand impact model presented in Exhibit 3-5, except that operating factors and operating hours are incorporated for each distinct operating period. Additionally, an adjustment is made for heating usage and cooling usage. The model used, and definitions of each element of the equation, are presented in Exhibit 3-6.

[4] Robert A Rundquist, Karl Johnson, and Donald Aumann. "Calculating Lighting and HVAC Interactions," *ASHRAE Journal*, November 1993.

Exhibit 3-6
Engineering Estimates of Gross Energy Impacts

$kWh_{sav,j}$	=	$\Delta UOL_j * U * \{(OFWK_i * YWKHO_j) + (OFWE_i * YWEHO_j) + (OFBN_i * YBNO_j)\} * 0.001 + AC_{sav} - Heat_{pen}$
where		
$kWh_{sav,j}$	=	Annual energy impact for action "j" (kWh / yr.)
ΔUOL_j	=	Estimated per-unit gross demand impact for action j
U	=	Number of units installed
$OFWK_i$	=	Annual weekday operating factor for segment i
$YWKHO_j$	=	Annual weekday operating hours
$OFWE_i$	=	Annual weekends (Saturday and Sunday separately) operating factor for segment i
$YWEHO_j$	=	Annual weekends (Saturday and Sunday separately) operating hours
$OFBN_i$	=	Annual operating factor for segment i when building is closed
$YBNO_j$	=	Annual hours when building is closed
AC_{sav}	=	Air conditioning savings resulting from lighting impacts
$Heat_{pen}$	=	Heating penalty resulting from lighting impacts

Each of the parameters listed in Exhibit 3-6 are developed as follows:

- The change in Unit Operating Load (ΔUOL_j) and the number of units (U) of each measure type installed are the same as those used in the demand model (Exhibit 3-5).

- Operating factors (percentage of retrofitted lighting units operating during a specified time - OFWK, OFWE, OFBN) are derived from lamp counts, lighting logger records, and questions asked during on-site audits and telephone surveys. They compensate for partial operation of the retrofitted lighting.

- Annual operating hours for each period (YWKHO for weekdays, YWEHO for weekends, and YBNO for all building closed periods) are developed from a combination of lighting logger measurements conducted during the post-installation period, and interview questions that address seasonal variations in retrofitted lighting usage.

- Cooling credits are computed using an approach that compensates for changes in HVAC load based upon both the lighting only impacts and local heating and cooling degree days.

- The heating penalty from energy-efficient lighting installation was estimated for those customers that heat with electricity. Using the ASHRAE method[5], the heating penalty for customers with electric resistance space heat is less than 5% of the lighting impact for any customer in PG&E's service territory.

3.2.3 RE and Customized Measure Segmentation

Measures are grouped in order to develop segments representing common technologies. This approach, while establishing estimates at the measure level, maximizes leveraging of data in the statistical analysis. The comparisons made at the individual measure level are listed in Exhibit 3-7.

Since lighting technologies are generally the same in both the RE and Customized programs, the most common technology groupings can be used as common categories for both programs. For the Customized program, a thorough review of the paper files was performed in order to confirm technology types, or reassign the allocation of measures to categories that matched the RE segmentation. During this review, many of the controlling engineering parameters were extracted from the applications and entered into an electronic dataset to facilitate analysis. Exhibit 3-7 illustrates the overlap of technology categories for the RE and Customized programs.[6]

When the measure code was received from PG&E, many of the measures with clearly defined action codes were allocated to the "Lighting Other" category, so that this category represented 35% of the total population. To facilitate evaluation, QC reallocated these measures to an appropriate technology group category. As a result, The "Lighting Other" category represents only about 5% of total participation in the Customized program.

[5]Ibid.

[6] The "PG&E Measure Code" used to define measures for both programs is also known as the "Action Code" in the MDSS system.

Exhibit 3-7
Comparison of Segmentation by Technology

RE Program		**Customized Program**	
Technology Segment Descriptions	**PG&E Measure Code**	**Technology Segment Descriptions**	**PG&E Measure Code**
Halogen		**Halogen**	
All wattages	L1	Low Voltage Halogen	182
< 45 watts	L60	Halogen Lamp Conversion	156
> 50 watts	L61		
Compact Fluorescent Lamps		**Compact Fluorescent Lamps**	102
Screw In CF			
All wattages	L2, L56		
5-13 watts	L62		
14-26 watts	L63		
Screw In CF- Reusable ballast			
All wattages	L3, L58, L59		
5-13 watts	L64		
14-26 watts	L65		
Hard Wired CF			
All wattages	L4		
5-13 watts	L66		
14-26 watts	L67		
27-50 watts	L68		
Incandescent to Fluorescent Fixture		**Incandescent to Fluorescent Fixture**	
With Energy Saving Ballast & T12 Lamps	L7	Incandescent to Fluorescent - Indoor	101
With Electronic Ballast & T8 Lamps	L8	Incandescent to Fluorescent - Outdoor	120
Exit Signs		**Exit Signs**	155
Incand. to Compact Fluorescents	L5	Incand. to LED	155
Incand. to LED or Electroluminescent Retrofit	L6		
Efficient Ballasts Changeouts		**Efficient Ballasts Changeouts**	
Electronic Ballasts		Modified Electromagnetic Ballasts	
2 Lamp Electronic Ballast	L14	Hybrid Ballasts	147
3 Lamp Electronic Ballast	L15	Primium Ballast (Core & Coil)	148
4 Lamp Electronic Ballast	L16	Electronic Ballasts	149
T8 Lamps and Electronic Ballasts		**T8 Lamps and Electronic Ballasts**	
New Fixtures			
One-Lamp Fixture	L9, L117, L121		
Two-Lamp Fixture	L10, L118, L122		
Three-Lamp Fixture	L11, L123		
Four-Lamp Fixture	L12, L120, L124		
2'-1 U Tube or 2 lamps	L69		
2'-2 U Tubes or 4 lamps	L70		
2'-3 U Tubes or 6 lamps	L71		
4'-1 lamp	L72		
4'-2 lamps	L73		
4'-3 lamps	L74		
4'-4 lamps or 8'-2 lamps	L75		
Fixture Modif.- Replace Lamps and Ballasts		Fixture Modif.- Replace Lamps and Ballasts	
Replace Lamps & Ballasts - 2' Fixture	L21	Replace Lamps & Ballasts - 2' Fixture	146
Replace Lamps & Ballasts - 3' Fixture	L22		
Replace Lamps & Ballasts - 4' Fixture	L23		
Replace Lamps & Ballasts - 8' Fixture	L24		
Delamp Fluorescent Fixtures		**Delamp Fluorescent Fixtures**	
Fixture Modif.- Delamp and Reflector		Fixture Modif.- Delamp and Reflector	
Removal - 2' Lamps & Ballasts	L17	1-F96T12 (60W) w / EE Magnetic Ballast	181
Removal - 3' Lamps	L18	Remove Lamps Reduce Lights	150
Removal - 4' Lamps	L19		
Removal - 8' Lamps	L20		
High Output T8 & T10 Conversion w / Delamp			
T10 & Energy Saving Ballast	L76		
T10 or T8 & Electronic Ballast	L77		
High Intensity Discharge		**High Intensity Discharge**	
Interior Compact HPS from Incand.		Metal Halide Fixtures - Interior	104
0-100 watts HPS	L25	HPS / LPS - Exterior	123
0-35 watts HPS	L78		
36-70 watts HPS	L79		
71-100 watts HPS	L80		
Interior Standard MH from Merc. Vapor			
101-175 watts MH	L26		
176-250 watts MH	L27, L37		
251-400 watts MH	L81		
Exterior HPS from Merc. Vapor			
0-100 watts	L28		
101-175 watts	L29		
176 watts & greater	L30		
Reduced Wattage Lighting		**Reduced Wattage Lighting**	
T8 (32 watt) Fluorescent Lamp	L13	4' Energy Saver Fluorescent Lamps	142
		8' Energy Saver Fluorescent Lamps	143
		T8 Fluorescent Lamps	144
		Lower Wattage Incandescent Lamps	152
		Current Limiters	153
Controls		**Controls**	
Time Clocks	L31	Lighting Controls	160
Occupancy Sensors		Lighting EMS	164
72-350 watts controlled	L32	Motion / Occupancy Sensors	166
351-1000 watts controlled	L33	Photocell	168
1000 watts and greater controlled	L34	Bypass / Delay	169
Wall Mounted	L82		
Ceiling Mounted	L83		
Bypass / Delay	L35		
Photocell	L36		
		Lighting Other	
		Daylighting	191
		Optical Reflectors	193
		Lighting Other	199

As part of the process of matching the action and measure codes, and of understanding the original calculations so that differences between the final evaluation results and the ex ante estimates could be explained, QC performed a review of the ex ante estimates and the parameters that went into them. *Appendix L* summarizes the distribution of NTG ratios that were applied, by technology and building type. These factors, plus the detailed understanding of the ex ante algorithms, allowed the clear identification of reasons for ex post differences, which are presented in *Section 4* of this report.

3.2.4 Engineering Connected Load Estimates

The basis of both engineering estimates and program design estimates is the per-unit connected load computation. In both cases, estimates are created by subtracting the estimate of "on" consumption of the average new fixture from the "on" consumption of the average original fixture. The documentation and comparison of evaluation estimates to program design estimates are the first steps to understanding reasons for differences between evaluation and program estimates.

The per-unit consumption estimates for the engineering analysis are from manufacturers' literature. Values for program design estimates were taken from the 1994 RE program estimates, as supplied with the October 1993 Forecast Filing.[7] Manufacturers' estimates were then reviewed and noted as a way to explain differences between evaluation results and program design estimates.

3.2.5 Engineering Operating Hour and Operating Factor Estimates

One of the primary differences between evaluation engineering estimates and program estimates is that evaluation estimates are based upon program participant-specific operating hours and operating factors (the percentage of retrofitted lights operating at a specified time). Program design estimates, because they are created before the program is conducted, are based upon expectations or standards for typical buildings, rather than the direct measurement of program participant energy use.

The source of operating hours assumptions for the program design estimates is an Operating Hours Study conducted in 1992 by HBRS. The operating hours are calculated as full load operating hours, thus defining an "on" operating factor of 1.0. The peak load diversity factor came from the October 1993 Forecast Filing referenced above. The value of 0.67 is based upon an analysis of 50 end-use metered points, according to a study that was performed by Regional Economic Research (RER).

[7] *Annual Summary Report on Demand Side Management Programs in 1994 and 1995,* Advice Filing 1800-G-A / 1446-E-A.

The sources of premise-specific operating hours for evaluation estimates are displayed in Exhibit 3-8. Nesting of the samples (lighting logger data within on-site audits, within telephone surveys) allows calibration of less expensive data collection methods to those that are more costly.

Exhibit 3-8
Operating Hours and Operating Factors for Engineering Models
(Sources Used to Determine Each Estimate)

Source \ Parameter		Operating Hours	Operating Factors
Program Design	**Peak kW**	NA	Peak Load Diversity = 0.67
	kWh	Specified by Building Type from Operating Hours Study	Assumed to Be = 1.0
Evaluation			
Telephone Survey	**Peak kW**	NA	Determined by Premise from Customer Self-Report, Calibrated to On-Site Findings
	kWh	Determined by Premise from Customer Self-Report, Calibrated by Audit Data and / or Run-Time Meter Data	Determined by Premise from Customer Self-Report, Calibrated to On-Site Findings
On-Site Audits	**Peak kW**	NA	Determined by Actual Count at Time of Audit and Extrapolated to Peak Hour Based upon Customer Self-Reports
	kWh	Deterined by Premise and Schedule Zone, Calibrated to Run-Time Meter Data for Metered Sites	Determined by Actual Count at Time of Audit and Extrapolated to Remaining Operating Hours Based upon Customer Self-Reports of Use Patterns
Lighting Loggers	**Peak kW**	NA	Determined by Actual Count During On-Site Audit
	kWh	Determined by Run-Time Meters by Schedule Zone	Determined by Actual Count During On-Site Audit

While lighting loggers supply information about whether the building is operating at the time of peak demand, for the peak demand estimate, the operating factor is actually estimated by extrapolation of the operating factor observed during the on-site audit, and is based upon actual lamp and fixture counts.

3.2.6 Engineering Cooling Benefit Estimates

Cooling savings resulting from reduced internal heat gains (caused by the installation of more energy-efficient lighting) are a function of the contribution of lighting internal gains to cooling load, in combination with the efficiency of the cooling system.

A modified version of the approach presented in a recent issue of the *ASHRAE Journal* [8] was used in this analysis. Equations for the demand and energy adjustments used in this evaluation are presented in Exhibit 3-9, together with definitions of the elements that compose the estimates.

Exhibit 3-9
Estimate of Cooling Benefit

$$AC_{SAVJ,}kW = kW_{LSAV,j} / MCOP$$

$$AC_{SAVJ}kWh = kWh_{LSAV,j} * RCF / MCOP$$

Where

$AC_{SAVj,}kW$	=	Additional kW savings attributed to reduced demand from lighting action "j" (kW)
kWLSAV,j	=	Demand savings directly attributable to action "j" (kW)
MCOP	=	Marginal coefficient of performance for cooling system, including auxiliaries and supply and returning fans (unitless)
ACSAVj,kWh	=	Additional savings attributed to reduced cooling load from lighting action "j" (kWh / yr)
kWhLSAV,j	=	Energy savings directly attributable to action "j" (kWh / yr)
RCF	=	Regional Cooling Factor—fraction of annual lighting energy that is rejected as heat and thus requires cooling. Value is dependent upon local cooling degree days, and is supplied by reference table (unitless)

[8] Robert A Rundquist, Karl Johnson, and Donald Aumann. “Calculating Lighting and HVAC Interactions,” *ASHRAE Journal*, November 1993.

The features of the ASHRAE method are as follows:

- The cooling *demand* savings are calculated by dividing the lighting energy saved ($kW_{LSAV,j}$) by the efficiency of the HVAC system (its marginal coefficient of performance – MCOP). The computation assumes that all energy saved during the peak period results in a reduction in peak demand. This methodology has the potential to increase lighting program peak demand impacts by approximately 33 percent.

- In calculating cooling *energy* savings, the lighting energy saved ($kW_{LSAV,j}$) is first multiplied by a regional correction factor (RCF) to reflect interregional differences in the percentage of lighting energy savings that affects air-conditioning energy usage over the entire cooling season.[9] The resulting adjusted energy savings are then divided by the MCOP to determine estimated HVAC system energy savings. Using this approach, it is estimated that, in the PG&E service area, cooling energy savings add approximately 12 percent to lighting energy savings.

The summer cooling energy savings that result from the installation of more efficient lighting fixtures is offset by a winter heating penalty caused by reduced heat contribution during the heating season.

3.2.7 Engineering Heating Penalty Estimates

The increase in winter heating energy requirements resulting from reduced internal gains (caused by the installation of energy-efficient lighting) is computed using a method similar to that used to calculate cooling benefits. In summary, the cooling credit and heating debit together should increase peak demand impacts by approximately 33 percent, and annual energy consumption by 8 to 10 percent. The heating algorithm and its elements are described in Exhibit 3-10.

[9] In the *ASHRAE Journal* article referenced above, the regional cooling factor (RCF) is supplied in a table for selected major cities in the United States. The table reflects the number of annual cooling degree days in each region.

Exhibit 3-10
Estimate of Heating Increase Penalty
(Electric Heating Only)

$$Heat_{pen,j,kWh} = (kWh_{LSAV,j} * RHF * PERIM \bullet FRACTION) / HPCOP$$

Where

$Heat_{pen,j,kWh}$	=	Additional heating energy required because of the lower heat rejection of new lights (kWh / yr)
$kWh_{LSAV,j}$	=	Energy savings directly attributable to installation of lighting measure "j" (kWh / yr)
RHF	=	Regional Heating Factor – fraction of annual lighting energy savings that would have been rejected as heat, thus requiring additional heating. The value is dependent upon local heating degree days, and is supplied by a reference table (unitless)
HPCOP	=	Efficiency of the electric heating system -- default of 1.0 for electric resistance heat or 2.0 for heat pumps (unitless)
PERIM•FRACTION	=	Fraction of the floor area that is within 15 feet of the perimeter wall (unitless)

The *ASHRAE Journal* method for calculating increases in heating *energy* savings entails multiplying the lighting energy saved (kWhLsav,j) by a regional correction factor (RCF) for heating to reflect interregional differences in the percentage of lighting energy savings that result in increases in heating energy requirements.[10] This product is then multiplied by the fraction of building floor area within 15 feet of the perimeter of the building, as this is where most heat loss occurs. Finally, the mechanical system efficiency parameter, HPCOP is applied to adjust for a conversion from building heat load to heating system energy use. In addition, three considerations are reflected in this model.

- The electric heating energy debit is smaller than the cooling credit, and is less than 1 percent of the lighting energy savings, depending upon the perimeter fraction.
- The heating *demand* savings is not addressed because PG&E is a summer peaking utility, and no heating occurs during the summer peak period.
- The heating penalty is only a factor if heating is electric.

[10] As is the case for cooling, the regional heating factor is supplied in a table in the *ASHRAE Journal* article for selected major cities in the United States. The table reflects the number of annual heating degree days in each region.

3.3 Billing Regression Analysis

The billing regression analysis of PG&E's Commercial Lighting Evaluation is an integrated part of the overall gross and net impact evaluation. The key objective of the analysis is to determine the first-year program energy impacts. Statistical analysis is employed to model the differences of customers' energy usage between pre- and post-installation periods. The model is specified using actual customer billing data, and independent variables that explain changes in customers' energy usage, including engineering estimates of program participation. This SAE analysis is consistent with the requirements of the Load Impact Regression Model (LIRM) defined in the CPUC Protocols. The analysis employed in this evaluation used all of the telephone survey points, with the exception of two sites. These two points disproportionately skew the performance of the model in the direction of increasing the impact.

The results of the billing regression analysis are estimated as ratios, termed "realization rates," of realized impacts to engineering impact estimates. Realized impacts represent the fractions of the engineering estimates actually observed or detected in the statistical analysis of actual billing data. The realization rates estimated as coefficients in the SAE regression models are relative to the results of the evaluation-based engineering estimates, not the PG&E program ex ante estimates. The SAE realization rates, the estimation of which is the topic of this subsection, are then used to estimate program impacts and realization rates relative to the ex ante estimates. Program realization rates are the topic of *Section 4.*

This subsection presents the approach and findings of the billing regression analysis. It begins with a discussion of analysis periods and data sources used in the billing regression analysis, and then presents the telephone sample design and final sample allocation. Next, the regression model specification and SAE realization rate results are presented. The presentation of a final specification used to estimate net impacts directly, termed "Approach A" is presented in the next subsection, (*Section 3.4.1*) NTG analysis. The "Approach A"billing regression analysis supports the direct estimation of net program impacts as a consequence on the energy analysis. The key assumption underlying this approach is that equipment purchases outside the program represent a baseline for what would have happened in the absence of the program. Appendices A, C and K detail implementation of the specific methods described below.

3.3.1 Use of Data Sources

The billing regression analysis for the 1994 Commercial Lighting Evaluation uses data from four primary data sources: the MDSS tracking database, the billing database, the telephone survey data, and the engineering estimates of changes of usage between the pre- and post-installation periods. It also utilizes the weather data tape from PG&E's load research weather sites. A summary of the data elements used in the regression analysis are presented below, and a more detailed discussion can be found in Appendices A and C.

- **Program Participant Tracking System** - The participant tracking system for the RE and Customized programs was maintained as part of the PG&E MDSS. It contains program application, rebate, and technical information about installed measures, including measure description, quantity, rebate amount, and ex ante demand, energy, and therm saving estimates. The MDSS database is linked to the billing database and other program databases through PG&E's customer control numbers.
- **PG&E Billing Data** - For this evaluation, the PG&E billing data were obtained from two PG&E data sources. The original nonresidential billing dataset contains monthly energy usage for all nonresidential accounts in PG&E's service territory, and was used in the sample design as described in *Appendix A*. The second billing dataset, which consists only of customer accounts in the surveyed dataset, was later obtained from PG&E's Load Data Services.[11] Since the second billing dataset has many useful fields not included in the first dataset, a decision was made to use the second billing dataset to conduct the statistical analysis. The billing series used in the analysis is PG&E's prorated monthly usage data, a series calculated by PG&E for each calendar month, from January 1991 to September 1995.
- **Weather Data** - The hourly dry bulb temperature collected for 25 PG&E load research weather sites is used in the billing regression analysis to calculate total monthly cooling and heating degree days for each month in the analysis period. For each customer in the analysis dataset, the appropriate weather site is linked to that customer by using the PG&E-defined weather site mapped to PG&E's local office.

In addition to the data sources discussed above, another key input to the regression analysis is the telephone survey data collected as part of this evaluation effort. The sample design and final sample allocation achieved from the telephone survey are discussed below.

3.3.2 Sample Design and Segmentation

The sample design for the PG&E Commercial Lighting Evaluation was based upon analysis of 1994 program participation data and PG&E billing data. The goal of the sample design was to achieve the most efficient utilization of project resources in order to estimate the first-year gross and net impacts in a manner that met the sample size and evaluation accuracy requirements defined by the Protocols. A detailed discussion of the sample design and sampling plan is presented in *Appendix A*.

The lighting evaluation is based upon a nested sample design approach. The main feature of this approach is that it consists of four groups of customers segmented according to the type of information available. The largest customer group included all

[11] A preliminary analysis has concluded that the monthly usage and bill read date information in these two datasets is consistent.

of the commercial customers who received rebates for eligible lighting technologies in 1994 (the "participant population") with monthly PG&E billing data and participant tracking data. The smallest group included the loggered participants with the most comprehensive information available: lighting logger data, on-site audit data, telephone survey data, participant tracking data, and billing data. A similar nested sample design was also implemented for the comparison group, with the exception that the logger data was not collected for the comparison group. The advantage of a nested sample design is that it yields overlapping samples. These are used to compute dual estimates from the engineering and statistical analysis for the same group of customers, and therefore yield robust and accurate estimates of the SAE realization rates.

The telephone survey sample was selected based upon the stratified random sampling techniques for both participant and comparison group. The objective of stratification is to improve the overall reliability of estimates by restricting the sample to reasonably homogeneous segments, while at the same time ensuring that sufficient representation of the population is preserved. The sample segmentation is developed across two dimensions: business types and technologies.

- The customer segment is defined primarily by the business types, which were determined based upon the MDSS database (for participants), and the Second Standard Industrial Classification (SIC2) code—which represents building activity—from the billing dataset (for the comparison group). Within each business type, the annual energy consumptions are used as proxies to group customers into usage bins, and sample points are selected to reflect the underlying distribution of the participant population.

- Technology segmentation is important because the use of electricity, and therefore the program impacts, varies by program measure. Therefore, by grouping together common technologies, the variation in impacts is reduced, which, in turn, results in more accurate estimates of the SAE realization rates. For example, all T12 to T8 retrofit measures are grouped together, despite the fact that some installations are new fixtures, while others are retrofits, and different measures have different levels of projected energy impacts. These factors are directly accounted for in the engineering estimates. That is, the engineering estimates account for interparticipant variation so that what is assumed is that the fraction of the expected impact is stable within a segment, rather than the level of the impact. This assumption is the basis for SAE models.

Ten business segments and 11 technology groups were defined and used in the sample design and sample allocation for the RE program. For each business and technology combination, the sample was allocated in proportion to avoided costs. The purpose of this weighting scheme is to identify which technologies and / or business types account for the greatest impact on the program's resource and shareholder values. Avoided costs, by business type and technology group, for the RE program are presented in

Exhibit A-2 of *Appendix A*. Three business types: offices, retail, and schools, account for more than 70 percent of the projected (ex ante) program-avoided costs in 1994; the office segment alone accounts for approximately 37 percent of the avoided costs.

Given the low participation in the Customized program (only about 120 participants in 1994), all hard copy application forms were reviewed and a census was attempted for all eligible participants. The Customized program total avoided costs account for approximately 6 percent of the total commercial sector.

3.3.3 Selection of Participant and Comparison Group

Participants in the lighting program are defined as those PG&E commercial customers who received rebates from PG&E in the 1994 calendar year for installing at least one lighting measure under the rebate programs.

The comparison group for this study is defined as PG&E commercial customers who did not receive rebates for lighting technologies in the 1994 calendar year under the nonresidential rebate programs, and who share many characteristics with the commercial sector participant group in terms of annual usage and business type distribution. Customers who were program participants in prior years are eligible for the comparison group. In order to avoid over surveying of PG&E's commercial customer base (i.e., calling the same customer twice for similar information), comparison group samples were coordinated with the HVAC end use evaluation effort.

The sampling unit for both participant and comparison groups was defined as customer premise. A premise is defined as all billing accounts that correspond to the same location and customer. The final participant sample frame consists of 1,675 premises drawn from the eligible population of 6,037 lighting program participants who were paid in 1994 from both the RE and Customized programs.

The comparison group sample frame consists of 4,039 customers drawn from the eligible population of 26,435 commercial customers that satisfied all of the screening criteria used in construction of the sample frame. In drawing the sample frame, targets are established for each business type and usage segment, so that the sample frame distribution, by building type and usage segment, is the same as that of the participant population.

The process of reduction to the eligible sample involved the elimination of customers that had 1) moved during the period of interest; or 2) had billing records with significant missing data. Customers were further screened to identify those who had high-quality data for each month, for all three years of the analysis window.

Appendix A (pages A19-A-26) details the reduction of the eligible population to a sample frame suitable for estimating realization rates and not confounded with uncertainty in the billing series itself. None of the criteria used to screen the sample are correlated with the SAE realization rate; therefore, the screening criteria preserve the transferability of the model results to the population. Moreover, since all the installation information pertaining to the entire participant population is used to develop the expected program impacts, this step introduces no bias in calculating unadjusted expected impacts.

3.3.4 Analysis Sample Size and Distribution

Two analysis samples of 480 participant and 458 nonparticipant commercial customers were collected for the evaluation. The data collected in the telephone survey supplies information on energy-related changes at each site for the billing period covered by the statistical billing data analysis.

As discussed earlier, this evaluation utilizes a nested sample design approach. The on-site audit sample and the lighting logger sample are collected as part of the telephone survey, with the exception of a few customers who completed an on-site audit and later declined to be telephone surveyed. The final analysis sample size of 480 commercial participant customers represents 325 customers who were surveyed only by telephone; 154 customers who were surveyed by telephone and on-site audited; and one customer who was on-site audited, but later refused to complete a telephone survey. This sample includes a total of 432 RE program indoor lighting participants; 20 Customized program indoor lighting participants; and 28 participants who installed only outdoor lighting measures under the RE or Customized programs. The final sample distribution by building type, program, and indoor/outdoor measures is presented in Exhibit 3-11.

Exhibit 3-11
Analysis Sample Distribution
By Program, End Use and Business Type

Building Type*	Participants			Comparison Group	Total
	Indoor		Outdoor		
	RE	Customized	RE/Customized		
Office	106	2	6	138	252
Retail	105	3	14	104	226
Coll/Univ	1	0	0	3	4
School	61	1	3	33	98
Grocery	27	11	0	30	68
Restaurant	20	0	2	29	51
Health Care	33	0	1	20	54
Hotel/Motel	14	1	0	36	51
Warehouse	32	1	1	32	66
Commercial Misc.	33	1	1	33	68
TOTAL	432	20	28	458	938

* Defined based upon survey reponses—may differ from MDSS.

In order to estimate independent realization rates at the business type and technology level, the lighting technologies were further grouped into seven categories, as shown in Exhibit 3-12. Among those technology categories, the standard-efficiency fluorescent group accounts for the largest share of impact, with approximately 65 percent of the total engineering impact estimate for energy. The second largest technology group is the interior HID and halogen group, which accounts for about 11 percent of the impacts, followed by the Customized measures (7 percent), and the compact fluorescent lamps (7 percent). The outdoor lighting measures account for approximately 5.6 percent of the total impacts.

Exhibit 3-12
Telephone Survey Sample Distribution by Technology

Lighting Technology	Description of Technology	Sample Size *
RE Program: Interior HID and Halogen	All Halogen Wattages, All Indoor HID Measures	65
RE Program: Compact Fluorescent Lamps	All Compact Fluorescent Measures	175
RE Program: Exit Signs	All Exit Sign Retrofit Measures	59
RE Program: Standard-Efficiency Fluorescent	Incandescent to Fluorescent Fixtures, Efficient Ballast Changeouts, T-8 Lamps and Electronic Ballasts, Delamp Fluorescent Fixtures, Reduced Wattage Lighting	351
RE Program: All Other Indoor Lighting Measures	All Controls, All Other Misc. Indoor Lighting Measures	57
Customized Program: All Indoor Measures	All CI Lighting Measures	20
Outdoor Lighting: All Outdoor RE and Customized Measures	Exterior HPS from Mercury Vapor, Outdoor Incandescent to Fluorescent, Exterior HPS/LPS	94

*Sum may exceed the total sample size because there were multiple measure installations.

3.3.5 Analysis Periods

According to the Protocols, participants are defined by the "paid date" instead of the "installation date." Most customers actually installed measures in 1993 or 1994, with 1994 installations accounting for approximately 75 percent of total installations.[12]

[12] Accurate determination of the installation dates is very difficult because information in the MDSS database is inadequate. However, a best-effort estimate was implemented based upon the analysis of the inspection dates and check issue dates from the MDSS database, in combination with customers' self-reported installation dates.

When the billing regression analysis is used to model the change of consumption attributable to the program measures, the first step is to isolate the pre- and post-installation periods for each customer in the analysis database, so that the impact of these measures can be verified.

Two comparison periods are specified so that pre-installation data from both 1992 and 1993 can be used. Two sets of analysis periods support the joint estimation of changes relative to two years of pre-installation data using a simultaneous equation approach described later in this section. Estimation occurs in a two stage least square (2SLS) model as defined in the next section, using the following two analysis periods:

- The primary analysis periods are defined in a way that maximizes the inclusion of a majority of the sample with high-quality data. Because the installation dates cannot be determined accurately for all customers in the analysis database, the pre-installation period (October 1991 - September 1992) and a post-installation period (October 1994 - September 1995) are defined for the entire participant sample. This definition creates a window so that billing data excluded from the analysis is wide enough to ensure that all participants have the effects of program measures isolated from the pre- and post-installation periods. In this way, realization rates are not biased by errors in estimating dates of installation.

- A second analysis period is used to estimate the first stage of the 2SLS model. The first-stage model is only used to estimate customer-specific inter-year correlation’s, and is less sensitive to errors that may be introduced by estimation of the installation dates. The second pair of pre- and post-installation periods compares 1993 (October 1992 - September 1993) to 1995 (October 1994 - September 1995). For these customers, prorated estimates of program impacts are computed to account for when the installation likely occurred, if it is estimated that installation took place during a portion of the pre-installation period.

For a more complete discussion of these analysis periods, and the model specification, see *Appendix C, Model Specification and Results* on pages C-9-C-12.

The specification of two analysis periods allows for the analysis of pre-installation periods in a manner that, through the use of the earlier pre-installation period, minimizes measurement error in the identification of installation, and retains the information of value contributed by the more recent pre-installation period. As discussed below, these analyses periods support seasonal billing data regression models. Seasonal models produced more stable results without artificially deflating the parameter standard errors that would be induced by autocorrelated monthly observations.

3.3.6 Model Specification and Results

The billing regression analysis for the lighting program uses two different multivariate regression models under an integrated framework of providing unbiased and robust model estimates in the commercial sector. The key feature of our approach is that it employs a simultaneous equation approach to account for both the year-to-year and cross-sectional variations in a manner that consistently and efficiently isolates program impacts.

A baseline model is initially estimated using only the comparison group sample. This model estimates a relationship that is then used to forecast the post-installation-year energy consumption for both participants and the comparison group, as a function of pre-installation-year usage. In this way, baseline energy usage is forecasted for participants by assuming that their usage will change, on average, in the same way that usage did for the comparison group.

The SAE impact model used in this evaluation is specified as a two-stage ordinary least squares (2SLS) model that allows for the utilization of all billing and sample data from two pre-installation periods (as described above). The estimated SAE realization rates are used to adjust the engineering estimates of expected annual energy impacts for the entire participant population. These impacts are presented in *Section 4*, and were used to compute program realization rates.

Baseline Model - The baseline model explains post-installation energy usage as a function of the pre-installation energy usage, weather changes, and customer self-reports of factors that could affect energy usage. In order to isolate the program impact from the energy usage changes, only the comparison group is used to fit this model. The baseline model has the following functional form:

$$kWh_{post,i} = \sum_j \alpha_j + \beta kWh_{pre,i} + \gamma(\Delta CDD_i) * kWh_{pre,i} + \sum_k \eta_k Chg_{i,k} + \varepsilon$$

Where

$kWh_{post,i}$ and $kWh_{pre,i}$ are customer i's annualized energy usage for the post- and pre-installation periods, respectively;

ΔCDD_i is the annual change of cooling degree days (base 65°F) between post-installation year and pre-installation year;

$Chg_{i,k}$ are the customer self-reported change variables from the survey data, including adding, replacing, or removing equipment associated with major end uses, changes in number of employees, and square footage;

α_j is the indicator variable (0/1) for the jth business type. It equals 1 if the customer is in that business type, and 0 otherwise;

β and γ are the estimated slopes on their respective independent variables; and,

ε is the random error term of the model

For each customer in the analysis dataset, two predicted usage values are calculated using the parameters of the baseline models estimated independently for the 1993 to 1995, and 1992 to 1995 analysis periods. They both take the same functional form, with different segment-level intercept series (α_j) and slopes (β and γ):

$$k\hat{W}h_{post,i} = F_{pre}(kWh_{pre}) = \sum_j \alpha_j + \beta kWh_{pre,i} + \gamma(\Delta CDD_i) * kWh_{pre,i}$$

SAE Model - Using the predicted post-installation usage values estimated in the baseline models, a simultaneous equation model is specified to estimate the SAE realization rates. This approach employs a 2SLS model that incorporates billing data and engineering estimates from 1993[13] and 1995 to fit the first (stage 1) model. The 1992 and 1995 data are used in the final (stage 2) model. The first stage contributes an estimate of customer-specific inter-year correlation that is used as an independent variable in the final model. The SAE simultaneous system can be described as follows:

Stage 1: $$kWh_{95,i} - F_{93}(kWh_{93}, \Delta CDD_{93}) = \sum_m \beta_m Eng_m + \sum_k \eta_k Chg_{i,k} + \mu_{93}$$

Stage 2: $$kWh_{95,i} - F_{92}(kWh_{92}, \Delta CDD_{92}) = \sum_m \beta'_m Eng_m + \sum_k \eta'_k Chg_{i,k} + \mu_{92}$$

with $$\mu_{92} = \lambda\mu_{93} + \sigma$$

The last equation represents the assumption that there is correlation in usage between the two years. By including the estimated residual from the stage 1 model[14] as an independent variable in the stage 2 model, the error term in the stage 2 model simplifies to a random error term σ and results in the estimation of a more accurate and stable final SAE model.

3.3.7 Billing Regression Analysis Results

This section presents the results of the billing regression analysis. *Appendix C*, pages C-12- C-14, presents a more complete discussion of the results of the regression analysis.

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[13] All years mentioned in the SAE analysis refer to a period covering the last quarter of the previous year, and the first nine months of the current year.

[14] This procedure is the econometric solution to this type of simultaneous equation system.

The coefficients of the engineering impacts in the stage 2 model are the SAE realization rates. Independent realization rates are estimated to provide PG&E with results by business type and technology group. Exhibit 3-13 summarizes the final SAE model results estimated using 936 customers out of a total sample of 938 customers. Two customers—one hospital participant and one college/university nonparticipant—were excluded from the final model because they introduced great influence over the parameter estimates (toward increased impacts). In addition, these two customers have the highest annual usage among all customers in the analysis dataset. Exhibit 3-13 summarizes the independent variables used in the final stage 2 model, along with the t-statistics and sample sizes available for each parameter estimate.

Exhibit 3-13
Billing Regression Analysis Final Model Outputs

Parameter Description	Parameter Estimate	90% Confident Bounds		t-statistic	Sample Sizes
		Lower	Upper		
Customer Specific Intercept from Stage 1	0.95	0.89	1.01	25.7	936
Estimates Realization Rates					
RE Program Standard Fluorescence					
Offices	-0.94	-1.10	-0.78	10.1	90
Retails	-0.82	-1.14	-0.50	5.2	84
Others	-0.70	-0.94	-0.46	6.9	177
RE Program HIDs					
Offices	-0.94	-1.21	-0.67	6.1	10
Retails	-0.75	-1.17	-0.33	3.9	28
Others	-1.60	-1.87	-1.33	6.1	27
RE Program Compact Fluorescence	-0.62	-1.33	0.09	2.3	175
RE Program Other Indoor Measures	-0.40	-2.63	1.83	0.7	105
Customized Program Indoor Measures	-1.57	-1.71	-1.43	12.0	20
RE/Customized Outdoor Measures	-0.54	-1.61	0.53	1.5	94
Change Variables (Multiplied by Pre-Usage)					
Add Lighting	0.131	-0.122	0.384	6.5	80
Replace Lighting (Outside Program)	-0.027	-1.124	1.070	1.5	38
Remove Lighting	-0.171	-1.119	0.777	1.7	6
Replace HVAC	-0.031	-0.689	0.627	2.5	60
Replace Other Equipment	-0.057	-1.142	1.028	1.5	52
Add Employee	0.038	-0.819	0.895	1.9	103
Reduce Employee	-0.053	-0.484	0.378	3.8	90
Installed Non-Lighting Program Measures	-0.055	-0.534	0.424	3.4	18

	Baseline Model	SAE Model
Number of Observation:	457	936
R-squared:	0.98	0.63

- The dependent variable is the difference between the actual and predicted 1995 usage using the 1992 baseline model.

- Customer-specific inter-year correlation is the residual term from the stage 1 model. The large t-statistics on this term suggest strong correlation between customers' usage from one year to another. Inclusion of this term contributes to a more stable model in the sense that there is very low correlation between all parameter estimates in the final model, especially the SAE realization rate parameters.

- Ten different realization rates are estimated, corresponding to business type and technology group segments. Only those measures with broad participation and relative high expected impacts can support a separate realization rate estimate. While all the realization rates have the right signs, some business types and technologies have much higher estimated impacts than others. All realization rate estimates are significant at the 95% confidence level (t-statistics greater than 2) except RE program other indoor lighting measures and RE/Customized outdoor measures, since these segments have high variation and relatively low impacts. This means that results from the billing regression analysis were used in the final evaluations results for all measures *except RE program other indoor lighting measures and RE/Customized outdoor measures. Engineering model estimates were used for these two measure categories.*

- All change variables have the expected signs. Only those change variables with a significant level greater than 0.15 are kept in the final model, through a stepwise regression procedure. Variables excluded from the model include changes in facility square footage, removal of HVAC equipment, and participation in the 1993 programs.

While QC investigated the use of TOU and load research demand data to support a similar SAE demand model, load information is not available in sufficient quantity to support such an analysis. The demand analysis conducted during this evaluation is based upon engineering models calibrated to on-site audit, spot-watt measurements, lamp counts, and lighting logger data. The spot- watt data are used to calibrate new equipment manufacturers' cut sheet data based upon actual measurements. The lamp counts are used to determine operating factors and burned-out lamp rates, pre- and post-installation. The lighting loggers are used to determine whether sites are actually operating in the "open" mode at the time of system peak. This is necessary, since many of the audits were conducted in the morning, and the lighting loggers confirmed self-reports that the facility was open or closed at the time of system peak.

3.3.8 Relative Precision Calculation

Relative precision at 90 percent and 80 percent confidence levels for the adjusted gross energy impact estimates are calculated at each of the SAE analysis segments. As mentioned above, a total of ten analysis segments were explicitly modeled, and the relative precision estimates based upon the model output are presented in Exhibit 3-14 below. In order to calculate the total program level adjusted gross impact and relative precision, the segment level results are weighted by their unadjusted engineering energy impact estimates in the following equations, and the results are presented in Exhibit 3-14.

- Analysis segment level relative precisions at the 90 percent confidence level were calculated using the following formula:

$$RP_i = (1.645 * StdErr_i) / RR_i$$

where

RP_i	=	the relative precision at analysis level
$StdErr_i$	=	the standard error of the realization rate for each analysis level
RR_i	=	the realization rate for each analysis level

- From the analysis level relative precisions, the program level relative precision was determined by the following equation:

$$RP = \sqrt{\sum (PR_i * M_i)^2} / \sum (RR_i * M_i) = 16\%$$

where

M_i	=	the gross impact estimate at each analysis level

Exhibit 3-14
Relative Precision Calculation

SAE Analysis Level	Engineering Gros Impact Estimate (MWh)	SAE Realiztion Rate	Relative Precision at 90%	Relative Precision at 80%
RE Program Standard Fluorescents				
Offices	93,822	94%	16%	13%
Retails	30,756	82%	32%	25%
Others	83,607	70%	24%	18%
RE Program HIDs				
Offices	8,611	94%	27%	21%
Retails	10,810	75%	42%	32%
Others	15,302	160%	27%	21%
RE Program Compact Fluorescents	23,719	62%	71%	55%
RE Program Other Indoor Measures	**15,635**	**40%**	**224%**	**175%**
Customized Program Indoor Measures	22,117	157%	14%	11%
RE/Customized Program Outdoor Measures	**18,058**	**54%**	**107%**	**84%**
TOTALS	322,437	86%	16%	12%

Note: Shaded rows indicate statistically insignificant results at the 90% confidence level.

The realization rates presented in Exhibit 3-14 above are the gross SAE realization rates, that is the gross realized impacts as compared to the gross *evaluation engineering estimates.* In order to compute the final gross realization rates, the gross evaluation estimates compared to the gross ex ante estimates, three steps need to occur. First, the gross evaluation engineering estimates presented in Exhibit 3-14 are multiplied by the SAE realization rates in Exhibit 3-14. Second, for the segments for which the 90 percent confidence level was not achieved (outdoor lighting and other indoor measures), the evaluation calibrated model engineering estimates of impact are to be assumed as the evaluation estimates (this is the same as assuming a realization rate of 1.0 in the previous step). When these two steps have been carried out, a total gross evaluation energy impact of 295,746 MWh is achieved (see Exhibit 4-1). Third, the evaluation estimate is divided by the gross ex ante estimate of impact (300,752 MWh total), resulting in the overall gross evaluation realization rate (gross evaluation estimates compared to the gross ex ante estimates) of 0.98. These steps are carried out by segment in *Section 4*, Evaluation Results Summaries, of this report.

3.4 Net-to-Gross Analysis

Two methods are employed to estimate program net impacts. The first method estimates net effects through an analysis of energy impacts for lighting actions conducted outside the program; this approach is termed the “net billing model.” The second method, a market analysis, involves the development of a model analyzing customer decisions in the lighting market. The market analysis models how participants first decided to purchase lighting equipment, and then, how they decided to purchase measures that correspond to those promoted by PG&E’s program.

The approach used to calculate program net effects uses self-reported responses from telephone survey data to estimate free ridership and spillover for lighting program participants, and spillover effects for nonparticipants. Results from each separate subanalysis are combined to generate NTG ratios.

First, the results from the net billing regression analysis are discussed.

3.4.1 Net Billing Regression Analysis

The net billing model produces results that support the estimates derived in the market analysis for two reasons. First, since some of the customers in the comparison group who replaced lighting outside of the program could have been free drivers, the net model produces an NTGs ratio that represents a lower bound of net impacts.[15]

[15]In fact, 22 of the 84 customers who had lighting actions outside the program were classified as free drivers in the market analysis. The net billing data model was run with and without these customers

Alternatively, the market analysis directly models spillover by analyzing reasons for equipment adoptions among both participants and nonparticipants. The confidence associated with this structural model for estimating spillover leads to a more supportable estimate of NTG. Finally, the market analysis produced results by technology group, whereas the net billing model only produced one overall estimate of NTG.

The specification of the SAE model includes a term that directly accounts for the impacts of equipment purchases made by customers in the comparison group. That is, the billing regression analysis supports the direct estimation of net program impacts as a consequence of the energy analysis. (This method has been termed "Approach A" in the work plan for this evaluation.) The key assumption underlying this approach is that equipment purchases outside the program represent a baseline for what would have happened in the absence of the program.

The specification of the net billing model includes an additional term that estimates the percentage of pre-installation usage that is saved if a customer in the comparison group implements a lighting retrofit. This parameter was estimated to be 2.7 percent based upon 38 customers (see Exhibit 3-13); and, it is interpreted as the natural savings that would have occurred in the absence of the program if participants had completed retrofits (i.e., a rate of natural conservation). Since participants saved an average of 11.7 percent of pre-installation usage,[16] this translates into an NTG of (11.7-2.7) / 11.7 or 77 percent. This parameter is measured with low precision—a t-statistic of only 1.5—which means that the 90 percent confidence interval around the 2.7 percent is from-0.7 percent to 6.1 percent, resulting in a range for the NTG ratio of 48 percent (lower) to 106 percent.

3.4.2 Free Ridership

A logistic regression model predicting free ridership was developed using self-report data in a pooled model incorporating data from all surveyed lighting program participants. [17] The multivariate purchase decision model attempts to estimate the probability that a customers' revealed choices are consistent with those of a free rider or net participant.

resulting in similar parameter estimates in both cases.

[16] An average impact of 11.7 percent is calculated as the ratio between unadjusted engineering estimates and the annualized 1992 actual usage for all 480 participants in the analysis dataset.

[17] Given the number of variables planned to be included in the initial models, we felt the logistic regressions would be under-powered if they were run separately for each measure group. Using a rule of thumb of 20 observations per model variable, only the T-8 group (N=144) could have supported its own logistic regression. Additionally, we believed that the behavioral model should hold for all purchase decisions, regardless of technology, since decision-making processes should be consistent across technologies.

Exhibit 3-15
Self-Reported Free Ridership: Superset of Model Variables

Model Variable	Wording of Question	Predicted Direction: Net Participant	Predicted Direction: Free Rider	In Final Model
	TIMING OF PLANS			
PERIOD_ BEFORE_ AWARE	How long were you considering <the measure> before you heard about the program?	short-moderate period	longer period	
NO_PLANS	Wasn't planning on purchase until approached	yes	no	x
PERIOD_ AFTER_ AWARE	How long did you take to decide to participate after becoming aware of the program?	longer period	shorter period	x
WAIT_NO_ PGM	How long would you have waited to <take the measure> without the program?	longer period	shorter period	x
WAIT_FOR_ PGM	Did you delay a retrofit in order to participate?	no	yes	
	OPTIONS			
QUOTES	How many estimates or quotes did you obtain before purchasing your new equipment?	few	many	
STD_EQUIP	Did you consider purchasing standard-efficiency equipment?	yes	no	x
BROKEN	(Did the customer mention broken equipment?)	yes	no	
	PROGRAM INFORMATION AND BENEFITS			
PGE_CONTA	How many times a year do you have contact with your PG&E rep?	few	many	
REBATE	(Did the customer mention the rebate?)	yes	no	
BILL_ SAVINGS	(Did the customer mention bill savings?)	yes	no	
FREE_RIDE	Before you knew about the program, which of the following statements best describes your company's plans to <take the measure>?	had considered, but no plans	planning to do it within the next 12 months	

The dependent variable in the model is based upon customer-reported plans in the absence of the program. A customer is coded as a net participant if reported plans indicate that the retrofit would not have been completed in the absence of the program, or would have occurred at a later date.[18]

Independent variables included in the initial model are also shown, along with their predicted effects, in Exhibit 3-15. Three categories of variables are used to explain free ridership. The first category consists of variables that involve the timing of a customer's plans for completing a retrofit, and the timing of their awareness of PG&E's programs. The second category captures variables that characterize the choices customers faced in considering a retrofit. Finally, the third category describes some of the benefits provided by PG&E's program and how they relate to a customer's purchase behavior. Exhibit 3-15 lists the variables that were considered for the free rider model and indicates those variables included in its final specification.

Timing of Plans - Four questions addressing the decision-making process and the length of time spent in various decision-making stages were included in the telephone survey. A question addressing length of time spent considering various equipment options, before becoming aware of the program, PERIOD_BEFORE_AWARE , was included in the model. Customers spending less time researching equipment before becoming aware of the program can be distinguished from free riders who had researched and chosen products before becoming aware of the program. While risk-averse customers may also have spent considerable time considering options, net participants (as a group) should spend less time seeking information than free riders. Contractor-driven net participants were expected to have spent no time shopping for lighting equipment before becoming aware of the program (NO_PLANS).

A second question addressing the length of time the customer spent considering the benefits provided by the program was also included in the model (PERIOD_AFTER_AWARE). Free riders, because they have essentially already made up their minds, should spend a short period of time assessing the benefits provided by the program. When presented with the option to install equipment or take some other efficiency action through the program, they are eager to do so. Contractor-driven net participants may also spend a relatively short period of time reaching a decision, but taken as a whole, net participants are expected to take more time to reach a decision to participate than free riders.

[18] Customers who accelerated a decision to retrofit were considered net participants.

The third decision-making question included in the model addressed the number of years a customer would have delayed the equipment retrofit had the program not existed (WAIT_NO_PROGRAM). This question is intended to differentiate decision-accelerated net participants from free riders.

A final question, WAIT_FOR_PROGRAM, was intended to serve as a flag identifying free riders based on prior purchase plans.

Options - In programs with aggressive target marketing by contractors and division representatives, participants may obtain few quotes for their prospective lighting purchases. Many customers will only obtain one quote from their initial program contact (often a lighting contractor) and then stay with one contractor. The number of quotes obtained (QUOTES) should discriminate between those customers who were driven into the program by tactical program marketing efforts versus those who were already active in the marketplace.

Customers who never considered standard-efficiency lighting measures prior to their purchase (STD_EQUIP) are likely free riders since the program was not a prime driver in their purchase of high-efficiency lighting equipment. Customers with older, failing equipment (BROKEN) may be driven into the market by the condition of their equipment, but once in the market, their equipment selection can be greatly affected by the program's contribution to the increased supply of energy-efficient lighting.

Program Information and Benefits - Customers in close contact with their division representatives have increased access to information about the benefits of participating (PGE_CONTACT). Customers in frequent communication with representatives may be "repeat" program participants whose likelihood of free ridership increases over time.

Program marketing efforts create a market for lighting retrofits and influence customer plans. Many customers indicated that they were drawn into the market by program marketing efforts. Program participants, more so than nonparticipants who also made lighting purchases, were more likely to echo program marketing messages such as a desire for bill savings (BILL_SAVINGS) or the program rebate (REBATE). These customers were drawn into the program by key program benefits, which provide the necessary motivation for customers who might not otherwise adopt program qualifying measures. These variables should be associated with decreasing likelihood of free ridership.

Details of the model-building process and final model selection appear in *Appendix J.* Pooled model results (the regression coefficients) were used to generate average free ridership rates for each technology group.

3.4.3 Spillover

The program spillover estimate contains two main components: a contribution from program participants and a contribution from nonparticipants.

Participants - Participant spillover effects were measured through simple self-report questions such as, "Since participating in the program, have you adopted any additional energy-efficiency recommendations?" Customers were asked about specific program-qualifying technologies such as T-8 lamps with electronic ballasts. Responses were tallied, and the rates of the actions in the participant population were calculated and multiplied by ex post estimates of measure savings (average percentage reductions in usage per account). These were then credited to the RE program as additional program kWh savings. This was done for each lighting technology group and the program as a whole.

Nonparticipants - The nonparticipant, free drivership analysis focused on the extent to which program-aware nonparticipants adopted the same program-qualifying measures. These estimates provide a lower bound on program educational effects. Because the survey was written to probe for changes since January 1992, and was conducted during the summer of 1995, the rates of implementation were reduced to reflect an average, typical year’s worth of installations. Implementation rates were then multiplied by the nonparticipant market size, or approximately 278,000 accounts.

General Methods. All intermediate effects were expressed as percentage reductions in annual usage. These were multiplied by each groups' average annual account size[19], and the impacts (in kWh) were summed to yield a final net kWh. This was then divided by the ex post gross kWh estimate to yield the final NTG ratio. Exhibit 3-16 shows an example of the spillover effects included for compact fluorescent lamps. Percentages shown in the exhibit are annual usage reductions used in the net energy calculations. Note the participant spillover effects (in this case for compact fluorescent lamps) apply to the NTG for the technology under which a customer participated.[20]

[19] Participant spillover effects were calculated as percentage reductions multiplied times the average *post-program* annual usage.

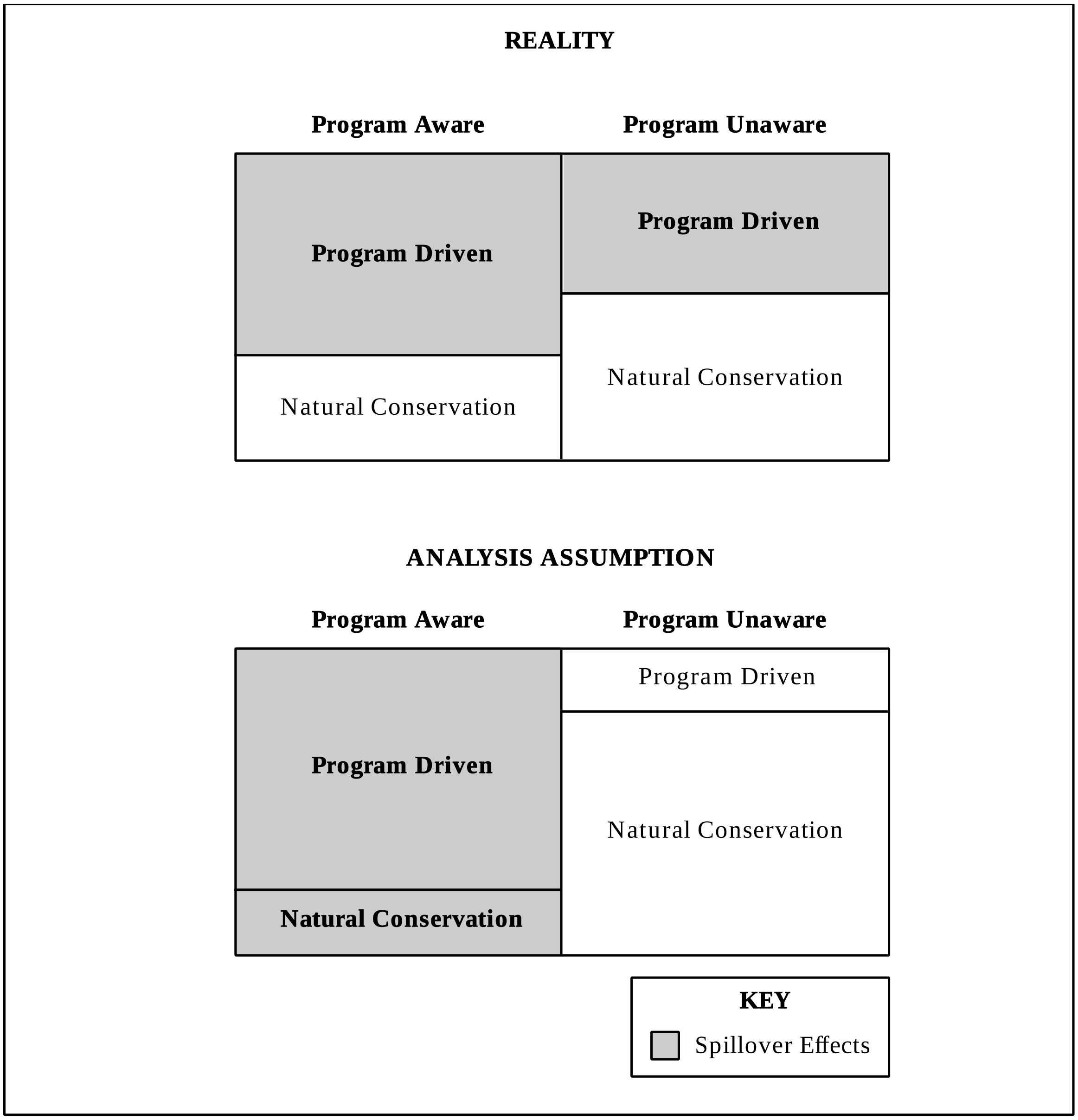
[20] Customers who installed multiple measures were categorized based on the measure that supplied the greatest impact on avoided cost.

Exhibit 3-16
Example: Spillover Effects Used for Compact Fluorescent Lamps

Technology	Spillover Effects: Participants' Within Measure Spillover	Spillover Effects: Participants' Other Measure Spillover	Spillover Effects: Nonparticipants' Spillover
Compact Fluorescent	2%		2%
Incandescent to Fluorescent		6%	
Efficient Ballast		1%	
T8 Lamps and Electronic Ballasts		3%	
Optical Reflectors w/ Fluor. Delamp		11%	
High Intensity Discharge		5%	
Halogen		5%	
Exit Signs		1%	
Controls		2%	

Caveats. By basing the program's market movement effects on the self-reports of aware nonparticipants we are both underestimating natural conservation among aware nonparticipant adopters and overestimating it among unaware nonparticipant adopters. Exhibit 3-17 shows how purchases outside the program can be divided into those reflecting the program's market movement effects and those reflecting natural conservation. These are shown alongside assumptions made in this analysis.

Exhibit 3-17
Representation of Nonparticipant Spillover Effects



In order to accurately measure the program's market effects, data from additional sources, in addition to self-reports, would be required. This stems from a major drawback of self-report data: namely, that there is no reason to believe that customers who made program qualifying retrofits outside the program would be able to accurately gauge the program's effect on structuring their choices. In other words, nonparticipants who make a program-qualifying purchase[21] may have no idea of the

[21] regardless of their program awareness

program's effect on the pricing and availability of equipment they purchase outside the program. The same can be said of nonparticipants or participants who report that they "would have adopted the measure without the program." This is a common dilemma in measuring program net effects when relying solely on self-reports. The solution to the problem does not lie in increasingly detailed probes of participants and nonparticipants. Rather, the solution lies in looking elsewhere for data and in adopting multi-level models or approaches that capture the program's macro-level effects on the distribution, availability, and pricing of energy efficiency options.

3.4.4 Integrated Estimate of NTG Adjustments

The final step in constructing the NTG ratio is to sum up all contributing effects into one index. Program gross impacts are adjusted for free ridership and spillover to produce the combined best-estimate of program net impacts. These net impacts are estimated by adding together the net effect of program participants,[22] program participant spillover effects, and nonparticipant spillover effects, as follows:

$$\frac{NTG = GI * (1 - FR) + Spillover_{Part} + Spillover_{NonPart}}{GI}$$

where,

NTG	=	the Net-to-Gross Ratio
GI	=	the Program Gross Impact
FR	=	the Free Ridership Rate
$Spillover_{Part}$	=	the estimated impact of participants' nonprogram energy conservation actions
$Spillover_{NonPart}$	=	the estimated impact of nonparticipants' program-influenced energy conservation actions

Because of the size of the remaining market (approximately 278,000 accounts) and its effect on NTG ratios, results shown in *Section 4* are given for four separate estimates of the nonparticipant contribution. First NTG ratios excluding nonparticipant contributions[23] are given. These are followed by NTG estimates that include the lower-bound estimate of nonparticipant contributions, the midpoint, and the 90 percent upper-bound nonparticipant spillover contribution. Summary tables in Section 1 show the decomposition of the final program NTG ratio into the following components:

[22] Taking free ridership into consideration

[23] but including participant spillover

- 1-FR
- Participant Spillover Effects
- Nonparticipant Spillover Effects

The process of applying the NTG adjustments to the gross energy and demand impacts is illustrated in Exhibits 3-18 and 3-19 below. The second column presents a summary of the gross ex ante impacts, and the gross ex post (evaluation) impacts. These impacts are then adjusted, on a row-by-row basis, by summing the appropriate free rider, participant spillover, or nonparticipant spillover adjustments and multiplying the sum times the gross impacts, to derive the net impacts in the two net columns. The realization rates, in the bottom section, are then generated by dividing the ex post impact by the ex ante impact.

While Exhibits 3-18 and 3-19 present results by end-use elements, the same method is used to estimate gross and net impact estimates that are presented by technology group in *Section 4*, Evaluation Results Summaries.

Exhibit 3-18
Net Energy Impact Summary

Technology Group	Gross	NTG Adjustments			Net	
	Gross Impact	Free Ridership Adjustment (1-FR)	Participant Spillover Adjustment	Nonparticipant Spillover Adjsutment	Net Impact without NP Spillover Adjustment	Net Impact with NP Spillover Adjustment
	(MWh)	(Unitless)	(Unitless)	(Unitless)	(MWh)	(MWh)
Ex Ante						
Indoor Lighting	280,014	0.67	0.10		215,858	
Outdoor Lighting	20,738	0.67	0.10		15,958	
Indoor & Outdoor Lighting	300,752	0.67	0.10		230,783	
Ex Post						
Indoor Lighting	277,688	0.87	0.03	0.18	250,058	300,043
Outdoor Lighting	18,058	0.82	0.06	0.27	15,891	20,745
Indoor & Outdoor Lighting	295,746	0.87	0.03	0.18	267,059	320,778
Realization Rates (ex post/ex ante)						
Indoor Lighting	0.99	NA	NA	NA	1.16	1.39
Outdoor Lighting	0.87	NA	NA	NA	1.00	1.30
Indoor & Outdoor Lighting	0.98	NA	NA	NA	1.16	1.39

Exhibit 3-19
Net Demand Impact Summary

Technology Group	Gross	NTG Adjustments			Net	
	Gross Impact	Free Ridership Adjustment (1-FR)	Participant Spillover Adjustment	Nonparticipant Spillover Adjsutment	Net Impact without NP Spillover Adjustment	Net Impact with NP Spillover Adjustment
	(kW)	(Unitless)	(Unitless)	(Unitless)	(kW)	(kW)
Ex Ante						
Indoor Lighting	52,416	0.67	0.10		40,351	
Outdoor Lighting	124	0.67	0.10		92	
Indoor & Outdoor Lighting	52,540	0.67	0.10		40,443	
Ex Post						
Indoor Lighting	62,389	0.87	0.03	0.19	56,181	69,000
Outdoor Lighting	782	0.83	0.06	0.27	696	884
Indoor & Outdoor Lighting	63,172	0.87	0.03	0.18	57,044	69,884
Realization Rates (ex post/ex ante)						
Indoor Lighting	1.19	NA	NA	NA	1.39	1.71
Outdoor Lighting	6.31	NA	NA	NA	7.53	9.56
Indoor & Outdoor Lighting	1.20	NA	NA	NA	1.41	1.73

Section 4

EVALUATION RESULTS SUMMARIES

This section summarizes the results of this evaluation, starting with the gross impact results, then discussing the net-to-gross (NTG) adjustments, and concluding with the program realization rates (ratio of evaluation findings to the ex ante program design estimates) for both gross and a net basis. Reasons for the deviations from the preconceived ex ante estimates are discussed in the presentation of program realization.

Where segment analysis could be supported, results are presented by technology and building segment. All results are segmented by program, Retrofit Express (RE) and Customized Incentives (Customized), and by indoor and outdoor applications. All results are aggregated to the entire program.

4.1 Gross Energy Impact Results

Exhibits 4-1 and 4-2 present the gross energy and demand impacts, respectively, from the evaluation for the RE and Customized programs for indoor and outdoor applications. The gross evaluation impacts for energy and demand by PG&E costing period are covered in *Appendix K*.

Exhibit 4-1
Gross ENERGY IMPACTS
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector First Year ENERGY IMPACTS (MWh)										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Indoor Lighting											
RE Program											
Compact Fluorescent	3,068	675	773	1,046	150	805	1,235	6,627	55	272	14,706
Incandescent to Fluorescent	1,297	484	59	435	86	122	297	513	78	35	3,407
Efficient Ballast	1,182	292	463	425	972	24	144	11	55	226	3,795
T8 Lamps and Electronic Ballasts	40,380	15,483	3,838	8,505	5,309	383	8,039	1,557	2,142	2,139	87,775
Optical Reflectors w / Fluor. Delamp	45,335	8,960	3,702	4,925	3,592	411	5,020	1,145	1,782	2,089	76,961
High Intensity Discharge	7,090	6,704	1,667	5,080	787	79	830	296	8,928	3,097	34,557
Halogen	1,005	1,403	410	105	109	427	621	1,773	107	167	6,128
Exit Signs	1,858	253	344	687	24	31	750	204	88	244	4,482
Controls	6,261	711	691	1,161	27	33	1,363	368	216	306	11,136
Other	-----	17	-----	-----	1	-----	-----	-----	-----	-----	17
RE Program Indoor Total	107,475	34,983	11,947	22,369	11,056	2,315	18,299	12,494	13,451	8,575	242,965
Customized Program											
Compact Fluorescent	378	82	-----	-----	96	-----	33	95	-----	-----	684
Standard Fluorescent	6,371	3,923	3,354	680	10,382	85	341	92	79	49	25,356
High Intensity Discharge	-----	388	-----	-----	89	-----	-----	-----	1,332	-----	1,808
Exit Signs	40	4	-----	-----	-----	-----	-----	-----	-----	-----	45
Controls	510	795	-----	-----	2,595	-----	-----	-----	-----	-----	3,901
Other	1,090	163	-----	-----	1,675	-----	-----	-----	-----	-----	2,929
Customized Program Indoor Total	8,390	5,356	3,354	680	14,838	85	374	187	1,411	49	34,723
Indoor Total	115,865	40,338	15,301	23,049	25,895	2,400	18,673	12,681	14,862	8,625	277,688
Exterior Lighting											
RE Program Exterior HID	2,923	4,679	580	3,132	463	698	607	1,933	916	1,281	17,211
Customized Program Exterior HID	86	-----	-----	-----	-----	-----	-----	-----	268	-----	354
Customized Program Traffic Lights	-----	-----	-----	-----	-----	-----	-----	-----	-----	493	493
Outdoor Total	3,009	4,679	580	3,132	463	698	607	1,933	1,184	1,774	18,058
Indoor and Outdoor Total	118,874	45,018	15,881	26,181	26,357	3,098	19,280	14,614	16,046	10,398	295,746

Exhibit 4-2
Gross DEMAND* IMPACTS
By Business Group and Technology Type
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector First Year DEMAND IMPACTS (kW)										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Indoor Lighting											
RE Program											
Compact Fluorescent	1,036	225	210	414	32	201	324	1,379	23	65	3,909
Incandescent to Fluorescent	299	136	16	159	18	29	75	95	29	8	865
Efficient Ballast	274	83	121	163	199	6	36	2	21	50	956
T8 Lamps and Electronic Ballasts	9,348	4,423	1,004	3,115	1,110	92	2,029	289	812	478	22,700
Optical Reflectors w/ Fluor. Delamp	10,505	2,578	968	1,778	753	98	1,260	213	671	467	19,291
High Intensity Discharge	1,644	2,041	194	838	71	8	94	24	1,494	306	6,714
Halogen	236	432	48	18	10	45	71	144	18	16	1,038
Exit Signs	231	31	43	86	3	4	93	25	11	30	556
Controls	1,551	160	130	245	1	5	222	44	36	46	2,441
Other	-----	2	-----	-----	0	-----	-----	-----	-----	-----	2
RE Program Indoor Total	25,125	10,110	2,734	6,816	2,197	489	4,204	2,216	3,115	1,465	58,471
Customized Program											
Compact Fluorescent	51	13	-----	-----	8	-----	3	8	-----	-----	82
Standard Fluorescent	879	584	391	118	962	9	38	7	13	6	3,008
High Intensity Discharge	-----	53	-----	-----	8	-----	-----	-----	226	-----	287
Exit Signs	3	0	-----	-----	-----	-----	-----	-----	-----	-----	4
Controls	40	62	-----	-----	201	-----	-----	-----	-----	-----	304
Other	86	13	-----	-----	134	-----	-----	-----	-----	-----	233
Customized Program Indoor Total	1,059	726	391	118	1,312	9	42	15	239	6	3,918
Indoor Total	26,184	10,836	3,126	6,934	3,509	498	4,246	2,231	3,355	1,471	62,389
Exterior Lighting											
RE Program Exterior HID	121	193	24	129	19	29	25	80	38	53	712
Customized Program Exterior HID	4	-----	-----	-----	-----	-----	-----	-----	11	-----	15
Customized Program Traffic Lights	-----	-----	-----	-----	-----	-----	-----	-----	-----	56	56
Outdoor Total	124	193	24	129	19	29	25	80	49	109	782
Indoor and Outdoor Total	26,309	11,029	3,149	7,063	3,528	527	4,271	2,311	3,404	1,580	63,172

*Summer On-Peak demand impacts are defined for weekdays during the hour 3:00-4:00 PM, May 1-October 31.

The results in Exhibits 4-1 and 4-2 illustrate the following findings:

- RE indoor technologies represented more than 80 percent and 90 percent of the energy and demand impacts, respectively.
- Office and retail business types represent more than 55 percent of the impacts, with office being the largest single segment accounting for about 40 percent.

- The three technologies that made the largest contributions to impacts were the replacement of standard-efficiency fluorescent lamps and ballasts with modern T-8 lamps and electronic ballasts; the installation of optical reflectors in combination with delamping in fluorescent fixtures; and the installation of high-intensity discharge (HID) lamps and ballasts for less efficient technologies. These three technologies represented more than 70 percent of the program energy and demand savings.
- The lowest energy impacts were contributed by the restaurant building type, because of low participation in the program. Lighting quality requirements within this segment have been an explanation for the predominance of incandescent installations that overcome the limitations of dimming capability in energy-efficient technologies.
- The Customized program plays a small role in the overall impact, with just over 10 percent of the energy savings and approximately 6 percent of the demand savings being attributable to this program.
- Similarly, outdoor lighting is a small contributor, with just about 6 percent of the energy savings and approximately 1 percent of the demand savings.

4.2 Net-to-Gross Adjustments

The NTG results account for all of the market spillover effects (free ridership, participant spillover, and nonparticipant spillover) into estimates by measure, and an overall estimate for the program. The market analysis NTG approach discussed in *Section 3* is the method that produced these results because of their higher reliability, and the fact that they could support measure-level analysis.

Exhibit 4-3 presents the NTG values by technology, along with the 90 percent confidence intervals, without nonparticipant spillover and with nonparticipant spillover. The estimates are presented this way because of the large effect that nonparticipant spillover can have on the NTG values.

Nonparticipant spillover accounts for the percentage of customers who were not participants but installed high-efficiency measures because of the presence of the program. This effect is determined by assessing the percentage of the nonparticipant population who installed high-efficiency measures because of the presence of the program, then multiplying this percentage by the nonparticipant population. Since the nonparticipant population is large, a small percentage of nonparticipant actions can create a large spillover effect relative to the program impact.

While QC computed and presents NTG estimates without and with nonparticipant spillover, we are convinced that nonparticipant spillover exists, and that the values presented including nonparticipant spillover are the best estimates of the NTG adjustments.

Exhibit 4-3
NTG Adjustments by Technology Type

Technology	Without NP Spillover		
	Lower 90%	**Midpoint**	**Upper 90%**
Compact Fluorescent	1.00	1.01	1.02
Incandescent to Fluorescent	0.83	0.89	0.95
Efficient Ballast	0.92	0.93	0.94
T8 Lamps and Electronic Ballasts	0.91	0.92	0.94
Optical Reflectors w/ Fluor. Delamp	0.95	0.96	0.96
High Intensity Discharge	0.86	0.88	0.90
Halogen	0.83	0.89	0.95
Exit Signs	1.02	1.08	1.14
Controls	0.89	0.93	0.96
Other	0.83	0.89	0.95
RE Program	0.92	0.93	0.93
Customized Program	0.70	0.73	0.76

Technology	With NP Spillover		
	Lower 90%	**Midpoint**	**Upper 90%**
Compact Fluorescent	1.01	1.45	1.99
Incandescent to Fluorescent	NA	0.89	NA
Efficient Ballast	0.93	2.00	2.00
T8 Lamps and Electronic Ballasts	0.92	1.19	1.50
Optical Reflectors w/ Fluor. Delamp	0.96	0.98	1.02
High Intensity Discharge	0.88	1.17	1.51
Halogen	NA	0.89	NA
Exit Signs	1.08	1.45	1.88
Controls	NA	0.93	NA
Other	NA	0.89	NA
RE Program	0.93	1.13	1.34
Customized Program	NA	0.73	NA

Several of the technology-specific estimates deserve individual discussion.

- **Compact Fluorescents** - Net estimates for compact fluorescent lighting were increased by two major contributions. First, program participants who installed compact fluorescent lighting through the program also reported installing T-8 lamps *after* participating. Additionally, 0.1 percent of nonparticipants surveyed also reported installing compact fluorescent lighting. Because the size of the nonparticipant market exceeds 270,000 accounts, the nonparticipant contribution drives the final NTG estimate to 1.45.
- **Exit Signs** - Ten percent of the customers who installed exit signs through the program were also estimated to have installed compact fluorescent lighting outside the program after participating. Nonparticipant spillover contributions further increased the NTG for LED exit lighting.
- **Electronic Ballasts** - More free driver nonparticipants installed electronic ballasts outside the program than customers within the program. This effect caused the NTG for electronic ballasts to exceed 2.0.

4.3 Net Impacts

Exhibits 4-4 and 4-5 present the net energy and demand impacts, respectively, from the evaluation for the RE and Customized programs for indoor and outdoor applications.

Exhibit 4-4
Net ENERGY IMPACTS
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector First Year ENERGY IMPACTS (MWh)										
	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.	Total
Indoor Lighting											
RE Program											
Compact Fluorescent	4,461	981	1,124	1,520	218	1,171	1,795	9,637	81	396	21,384
Incandescent to Fluorescent	1,161	433	53	389	77	110	265	459	70	32	3,048
Efficient Ballast	2,364	585	927	850	1,943	48	289	22	110	451	7,589
T8 Lamps and Electronic Ballasts	47,926	18,377	4,555	10,095	6,301	455	9,542	1,848	2,542	2,539	104,179
Optical Reflectors w / Fluor. Delamp	44,585	8,812	3,641	4,844	3,533	404	4,937	1,126	1,753	2,055	75,689
High Intensity Discharge	8,290	7,839	1,949	5,940	920	92	971	346	10,438	3,621	40,405
Halogen	899	1,256	367	94	98	382	556	1,586	96	149	5,483
Exit Signs	2,688	366	497	994	35	44	1,085	296	128	353	6,486
Controls	5,792	658	639	1,074	25	30	1,261	340	200	283	10,302
Other	-----	15	-----	-----	1	-----	-----	-----	-----	-----	16
RE Program Indoor Total	118,165	39,321	13,752	25,800	13,150	2,737	20,701	15,660	15,416	9,879	274,581
Customized Program											
Compact Fluorescent	277	60	-----	-----	70	-----	24	69	-----	-----	501
Standard Fluorescent	4,672	2,877	2,459	498	7,613	62	250	67	58	36	18,594
High Intensity Discharge	-----	284	-----	-----	65	-----	-----	-----	976	-----	1,326
Exit Signs	30	3	-----	-----	-----	-----	-----	-----	-----	-----	33
Controls	374	583	-----	-----	1,903	-----	-----	-----	-----	-----	2,861
Other	800	120	-----	-----	1,229	-----	-----	-----	-----	-----	2,148
Customized Program Indoor Total	6,153	3,927	2,459	498	10,881	62	274	137	1,035	36	25,462
Indoor Total	124,318	43,248	16,211	26,298	24,031	2,799	20,975	15,797	16,451	9,915	300,043
Exterior Lighting											
RE Program Exterior HID	3,418	5,471	678	3,662	541	816	709	2,260	1,071	1,497	20,124
Customized Program Exterior HID	63	-----	-----	-----	-----	-----	-----	-----	197	-----	260
Customized Program Traffic Lights	-----	-----	-----	-----	-----	-----	-----	-----	-----	361	361
Outdoor Total	3,481	5,471	678	3,662	541	816	709	2,260	1,268	1,859	20,745
Indoor and Outdoor Total	127,799	48,719	16,889	29,960	24,572	3,615	21,684	18,057	17,719	11,774	320,788

Exhibit 4-5
Net DEMAND* IMPACTS
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector First Year DEMAND IMPACTS (kW)										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Indoor Lighting											
RE Program											
Compact Fluorescent	1,507	327	305	602	46	293	471	2,005	33	94	5,683
Incandescent to Fluorescent	268	121	14	142	16	26	67	85	26	7	774
Efficient Ballast	547	166	242	326	399	12	73	4	42	101	1,912
T8 Lamps and Electronic Ballasts	11,095	5,250	1,192	3,697	1,317	109	2,408	343	964	567	26,942
Optical Reflectors w/ Fluor. Delamp	10,332	2,535	952	1,749	740	97	1,239	209	660	459	18,972
High Intensity Discharge	1,922	2,386	226	980	83	10	110	28	1,747	358	7,850
Halogen	211	387	43	16	9	40	63	129	16	15	929
Exit Signs	334	45	63	124	4	6	135	37	15	43	805
Controls	1,435	148	121	226	1	4	206	41	34	43	2,259
Other	-----	2	-----	-----	0	-----	-----	-----	-----	-----	2
RE Program Indoor Total	27,651	11,367	3,158	7,863	2,616	597	4,772	2,882	3,537	1,685	66,127
Customized Program											
Compact Fluorescent	37	9	-----	-----	6	-----	3	6	-----	-----	60
Standard Fluorescent	644	429	287	86	705	7	28	5	10	4	2,206
High Intensity Discharge	-----	39	-----	-----	6	-----	-----	-----	166	-----	211
Exit Signs	2	0	-----	-----	-----	-----	-----	-----	-----	-----	3
Controls	30	46	-----	-----	147	-----	-----	-----	-----	-----	223
Other	63	9	-----	-----	98	-----	-----	-----	-----	-----	171
Customized Program Indoor Total	777	532	287	86	962	7	31	11	176	4	2,873
Indoor Total	28,428	11,899	3,445	7,949	3,578	603	4,802	2,893	3,713	1,689	69,000
Exterior Lighting											
RE Program Exterior HID	141	226	28	151	22	34	29	93	44	62	832
Customized Program Exterior HID	3	-----	-----	-----	-----	-----	-----	-----	8	-----	11
Customized Program Traffic Lights	-----	-----	-----	-----	-----	-----	-----	-----	-----	41	41
Outdoor Total	144	226	28	151	22	34	29	93	52	103	884
Indoor and Outdoor Total	28,572	12,125	3,473	8,100	3,601	637	4,832	2,986	3,765	1,793	69,884

*Summer On-Peak demand impacts are defined for weekdays during the hour 3:00-4:00 PM, May 1-October 31.

Overall, Exhibits 4-4 and 4-5 show an 8.5 percent increase in ex-post program energy savings, and a 10.6 percent increase in demand savings (when compared to Exhibits 4-1 and 4-2, gross impacts), as a result of the application of the NTG adjustments presented in Exhibit 4-3. The NTG adjustments modified the general impact picture very little. T-8/electronic ballast, optical reflectors with decamp, and HID replacements for less efficient lamps still dominate the savings representing more than two thirds of the energy and demand impacts. On a building basis, office and retail segments still dominate impacts with more than 55 percent of the total impact for both energy and demand.

Close examination of these results identifies the following findings:

- **Efficient Ballasts** - The impact doubled, as predicted by the NTG adjustment, but this had little effect on the overall impact because it represents only 2 to 3 percent of the total impact.

- **Hotel/motel** - The hotel/motel business type showed a 24 percent increase in energy, and a 29 percent increase in demand impact due primarily to the high proportion of savings represented by compact fluorescent technology in this building segment.

- **Grocery** - The grocery business type showed a decreased in energy impact and an increase in demand impact because of the low NTG on custom measures. The grocery building segment had large estimated impacts in standard fluorescent custom measures. This measure had a substantial energy impact but a small demand impact.

4.4 Realization Rates

Exhibits 4-6 through 4-9 present the gross and net realization rates for energy and demand impacts for the RE and Customized program indoor and outdoor lighting applications. The four realization rate exhibits are analyzed in order, so that factors that contributed to the results can be discussed in order of impact, followed by market analysis results.

4.4.1 Gross Realization Rates for Energy Impacts

The gross energy realization rates are presented in Exhibit 4-6. These values represent, by segment, the ratio of gross impact evaluation findings to the gross ex ante program design estimate of savings. These realization rates illustrate how well the ex ante estimates predicted energy savings, before taking into account customer behavioral effects, both inside and outside the program.

Exhibit 4-6
Gross ENERGY Impact REALIZATION RATES
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector ENERGY Impact REALIZATION RATES#										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Average**
Indoor Lighting											
RE Program											
Compact Fluorescent	0.60	0.41	0.72	0.52	0.45	0.56	0.60	0.69	0.31	0.52	0.61
Incandescent to Fluorescent	1.11	0.90	0.87	0.70	0.75	0.84	0.94	1.29	0.53	2.62	0.97
Efficient Ballast	0.57	0.40	0.60	0.40	0.55	0.29	0.46	0.79	0.28	0.56	0.51
T8 Lamps and Electronic Ballasts	1.05	0.74	0.94	0.64	0.69	0.73	0.86	1.18	0.47	1.02	0.86
Optical Reflectors w / Fluor. Delamp	1.18	0.83	1.09	0.69	0.74	0.84	0.97	1.30	0.59	1.36	1.02
High Intensity Discharge	1.15	0.70	4.46	1.94	1.60	1.82	2.15	2.99	1.22	2.10	1.21
Halogen	1.91	1.45	3.84	2.27	4.20	4.56	3.65	5.64	2.12	5.01	2.63
Exit Signs	1.07	1.00	1.39	1.06	1.06	1.06	1.05	1.09	0.98	1.04	1.08
Controls	0.92	0.96	1.45	0.63	0.71	1.23	1.35	1.56	0.95	1.03	0.96
Other	-----	1.08	-----	-----	1.12	-----	-----	-----	-----	-----	1.08
RE Program Indoor Average	1.07	0.76	1.13	0.76	0.72	0.80	0.94	0.95	0.85	1.30	0.94
Customized Program											
Compact Fluorescent¥											
Standard Fluorescent¥											
High Intensity Discharge¥											
Exit Signs¥											
Controls¥											
Other¥											
Customized Program Indoor Average											1.69
Indoor Average											0.99
Exterior Lighting											
RE Program Exterior HID	0.87	0.87	1.07	0.87	0.87	0.87	0.87	0.85	0.86	0.93	0.88
Customized Program Exterior HID											0.85
Customized Program Traffic Lights											0.71
Outdoor Average											0.87
Indoor and Outdoor Average											0.98

\# The program design gross impact realization rates are defined as the ratio of evaluation impact to MDSS impact.

¥ Customized Incentives Program results are not reported by technology group because measure classifications are not carefully tracked in the MDSS.

Overall, Exhibit 4-6 shows that the ex ante estimates are close to the gross impact estimates. The average realization rate for RE indoor applications is 0.94, while Customized is 1.69, resulting in a program realization rate of 0.99 for indoor lighting applications. When this is combined with the 0.87 realization rate for outdoor lighting, a weighted overall program realization rate of 0.98 results.

Segment level realization rates were not possible for Customized because the MDSS did not track ex ante estimates by measure technology.

The results presented in Exhibit 4-6 can be explained using information from the review of the ex ante estimates in conjunction with the impact analysis results. Explanations of the results by technology are as follows:

- **Compact Fluorescents** - The low program realization rates for compact fluorescent technology are a product of the billing regression analysis yielding a 62 percent realization on the engineering estimates. These results were significant at greater than the 90 percent confidence level. The primary segments for compact fluorescents were hotel / motel and office, representing 45 percent and 21 percent of the gross energy savings, respectively.
  - The operating factors for this technology were estimated only for the office segment and were lower than expected. This adjustment was made in the engineering estimates for the office segment alone. The hotel / motel segment, a segment that was not included in the on-site sample because it represented only about 5 percent of the total ex ante impacts, was based upon ex ante estimates. The sample did not support independent analyses of the hotel / motel and office segments; therefore, the low average SAE realization rate for this must be attributed primarily to the hotel / motel segment.
  - QC's experience has been that compact fluorescents in the hotel / motel segment are either placed in hallways that have 24-hour operation, or in guest rooms, where operation is erratic, and inspection and monitoring are not viable. The low realization rate results, therefore, because a significant number of the compact fluorescent lamps installed in the hotel / motel building segment were installed in guest rooms. Even for the other building types, lower operating factors than expected are likely, since compact fluorescents typically replace incandescent lamps in locations where occupancy is inconsistent.
- **Efficient Ballast** - The low gross program realization rates for the efficient ballast technology is a result of an error in the MDSS. The MDSS applied the per-fixture ex ante savings value to lamp counts for a portion (1993 program applicants) of the measures tracked. This resulted in ex ante estimates in the MDSS that were approximately 100 percent higher than they should have been.
- **Halogen** - The high realization rates for the halogen technologies are a result of the ex ante estimates for this technology assuming a short lamp life, with the lamp being replaced with a conventional light at the end of the original lamp life. No evidence of this practice was found in the field nor detected in the billing regression analysis. These high realization rates have a small effect on the overall realization rates because the energy impact of this technology accounts for only 2 percent of the total.
- **Fluorescent Technologies, Low Billing Regression Realization Rates** - The low realization rates for retail, school, grocery, and restaurant business types are a direct

result of low realized impacts detected in the billing regression analysis for fluorescent technologies. Other than that ex ante estimates for this technology may have been derived from unrealistic assumptions, no specific reasons explaining this result could be found.

- **High-Intensity Discharge** - The high realization rates reported for many building types under the HID technology type are the result of inexplicably low MDSS figures. An attempt to reproduce the MDSS estimates, based upon the ex ante input values and participation numbers, resulted in considerably higher values than those reported in the MDSS.

4.4.2 Gross Realization Rates for Demand Impacts

The gross demand realization rates are presented in Exhibit 4-7. These values represent, by segment, the ratio of gross impact evaluation findings to the gross ex ante program design estimate of savings. These realization rates illustrate how well the ex ante estimates predicted demand savings, before taking into account customers' actions within the lighting market.

Exhibit 4-7
Gross DEMAND* Impact REALIZATION RATES
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.	Average
	Commercial Sector DEMAND Impact REALIZATION RATES#										
Indoor Lighting											
RE Program											
Compact Fluorescent	1.07	0.90	1.03	0.65	1.00	1.00	0.94	0.86	0.77	0.74	0.90
Incandescent to Fluorescent	1.38	1.63	1.19	0.81	1.64	1.45	1.43	1.43	1.21	3.49	1.26
Efficient Ballast	0.68	0.76	0.82	0.47	1.17	0.50	0.68	0.87	0.63	0.74	0.71
T8 Lamps and Electronic Ballasts	1.28	1.45	1.29	0.74	1.52	1.24	1.29	1.31	1.06	1.38	1.19
Optical Reflectors w / Fluor. Delamp	1.39	1.54	1.49	0.78	1.63	1.44	1.42	1.42	1.13	1.79	1.32
High Intensity Discharge	1.45	1.38	2.71	1.01	1.51	1.38	1.45	1.45	1.22	1.24	1.31
Halogen	1.80	1.76	1.69	1.38	1.62	1.88	1.69	1.82	1.46	1.78	1.76
Exit Signs	1.16	1.07	1.54	1.15	1.16	1.18	1.15	1.19	1.03	1.10	1.17
Controls	0.95	0.92	1.18	0.61	0.17	0.99	0.91	1.33	0.72	0.88	0.90
Other	-----	0.54	-----	-----	0.59	-----	-----	-----	-----	-----	0.54
RE Program Indoor Average	1.28	1.42	1.34	0.76	1.50	1.18	1.26	1.01	1.14	1.33	1.19
CI Program											
Compact Fluorescent¥											
Standard Fluorescent¥											
High Intensity Discharge¥											
Exit Signs¥											
Controls¥											
Other¥											
CI Program Indoor Average											1.13
Indoor Average											1.19
Exterior Lighting											
RE Program Exterior HID§	-----	-----	-----	11.56	-----	-----	-----	235.09	-----	-----	61.66
CI Program Exterior HID§											-----
CI Program Traffic Lights											0.50
Outdoor Average											6.31
Indoor and Outdoor Average											1.20

* Summer On-Peak demand impacts are defined for weekdays during the hour 3:00-4:00 PM, May 1-October 31.
\# The program design gross impact realization rates are defined as the ratio of evaluation impact to MDSS impact.
¥ Customized Incentives Program results are not reported by technology group because measure classifications are not carefully tracked in the MDSS.
§ In general, MDSS impacts for exterior lighting systems are zero, with only limited exceptions to this rule.

Overall, the gross demand estimates presented in Exhibit 4-7 are 20 percent higher than the ex ante values. The two primary reasons for this difference are higher operating factors (through lamp counts) than the operating factors used in the ex ante estimates were observed; and the evaluation estimates include HVAC interaction, which was not accounted for in the ex ante values.

Some of the results presented in Exhibit 4-7 can be explained using information from review of the ex ante estimates and the evaluation engineering and billing regression analyses. Specific comments and justifications for the results presented in Exhibit 4-7 are as follows:

- **Compact Fluorescents** - The lower realization rates are due to lower operating factors observed for this technology during field inspections. These operating factors are closer to the operating factors used in the ex ante estimates.
- **Efficient Ballast** - The low gross realization rates reported for the efficient ballast technology is a result of an error in the MDSS. The MDSS applied the per-fixture ex ante savings value to lamp counts for a portion (1993 program applicants) of the measures tracked. This resulted in ex ante estimates in the MDSS that were approximately 100 percent higher than they should have been.
- **High-Intensity Discharge** - The high realization rates reported for many building types under the HID technology type are a result of mistakes in the MDSS figures for this technology, as described above.
- **Halogen** - As previously discussed, the high realization rate for the halogen technologies results from ex ante estimates for this technology, which are based on a short lamp life, with the lamp being replaced with a conventional light at the end of the original lamp life.
- **Grocery** - The high realization rate on grocery building type is due to high operating factors (as observed during inspections through lamp counts), and high diversity factor (high percentage of stores open at peak hour).
- **Schools** - The low realization rate is a result of low diversity factor for schools (a high percentage of schools closed at summer peak hour).
- **Hotel/motel** - The low realization rate is a result of the low realization rate for compact fluorescent technology, which represents more than half of the demand impact in this building type.
- **Exterior HIDs** - The wildly high realization rates for this technology are a result of the ex ante peak demand impact estimates being zero for most applications of this technology. While this is reasonable in theory, field inspections found that many exterior lighting applications are on during peak hours. The extremely high realization rates result from the extremely conservative impacts entered in the MDSS for this application.
- **Traffic Lights (red only) -** The MDSS value for traffic lights does not account for the fact that red traffic lights are on less than 100 percent of the time. The engineering estimates used a conservative diversity factor of 50 percent, resulting in the 0.50 realization rate. Alternatively, the energy estimate reflects the somewhat higher diversity factor (66 percent), based upon a Department of Transportation study.

- **Controls** - The estimated impacts for controls are low because QC could not develop a good demand estimate based upon the data available. As a result, QC assumed a conservative ex post demand value for this extremely small segment impact.

4.4.3 Net Realization Rates for Energy Impacts

The difference between the gross and net realization rates is substantial. This is because of the differences between the ex ante and the ex post estimates of the NTG adjustment. The ex ante estimate varied between 0.72 and 0.78, depending upon the segment. As can be seen from Exhibit 4-3 above, the NTG estimates vary between 0.73 and 2.0, depending upon the technology, resulting in an overall estimate of 1.13 for RE and 0.73 for Customized. As Exhibit 4-1 and 4-2 show, RE represents about 90 percent of the lighting impact for both energy and demand. These NTG adjustment differences result in a 42 percent increase in energy and a 44 percent increase in demand impact.

The net energy realization rates are presented in Exhibit 4-8. These values represent, by segment, the ratio of net impact evaluation findings to the net ex ante program design estimate of savings. The realization rates illustrate how well the ex ante estimates predicted energy savings, after taking into account customers' actions within the lighting market.

Exhibit 4-8
Net ENERGY Impact REALIZATION RATES
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / Program and Technology Group	Commercial Sector ENERGY Impact REALIZATION RATES#										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Average**
Indoor Lighting											
RE Program											
Compact Fluorescent	1.13	0.77	1.36	0.98	0.86	1.05	1.14	1.30	0.59	0.98	1.15
Incandescent to Fluorescent	1.28	1.04	1.02	0.82	0.87	0.98	1.10	1.50	0.62	3.04	1.12
Efficient Ballast	1.48	1.04	1.55	1.03	1.44	0.76	1.18	2.04	0.72	1.46	1.33
T8 Lamps and Electronic Ballasts	1.62	1.15	1.45	0.98	1.07	1.12	1.32	1.81	0.72	1.58	1.32
Optical Reflectors w / Fluor. Delamp	1.50	1.07	1.39	0.88	0.95	1.07	1.23	1.66	0.76	1.73	1.30
High Intensity Discharge	1.74	1.07	6.77	2.95	2.43	2.76	3.26	4.54	1.86	3.19	1.84
Halogen	2.22	1.69	4.46	2.63	4.88	5.30	4.25	6.55	2.47	5.82	3.05
Exit Signs	2.01	1.87	2.62	1.99	1.98	2.00	1.98	2.05	1.84	1.95	2.02
Controls	1.11	1.15	1.74	0.76	0.86	1.48	1.62	1.87	1.14	1.24	1.15
Other	-----	1.38	-----	-----	1.43	-----	-----	-----	-----	-----	1.38
RE Program Indoor Average	1.53	1.11	1.69	1.14	1.12	1.23	1.38	1.55	1.27	1.94	1.37
Customized Program											
Compact Fluorescent¥											
Standard Fluorescent¥											
High Intensity Discharge¥											
Exit Signs¥											
Controls¥											
Other¥											
Customized Program Indoor Average											1.66
Indoor Average											1.39
Exterior Lighting											
RE Program Exterior HID	1.32	1.32	1.62	1.32	1.32	1.32	1.33	1.29	1.30	1.41	1.33
Customized Program Exterior HID											0.84
Customized Program Traffic Lights											0.70
Outdoor Average											1.30
Indoor and Outdoor Average											1.39

\# The program design gross impact realization rates are defined as the ratio of evaluation impact to MDSS impact.

¥ Customized Incentives Program results are not reported by technology group because measure classifications are not carefully tracked in the MDSS.

Overall, given the large difference between the NTG adjustment factors discussed above, and the generally high gross realization rates discussed earlier, it is not surprising that all technology and building segment average realization rates are above 1.0. Additionally, even though the realization rate for the Customized program was 0.73, this was virtually the same realization rate as the ex ante estimate, resulting in only a minor decrease in impact estimate for the Customized program elements.

As discussed previously, some of the results presented in Exhibit 4-8 can be explained using information from the review of the ex ante estimates and the evaluation engineering, billing regression, and NTG analyses. Most of the comments discussed in relation to the gross realization rate estimates apply to the net realization rates. Some are repeated here for thoroughness. Specific comments and justifications for the net realization rates presented in Exhibit 4-8 are as follows:

- **Compact Fluorescents and Efficient Ballast** - The low gross realization rates discussed earlier for compact fluorescent and efficient ballast technologies have been more than offset by the difference between the ex ante and ex post NTG adjustments. It must be remembered that the low gross realization rates reported for the efficient ballast technology is a result of an error in the MDSS. The MDSS applied the per fixture ex ante savings value to lamp counts for a portion (1993 program applicants) of the measures tracked.

- **Halogen** - The high realization rates for the halogen technologies are driven by the gross impact results.

- **Fluorescent Technologies, Low Billing Regression Realization Rates** - The relatively low realization rates for retail, school, grocery, and restaurant businesses are still driven by the gross impact results.

- **High Intensity Discharge** - As noted before, these ex ante estimates are the result of MDSS data or calculation errors.

- **Main Realization Rates Reasonable** - The realization rates that represent the largest proportion (84 percent) of the total net energy savings (compact fluorescents, T-8/electronic ballasts, optical reflectors with delamp, HID for less efficient technologies, and controls) all have realization rates between 1.15 and 1.33 with the exception of HIDs, where incorrect entry of data in the MDSS has caused artificially high realization rates.

Exhibit 4-9
Net DEMAND* Impact REALIZATION RATES
By Business Type and Technology Group
Commercial Indoor and Outdoor Lighting Applications

Business Type / **Program and Technology Group**	**Commercial Sector DEMAND Impact REALIZATION RATES#**										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Average**
Indoor Lighting											
RE Program											
Compact Fluorescent	2.03	1.69	1.94	1.22	1.89	1.89	1.78	1.62	1.46	1.39	1.69
Incandescent to Fluorescent	1.61	1.90	1.39	0.94	1.90	1.68	1.66	1.66	1.40	4.05	1.46
Efficient Ballast	1.78	1.97	2.13	1.23	3.03	1.30	1.76	2.25	1.63	1.93	1.85
T8 Lamps and Electronic Ballasts	1.97	2.24	1.98	1.13	2.34	1.91	2.00	2.02	1.64	2.12	1.83
Optical Reflectors w / Fluor. Delamp	1.78	1.97	1.90	1.00	2.08	1.84	1.81	1.81	1.45	2.29	1.69
High Intensity Discharge	2.20	2.10	4.11	1.53	2.29	2.09	2.21	2.20	1.86	1.88	1.99
Halogen	2.09	2.04	1.96	1.60	1.88	2.19	1.97	2.12	1.70	2.06	2.04
Exit Signs	2.19	2.02	2.89	2.17	2.18	2.23	2.16	2.24	1.93	2.07	2.20
Controls	1.14	1.11	1.41	0.73	0.20	1.18	1.09	1.59	0.86	1.06	1.08
Other	-----	0.69	-----	-----	0.75	-----	-----	-----	-----	-----	0.70
RE Program Indoor Average	1.84	2.08	2.01	1.13	2.31	1.87	1.86	1.70	1.68	1.99	1.75
Customized Program											
Compact Fluorescent¥											
Standard Fluorescent¥											
High Intensity Discharge¥											
Exit Signs¥											
Controls¥											
Other¥											
Customized Program Indoor Average											1.12
Indoor Average											1.71
Exterior Lighting											
RE Program Exterior HID§	-----	-----	-----	19.31	-----	-----	-----	392.66	-----	-----	102.99
Customized Program Exterior HID§											-----
Customized Program Traffic Lights											0.49
Outdoor Average											9.56
Indoor and Outdoor Average											1.73

* Summer On-Peak demand impacts are defined for weekdays during the hour 3:00-4:00 PM, May 1-October 31.
# The program design gross impact realization rates are defined as the ratio of evaluation impact to MDSS impact.
¥ Customized Incentives Program results are not reported by technology group because measure classifications are not carefully tracked in the MDSS.
§ In general, MDSS impacts for exterior lighting systems are zero, with only limited exceptions to this rule.

4.4.4 Net Realization Rates for Demand Impacts

The net demand realization rates are presented in Exhibit 4-9. These values represent, by segment, the ratio of net impact evaluation findings to the net ex ante program design estimate of savings. These realization rates illustrate how well the ex ante estimates predicted demand savings, after taking into account customers' actions within the lighting market. Since NTG estimates need to be applied to both energy and demand impacts, the market analysis that models customers' plans are a more supportable set of results than the net billing analysis model that is derived exclusively from energy data.

As with the net energy estimates discussed above, the overall effect of the NTG adjustments results in high realization rates, especially since some gross realization rate estimates were already greater than 1.0.

Most of the specific comments applied to the net energy and gross realization rate discussions apply to the net realization rates as well. Those reasons not summarized in the previous section are listed below.

- **Schools** - The gross demand realization rate still drives the results for this business type, since the lower than average realization rate is due to low diversity factor for schools (a high percentage of schools are closed during summer peak hour).
- **Exterior HIDs** - As noted above, the wildly high realization rates for this technology are a result of the ex ante peak demand impact estimates being zero for most applications in this technology.
- **Controls** - The estimated impacts for controls are low because QC could not develop a good demand estimate based upon the data available. As a result, QC assumed a conservative ex post demand value for this extremely small segment impact.

4.5 Overview of Realization Rates

Overall, the net energy and demand impacts and realization rates are higher than predicted by the ex ante impact estimates. However, these high realization rates are well documented and supportable based upon the information developed during the evaluation. The ex post estimates are higher than the ex ante values because of the following:

- The evaluation field data collection established generally higher operating factors and longer operating hours than were assumed in the ex ante estimates.
- The billing regression analysis established solid (0.94 to 0.70) SAE realization rates (billing regression estimate divided by the evaluation engineering estimates) for the highest participation segments.
- The NTG adjustment estimation resulted in a mean estimate 40 to 45 percent higher than the conservative estimates use in the ex ante values.

In summary, PG&E's ex ante estimate of energy savings was 39 percent below the ex post estimate of net energy savings, and the ex ante estimate of demand savings was 73 percent below the ex post estimate of net demand.

4.6 Program Design Estimates

The evaluation team offers the following comments and recommendations regarding the methods used to generate program design estimates (further details are available in *Appendix B,* pages B-25 through B-32):

- An extensive review of the program design algorithms and collected field data on building segment-specific operating hours and operating factors provided insights into these parameters. These full load hours account only for lighting system operation, not total impact -- thus isolating the lighting technology impacts from the HVAC program impact contributions. This information should be incorporated into the PG&E design estimates by substituting the following adjusted full load hours into the current design algorithm by business type:

Exhibit 4-10
Full Load Hours by Business Type

Industry Group	Indoor Lighting Annual Hours of Operation Evaluation Estimate	Program Design Estimate
Office	3,900	3,400
Retail	4,200	4,700
College / University	3,700	3,500
School	2,000	2,100
Grocery	6,800	7,000
Restaurant	4,800	4,800
Health Care / Hospital	4,900	4,000
Hotel / Motel	5,400	4,000
Warehouse	3,100	4,000
Miscellaneous	4,800	4,000

- The coincident diversified operating factors (CDOFs) generated by business type—for use in predicting demand during the on-peak season at the system peak hour—should be incorporated into the PG&E design estimates. That is, these estimates should be substituted for applicable measures that currently have a coincident diversity factor (CDF) of 0.67. The following are recommended CDOFs by business type:

Exhibit 4-11
CDOFs by Business Type

Industry Group	Indoor Lighting Peak Hour CDOF	
	Evaluation Estimate	**Program Design Estimate**
Office	0.78	0.67
Retail	0.90	0.67
College / University	0.61	0.67
School	0.46	0.67
Grocery	0.91	0.67
Restaurant	0.70	0.67
Health Care / Hospital	0.78	0.67
Hotel / Motel	0.64	0.67
Warehouse	0.78	0.67
Miscellaneous	0.71	0.67

- Program design first-year energy impact estimates for halogen lamps are generated under the assumption that these fixtures will burn out within the first year, and then either remain out or be replaced by another technology. On-site audit results have clearly shown that the burn-out rates in halogen lamps are small (less than 1 percent of the halogen lamps inspected were burned out), leading to the conclusion that halogen lamp failure rates are not abnormally prevalent one year after the initial installation. We recommend that retention studies carefully record the fate of halogen retrofit technologies, and that, based upon these results, consideration should be given to analyzing program design estimates using hours of operation that extend beyond the life of a halogen lamp.

- Program design demand impact estimates for exterior lighting systems assume no operation during daylight hours, and thus generally predict zero demand during the summer on-peak hour. Both on-site audit schedules and on-site lamp counts have discounted this hypothesis, showing that exterior lights do occasionally operate during daylight hours. Data supporting or discounting these findings should continue to be gathered, in order to better define the probability of exterior fixture operation during daylight hours.

- Program design demand impact estimates recorded in the MDSS (for customers participating in the Customized program indoor lighting measures) were typically found to contain the difference in connected load between the retrofit and existing system. This record of demand impact is inconsistent with the indoor lighting demand recorded for RE customers, where the difference in connected load is adjusted by a coincident diversity factor (typical CDF adjustment for applicable measures is 0.67). We recommend that demand impacts for applicable Customized program measures be adjusted in a similar fashion to ensure consistency in these MDSS records.

Section 5

RECOMMENDATIONS

Recommendations that would enhance future program performance and evaluation are presented in this section. Recommendations regarding evaluation methods are followed by those affecting the program's design. Finally, recommendations regarding the Protocols are offered.

5.1 Evaluation Methods

The evaluation team offers the following comments and recommendations regarding methods used in the 1994 evaluation:

- **General Issues for Quantifying Spillover Effects** - Because the nonparticipant market size is so large, including nonparticipant spillover effects in net-to-gross (NTG) calculations has a profound impact on the final NTG ratios. With the inclusion of nonparticipant effects, the NTG ratios can exceed 2.0. Therefore, the evaluation team recommends collecting additional data (such as trade ally surveys) every second or third year to gauge the program's market movement effects. This second source of data will help support the program's cost recovery claims for spillover effects.

- **Trade on Established Information in Future Evaluations** - This evaluation developed extensive observed and measured operating factor and operating hours information on the highest participation segments, in order to obtain the best estimates of savings for the largest contributors to savings. Less robust information was developed on medium- and low- participation segments. There is no reason to believe that the operating factor and operating hours information developed in this evaluation will change from year to year. QC recommends that PG&E develop an understanding with the CPUC on the validity and use of this information in subsequent evaluations, so that the resources dedicated to subsequent evaluations can be used to improve information on the medium- and low- participation segments, or to develop information on other parameters, rather than just measuring the same parameters over again.

5.2 Measures Offered

The realization rate estimates in *Section 4* (ratio of the evaluation estimated savings to the ex ante savings on a gross and net basis), allow for the identification of technologies or building types that either exceed or fall below expectations.

In general, the commercial lighting technologies offered exceeded program design expectations on both a gross and net basis. This is primarily a result of the ex ante estimates being based upon hours of operation shorter than those measured during the evaluation, and the application of ex ante NTG adjustments that were lower than the values established by the evaluation.

These exhibits allow identification of technologies or building types that should be reassessed in terms of their viability as technologies. This does not imply that these technologies are not valuable, but rather that the original estimate of design savings was higher than that actually achieved. The following segments should be reviewed for viability as part of the overall assessment.

- **Schools** showed low realization rates on both a gross and net basis for most technologies. Those technologies that showed realization rates above 1.0 were generally low- participation/low-impact measures for the schools segment. The evaluation impacts were low because both the hours of operation and the operating factors for the school building segment were substantially below those anticipated. In addition, schools tend not to operate during system peak (summer), and are less likely to be air-conditioned than other commercial buildings. We realize that eliminating schools may not be viable for other reasons.
- **Compact Fluorescents** showed low energy realization rates across all business segments. This is primarily a result of low, but significant, realized savings estimates in the billing regression analysis for all compact fluorescents, which were analyzed as a group. The primary segments for compact fluorescents were hotel/motel and office, representing 45 percent and 21 percent of the gross energy savings, respectively. Compact fluorescents are generally installed in fixtures that have traditionally used incandescent lamps, and as such, are more likely to be switched off when not needed (e.g., in bathrooms, closets, store rooms, etc.). The hotel/motel segment was not subject to on-site inspections because it represented only approximately 5 percent of the savings (energy and demand), and because our experience indicated that compact fluorescents in the hotel/motel segment are either placed in hallways that have 24-hour operation, or in guest rooms, where operation is erratic, and inspection and monitoring are not viable The realization rate for this technology is low because a significant number of the compact fluorescent lamps installed in the hotel/motel building segment were probably installed in guest rooms. If feasible, PG&E should consider limiting rebates in the hotel/motel building type to common area applications.

All other technologies or building segments with low realization rates are discussed and explained in *Section 4, Evaluation Results Summaries.*

5.3 Protocols

After working with the ex post application of the Protocols for over a year, QC would like to offer the following recommendations:

- **Clarify the Sample Size for the Retention Panel - Table 9A** - Table 9A states as part of the footnote that “The utility should select the top ten measures ranked by net resource value or the number of measures that constitute the first 50% of the estimated resource value, whichever number of measures is less.” The Protocols do not specify the size of the sample required to satisfy this “top ten or 50%” requirement. PG&E has specified a retention panel size of 150 sites (probably based upon the number of on-sites that are being executed). Without a Protocol-based sample size, it is always a guessing game between the consultant and PG&E as to what will satisfy the Protocol requirements for Table 9A.

- **Coordinate Table 11 and Table 6** - The new Table 6 and Table 11 are inconsistent in their application in that Table 11 does not include the footnote indicating the optional nature of some of the inclusions. Tables 6 and 11 should be made consistent with the rest of the Protocols.

- **Clarify Basis, Meaning, and Purpose for Square Footage Estimates (Table 6, C-4, C-5)** - Tables C-4 and C-5 request reporting of results in “Designated Unit(s) of Measurement” for lighting of “load impacts per square foot per 1000 hours of operation.” Under Participant Group, point 4 the square footage estimates is defined as “<u>Square footage estimates </u>(conditioned space and lighted area) used in the end use model(s) to produce estimates of pre installation usage, base year usage, and first year impacts must be based on (a) premise-specific data collected and used for purposes of establishing the terms and conditions of financial assistance, or, if not available; (b) premise-specific data collected on-site from all remaining customers in the participant group evaluation sample.” This definition does not identify whether the square footage to be used in the computation is the retrofitted square footage, or the total facility square footage. In consultation with the PG&E project manager, the total rather than retrofitted square footage, based upon on-site data collection, was applied. It may well be that other contractors are basing computations on retrofitted facility square footage, in which case they will develop totally different estimates. The definition and purpose of the square footage estimates should be clarified to assist the utilities and contractors in developing useful, meaningful Protocol- compliance estimates.

- **Identify Meaningful Designated Units for Controls Measures** - Designated units of load impact per square foot per 1000 hours of operation have no meaning for controls measures where the connected load does not change. These measures include time clocks, photo-cell controls, energy management systems, occupancy sensors, and any other control-oriented measures. While these represent a small portion of the program, it is unclear how the results should be reported. Modifications to the Protocols should be made to clarify how they should be reported.

1994 COMMERCIAL RETROFIT PROGRAM
EVALUATION OF LIGHTING TECHNOLOGIES

FINAL IMPACT EVALUATION REPORT
APPENDICES

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1994 COMMERCIAL RETROFIT PROGRAM EVALUATION OF LIGHTING TECHNOLOGIES

FINAL IMPACT EVALUATION REPORT APPENDICES

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LIST OF APPENDICES

Appendix A

SAMPLE DESIGN PROTOCOLS

Appendix A

SAMPLE DESIGN

This appendix presents the existing data sources and sample design approach used for the evaluation of Pacific Gas and Electric Company's (PG&E's) 1994 Commercial Lighting Technologies Evaluation It begins with a discussion of data sources used in the sample design, followed by detailed descriptions of the steps undertaken to design the telephone survey, on-site audit, and lighting logger samples for the impact and process evaluation. This appendix concludes with a discussion of the California Public Utilities Commission (CPUC) Evaluation and Measurement Protocols (the Protocols) requirements, and how those requirements are met in the current sample design.

A.1 Existing Data Sources for Sample Design

A.1.1 Program Participant Tracking System

The participant tracking system for the Retrofit Express (RE) and Customized Incentives (Customized) Programs is maintained as part of the PG&E Management Decision Support System (MDSS). It contains program application, rebate, and technical information regarding installed measures, including measure descriptions, quantities, rebate amounts, and ex ante demand, energy and therm saving estimates. The MDSS extract used in this evaluation is consistent with data used in the PG&E March 31 Annual Earning Assessment Proceedings (AEAP) Report.

For the RE/Customized programs, participation was tracked at both application and measure levels, and stored in two separate databases, linked by application code and program year. Each application can cover multiple measures and accounts, and each measure is linked to a PG&E electrical or gas service location where the measures are supposed to be installed. The account location is identified by its account number, or a unique seven-digit identification number (PG&E's control number). Because they are not reassigned or changed, like the customer account numbers may be, control numbers are used to identify customer service locations and serve as key fields to link different datasets.

A.1.2 PG&E Billing Data

Two installments of billing data were received for the evaluation. The first, received in March 1995, covers the period between January 1992 and February 1995. The second dataset was received in late November 1995, covering the period from September 1994 through September 1995. Depending upon the time period, the number of unique control numbers in the billing dataset ranged from 723k in 1992, to 758k in 1995. The billing dataset contains monthly energy-consumption information for all nonresidential electric accounts in the PG&E service territory, as well as other billing-related information, such as customer name, service location, rate schedule, and Standard Industrial Classification (SIC) code. The final integrated multi-year billing dataset contains a total of 761,669 unique control numbers.

Preparation of the billing data for selection of participant and comparison group samples is discussed in greater detail in the sample frame sections that follow.

A.2 Sample Design Overview

The sampling plan for the Commercial Lighting Evaluation is based upon analysis of 1994 program participation data and the PG&E billing data. The goal of the design approach is to achieve the most efficient utilization of project resources, in order to meet the following objectives:

- Determine least-cost optimal sample allocation for first-year gross impact analysis, based upon sample size and evaluation accuracy requirements of the Protocols
- Allocate sufficient sample points to meet net-to-gross (NTG) and process evaluation objectives
- Reallocate available resources, wherever feasible, to focus on measures and/or program features deemed most important by PG&E staff for future program design

The lighting evaluation sample design is based upon a nested sample design approach. This approach consists of four groups of customers in subsets, according to the type of information available. The largest customer group includes all of the commercial customers with monthly PG&E billing data and participant tracking data who were rebated for eligible lighting technologies in 1994 (the "participant population"). The smallest group is the metered participants, who have the most comprehensive information available. These participants have lighting logger data, on-site audit data, telephone survey data, participant tracking data, and billing data. A similar nested sample design was also implemented for the comparison group, with the exception that logger data was not collected for that group. The advantage of a nested sample design is that it yields overlapping samples, which are used to compute dual estimates from the engineering and statistical analysis for the same group of customers, and therefore yields meaningful estimates of the realization rates.

A.3 Sample Frame

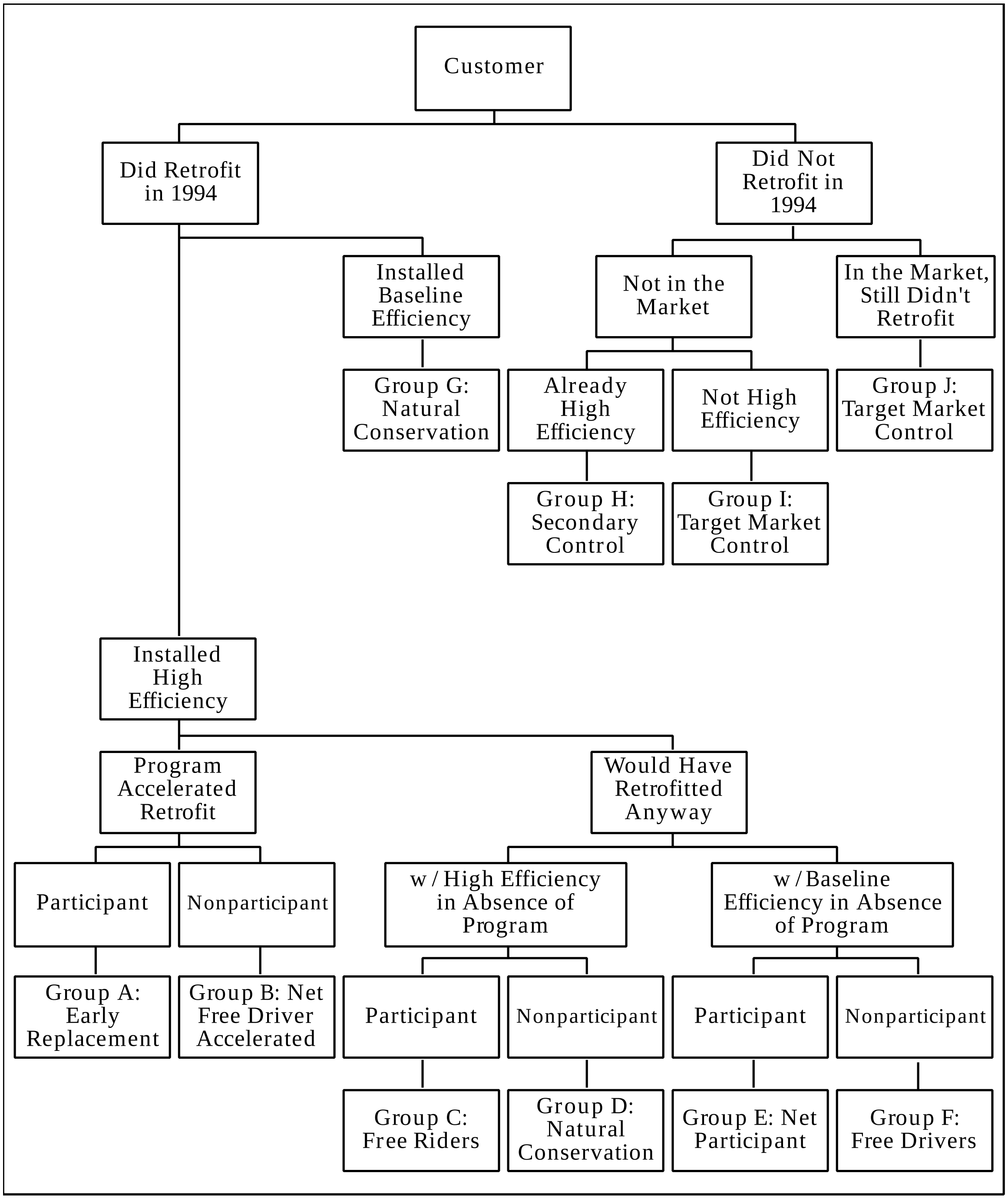
The first step in sample design is to determine the sampling frame. In general, the sampling frame includes only those customers who are program participants, or likely targets of the program, rather than all customers in the population. It sets the stage for all data collection activities that follow, and determines the availability of billing and demand data for the remainder of the analysis. In addition, it prevents drawing samples outside the sampling frame.

In this evaluation, different analyses (e.g., impact analysis, free rider analysis, and spillover analysis) use different sampling frames, which are defined by analyzing what possible actions a customer in PG&E's service territory could have taken during the study period. This classification provides the basis for the sample design. Without this kind of control, the SAE analysis change model cannot be estimated, since nonprogram-induced changes cannot be separated from changes between periods attributable to other factors, such as weather and economic trends.

Exhibit A-1 illustrates a decision-tree analysis of possible program-related customer actions. The bottom-most groupings on the diagram illustrate the application of each type of action.

- Group A and B accelerated their decision to retrofit and purchased high-efficiency lighting, and all count as net program participants.
- Participants (Groups A, C, E) and nonparticipants unaware of the program (in Groups D, G, and, if any, in Groups B and F) will be used in the free ridership analysis.
- Spillover / free drivership will be analyzed by attempting to identify and assess reasons for adoption among customers in Groups B and F.
- The gross impact analysis will be best controlled for by customers in Groups J and I, since these are customers (both in and out of the market) who possess equipment similar to participants' pre-existing systems.

Exhibit A-1
Possible Customer Actions Related to Program Measures



A.4 Sample Segmentation

Evaluation of the Commercial lighting program at the participant segment level allows more precise, and insightful, evaluation analyses than those undertaken at the aggregate PG&E system level. A participant segmentation scheme was developed to provide some homogeneous segments for analysis; it is, however, sufficiently aggregated for statistical analysis.

The program segmentation consists of two components: participant segmentation and technology segmentation. Based upon the available MDSS database, Exhibits A-2 through A-4 that follow present the final participant and technology segments used in the sample design, data collection, and program analysis and reporting.

The first step in the participant segmentation process grouped firms by business type, as defined in the MDSS. There are a total of 11 business types in the MDSS database; however, approximately 35 percent of the program projects were assigned to two miscellaneous categories, named ALL and Other (OTR). Participants in these two groups were redistributed on the basis of their Second Standard Industrial Classification (SIC2) code, and put into the existing nine business types, and a new, smaller miscellaneous group. The final data distribution, by business type, is presented in Exhibit A-2.

Exhibit A-2
Commercial Lighting Technology Participant Segmentation and Data Distribution in 1994

Data Distribution \ Business Type	Commercial										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
RE Program											
Expected Net kW Impacts (kW)	10,590	5,181	1,242	4,452	1,036	380	1,707	1,512	1,847	631	28,578
% kW Impacts	30.1%	14.7%	3.5%	12.7%	2.9%	1.1%	4.9%	4.3%	5.2%	1.8%	81.2%
Expected Net MWh Impacts (MWh)	57,387	37,494	6,573	17,279	11,229	3,260	10,810	11,325	11,664	5,045	172,068
% MWh Impacts	27.2%	17.8%	3.1%	8.2%	5.3%	1.5%	5.1%	5.4%	5.5%	2.4%	81.6%
Avoided Cost in 1994 ($1,000)	37,108	23,665	4,047	12,540	6,687	1,515	6,556	6,534	7,991	3,087	109,729
% Avoided Cost	27.6%	17.6%	3.0%	9.3%	5.0%	1.1%	4.9%	4.9%	5.9%	2.3%	81.5%
# of Paid Items in 1994	3,896	2,817	351	1,464	649	487	1,034	713	678	475	12,564
# of Paid Projects in 1994	1,467	1,256	111	449	279	229	381	251	308	95	4,826
# of Unique Master Accounts	1,260	1,150	39	383	260	216	293	206	282	78	4,167
Customized Program											
Expected Net kW Impacts (kW)	473	456	225	34	731	2	44	10	215	117	2,307
% kW Impacts	20.0%	19.3%	9.5%	1.4%	30.9%	0.1%	1.9%	0.4%	9.1%	5.0%	97.5%
Expected Net MWh Impacts (MWh)	2,229	2,788	819	68	7,147	8	247	77	1,163	737	15,283
% MWh Impacts	14.3%	17.9%	5.3%	0.4%	45.9%	0.1%	1.6%	0.5%	7.5%	4.7%	98.1%
Avoided Cost in 1994 ($1,000)	1,477	1,364	538	77	3,072	5	115	32	540	520	7,740
% Avoided Cost	18.8%	17.3%	6.8%	1.0%	39.0%	0.1%	1.5%	0.4%	6.9%	6.6%	98.3%
# of Paid Items in 1994	23	19	2	1	51	1	3	4	7	81	192
# of Paid Projects in 1994	20	16	2	1	48	1	3	2	5	4	102
# of Unique Master Accounts	20	14	2	1	47	1	3	2	4	4	98

Another segmentation element was the size of the firm. The annual energy consumption values were used to group customers into three usage/size categories:, small, medium, and large. The comparison group customers are then selected to mirror the underlying distribution of the participant target population. For a given business type, the lighting use area or schedule zone was used to obtain consistent estimates of operating hours and operating factors, as discussed earlier.

As shown in Exhibit A-2, three business types, office, retail, and school, account for more than 70 percent of the projected (ex ante) program avoided cost in 1994. The avoided cost of the Customized program is only about 6 percent of the avoided cost of the RE program.

A.5 Technology Segmentation (RE Program)

For this evaluation, program measures have been reorganized into technology groups, combining technologies with similar energy reduction responses. This grouping strengthens the analysis by increasing the number of points and decreasing the variation per group.

Grouping by technology is important because the use of electricity, and therefore the program impacts, varies widely across technologies. Grouping common technologies reduces variation in the results.

The three elements of the technology segmentation are as follows:

- **Technology Groups**, presented in bold in Exhibit A-3, encompass all measures offered by the RE Program, which are expected to have similar energy saving responses. For example, all T12 to T8 retrofit measures are grouped together, despite the fact that 1) some are new fixtures, and some retrofitted fixture; and 2) different measures have different levels of projected energy savings. The projected energy savings differences will be accounted for in the engineering estimates, yielding similar per-unit responses.

- **Measure Group**, the second level of segmentation, groups measures by the PG&E RE program measure description.

- **Measure,** the highest level of segmentation presented, is the actual measure offered by the PG&E RE program.

In some instances, the measure-level descriptions appear repetitive or overlapping, because measures from both the 1993 and 1994 RE programs are included in the evaluation of measures paid in calendar year 1994.

The RE technology segmentation presented in Exhibit A-3 shows the highest level of segmentation, at the measure level for the commercial sector. While evaluation engineering estimates were developed at this level, final billing regression analysis results were only significant at selected technology-group levels.

T12 to T8 fluorescent technology retrofits, and mercury vapor lamp replacement with high-intensity discharge lamps accounted for more than 70 percent of the program design (ex ante) kW and kWh saving for the RE program.

A.6 Technology Segmentation (Customized Program)

In general, the same technologies are used in custom applications or configurations in the Customized program. The same technology groups applied to the RE program are also used in the Customized program. The measure groups and measures are, however, specific to the Customized program.

The diversity of measures and applications make segmentation much less important to the analysis of savings for the Customized program. The evaluation of savings for the Customized program relies heavily upon 1) comprehensive review of the paper documentation for the 102 program applicants; (2) grouping of similar projects into common technology groups, when possible; and 3) engineering estimation of savings based upon application information and data collected during on-site audits.

Review of the distribution of energy and demand savings across the measures listed in Exhibit A-4 reveals a much broader distribution of saving across measures. For example, T8 / energy-efficient ballasts represent approximately 16 percent of the program design savings, as compared to approximately 30 percent for the RE program. This is not surprising for a customized incentive program accompanied by a comprehensive prescriptive program.

Exhibit A-3
Commercial Lighting Technology Segmentation – RE Program

Technology Segment Descriptions	PG&E Measure Code	# of Measures	Expected Impacts kW	MWh
Halogen				
All wattages	L1	8,647	171	514
< 45 watts	L60	1,117	22	67
> 50 watts	L61	11,682	397	1,752
Compact Fluorescent Lamps				
Screw In CF				
All wattages	L2, L56	8,665	293	1,623
5-13 watts	L62	2,173	65	360
14-26 watts	L63	8,007	238	1,329
Screw In CF- Reusable ballast				
All wattages	L3, L58, L59	18,812	561	3,330
5-13 watts	L64	20,932	628	3,278
14-26 watts	L65	16,092	482	2,528
Hard Wired CF				
All wattages	L4	20,862	1,209	6,879
5-13 watts	L66	10,310	309	1,689
14-26 watts	L67	15,635	468	2,487
27-50 watts	L68	3,003	105	550
Incandescent to Fluorescent Fixture				
With Energy Saving Ballast & T12 Lamps	L7	2,634	370	2,007
With Electronic Ballast & T8 Lamps	L8	1,973	318	1,522
Exit Signs				
Incand. to Compact Fluorescents	L5	10,249	295	2,581
Incand. to LED or Electroluminescent Retrofit	L6	5,607	181	1,583
Efficient Ballasts Changeouts				
Electronic Ballasts				
2 Lamp Electronic Ballast	L14	74,834	942	5,311
3 Lamp Electronic Ballast	L15	3,780	58	313
4 Lamp Electronic Ballast	L16	17,528	340	1,794
T8 Lamps and Electronic Ballasts				
New Fixtures				
One-Lamp Fixture	L9, L117, L121	1,467	22	107
Two-Lamp Fixture	L10, L118, L122	20,538	265	1,345
Three-Lamp Fixture	L11, L123	15,221	337	1,576
Four-Lamp Fixture	L12, L120, L124	17,177	452	2,619
2'-1 U Tube or 2 lamps	L69	710	10	57
2'-2 U Tubes or 4 lamps	L70	2,022	52	305
2'-3 U Tubes or 6 lamps	L71	599	31	189
4'-1 lamp	L72	2,606	39	229
4'-2 lamps	L73	32,639	485	2,484
4'-3 lamps	L74	27,042	676	3,476
4'-4 lamps or 8'-2 lamps	L75	30,784	923	6,214

Technology Segment Descriptions	PG&E Measure Code	# of Measures	Expected Impacts kW	MWh
Fixture Modif.- Replace Lamps and Ballasts				
Replace Lamps & Ballasts - 2' Fixture	L21	46,675	327	1,897
Replace Lamps & Ballasts - 3' Fixture	L22	24,503	189	1,048
Replace Lamps & Ballasts - 4' Fixture	L23	1,701,262	13,420	70,720
Replace Lamps & Ballasts - 8' Fixture	L24	67,921	1,019	5,844
Delamp Fluorescent Fixtures				
Fixture Modif.- Delamp and Reflector				
Removal - 2' Lamps & Ballasts	L17	4,750	100	559
Removal - 3' Lamps	L18	4,641	69	355
Removal - 4' Lamps	L19	404,236	12,306	62,410
Removal - 8' Lamps	L20	32,283	2,059	12,152
High Output T8 & T10 Conversion w / Delamp				
T10 & Energy Saving Ballast	L76	317	7	42
T10 or T8 & Electronic Ballast	L77	1,308	39	199
High Intensity Discharge				
Interior Compact HPS from Incand.				
0-100 watts HPS	L25	651	74	412
0-35 watts HPS	L78	53	4	19
36-70 watts HPS	L79	664	50	292
71-100 watts HPS	L80	473	49	240
Interior Standard MH from Merc. Vapor				
101-175 watts MH	L26	2,254	283	1,498
176-250 watts MH	L27, L37	5,977	2,552	13,997
251-400 watts MH	L81	5,084	2,107	12,036
Exterior HPS from Merc. Vapor				
0-100 watts	L28	7,840	0	3,615
101-175 watts	L29	3,418	0	3,362
176 watts & greater	L30	5,105	11	12,652
Reduced Wattage Lighting	L13	138,184	845	4,032
Controls				
Time Clocks	L31	713	0	312
Occupancy Sensors				
72-350 watts controlled	L32	3,287	195	870
351-1000 watts controlled	L33	2,907	588	2,286
1000 watts and greater controlled	L34	769	209	1,053
Wall Mounted	L82	7,587	466	2,082
Ceiling Mounted	L83	5,704	1,181	4,589
Bypass / Delay	L35	694	72	280
Photocell	L36	1,882	0	185
Other Lighting	L114 - L116	154	4	16
RE Program Total	ALL	**2,894,643**	**48,971**	**279,149**

Exhibit A-4
Commercial Lighting Technology Segmentation – Customized Program

Technology Segment Descriptions	**PG&E Measure Code**	**# of Items**	**Expected Impacts**	
			kW	**MWh**
Halogen				
Low Voltage Halogen	182	0	0	0
Halogen Lamp Conversion	156	2	4	18
Compact Fluorescent Lamps	102	4	26	130
Incandescent to Fluorescent Fixture				
Incandescent to Fluorescent - Indoor	101	1	5	42
Incandescent to Fluorescent - Outdoor	120	4	0	314
Exit Signs	155	2	1	12
Efficient Ballasts Changeouts				
Modified Electromagnetic Ballasts				
Hybrid Ballasts	147	6	165	1,258
Primium Ballast (Core & Coil)	148	2	56	387
Electronic Ballasts	149	4	677	2,937
T8 Lamps and Electronic Ballasts	146	20	407	2,624
Delamp Fluorescent Fixtures				
Fixture Modif.- Delamp and Reflector	181	1	16	181
Remove Lamps Reduce Lights	150	1	13	100
High Intensity Discharge				
Metal Halide Fixtures - Interior	104	1	2	10
HPS/LPS - Interior	105	2	98	563
HPS/LPS - Exterior	123	1	0	105
Reduced Wattage Lighting				
4' Energy Saver Fluorescent Lamps	142	0	0	0
8' Energy Saver Fluorescent Lamps	143	8	124	1,128
T8 Fluorescent Lamps	144	3	119	442
Lower Wattage Incandescent Lamps	152	1	2	5
Current Limiters	153	1	22	168
Controls				
Lighting Controls	160	4	47	896
Lighting EMS	164	13	0	1,156
Motion/Occupancy Sensors	166	1	30	118
Photocell	168	1	0	115
Bypass/Delay	169	1	0	11
Lighting Other				
Daylighting	191	0	0	0
Optical Reflectors	193	5	12	50
Lighting Other	151,195,199	131	1,743	8,826
Customized Program Total	**ALL**	**220**	**3,568**	**21,596**

The column titled “# of Items” in Exhibit A-4 refers to the number of times that type of measure appeared on an application form. Because each application is different, the total number of measures is not a relevant index.

The distribution of measures reflects the allotment of these applications after reallocation based upon a review of the paper application files. As originally allocated in the MDSS, the “other lighting” category represented approximately 50 percent of the energy and load ex ante estimates of savings. Reallocation of these applications was important in order to include the maximum number of measures into the billing regression analysis, and maximize the transfer of realization rates from the billing analysis to similar measures in the Customized program.

A.7 Sample Weighting Techniques

The 1994 Commercial Lighting Evaluation sample design allocated sample sizes in proportion to the program segment-level avoided cost, which served as the primary segment-level sample weights in the subsequent sample allocation.

A key step in developing the sampling plan is to calculate appropriate weights by the segments mentioned above. The purpose of this weighting scheme is to identify which technologies and / or business types in the RE and Customized programs account for the greatest impact on the program resource and shareholder values. For this evaluation, the primary prioritization relies upon program segment-level avoided cost reported in the MDSS database, which is a combination of expected program demand and energy savings weighted by PG&E system marginal costs.

Another consideration in designing the sample is compliance with the Protocols. The sample allocation was designed to meet the sample size and relative precision requirements of the Protocols, as established in Table 5.

Finally, the sample allocation also reflects feedback from PG&E program staff regarding future design of the program and the uncertainty of the current program estimates.

Exhibit A-5 presents the avoided cost, by business type and measure group, for the RE program.

Exhibit A-5
Commercial Lighting Technologies – RE Program
Percentage of Avoided Cost by Business Type and Measure Group

Business Type / Measure Group	Commercial										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Halogen	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Compact Fluorescent Lamps											
Screw In CF	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%
Screw In CF- Reusable ballast	0.2%	0.1%	0.0%	0.2%	0.0%	0.1%	0.1%	0.4%	0.0%	0.0%	1.1%
Hard Wired CF	1.0%	0.2%	0.2%	0.4%	0.0%	0.2%	0.4%	2.4%	0.0%	0.1%	5.0%
Incandescent to Fluorescent Fixture											
With Energy Saving Ballast & T12 Lamps	0.2%	0.1%	0.0%	0.1%	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.8%
With Electronic Ballast & T8 Lamps	0.2%	0.1%	0.0%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Exit Signs											
Incand. to Compact Fluorescents	0.4%	0.1%	0.0%	0.2%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%	0.9%
Incand. to LED or Electroluminescent Retrofit	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%	0.6%
Efficient Ballasts Changeouts											
Electronic Ballasts	0.8%	0.3%	0.3%	0.5%	0.6%	0.0%	0.1%	0.0%	0.1%	0.2%	2.8%
T8 Lamps and Electronic Ballasts											
New Fixtures	2.0%	1.6%	0.2%	1.3%	1.4%	0.0%	0.2%	0.2%	0.5%	0.1%	7.5%
Fixture Modif.- Replace Lamps and Ballasts	12.4%	5.9%	1.2%	4.4%	1.2%	0.1%	3.2%	0.3%	1.1%	0.6%	30.5%
Delamp Fluorescent Fixtures											
Fixture Modif.- Delamp and Reflector	14.9%	3.9%	1.3%	3.2%	1.6%	0.2%	2.0%	0.3%	1.2%	0.6%	29.1%
High Output T8 & T10 Conversion w/ Delamp	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
High Intensity Discharge											
Interior Compact HPS from Incand.	0.1%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%
Interior Standard MH from Merc. Vapor	2.4%	3.6%	0.1%	1.2%	0.2%	0.0%	0.2%	0.0%	3.0%	0.6%	11.3%
Exterior HPS from Merc. Vapor	1.0%	1.6%	0.2%	1.1%	0.2%	0.2%	0.2%	0.7%	0.3%	0.4%	5.7%
Reduced Wattage Lighting	0.2%	0.1%	0.1%	0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.6%
Controls											
Time Clocks	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Occupancy Sensors	1.5%	0.2%	0.1%	0.4%	0.0%	0.0%	0.2%	0.0%	0.0%	0.1%	2.5%
Bypass/Delay	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Photocell	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other Lighting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Program Total	37.7%	17.9%	3.9%	13.5%	5.2%	1.0%	7.0%	4.6%	6.4%	2.8%	100.0%

A.8 Sample Sizes

The PG&E C/I Lighting Program Evaluation sampling plan consists of a telephone sample of 900 customers (450 participants and 450 comparison group customers), an on-site audit sample of 300 customers (150 participants and 150 comparison group customers), and a lighting logger sample of 150 participants. The sample design complies with the Protocols and meets the program evaluation objectives. In this evaluation, the sampling unit is the PG&E control number, which defines a unique service address. Applications in the MDSS database can cover more than one control number. The distribution of these sample points is presented in Exhibit A-6.

Exhibits A-7 through A-9 present the detailed RE program sampling for the telephone survey, on-site audit, and lighting logger samples, respectively. Because of the relatively large number of measures, sample size and allocation will only be shown at the measure-group level.

Telephone Survey Sample Allocation by Segment - For each segment, the RE program sample design allocated the sample in proportion to the program-avoided cost by segment. This sample design (Exhibit A-7) concentrates sample points to segments that represent highest impact, in order to obtain the best estimate of impact for the largest portion of the population. This sample allocation, combined with the random sampling techniques within each segment, produces a stratified random telephone survey sample representing the RE lighting program-participant population (paid in 1994). In addition, the same process also generates a nonparticipant sample that is used as a comparison group for the evaluation.

On-site Audit Sample Allocation by Segment - Exhibit A-8 presents the RE program sample allocation for the on-site audit sample. Similar to the telephone survey sample, this sample was also structured to be approximately proportional to the program segment-level avoided cost estimates.

Lighting Logger Sample Allocation by Segment - The sample allocation for the lighting logger sample is presented in Exhibit A-9. This sample is not intended to be a random sample, nor strictly proportional to the program-avoided cost. The sample allocations were manipulated in order to assure adequate sample sizes for calibration of engineering models (see *Appendix B*).

Exhibit A-6
Commercial Lighting Evaluation Sample Allocation

Program	Sample Frame	Telephone Survey		On-Site Audit	Lighting Logger
		Lighting	HVAC Process Survey		
Participant	2,193	450	80	150	150
Comparison Group	4,039	450	0	150	0
TOTAL	**6,232**	**900**	**80**	**300**	**150**

*Based upon a preliminary analysis of the incomplete 1994 MDSS database.

†Actual numbers will be determined when the billing data becomes available.

Exhibit A-7
Retrofit Express Program – Commercial Lighting Technologies
Telephone Survey Sample Allocation

Business Type / Measure Group	Commercial Sector										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Halogen	0	0	0	0	0	0	0	0	0	0	0
Compact Fluorescent Lamps											
Screw In CF	0	0	0	0	0	0	0	0	0	0	0
Screw In CF- Reusable ballast	1	0	0	1	0	0	0	2	0	0	4
Hard Wired CF	4	1	1	2	0	3	2	11	0	0	24
Incandescent to Fluorescent Fixture											
With Energy Saving Ballast & T12 Lamps	1	0	0	0	0	0	0	1	0	0	2
With Electronic Ballast & T8 Lamps	1	0	0	1	0	0	0	0	0	0	2
Exit Signs											
Incand. to Compact Fluorescents	2	0	0	1	0	0	0	0	0	0	3
Incand. to LED or Electroluminescent Retrofit	1	0	0	0	0	0	1	0	0	0	2
Efficient Ballasts Changeouts											
Electronic Ballasts	4	1	1	2	3	1	1	0	0	0	13
T8 Lamps and Electronic Ballasts											
New Fixtures	9	7	1	6	6	0	1	1	2	0	33
Fixture Modif.- Replace Lamps and Ballasts	57	27	5	20	5	4	15	1	5	0	139
Delamp Fluorescent Fixtures											
Fixture Modif.- Delamp and Reflector	68	18	7	14	7	5	9	3	5	0	136
High Output T8 & T10 Conversion w/ Delamp	0	0	0	0	0	0	0	0	0	0	0
High Intensity Discharge											
Interior Compact HPS from Incand.	1	1	0	0	0	0	0	0	0	0	2
Interior Standard MH from Merc. Vapor	11	16	1	5	1	3	1	0	13	0	51
Exterior HPS from Merc. Vapor	4	7	1	5	1	3	1	3	1	0	26
Reduced Wattage Lighting	1	0	0	1	0	0	0	0	0	0	2
Controls											
Time Clocks	0	0	0	0	0	0	0	0	0	0	0
Occupancy Sensors	7	1	0	2	0	0	1	0	0	0	11
Bypass/Delay	0	0	0	0	0	0	0	0	0	0	0
Photocell	0	0	0	0	0	0	0	0	0	0	0
Other Lighting	0	0	0	0	0	0	0	0	0	0	0
Program Participant	**172**	**79**	**17**	**60**	**23**	**19**	**32**	**22**	**26**	**0**	**450**
Comparison Group	**172**	**79**	**17**	**60**	**23**	**19**	**32**	**22**	**26**	**0**	**450**

Exhibit A-8
Retrofit Express Program – Commercial Lighting Technologies
On-Site Audit Sample Allocation

Business Type / Measure Group	Commercial Sector										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total**
Halogen	0	0	0	0	0	0	0	0	0	0	0
Compact Fluorescent Lamps											
Screw In CF	0	0	0	0	0	0	0	0	0	0	0
Screw In CF- Reusable ballast	3	0	0	0	0	0	0	0	0	0	3
Hard Wired CF	3	0	0	0	0	0	0	0	0	0	3
Incandescent to Fluorescent Fixture											
With Energy Saving Ballast & T12 Lamps	0	0	0	0	0	0	0	0	0	0	0
With Electronic Ballast & T8 Lamps	0	0	0	0	0	0	0	0	0	0	0
Exit Signs											
Incand. to Compact Fluorescents	3	0	0	0	0	0	0	0	0	0	3
Incand. to LED or Electroluminescent Retrofit	0	0	0	0	0	0	0	0	0	0	0
Efficient Ballasts Changeouts											
Electronic Ballasts	3	0	0	0	4	0	0	0	0	0	7
T8 Lamps and Electronic Ballasts											
New Fixtures	4	2	0	2	4	0	0	0	3	0	15
Fixture Modif.- Replace Lamps and Ballasts	20	11	0	7	4	0	0	0	4	0	46
Delamp Fluorescent Fixtures											
Fixture Modif.- Delamp and Reflector	23	9	0	5	4	0	0	0	5	0	46
High Output T8 & T10 Conversion w/ Delamp	0	0	0	0	0	0	0	0	0	0	0
High Intensity Discharge											
Interior Compact HPS from Incand.	0	0	0	0	0	0	0	0	0	0	0
Interior Standard MH from Merc. Vapor	5	5	0	2	0	0	0	0	4	0	16
Exterior HPS from Merc. Vapor	3	2	0	2	0	0	0	0	0	0	7
Reduced Wattage Lighting	0	0	0	0	0	0	0	0	0	0	0
Controls											
Time Clocks	0	0	0	0	0	0	0	0	0	0	0
Occupancy Sensors	2	0	0	2	0	0	0	0	0	0	4
Bypass/Delay	0	0	0	0	0	0	0	0	0	0	0
Photocell	0	0	0	0	0	0	0	0	0	0	0
Program Participant	**69**	**29**	**0**	**20**	**16**	**0**	**0**	**0**	**16**	**0**	**150**
Comparison Group	**69**	**29**	**0**	**20**	**16**	**0**	**0**	**0**	**16**	**0**	**150**

Exhibit A-9
Retrofit Express Program – Commercial Lighting Technologies
Lighting Logger Sample Allocation

Measure Group / Business Type	Commercial Sector										
	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.	Total
Halogen	0	0	0	0	0	0	0	0	0	0	0
Compact Fluorescent Lamps											
Screw In CF	0	0	0	0	0	0	0	0	0	0	0
Screw In CF- Reusable ballast	0	0	0	0	0	0	0	1	0	0	1
Hard Wired CF	2	0	0	0	0	0	0	4	0	0	6
Incandescent to Fluorescent Fixture											
With Energy Saving Ballast & T12 Lamps	0	0	0	0	0	0	0	0	0	0	0
With Electronic Ballast & T8 Lamps	0	0	0	0	0	0	0	0	0	0	0
Exit Signs											
Incand. to Compact Fluorescents	1	0	0	0	0	0	0	0	0	0	1
Incand. to LED or Electroluminescent Retrofit	0	0	0	0	0	0	0	0	0	0	0
Efficient Ballasts Changeouts											
Electronic Ballasts	3	2	0	0	0	0	0	0	0	0	5
T8 Lamps and Electronic Ballasts											
New Fixtures	3	2	0	2	2	0	0	0	1	0	10
Fixture Modif.- Replace Lamps and Ballasts	19	9	3	7	3	0	5	0	4	1	51
Delamp Fluorescent Fixtures											
Fixture Modif.- Delamp and Reflector	22	6	4	5	2	0	4	0	3	0	46
High Output T8 & T10 Conversion w/ Delamp	0	0	0	0	0	0	0	0	0	0	0
High Intensity Discharge											
Interior Compact HPS from Incand.	0	0	0	0	0	0	0	0	0	0	0
Interior Standard MH from Merc. Vapor	4	5	0	3	0	0	0	0	4	0	16
Exterior HPS from Merc. Vapor	1	2	0	2	0	0	0	2	1	0	8
Reduced Wattage Lighting	0	0	0	0	0	0	0	0	0	0	0
Controls											
Time Clocks	0	0	0	0	0	0	0	0	0	0	0
Occupancy Sensors	6	0	0	0	0	0	0	0	0	0	6
Bypass/Delay	0	0	0	0	0	0	0	0	0	0	0
Photocell	0	0	0	0	0	0	0	0	0	0	0
Program Participant	**61**	**26**	**7**	**19**	**7**	**0**	**9**	**7**	**13**	**1**	**150**
Comparison Group	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

A.9 Billing Data Preparation

Once the sampling approach and segmentation scheme are determined, the next step is the preparation of the billing and tracking system data for sample selection. A final analysis dataset of billing data was created, consisting of all 6,037 lighting program participants paid in 1994, and 104,052 1994 nonparticipants. All unique lighting program control numbers, representing participants paid in 1994 and identified from PG&E's MDSS, were retained in the final dataset, regardless of the quality of customer billing data. However, the nonparticipant control numbers that were retained were identified as eligible nonparticipants and screened for data quality using a number of criteria.

As noted above, the entire PG&E nonresidential population was initially identified as the 754,928 accounts with PG&E control numbers that were not in the set of 6,037 control numbers of lighting program participants paid in 1994. From this group of

754,928 accounts, potential nonparticipant accounts were identified as the 278,073 accounts with SIC codes matching any of the 589 unique SIC codes represented in the 1994 lighting program participant population. Of these 278,073 customers, 104,052 were identified as eligible for the final analysis dataset based upon the quality of their billing data. Criteria considered in the assessment of the quality of customer billing data quality are as follows:

- Presence of a billing rate schedule for the customer: Customers are required to have a rate schedule code for all years spanned by the billing data. There were 53,582 accounts rejected for failing to satisfy this criterion.
- Quality of usage readings for the customer for the period of January 1993 through February 1995: Customers are required to have non-missing, non-zero usage values for all months spanned by the billing data. Customers are also required to have realistic PG&E revenues for the period. Realistic revenues are defined as revenues of at least $0.03 per kWh, but no greater than $0.25 per kWh. A total of 42,552 accounts were eliminated from eligibility for the final analysis database based upon this criterion.
- Cohesion of billing data across years: The original billing data was received by year ,i.e., the billing data for each calendar year was stored on a separate data tape. Data from different billing tapes were checked to ensure that the first month on each tape was immediately after the last month of the previous year’s tape. A total of 52,667 accounts have mismatched billing data across tapes.
- Presence of multiple billing records for the customer in the 1993, 1994, or 1995 billing data: Customers with multiple records in any of the three billing years were ineligible for the final analysis dataset. This criterion removed 16,124 accounts from the final analysis database.
- Quality of read dates for the customer: Read dates are required to be monotonic, and within 180 days of the expected date range for the read date. Expected date ranges are determined from the year of the tape from which the date was read, as well as the order of the variable in that particular year's data. Based upon this requirement, 539 accounts were considered ineligible for the final analysis database.
- Absence of changes in key elements of the customer's billing data over the billing data period: Customers were selected only if the following remained constant over the entire January 1993 - February 1995 period:
    - Corporation identification number
    - Date on premises
    - Date on system
    - Meter number
    - Rate schedule
    - Premise identification number

- Second SIC Code (SIC2)

- There were 8,557 accounts eliminated from eligibility for the final analysis database as a result of this screening requirement.

The final billing data analysis database, created using the methods detailed above, consisted of a total of 6,037 participant and 104,052 nonparticipant accounts. This analysis database is used in the generation of participant and comparison group telephone survey and on-site survey sample frames. The methods and stages of data attrition used in the generation of these sample frames are described below.

A.10 Participant Sample Frame

This section details the reduction of the eligible participant population to a sample frame suitable for impact analysis. None of the criteria used to screen the sample are believed to have adverse impacts on the sample representativeness; therefore, the screening criteria preserve the transferability of the impact results to the population.

Unlike nonparticipant accounts, for which data attrition is a prerequisite for inclusion in the final billing data analysis dataset, all 6,037 lighting program accounts paid in 1994 were included in the analysis dataset, regardless of the quality of their data. For these accounts, all aspects of data attrition and screening are undertaken at the sample frame construction stage, using criteria similar to those used in the screening of nonparticipant accounts, together with several additional criteria. The final participant sample frame consists of 1,625 commercial customers drawn from the eligible population of 6,741 lighting program participants paid in 1994. Criteria considered in the assessment of the quality of participant account billing data are as follows:

- Presence of a billing rate schedule for the customer: Customers are required to have a rate schedule code for all years spanned by the billing data. Fifty-six customers were rejected for failing to satisfy this criterion.

- Quality of usage readings for the customer for the period of January 1993 through February 1995: Customers are required to have non-missing, non-zero usage values for all months spanned by the billing data. Customers are also required to have realistic PG&E revenues for the period. Realistic revenues are defined as revenues of at least $0.03 per kWh, but no greater than $0.25 per kWh. There were 1,236 customers rejected for failing to satisfy this criterion.

- Cohesion of billing data across years: The original billing data was received by year, i.e., the billing data for each calendar year was stored on a separate data tape. Data from different billing tapes was checked to ensure that the first month on each tape was immediately after the last month of the previous year's tape. A total of thirteen accounts have mismatched billing data across tapes.

- Presence of multiple billing records for the customer in the 1993, 1994, or 1995 billing data: Customers with multiple records in any of the three billing years were ineligible for the final analysis dataset. No customers were rejected for failing to satisfy this criterion.

- Quality of read dates for the customer: Read dates are required to be monotonic, and within 180 days of the expected date range for the read date. Expected date ranges are determined from the year of the tape from which the date was read, as well as the order of the variable in that particular year's data. There were 213 customers rejected for failing to satisfy this criterion.

- Absence of changes in key elements of the customer's billing data over the billing data period: Customers were selected only if the following remained constant over the entire January 1993 - February 1995 period:

  - Corporation identification number
  - Date on premises
  - Date on system
  - Meter number
  - Rate schedule
  - Premise identification number
  - Second SIC Code (SIC2)

- There were 779 customers rejected for failing to satisfy this criterion.

- Nonparticipation in the 1993 lighting program: Accounts included in the sample frame for the 1994 lighting program could not have participated in the 1993 program. There were 596 accounts eliminated from sample frame eligibility for this reason. However, this group of nonparticipants was later added back to the sample frame near the end of the survey data collection, based upon the participant definition in the Protocols, *Appendix A*. The sample selection procedure for this group of customers was designed to match the probability of selection for the rest of the customers in the sample frame, so that the combined sample will still be a random sample in each of the sample stratum.

- Participation in other incentive programs: Accounts that participated in other incentive programs in 1994 were excluded from eligibility for the lighting program sample frame. There were 176 accounts eliminated for this reason.

- PG&E division representative deletion requests: Lists of customers in the sample frame were sent to the appropriate PG&E division representative for approval. Based upon responses from the representatives, customers were deleted from the sample frame. These deletions removed 172 customers from eligibility for the sample frame.
- Reasonable usage across years and populated telephone numbers: Accounts are screened to ensure that the mean usage on the account for 1994 is no more than twice the mean usage on the account for 1993. Accounts are also screened to ensure they have reasonable phone numbers, and any accounts with no telephone number, or zeros in place of a number, are rejected from the sample frame. There were 1,171 accounts eliminated from eligibility for failing to meet this criterion.

The 1,625 participant accounts remaining following this screening process comprise the final participant sample frame used in the collection of telephone and on-site survey data.

A.11 Comparison Group Sample Frame

The comparison group sample frame consists of 4,039 commercial customers drawn from the eligible population of 104,052 nonparticipants in the 1994 lighting program. Since comparison group surveys were conducted only for customers in the commercial sector, the first step in creation of the sample frame is to limit eligibility to only those accounts having SIC codes representing commercial business activities. Further screening, based upon several factors, of the remaining 87,450 eligible accounts was undertaken to arrive at the final comparison group sample frame. The screening criteria used, and the number of customers eliminated as a result of each criterion, are detailed below.

- Excessive changes in usage between 1993 and 1994 billing years: Accounts are screened to ensure that the mean usage on the account for 1994 is no more than twice the mean usage on the account for 1993. There were 2,868 accounts eliminated for failing to meet this criterion.
- Geographic location of customers: Accounts are screened to insure that they fall within the geographic regions targeted for comparison group telephone survey and on-site survey data collection. There were 55,052 accounts eliminated for failing to meet this criterion.
- Customer presence in other survey samples: Accounts sharing PG&E corporation identification numbers with any accounts in the sample frame for the HVAC program evaluation survey conducted by SBW, Inc., the lighting program evaluation participant survey sample frame, and the lighting program evaluation comparison group survey pretest sample frame were eliminated from eligibility for the lighting program evaluation comparison group sample frame. There were 3,095 accounts eliminated for this reason.

Following the data screening, the comparison group survey sample frame of 4,039 customers is randomly drawn from the 26,435 accounts that satisfied all of the screening criteria used in construction of the sample frame. In drawing the sample frame, targets are established for each business type and usage segment, so that the sample frame distribution, by business type and usage segment, is the same as that of the surveyed lighting program participant population. The drawing is conducted in this manner to ensure sufficient representation of each business type / usage segment combination in the sample frame and allow survey data collection in accordance with the sample design.

A.12 Final Sample Sizes

The final sample sizes for the telephone, on-site, and lighting logger samples collected for the evaluation are presented in this section. Exhibit A-10 details the commercial sector telephone and on-site survey distributions by program (RE or Customized), and an indoor / outdoor technology classification.

Exhibit A-10
Telephone and On-Site Survey Data Collected by Program and End Use

Program	Total Surveys	On-Site Audits	On-Site Without Surveys	Analysis Dataset
Indoor Lighting (RE)	432	134	0	432
Indoor Lighting (Customized)	19	17	1	20
Outdoor Lighting (RE)	28	4	0	28
Outdoor Lighting (Customized)	0	0	0	0
Commercial Participant Total	479	155	1	480
Commercial Comparison Group	458	143	0	458

A.12.1 Telephone Survey Sample

Telephone surveys were collected for a total of 937 customers, 479 of which are participants, (451 indoor lighting participants, and 28 outdoor lighting measure participants) and the remaining 458 are in the comparison group. The telephone survey data is designed to provide insight into changes in the quantity and usage patterns of electrical equipment present at an account. The final sample allocation of the telephone survey sample, by technology and business type, is detailed in Exhibit A-11.

Exhibit A-11
Telephone Survey Sample Sizes by Business Type and Technology

Lighting Technology / Business Type **	Commercial Sector										
	Office	**Retail**	**College/Univ**	**School**	**Grocery**	**Restaurant**	**Health Care**	**Hotel/Motel**	**Warehouse**	**Misc.**	**Total ***
RE Indoor Measures											
Halogen	5	6	0	0	0	0	2	1	1	3	18
Compact Fluorescent Lamps	60	24	0	68	7	20	24	21	6	23	253
Incandescent to Fluorescent Fixture	6	5	0	4	0	0	3	0	0	3	21
Exit Signs	16	5	0	17	3	1	5	1	3	8	59
Efficient Ballasts Changeouts	21	11	0	17	22	0	8	0	3	6	88
T8 Lamps and Electronic Ballasts	105	102	2	97	22	8	40	3	26	32	437
Delamp Fluorescent Fixtures	53	57	1	28	11	5	17	0	13	13	198
High-Intensity Discharge	22	41	0	24	8	3	0	3	14	20	135
Reduced Wattage Lighting	13	7	0	10	4	0	4	0	2	3	43
Controls	11	16	0	10	4	0	5	5	8	11	70
Other Lighting	0	0	0	0	0	0	0	0	0	0	0
Customized Indoor Measures	3	6	0	1	16	1	1	1	1	2	32
RE/Customized Outdoor Measures	6	16	3	2	0	2	2	0	1	1	33
Participant Total	**114**	**122**	**1**	**65**	**38**	**22**	**34**	**15**	**33**	**35**	**479**
Comparison Group Sample	**138**	**104**	**3**	**33**	**30**	**29**	**20**	**36**	**32**	**33**	**458**

* Sum may exceed the total sample size because of participation in multiple measures.
** Survey self-report business type.

A.12.2 On-Site Survey Sample

A total of 291 on-site surveys were conducted for the commercial sector, with 155 participants and 143 comparison group customers. In accordance with the nested sample approach, 290 of these 291 surveys were conducted with customers who also completed a telephone survey. One customer completed the on-site survey, but did not complete the telephone survey. Distribution of the on-site survey sample, by business and technology type, is presented in Exhibit A-12 below.

Exhibit A-12
On-Site Survey Sample Sizes by Business Type and Technology

Lighting Technology / Business Type **	Commercial Sector										
	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.	Total *
RE Indoor Measures											
Halogen	3	1	0	0	0	0	0	0	0	2	6
Compact Fluorescent Lamps	27	4	0	11	6	3	1	0	4	7	63
Incandescent to Fluorescent Fixture	2	0	0	0	0	0	0	0	0	0	2
Exit Signs	7	0	0	2	2	0	0	0	1	3	15
Efficient Ballasts Changeouts	4	0	0	8	20	0	0	0	0	3	35
T8 Lamps and Electronic Ballasts	43	18	0	25	17	4	3	0	9	15	134
Delamp Fluorescent Fixtures	27	10	0	3	4	1	1	0	6	4	56
High-Intensity Discharge	8	13	0	6	2	0	0	0	4	6	39
Reduced Wattage Lighting	3	0	0	5	3	0	0	0	0	2	13
Controls	6	3	0	2	0	0	0	0	1	8	20
Other Lighting	0	0	0	0	0	0	0	0	0	0	0
Customized Indoor Measures	3	1	0	1	14	0	0	0	1	1	21
RE/Customized Outdoor Measures	0	2	0	2	0	0	0	0	1	0	5
Participant Total	**43**	**30**	**0**	**20**	**26**	**5**	**3**	**0**	**14**	**14**	**155**
Comparison Group Sample	**57**	**31**	**0**	**12**	**12**	**5**	**0**	**6**	**10**	**10**	**143**

* Sum may exceed the total sample size because of participation in multiple measures.
** Survey self-report business type.

A.12.3 Logger Sample

A total of 236 loggers were installed within the sample of 155 on-site surveyed customers. Among them, 69 were installed at office sites, 54 in groceries, 42 in schools, 24 in retails, with the remaining 47 installed in other business types.

A.13 Relative Precision

Given a sample design, the relative precision, based upon total annual energy use, reflects the uncertainty regarding the extent to which the allocated sample sizes are large enough to control for the population variance in terms of annual energy usage. The final achieved telephone survey sample (indoor lighting technology) is expected to yield an overall relative precision of 8.4 percent in terms of annual energy consumption.

Precision for the telephone sample is calculated using the following procedure:

- First, the 1994 annual energy consumption is computed for all participants in the analysis dataset. Since the Protocols' requirement for relative precision of samples is only applicable to the indoor lighting end use, only telephone surveyed or on-site audited indoor lighting participants (a total of 452 customers) were used in the calculation.

- Next, four strata are constructed based on customers' annual usage. Customers with annual usage in 0-40, 40-70, 70-90, and 90+ percentiles of the sample population are grouped into different strata. Exhibit A-13 presents the stratum-level sample size, sample weight, sample mean, and estimated standard errors.

- Then, the program level mean and standard error are calculated using classic stratified sample techniques. [1]The functional relation can be best described in the following equations:

$$\overline{m} = \sum_i w_i * \overline{m}_i = 344{,}316 \text{ kWh} \quad \text{with } w_i = \frac{n_i}{n}$$

$$\text{StdErr} = \sum_i (w_i)^2 * \frac{\text{StdErr}_i}{n_i} = 17{,}480 \quad \text{kWh}$$

- Finally, the relative precision at 90 percent confidence level is calculated as

$$RP = \frac{1.645 * \text{StdErr}}{\overline{m}} = 8.4\%$$

Exhibit A-13
Telephone Sample - Relative Precision Levels

Stratum	Sample Size	Segment Weight	Mean 1994 Usage	Sample Estimated Standard Error
1	180	0.40	29,027	1,304
2	136	0.30	126,145	3,506
3	90	0.20	483,877	22,950
4	46	0.10	1,950,032	165,383
Total	452	1.00	344,316	17,480

[1] Cochran, W.G., *Sampling Techniques*, Third Edition, John Wiley & Sons, 1977. pp 91-95.

The same calculation for the 458 comparison group customers yields a relative precision of 9.4 percent in terms of their 1994 annual energy consumption. This ensures that the sample design meets the requirement of a 10 percent relative precision in the Protocols for the commercial sectors, indoor lighting end use. However, it is important to note that this expected precision is based upon the *annual energy usage*, and does not imply the same level of precision for the final *end-use impact* evaluation results.

A.14 Demonstration of Protocol Compliance

A.14.1 Sampling Procedures Adopted

The sample design used to evaluate the 1994 Commercial Lighting Program follows the rules established by the CPUC in the January 1995 revisions to the "Protocols and Procedures for the Verification of Costs, Benefits and Shareholder Earning from Demand Side Management Programs." Recent revisions to the Protocols—a draft dated 6/27/95—were incorporated wherever appropriate. The purpose of this section of the report is to identify compliance with these Protocols, with respect to the 1994 Commercial Lighting Program Evaluation activities.

A.14.2 Sample Definitions

The following definitions are provided to introduce the primary segments targeted—both a participant sample and a comparison group—to ensure experiment control:

- **Participants** - According to Table 5, part C, paragraph 1 of the Protocols, participants are defined as "those who received utility financial assistance to install a measure or group of measures during the program year."

- **Comparison Group** - A control group is defined as a group of customers that represents what would have happened in the absence of the program. According to Table 5, part D, paragraphs 3 & 4, the comparison groups include both "customers who installed applicable measures" and "customers who did not install applicable measures," with no preference for either group (i.e., random or stratified random sample). This sample is therefore representative of the population, excluding only program participants during the evaluation year.

A.14.3 Overall Sampling Procedures

The commercial customer samples are driven by a primary data collection activity; in this case, the telephone surveys serve as the primary site-specific data collection elements that contribute to the analysis dataset. The commercial telephone sample was drawn to achieve a stratified random sample and optimally distribute the allocated sample points.

A.14.4 Detailed Protocol Sample Requirement

The commercial participant and comparison group samples are designed to meet the Protocol requirements in terms of analysis dataset sample size, precision of the results, availability of pre- and post-billing data contributing to the analysis dataset, and in ensuring cost-effective use of measured data.

- *Analysis Dataset Sample for Commercial Participants*: The Protocols require that a program with more than 450 participants has a randomly drawn sample sufficiently large to achieve minimum energy use precision of ±10% at the 90% confidence level, and at least 450 contributing points in the analysis dataset.

  - The 480 analysis dataset points, 452 of which were for customers with indoor lighting measures, were supplemented with 155 nested on-site points to ensure sample size compliance with Protocol requirements in Table 5, part C, paragraph 3. Data collection protocols are also met regarding minimum analysis dataset size, if primary site-specific data are collected on-site, as per Table 5, part C, paragraph 4 of the Protocols.

  - Data collection efforts are further strengthened during on-site activities through the installation of lighting loggers. These devices record specific fixture operating profiles during the monitoring period, and serve to calibrate self-reported lighting operating schedules. Data collected in this way follows the participant protocol recommendations set forth in Table C-4, paragraph 1 of the Protocols.

  - As discussed earlier, the sample collected for the commercial section, indoor lighting end use achieves a relative precision of 8.4 percent at a 90 percent confidence level, as required by the Protocols, Table 5, part C, paragraph 4.

  - All 480 participant sample points were screened for bad billing or MDSS data to ensure each point eventually contributed to the analysis dataset. In addition, each participant chosen for the telephone sample is required to have at least nine months of post-installation billing data, and 12 months of pre-installation data, as per the Protocols, Table 5, part D, paragraphs 2 and 1, respectively.

- **Analysis Dataset Sample for Commercial Comparison Group** - The Protocols require that the comparison group sample "be drawn using the same criteria for participants," as per Table 5, part C, paragraph 6.

  - The 458 analysis dataset points meet the sample size requirement in Table 5, part C, paragraph 3. The calculated relative precision of 9.4 percent at a 90 percent confidence level meets the precision requirement in Table 5, part C, paragraph 4.

- The commercial comparison group telephone sample is drawn based upon the similar distribution of participant sample, in terms of their business types and annual usage. Since lighting equipment characteristics are unknown for nonparticipants, no stratification was included for lighting equipment groups.

- To ensure compliance with comparison group protocols, the telephone survey sample frame is drawn to meet the billing data requirements of Table 5, part D, paragraphs 3 and 4 of the Protocols. All customers in the analysis dataset have billing data from January 1991 to September 1995, which ensures an adequate pre- and post-installation billing periods for customers who installed applicable measures between 1993 and 1994.

Appendix B

ENGINEERING DETAILED COMPUTATIONAL METHODS

Appendix B

ENGINEERING DETAILED COMPUTATIONAL METHODS

The technical approach and intermediate engineering results that support realized gross impacts in the 1994 Pacific Gas and Electric Company (PG&E) Commercial Lighting Technologies Evaluation (Commercial Lighting Evaluation) are presented in this section. The purpose of a presentation of the engineering computations is to provide detailed intermediate results that either compliment or dispel significantly the current methods used to generate program design demand and energy impact estimates. Results are presented to ensure that future program design and evaluation activities will benefit from the engineering parameters generated during the 1994 program evaluation effort.

B.1 Appendix B Structure

This appendix is structured as follows:

- The appendix begins with a presentation of the general approach used to generate both evaluation results and program design estimates. The purpose of a presentation of the engineering approach is to:
  - Summarize and define each of the lighting end-use impact components that were used to generate final impact results
  - Demonstrate key differences between the evaluation methods and those used to derive program design estimates
  - Provide intermediate engineering results and discuss the data sources and methods used to derive each parameter
- Next, program design estimate methods that were used to generate impacts for the majority of the 1994 program applications are introduced. This discussion focuses on the methods used to derive impacts for the Retrofit Express (RE) Program.
- The evaluation approach is then presented, incorporating both of the general methodologies from Section 3 of this report, but simplifying that approach by introducing an hourly impact model.

- Then, detailed derivations are presented for several key engineering parameters, including premise operating schedules, technology- and business type-dependent operating factors, and impacts caused by the interaction between lighting system heat gain, and heating and cooling system energy use.

- Next, engineering intermediate results that PG&E may elect to incorporate in future program design efforts are presented.

  - First, database estimates of fixture connected load are compared against measured fixture connected loads that were sampled during on-site audit activities. The purpose ofd this analysis was to determine if adjustments to database estimates of connected load were necessary, because of differences between field-measured fixture operating loads and those claimed in manufacturers' product literature.

  - Then, the frequency of observed lamp burn-out is explored to highlight the importance of including these adjustments in all future program design estimates.

  - Next, the existing fixture frequency is explored, both as observed during on-site data collection activities, and also according to assumed fixture replacement under program design guidelines.

  - Then, evaluation estimates of annual fixture hours of operation are compared against parameter estimate assumptions, yielding results by technology group.

  - Next, evaluation estimates of Summer On-peak coincident diversified operating factor (CDOF) are presented, yielding significant results by technology group.

  - Lastly, evaluation estimate results are presented for heating and cooling energy and demand impacts caused by the retrofit of standard-efficiency lighting systems with high efficiency systems offered under the program.

- Then, the methods are described that were used to both classify and analyze 1994 program impacts for lighting retrofits installed under the Customized Incentives (Customized) Program.

- Finally, to summarize the engineering effort, RE-selected hourly impact profiles are presented by daytype, business type, and time-of-use (TOU) costing period B.2 Engineering Gross Impact Evaluation Approach.

B.2 Overview of the Evaluation Approach

This overview of the engineering approach will address the generic methodology used to estimate impacts for the majority of the lighting retrofits covered under the RE and Customized programs, and the data sources contributing to these estimates of energy and demand impact. More specifically, the following are addressed as follows:

- Lighting end-use parameters, which contribute to energy and demand impact estimates, are introduced using the impact decomposition approach.
- Data sources that contributed to each component of impact are then discussed. This introduction focuses on the accuracy of these contributing data elements, and the concept of the nested sample design that was used to transfer accurate data elements.

B.2.1 Introduction to the Impact Decomposition Approach

The general lighting model used to estimate most of the impacts under the RE and Customized programs were founded on the decomposition of lighting impacts into manageable engineering parameters. The impact decomposition was used to estimate unadjusted engineering impacts (UEI's) over a specified period of time—by season / daytype / hour—and is defined as follows:

UEIt	=	[(ƱOL x U x OFt) x T] x [1+HVAC], where
ƱOL	=	the technology level maximum change in connected kW associated with a particular measure.
U	=	the number of measure units installed for a particular application.
OFt	=	the operating factor which describes the percentage of full load used by a group of fixtures during a prescribed period of time, t.
T	=	the time interval for which an impact is estimated; for most measures, the OF term is the engineering parameter that changes significantly over time. Time intervals for lighting estimates were single hours, segmented by hours "on" (open operating factor) and hours "off" (closed operating factor) schedules.[1]
HVAC	=	the component of impact associated with both a net energy savings due to cooling and a net energy increase due to heating.

The process of analyzing each contributing element in this relationship with respect to time dependency is referred to in this approach as engineering model calibration.

[1] Although there are periods of time when lights are generally considered off, many lights are either accidentally or purposely left on during these periods. The effective hours of lighting operation captured during these off periods were applied using the operating factor term (the probability that lights operate during a particular time interval).

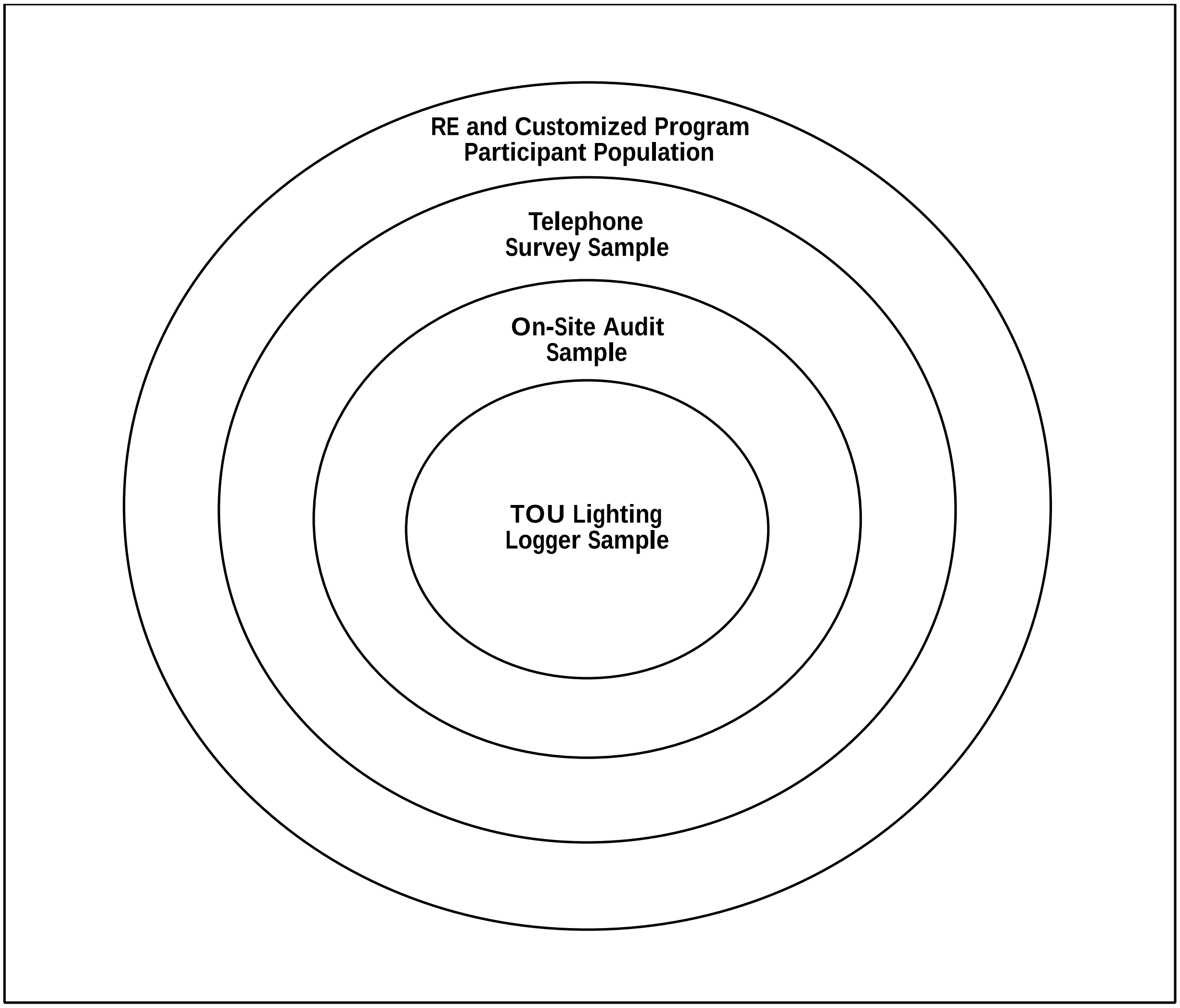
Premise-specific estimates were calibrated to either premise self-reports, business type segment-level results, and / or technology group segment-level results. Calibration of the lighting end-use engineering parameters yielded typical lighting hourly load shapes by daytype and season. We recommend incorporating these calibrated results in all future lighting program evaluation activities, specifically the engineering-based program design calculations prepared for cost-recovery activities.

Note that neither program design demand nor energy impact estimates include claimed credits for the indirect HVAC impacts associated with a reduction in internal heat gain (as a result of an efficient lighting retrofit).

B.2.2 Data Sources and the Nested Sample Design

The impact approach used several data sources to collect similar engineering parameters. The purpose of gathering like information from several sources was to ensure calibration of engineering parameters using the most accurate data gathered. Exhibit B-1 depicts the nested sample design that was used to generate the most accurate estimate of engineering parameters, given certain constraints imposed by limited resources.

Exhibit B-1
Schematic of the Commercial Lighting Program
Data Collection Nested Sample Design



Resource constraints required that the most accurate, and therefore valuable, analytical data were gathered at a relatively small sample of sites, and that these data were then transferred to a larger samples of participants using leveraging techniques , whenever possible.

A good example of this calibration process using the nested sample design involves the use of logger information to calibrate on-site self-report lighting schedules, and likewise, the use of calibrated on-site self-report lighting schedules to calibrate the telephone sample self-report lighting schedules. The lighting logger sample provided information regarding typical daytype lighting profiles for fixtures operated within the on-site sample, by schedule group. Schedule groups are defined as groups of rooms and / or fixtures at a site that operate on a similar and unique schedule. Details regarding the derivation of calibrated operating schedules is covered in detail on pages B-12 and B-13 of this appendix.

B.3 Program Design Impact Estimate Methods

B.3.1 Overview

The methods implemented to achieve 1994 RE program design impacts are introduced in this section[2]. The gross program design impacts that were generated using these methods are recorded in the Management Decision Support System (MDSS) database. These methods are introduced at this early stage in the engineering approach to enable the direct comparisons between evaluation and program design engineering parameters that appear throughout the remainder of this section. In this section, engineering parameters that were used to generate program design impact estimates are defined, including the following:

- Measure-specific, per-unit noncoincident demand impacts (the difference in fixture connected load pre- and post-retrofit) were used as inputs to both the energy and demand impact estimates.
- A Coincident Diversity Factor (CDF) is described, a parameter applicable to demand impact estimates.
- Annual hours of operation, defined by business type, were used to generate annual energy impact estimates.

Results are presented based on an effort to regenerate program design estimates by applying the methods described in this section. Several important discrepancies were found between the intended application of these impact methods and the gross impacts stored in the MDSS.

B.3.2 Noncoincident Demand Impact Calculations

All lighting estimates require the use of pre- and post-retrofit fixture connected loads or more typically, the change in fixture connected. This engineering parameter represents the ΔUOL term in the impact decomposition approach. This change in lighting system connected load is referred to as the noncoincident demand impact, which is defined for each RE measure using the following formula:

$$kW_{NCP} = kW_E - kW_R \qquad (1)$$

[2] These methodologies are described in a document titled "1994 Lighting Retrofit Express Program", submitted by Darrell Hall and Sam Cohen. They resulted in the values presented in the *Annual Summary Report on Demand Side Management Programs in 1994 and 1995*, Advice Filing 1800-G-A / 1446-E-A.

Where:

kW_{NCP} = Per-unit noncoincident demand impact by measure

kW_E = Per-unit existing measure demand

kW_R = Per-unit retrofit measure demand

Exhibit B-2 provides a summary of the assumed change in connected load for the measures installed according to the 1994 RE document cited above. This difference in connected load is based upon both the measure definition specified under the RE program (and typical customer installations for each measure), and an assumed existing system that represents a typical customer configuration prior to retrofit. Each individual fixture connected load, both pre- and post-retrofit, was carefully scrutinized and compared with manufacturers' data for the technologies and lamp wattage specified. In all cases, manufacturers' data supported the pre- and post-retrofit connected load assumptions used to produce program design estimates. In addition, fixture connected loads were field tested using spot-watt metering devices to determine the accuracy of manufacturers' data for fixture connected loads. Spot metering results, which also support manufacturers' data for fixture connected loads, are provided on page B-26 of this appendix.

Exhibit B-2
Fixture Assumptions Used to Generate
Retrofit Express Commercial Lighting Program Design Estimates

Generic Measure Group Descriptions	Code Application Year	Measure Code In the MDSS Database	1994 Per-Unit NC Impact§ (Watts)	Coincident Diversity Factor	Per-Unit Peak Demand MDSS Impact (Watts)	Per-Unit Annual Energy MDSS Impact¥ (kWh)
Halogen						
< 45 watts	1994	L60	30.0	0.67	20.1	60
> 50 watts	1994	L61	50.0	0.67	33.5	150 / 105
Compact Fluorescent Lamps						
Screw In CF						
5-13 watts	1994	L62	45.0	0.67	30.2	
14-26 watts	1994	L63	45.0	0.67	30.2	
Screw In CF- Reusable ballast						
5-13 watts	1994	L64	45.0	0.67	30.2	
14-26 watts	1994	L65	45.0	0.67	30.2	
Hard Wired CF						
5-13 watts	1994	L66	45.0	0.67	30.2	
14-26 watts	1994	L67	45.0	0.67	30.2	
27-50 watts	1994	L68	52.0	0.67	34.8	
Incandescent to Fluorescent Fixture						
With Energy Saving Ballast & T12 Lamps	1993&4	L7	212.0	0.67	142.0	
With Electronic Ballast & T8 Lamps	1993&4	L8	240.0	0.67	160.8	
Exit Signs						
Incand. to Compact Fluorescents	1993&4	L5	29.0	1.00	29.0	254
Incand. to LED or Electroluminescent Retrofit	1993&4	L6	33.0	1.00	33.0	289
Efficient Ballasts Changeouts						
Electronic Ballasts						
2 Lamp Electronic Ballast	1993&4	L14	19.0	0.67	12.7	
3 Lamp Electronic Ballast	1993&4	L15	29.0	0.67	19.4	
4 Lamp Electronic Ballast	1993&4	L16	38.0	0.67	25.5	
T8 Lamps and Electronic Ballasts						
New Fixtures						
2'-1 U Tube or 2 lamps	1994	L69	21.0	0.67	14.1	
2'-2 U Tubes or 4 lamps	1994	L70	43.0	0.67	28.8	
2'-3 U Tubes or 6 lamps	1994	L71	78.0	0.67	52.3	
4'-1 lamp	1994	L72	22.0	0.67	14.7	
4'-2 lamps	1994	L73	22.0	0.67	14.7	
4'-3 lamps	1994	L74	37.0	0.67	24.8	
4'-4 lamps or 8'-2 lamps	1994	L75	45.0	0.67	30.2	
Fixture Modif.- Replace Lamps and Ballasts						
Replace Lamps & Ballasts - 2' Fixture	1993&4	L21	10.5	0.67	7.0	
Replace Lamps & Ballasts - 3' Fixture	1993&4	L22	13.0	0.67	8.7	
Replace Lamps & Ballasts - 4' Fixture	1993&4	L23	11.8	0.67	7.9	
Replace Lamps & Ballasts - 8' Fixture	1993&4	L24	22.5	0.67	15.1	
Delamp Fluorescent Fixtures						
Fixture Modif.- Delamp and Reflector						
Removal - 2' Lamps & Ballasts	1993&4	L17	32.0	0.67	21.4	
Removal - 3' Lamps	1993&4	L18	43.0	0.67	28.8	
Removal - 4' Lamps	1993&4	L19	46.0	0.67	30.8	
Removal - 8' Lamps	1993&4	L20	96.0	0.67	64.3	
High Output T8 & T10 Conversion w / Delamp						
T10 & Energy Saving Ballast	1994	L76	31.0	0.67	20.8	
T10 or T8 & Electronic Ballast	1994	L77	45.0	0.67	30.2	
High Intensity Discharge						
Interior Compact HPS						
0-35 watts HPS	1994	L78	107.0	0.67	71.7	
36-70 watts HPS	1994	L79	112.0	0.67	75.0	
71-100 watts HPS	1994	L80	155.0	0.67	103.9	
Interior Standard MH from Merc. Vapor						
101-175 watts MH	1993&4	L26	240.0	0.67	160.8	
176-250 watts MH	1993&4	L27	528.0	0.67	353.8	
251-400 watts MH		L81	620.0	0.67	415.4	
Exterior HPS from Merc. Vapor						
0-100 watts	1993&4	L28	113.0	0.00	0.0	463
101-175 watts	1993&4	L29	240.0	0.00	0.0	984
176 watts & greater	1993&4	L30	610.0	0.00	0.0	2,501
Controls						
Time Clocks	1993&4	L31	N / A	N / A	0.0	439
Occupancy Sensors			N / A	N / A		
72-350 watts controlled	1993	L32	N / A	N / A	62.0	277
351-1000 watts controlled	1993	L33	N / A	N / A	212.0	824
1000 watts and greater controlled	1993	L34	N / A	N / A	280.0	1409
Wall Mounted	1994	L82	N / A	N / A	62.0	277
Ceiling Mounted	1994	L83	N / A	N / A	212.0	824
Bypass / Delay	1993&4	L35	N / A	N / A	106.0	412
Photocell	1993&4	L36	N / A	N / A	0.0	99

§ Non-coincident demand impact -- the difference between the non-coincident existing (assumed) measure and retrofit measure demand.
¥ Most program design (MDSS) energy impact estimates vary as a function of business type.

The Retrofit Express connected load figures were carried over into the evaluation analyses of program savings, though modified wherever possible for lamp burn-out rates in both the new and existing systems. Typical lamp burn-out rates were determined for specific technology groups, based upon data gathered during on-site audit activities. Burned-out lamp rates and methodologies are presented in an upcoming section of this appendix.

The largest potential error in estimating noncoincident demand estimates is made in the assumptions regarding the existing lighting system prior to the adoption of retrofit measures. Technology group saturations for existing systems were gathered on-site that largely support the systems specified in these program assumptions. The results of these analyses are provided in an upcoming section of this appendix.

Also provided in Exhibit B-2 are the specific CDFs and nonsegment-specific annual energy savings estimates used in generating program design estimates. These terms are described in detail in the following two sections.

B.3.3 Coincident Demand Impact Calculations

Engineering estimates of noncoincident demand impact from equation (1) are multiplied by a CDF, which was developed based upon PG&E load research data, as part of the Commercial End-Use Metering Project performed by Regional Economic Research (RER). CDF is mathematically defined as:

CDF = Coincidence Factor x Diversity Factor

where:

Coincidence Factor is the ratio of the measure demand reduction at system peak and the noncoincident demand impact

and

Diversity Factor is the probability that a given measure is on at the time of system peak

The value of CDF for most lighting end-use program design estimates is 0.67. Hence, coincident demand impacts are typically estimated as follows:

Coincident Demand Impact = 0.67 x kW_{NCP}

As shown in Exhibit B-2, the CDF does vary for certain measures, specifically exit lights and exterior lights. Evaluation results did not use this CDF value to estimate impacts, using instead detailed evaluation methods. Evaluation methods used customer-specific schedules in conjunction with business type and technology group operating factors to generate program impacts at the hourly level, as discussed on page B-12 of this appendix.

B.3.4 Annual Energy Impact Calculations

Per-unit program design energy impacts are typically calculated based upon the product of the per-unit non-coincident demand impact and industry group annual hours of fixture operation, as shown in the following equation:

$$kWh_{ANNUAL} = kW_{NCP} \times hrs_z \qquad (2)$$

Where:

kWh_{ANNUAL} = Per-unit annual energy impact by measure

hrs_z = Annual hours that a given measure operates in industry group z

B.3.5 Annual Hours of Operation by Business Type

Annual hours of fixture operation are based upon results from a PG&E study (HBRS and BCI 1992) and negotiations regarding impact estimates, according to a 1991 PG&E Advice Filing with the CPUC. Hours of operation vary by business type, except in cases where all sectors share identical estimates for hours of operation, such as exit lighting or exterior lighting. Exhibit B-3 provides assumed hours of operation for various business types, as specified in the majority of the program design estimates. Refer to Exhibit B-2 for additional information regarding measures that are assumed to have the same energy impacts, independent of business type.

Exhibit B-3
Annual Fixture Operating Assumptions Used to Generate
Retrofit Express Commercial Lighting Program Design Estimates

Business Type	Annual Operating Hours*
Office	3,400
Retail	4,700
University	3,500
School	2,100
Grocery	7,000
Restaurant	4,800
Health Care / Hospital	4,000
Hotel / Motel	4,000
Warehouse	4,000
All Other	4,000

* All exterior lights are assumed to operate 4,100 hours per year regardless of business type.

Exterior lights are assumed to have the same annual hours of operation across all business types, even across sectors. They are assumed to be controlled by a combined time clock and photocell system, resulting in 4,100 operating hours per year. This figure assumes that lights operate 12 hours a day, except during summer, when the photocell reduces operation by another three hours per day.

The evaluation results do not use the operating hours specified in the program design methodology, yielding instead to customer schedules derived using self-reported telephone survey responses, on-site schedule group responses, and lighting logger data to calibrate those responses. Again, unique customer lighting profiles were generated at the hourly level by daytype and season, in order to accurately estimate impacts according to PG&E-specified TOU periods. This methodology ensured consistency between hourly impacts and energy impacts, where energy is derived by simply adding across specific hours.

B.3.6 Reproduction of Program Design Estimates

In an attempt to verify both the methods used to generate program design impacts and the impact estimates stored in the MDSS, RE program design impacts were reproduced. Although the methods were generally found to be applied correctly in the MDSS, in several instances, differences were found between the reproduced values and those stored in the MDSS. Further investigation showed that for specific cases, impact estimates in the MDSS were calculated incorrectly. Those particular instances are summarized below.

- L14-L16: Electronic ballast measure energy and demand impact estimates, that were applied for under the 1993 RE program application form, were inadvertently over-estimated by two to four times, depending upon the measure installed. The unit of rebated measure under the 1993 program was lamps and not ballasts, causing this error in estimated impact.

- L21: Energy estimates for a subset of this 2’ T8 lamp and ballast replacement measure were overestimated by approximately 40 percent. The cause of this error appears to be related to business type classification.

- L20: Energy estimates for a subset of this 8’ reflector and lamp removal measure were underestimated by approximately 60 percent. The cause of this error appears to be related to business type classification.

- L61: Energy estimates for a small subset of this halogen retrofit measure were overestimated by approximately 40 percent. The cause of this error appears to be related to program design assumptions that should have been implemented for schools.

In addition, other spurious MDSS impact estimates were infrequently detected. The source of these other events could not be specifically isolated.

B.4 Evaluation Approach

To satisfy the requirements of PG&E for impact estimates by TOU costing periods, all impact estimates were generated at an hourly level. Engineering estimates that were used as inputs to the SAE were additionally estimated according to each particular customer's self-reported operating schedule.

To estimate impacts for each hour, customer operating schedules were developed by daytype, hour and season, and expressed as numeric values between zero and one, where one indicates that the probability of being open is 100 percent, and zero represents a closed premise. Impacts utilize distinct operating factors by daytype for both the closed periods and the open periods (operating factors are also dependent upon business type and technology group, but that is not important to this discussion). To estimate impacts for each hour, fixture noncoincident demand connected loads are used along with the applicable schedule and operating factors, according to the following equation:

$$UEI_{ijzdhs} = \Delta UOL_i \times U_{ij} \times \left[\left(PO_{jdhs} \times OOF_{izd}\right) + \left(\left(1 - PO_{jdhs}\right) \times COF_{izd}\right)\right] \times \left[1 + HVAC_{ijs}\right]$$

Where:

UEIijzdhs is the unadjusted engineering impact for measure i, customer j, business type z, for daytype d, hour h and season s.

ΔUOLi is the change in connected load for technology measure i.

Uij is the number of units of technology type i installed by customer j.

POjdhs is the schedule defined probability that customer j will be open on daytype d during the hour h and season s.

OOFizd is the open operating factor which describes the percentage of full load during normal business hours used by a group of fixtures of type i, in business type z, during daytype d.

COFizd is the closed operating factor which describes the percentage of full load during non-business hours used by a group of fixtures of type i, in business type z, during daytype d.

HVACijs is the contribution of impact caused by both heating and cooling interaction for technology measure i, installed by customer j, during the season s.

Impacts for each measure / season / daytype / hour (and often by customer) were derived and applied to a 1994 calendar, yielding demand profiles for all 8760 hours in a year.

B.5 Detailed Engineering Derivations

B.5.1 Customer Operating Schedule Derivation

The calibration of customer lighting schedules was achieved using the following approach:

- Within the larger on-site sample, self-reported schedules (or profiles) were gathered at the schedule group level by daytype, allowing analysis of schedule group self-report accuracy using the lighting logger sample. The detected bias in customer self-reported hours of operation at the schedule group level was then applied to the larger sample of schedule group self-reports by business type, thus calibrating all schedule group lighting schedules. The following key points describe the details of the calibration process for schedule groups:

    - Self-reported schedule group profiles were generated that consist of hourly values generally consisting of one’s and zero’s, though “shoulder” hours (when a building transitions from on to off) may have intermediate values. These values represent the probability for any given hour of the day that lights are operating, according to the on-site contact. Schedule group hourly profiles were generated for each of three daytypes, Weekday, Saturday and Sunday.

    - Loggers that were installed within schedule groups at a selected number of audits, are placed with the intention of gathering a measured equivalent of the schedule group operating schedule. Each logger stores a continuous date and time-stamped transition record of lights being turned on or turned off during the monitoring period. The data from each logger was then transformed into a useful format for analytical purposes, specifically, each 15-minute interval during the monitoring period was assigned a value between one and zero that specifies the percentage of time during each interval that a particular light operated. Then, for each logger, hourly mean values were generated by daytype using aggregating hourly results across the entire monitoring period. This yielded an hourly / daytype operating factor for the fixture monitored, or the percentage of time that each monitored fixture operated during the course of the monitoring effort, or the probability of operation.

    - Lastly, logger and self-reported operating schedules were compared to each other at the business segment level to detect bias in the self report transitions from on to off. All loggers and schedule groups that contributed to a particular segment were independently combined using a weighted mean, where weights were applied based upon the total retrofit technology connected load within each particular schedule group. For logger data, the transition from on to off was set to be half the distance between the maximum hour-specific observation and the minimum hour-specific observation. All schedule group self-reports were then adjusted according to these results, by moving the periods of transition from on to off, and the transitions from off to on, according to segment mean bias detected within the logger sample. In general the results of these analyses showed that customer self-reports were highly accurate. Therefore, in the absence of well behaved segment-specific results, unadjusted customer self-reports were used.

- Then, self-reported lighting schedules from the telephone sample were calibrated based upon more precise schedule group profiles gathered onsite. A weighting scheme was devised (based upon total new fixture connected load) within each schedule group to attain premise level schedules within the on-site sample. The detected bias in customer self-report hours of operation from the telephone response was then applied to the larger sample of telephone survey self-reports by business type, thus calibrating all telephone survey lighting schedules. The details of this load shape comparison and adjustment are very similar to the methods used in adjusting schedule group self-reports. For that reason, greater detail is not provided regarding the specifics steps implemented to adjust the telephone survey self-reports.

- Lastly, business type segment level adjusted fixture operating schedules were generated for use in MDSS impacts outside the survey and on-site audit samples. These segment mean business type schedules incorporate two distinct calibration steps, bias in on-site self-reported schedules, and bias in telephone survey self-reported schedules, calibration steps that are grounded on the best available information gathered in this research effort: lighting logger data. All schedules derived, whether customer-specific or business type segment-specific, were hourly / daytype / seasonal probabilities that a customer operates their lighting system, stored in this fashion to enable impact calculations at the hourly level.

B.5.2 Business Type and Technology Group Operating Factors

Operating factors, the percentage of lights operating during a specified time interval, were generated by business type and technology group, for facility operating and non-operating periods by daytype. The operating factors that are applied to the probability that a given facility is operating comprise the open operating factor (OOF), and those that are applied to one minus the probability that a given facility is operating comprise the closed operating factor (COF). The data sources contributing to these estimates were taken primarily from two sources: new technology lamp counts performed at the time of each audit, and lighting logger data used in conjunction with the calibrated schedule group profiles. The steps that were implemented to derive operating factors are presented below.

- OOFs were primarily supported by lamp counts that were taken during each on-site audit. Lamp counts were conducted for each retrofit technology installed, and segmented into lamps that were on and lamps that were off, representing a technology-specific instantaneous OOFs. Since on-site audits were conducted on weekdays during normal facility business hours, lamp counts were used to estimate OOFs for weekdays. These customer results were then weighted across customers, yielding a single business type and technology group operating factor that was used consistently for all retrofit estimates falling into that particular segment. For business type and technology group segments with relatively low numbers of lamps counted, weighted mean values were generated across a number of business type segments to strengthen those mean values.

- COFs were estimated by daytype and business type using logger data, calibrated schedule group profiles, and weights by technology that are based upon retrofit fixture connected load. A simplified description of the procedure implemented is that all hourly logger observations categorized as non-operating, for a particular business and daytype segment, were used to generate a single mean value. This is roughly true, though a weighting scheme was implemented based upon the total schedule group retrofit technology connected load.

- It was also necessary to produce both Saturday and Sunday operating factors for the facility operating condition, with no supporting lamp count data. The loggers were used to generate OOFs by daytype, during the facility operating period. The ratio of resulting Saturday or Sunday operating factors to weekday provided a business type operating factor adjustment. These adjustments were then applied to the operating factors generated using lamp count data, yielding Saturday and Sunday OOFs. This analysis step also allowed for a comparison by business type of OOFs that were generated using lamp counts with those generated using logger data. These comparisons strongly support the operating factors generated for weekdays using lamp counts, which, in turn, support the operating factors generated using logger profiles.

B.5.3 HVAC Interactive Effects

B.5.3.1 Introduction to HVAC Interactive effects

In addition to the direct effects of lighting retrofits on premise energy and demand, the contribution of impact caused by cooling and heating system use is described in this section. Internal gains affect both the air-conditioning and heating loads in buildings, and thus HVAC equipment run-time and consumption. Lighting retrofits modify the heat gain in buildings, and thus heating system and air-conditioner usage. When high-efficiency lighting systems replace standard-efficiency systems, cooling loads are decreased while heating loads increase. This section presents the method used to quantify those impacts.

The engineering data sources used to evaluate the 1994 commercial lighting program are identified in Exhibit B-4. Shaded regions identify the primary data sources contributing to HVAC interactive estimates.

Exhibit B-4

Data Sources Contributing to Heating and Cooling Interactive Estimates

Research Objectives / Data Sources	Billing Data			Telephone Survey		On-Site Audit		P/NP Metering	
	Usage Metered	Demand Metered	MDSS Database	Lighting Participant	Program Non-Participant	Lighting Participant	Program Non-Participant	Spot Watt	TOU Metering
IMPACT ANALYSIS									
Unit Operating Load/Impact									
Old Wattage			4			4	4	4	
New Wattage			4			4		4	
Impact (UOI)			4			4		4	
Hours of Operation									
Operating Factor (OF)				4	4	4	4		4
Operating Hours (OH)				4	4	4	4		4
Measure Installation									
Unit Installed (U)			4			4			
Retention						4			
Burned-Out Lamps						4	4		
Impact Adjustment									
SAE Demand Realization Rate									
SAE Energy Realization Rate									
H-Factor by Cost Periods									
Net-to-Gross Ratio									
Interactions									
Cooling Savings				4	4	4			
Heating Penalty				4	4	4			

Survey responses and calibration data gathered on-site were the most important data sources contributing to the HVAC interactive analyses of energy and demand.

The interactive effects of HVAC appliances were estimated using methods developed by ASHRAE, and published in the *ASHRAE Journal*.[3] This article explores the use of HVAC energy as a function of energy-efficient lighting design, and potential savings and penalties resulting from efficient technology retrofits.

This section includes a thorough overview of the steps required to implement interactive adjustments to lighting technology-level impacts. Flowcharts are used to depict key decisions that must be made for each contributing customer, and equations are supplied that were used to estimate the interactive benefits (savings) and costs (penalties) for each lighting participant.

[3] Rundquist, R., *et al.* 1993. "Calculating Lighting and HVAC Interactions", ASHRAE Journal, November 1993, pages 28-37.

B.5.3.2 Cooling Energy Equations

The algorithm that was used to estimate cooling energy interactive savings is presented in Exhibit B-5. To estimate the annual cooling energy contribution from the HVAC system, two new terms are introduced in addition to those already required to estimate the lighting technology-only contribution.

Exhibit B-5
Gross Annual Cooling Energy Impact Algorithm

$$COOLSAV_j = \left[HGANNUAL_j \, x \, \frac{1}{MCOP_j} \right] x \left[\sum_{t=1}^{T_j} \Delta \, kWh_{tjz} \right]$$

where:

$COOLSAV_j$ = Annual HVAC savings resulting from lighting reduction for premise j

$HGANNUAL_j$ = Annual fraction of internal heat gain removed mechanically for premise j

$MCOP_j$ = Marginal coefficient of performance of cooling equipment for premise j

$\Delta \, kWh_{tjz}$ = Technology t annual energy savings for premise j, a member of industry group z

Tj = The number of lighting technologies installed in premise j

The first term, HGANNUALj, describes the fraction of heat gain removed mechanically from the building, as defined in the ASHRAE method Table 1 (from the ASHRAE article, appended to this report). The fraction of heat gain removed mechanically is a function of building size, and whether or not the building is served by an economizer (a device that uses outside air rather than mechanically chilled air to cool buildings when the outside temperature is sufficiently low). The reduced heat gain caused by an energy-efficient lighting retrofit can only benefit cooling system energy use when lighting waste heat is mechanically cooled. Additionally, the fraction of heat gain that is mechanically cooled is always less than one, because of outdoor air ventilation (including the use of economizers), exhaust fans (that mechanically remove heat), and building envelope infiltration.

Table 1 inputs are weather normalized for various locations throughout the United States, including three cities within PG&E's service territory. Either Santa Barbara, San Francisco, or Sacramento was used as a proxy for each participant site.

The second term, MCOPj, defines the marginal cooling system efficiency, a variable describing the efficiency (including all auxiliaries, and supply and return fans) applicable to the incremental cooling load. A default system efficiency is supplied by the ASHRAE method for estimates that involve the retrofit of lighting systems. The MCOP term serves as a conversion constant in the HVAC energy equation, producing an estimate of electricity consumption needed to mechanically cool lighting waste heat.

Next the methods used to determine the cooling interactive terms used in the ASHRAE method are described in greater detail.

B.5.3.3 Application of the ASHRAE Cooling Energy Method

Exhibit B-6 introduces the decision-making processes leading to the calculation of annual cooling energy impacts. This exhibit illustrates several key points.

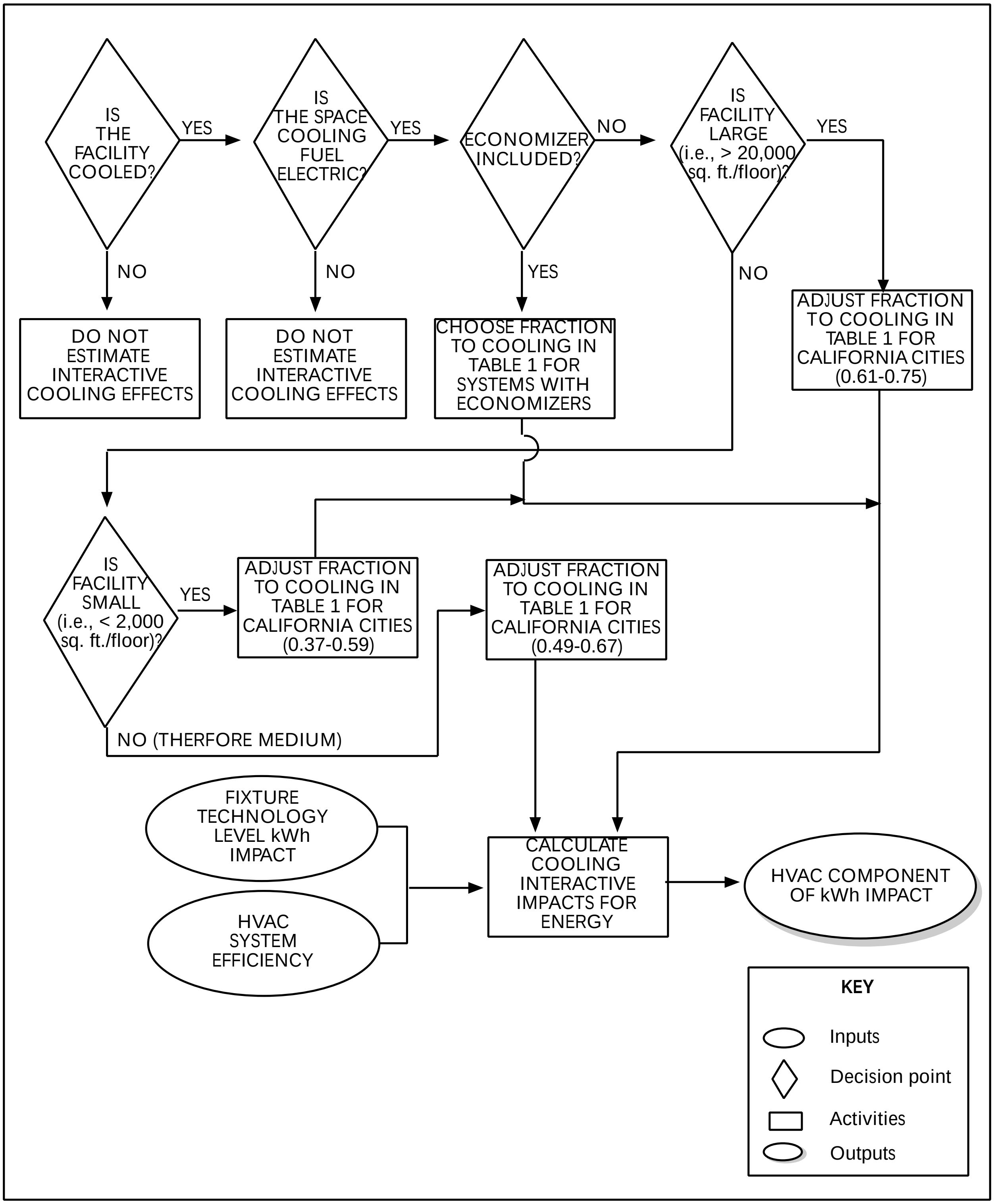
- First, cooling impacts were estimated only for premises with cooling systems.

- Second, engineering impacts were estimated only for sites served by electric-powered cooling systems, since engineering impacts served as inputs to SAE analyses, which were supported by electric billing data. Engineering impacts were estimated in two ways.

  - For premises served by HVAC systems that included an economizer mode, ASHRAE article Table 1 HGANNUALj values were selected.

  - For premises without economizers, values for HGANNUALj were calculated based upon the building size per floor.

Exhibit B-6
Determining the Cooling Interactive Contribution to Energy Impacts



Buildings are classified into three size categories: large, medium, and small, with relatively large to small values of HGANNUALj, respectively. Premises served by economizers have the smallest relative values of HGANNUALj, thus implying that less lighting system heat is mechanically cooled on an annual basis when economizers are present.

ASHRAE HVAC impacts are achieved by multiplying the heat gain fraction removed mechanically (HGANNUALj) and the marginal coefficient of performance (MCOPj) with annual fixture-level energy impacts for indoor lighting systems, on a per-premise basis. The resulting cooling energy savings are used as inputs to the SAE analyses, along with both technology-level impacts and heating penalty estimates (as described below).

B.5.3.4 Heating Energy Equations

To estimate the annual heating energy penalty from HVAC system electric heating, three new terms are introduced in addition to those already required to estimate the lighting technology-only impacts. The algorithm presented in Exhibit B-7 was used to estimate heating energy interactive penalties, and includes the following distinctive terms:

- HVAC interactive heating estimates include a term that describes the fraction of internal heat gain contributing to the building heating loads (HLANNUALj), as defined in the ASHRAE publication, Table 1. The following points must be considered :

  - Because of the typical reduction in internal gains associated with lighting efficiency upgrades, more heat is needed from the HVAC system to meet building losses.

  - This input is weather normalized for various locations throughout the United States, including three cities located within PG&E’s service territory. A particular city is used as a proxy for each participant site.

- The contribution to the heating system is also influenced by the dimensions of each building. The fraction of each retrofit on the exterior 15-foot perimeter, PERIMETERj, is used to define the fraction of fixture heat contributing to the annual heating load. The internal "core" zones are always assumed to require cooling, never heating.

- HVAC interactive estimates also include a term that describes the heating system efficiency (HPCOPj), which depends upon system type for estimates of electric energy penalties, specifically, whether heat pump or resistance heat. Resistance heaters are assumed to have an HPCOP of 1.0, whereas an HPCOP of 1.5 is recommended for heat pump systems.

Exhibit B-7
Gross Annual Heating Energy Impact Algorithm

$$HEATPEN_j = \left[HLANNUAL_j \; x \; PERIMETER_j \; x \; \frac{1}{HPCOP_j} \right] x \left[\sum_{t=1}^{T_j} \Delta kWh_{tjz} \right]$$

where:

$HEATPEN_j$	=	Annual HVAC penalty resulting from lighting retrofit for premise j
$HLANNUAL_j$	=	Annual fraction of internal heat gain contributing to building heating load for premise j
$PERIMETER_j$	=	Fraction of lighting retrofit on the perimeter area for premise j
$HPCOP_j$	=	Heat pump coefficient of performance of heating equipment for premise j
ΔkWh_{tjz}	=	Technology t annual energy savings for premise j, a member of industry group z
T_j	=	The number of lighting technologies installed in premise j

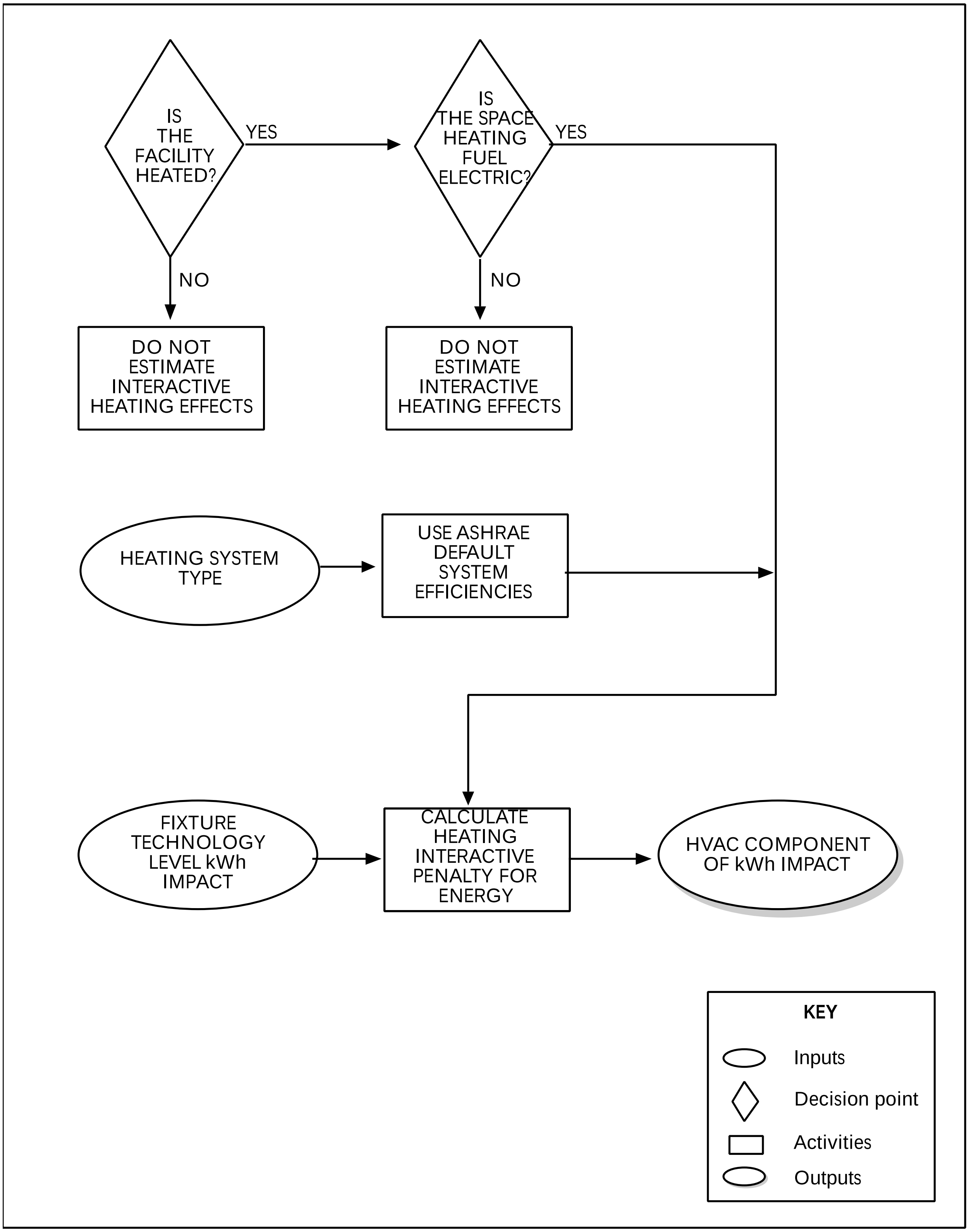
Next the logic used to determine heating interactive estimates (according to the ASHRAE method) are described in greater detail.

B.5.3.5 Application of the ASHRAE Heating Energy Method

As described earlier, the efficient lighting technologies installed under the lighting program caused a reduction in internal heat gains in buildings, and a related increase in the energy required to heat internal spaces. The flow chart shown in Exhibit B-8 establishes the general decisions used to estimate heating impacts using the ASHRAE method. To apply the ASHRAE method requires determining the heating system fuel and, if electric, whether or not the system is a heat pump.

Exhibit B-8

Determining the Heating Interactive Contribution to Energy Impacts



Presented next are the methods used to determine the distribution of annual cooling impacts and heating penalties among each hour of the year.

B.5.3.6 Hourly HVAC Impacts

PG&E requires that impacts be generated according to costing periods related to TOU customer rates. Since the ASHRAE impacts predict a reduction in cooling energy use and increased heating energy use on an annual basis, a methodology had to be developed to distribute the annual impacts determined using the ASHRAE method to each customer on an hourly basis. This section describes the method that was developed.

The distribution of impacts to each hour of the day was accomplished while maintaining several key constraints.

- HVAC impacts were applied during selected days in proportion to hourly lighting system impacts.
- Cooling impacts were applied to selected days as a function of summed daily temperature.
- Heating impacts were applied to selected days as a function of summed daily temperature.
- HVAC impacts for any given hour were applied based upon mechanical system efficiency parameters supported by the ASHRAE method.

Details regarding the methodology are described below, with special consideration of the constraints described above.

In applying both cooling and heating impacts, certain parameters introduced in exhibits B-5 and B-7 specify the fraction of annual fixture heat gain that must be either mechanically cooled or mechanically heated. For cooling impacts, the term HGANNUALj describes the customer-specific fraction of fixture heat gain that requires cooling, and for heating impacts, HLANNUALj x PERIMETERj describes the customer-specific fraction of the fixture heat gain that contributes to annual heating loads. The method of distributing HVAC impacts over each hour of the year relies upon these terms to identify the fraction of days in each year to which HVAC impacts were applied. To select specific days (to which HVAC impacts are applied), all days in a year were ranked according to summed daily temperatures, for each of three applicable weather tapes, WYEC Santa Barbara, San Francisco, and Sacramento. Dry bulb temperatures were used for this procedure.

For cooling impacts, the selected days to which impacts were applied on an hourly basis are those days with the highest summed daily temperatures. The number of days applied per customer is always HGANNUALj x 365. Hourly impacts for applicable indoor measures were generated using the following formula:

$$HVAC_{ijzdhs} = \frac{UEI_{ijzdhs}}{MCOP_j}$$

Likewise, for heating impacts, the selected days to which impacts were applied on an hourly basis are those days with the lowest summed daily temperatures. The number of days applied per customer is always HLANNUALj x PERIMETERj x 365. Hourly impacts for applicable indoor measures were generated using the following formula:

$$HVAC_{ijzdhs} = \frac{UEI_{ijzdhs}}{HPCOP_j}$$

B.5.3.7 HVAC Demand

The distribution of hourly estimates of HVAC impact during the summer on-peak period and system peak hour, vary day-to-day with changes in fixture operating schedule and outdoor temperature. To arrive at a single program figure for any particular business type and lighting technology segment, mean values were calculated for the peak hour across the entire summer on-peak period, thus providing a diversified estimate of HVAC impact.

This concludes the derivation of HVAC interactive engineering parameters.

B.6 Evaluation Results

B.6.1 Overview

This section provides the reader with detailed engineering results for parameters that contributed to unadjusted gross evaluation impact estimates. PG&E should consider adopting many of the results presented to improve the accuracy of program design estimates.

B.6.2 Measured Fixture Connected Loads

Noncoincident change in fixture connected load for each measure installed was determined based upon manufacturers' product literature for both the retrofit technologies, and for assumed existing technologies. To test the accuracy of manufacturers' literature, instantaneous fixture connected loads were measured during on-site activities. Equipped with a spot-watt metering device called a watt probe, both new and existing fixture connected loads were measured. Measurements were taken by locating a switch with just a single type of fixture served on that particular circuit. An attempt was always made to take measurements on circuits with as many new fixtures as possible, thus ensuring high precision for circuits drawing more than 200 watts.

Individual measurements were grouped based upon several selected technology groups. Technologies were grouped to attain a single result that represents a diverse group of fixture configurations (i.e., the T8 technology group contained measurements for 2’, 4’, and 8’ fixtures, in 1-, 2-, 3-, and 4-lamp configurations). Furthermore, the measurements were all normalized for these groupings per total lamp wattage in each fixture. This allowed the calculation of confidence bounds surrounding measurements from a diverse group of fixture configurations that all fall into a particular technology group.

Measured fixture connected load results, normalized to total lamp watts served, are provided in Exhibit B-9. At the top of the exhibit, mean normalized measurements are presented by technology group, along with the lower and upper confidence bounds, calculated at the 95 percent confidence interval.

Exhibit B-9
Technology Group Spot-Watt Results

	Normalized Spot Watt Measurement Results					
Technology Group	Number of Spot Watt Measurements per Technology Group	Mean Ratio of Measured Watts to Lamp Watts	Standard Deviation	95% Confidence Interval	Lower Bound	Upper Bound
T-12 Fixtures	27	1.04	0.08	0.03	1.01	1.07
T-8 Fixtures	85	0.94	0.15	0.03	0.91	0.97
CF Fixtures	13	1.11	0.20	0.12	0.99	1.23
Metal Halide Fixtures	7	1.19	0.18	0.17	1.02	1.36
HPS Fixtures	5	0.92	0.31	0.39	0.53	1.31
Mercury Vapor Fixtures	2	1.19	0.03	0.29	0.90	1.49

		Tested Program Design Fixture Connected Loads			
Technology Group	Program Design Fixture Description	Watts per fixture	Total Lamp Watts	Ratio MDSS/Lamp Watts	Within the 95% C.I. for the Specific Technology Group?
T-12 Fixtures	2L 4' T-12 w/ ES MB	80	80	1.00	Yes
T-12 Fixtures	3L 4' T-12 w/ 2 ES MB	121	120	1.01	Yes
T-12 Fixtures	2L 8' T-12 w/ 2 ES MB	151	150	1.01	Yes
T-8 Fixtures	2L 4' T-8 w/ EB	58	64	0.91	Yes
T-8 Fixtures	3L 4' T-8 w/ EB	84	96	0.88	**No**
T-8 Fixtures	2L 8' T-8 w/ EB	106	118	0.90	Yes
CF Fixtures	13 Watt Compact Fl.	15	13	1.15	Yes
CF Fixtures	2 23 Watt Compact Fl.	30	26	1.15	Yes
CF Fixtures	44 Watt Compact Fl.	48	44	1.09	Yes
Metal Halide Fixtures	175 Watt Metal Halide	210	175	1.20	Yes
Metal Halide Fixtures	250 Watt Metal Halide	292	250	1.17	Yes
Metal Halide Fixtures	400 Watt Metal Halide	455	400	1.14	Yes
HPS Fixtures	35 Watt Int HPS	43	35	1.23	Yes
HPS Fixtures	70 Watt Int HPS	88	70	1.26	Yes
HPS Fixtures	100 Watt Int HPS	130	100	1.30	Yes
HPS Fixtures	100 Watt Ext HPS	130	100	1.30	Yes
HPS Fixtures	400 Watt Ext HPS	465	400	1.16	Yes
Mercury Vapor Fixtures	250 Watt Mercury Vapor	285	250	1.14	Yes
Mercury Vapor Fixtures	400 Watt Mercury Vapor	450	400	1.13	Yes
Mercury Vapor Fixtures	750 Watt Mercury Vapor	820	750	1.09	Yes
Mercury Vapor Fixtures	1000 Watt Mercury Vapor	1075	1000	1.08	Yes

To test the accuracy of fixture connected load levels that were assumed for both the calculation of evaluation results and program design estimates, selected fixture connected loads from each technology group were tested to determine whether or not the normalized connected loads for those fixtures fall within the measured 95 percent confidence interval. These tests were carried out based upon the technology group to which each measure belongs, as summarized in the bottom portion of Exhibit B-9. These results show that in all but one of the selected cases, the fixture connected loads used to derive impacts fell within the 95 percent confidence interval for a particular technology group. This result suggests that fixture connected loads based upon manufacturers' product literature are accurate and should continue to be used.

B.6.3 Burned Out Lamp Rates

When retrofit lighting programs are implemented, burned-out lamps are often replaced. For those particular lamps, the first year impacts yield an increase in energy use, though the program saves energy across all observations. In addition, new fixtures often fail a short time after installation, resulting in a decrease in energy use for those particular fixtures. In an effort to quantify these impacts, burned-out lamps were counted during the on-site audits (in addition to the total number of lamps observed). All such counts were categorized as either retrofit technologies or existing technologies, to allow separate analysis of the pre- and post-retrofit burned-out lamp rates.

Total lamp counts yielded significant burned-out lamp results in four fixture categories, as provided in Exhibit B-10 below:

Exhibit B-10
Observed Burned Out Lamp Rates

Pre- or Post-Retrofit	Technology Group	Observed Burned Out Lamp Rate
Pre-Retrofit	Incandescent	2.16%
Pre-Retrofit	Standard Fluorescent	3.05%
Post-Retrofit	Compact Fluorescent	0.37%
Post-Retrofit	Standard Fluorescent	0.26%

These burned-out lamp observations were applied to the pre- and post-retrofit connected load assumptions based upon the following rules:

- Burned-out lamp rates were only applied within the RE program because of the diversity of measures that were applied within the Customized program.

- Burned-out lamp rates were only applied to measures where both the pre- and post-retrofit technologies had supporting burned-out lamp data, never just pre- or just post-retrofit fixture loads.

The following equation was used to incorporate burn-out rates within the estimated change in connected load pre- to post-retrofit:

$$kW_{NCP} = \left[(1 - BO_E) \times kW_E\right] - \left[(1 - BO_R) \times kW_R\right]$$

Where:

BO_E = Estimated burn-out rate for the existing measure system

BO_R = Estimated burn-out rate for the retrofit measure system

B.6.4 Existing Fixture Saturation by Technology Group

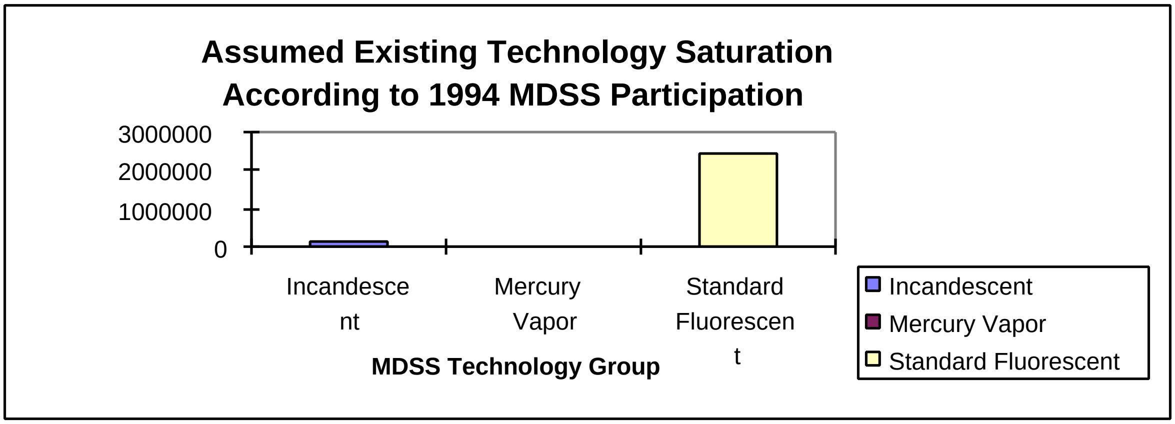
All RE evaluation impacts utilize program design assumptions regarding the fixtures removed at the time of retrofit. These assumptions were tested using observed existing technology saturations recorded during implementation of the on-site audits.

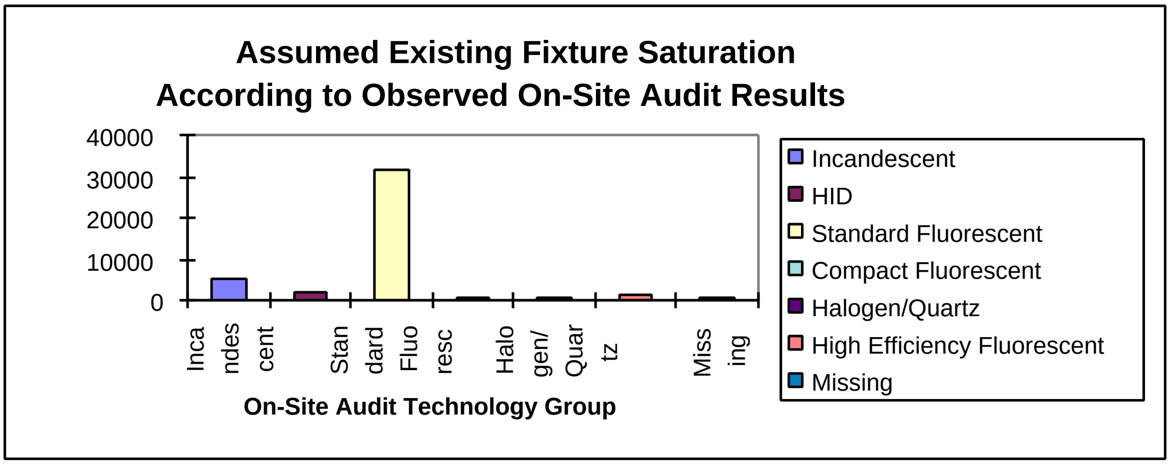
Exhibit B-11 provides the results of existing fixture saturation comparisons, according to both participation in the RE program and on-site results. Estimates of the total number of lamps replaced were derived using participation data and assumed fixture configurations for replaced systems, yielding total lamps by technology group. Estimates from the on-site audits were derived by mapping each existing system observation to a particular technology group, and then subsequently summing the total number of lamp observations recorded during on-site activities within each technology group.

The existing system fixture saturation recorded on site agrees in general with the assumed program design saturation, though the fixture types are more diverse in the actual population. The change in connected load pre- to post-retrofit is a very important parameter used to estimate program savings, and yet little is actually known about the type or frequency with which particular systems are replaced. This is a weakness in the MDSS we recommend correcting.

Exhibit B-11

Observed Existing Fixture Saturation vs. Program Design Replacement Assumptions





B.6.5 Hours of Fixture Operation by Business Type and Technology Group

Exhibit B-12 presents a summary of the annual hours of fixture operation applied in generating RE energy impacts in the commercial sector.

Exhibit B-12
Commercial Sector Annual Fixture Hours of Operation by Business Type and Technology Group

Program and Technology Group \ Business Type	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.
	Commercial Sector Hours of Fixture Operation									
Indoor Lighting										
Retrofit Express Program										
Compact Fluorescent	3,600	3,100	3,200	1,800	5,100	4,300	4,000	4,900	2,300	3,900
Standard Fluorescent	3,900	4,300	3,800	2,000	6,900	5,200	4,900	6,500	3,000	4,800
High Intensity Discharge	4,200	4,000	3,900	2,400	6,500	5,600	5,100	6,800	3,200	5,100
Halogen	4,200	3,900	3,900	2,300	6,500	5,500	5,100	6,900	3,100	5,000
Exit Signs	8,200	8,200	8,200	8,200	8,200	8,200	8,200	8,200	8,200	8,200
Controls (Occ. Sens. Only)†	900	1,000	800	600	700	1,300	1,400	1,900	900	1,100
Exterior Lighting										
Retrofit Express Exterior HID	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600

† Hours presented for occupancy sensors reflect the net reduction in hours of operation.

Although the hours presented are at the detailed level of business type and technology group, providing details from the engineering methods applied, we cannot recommend at this time that results at this detailed level be applied to other samples of participants.

The annual fixture operating figures presented here are based upon the combined application of customer operating schedules by daytype and season, and open and closed operating factors developed by daytype, business type, and technology group. To prevent unnecessary reporting and tables, presentation of the operating factors and operating schedules has been replaced with information at levels of detail more suitable for PG&E's use, i.e., the annual fixture operating hours summaries just presented, and the summer on-peak coincident diversified operating factors that follow.

B.6.6 Coincident Diversified Operating Factors by Business Type and Technology Group

Exhibit B-13 presents a summary of the commercial sector peak-hour coincident diversified operating factors (CDOF's), the percentage of connected load use estimated for the peak hour on a mean basis across the summer on-peak period. This term incorporates diversity as a function of both customer operating schedules, and weekday open and closed operating factors that were developed by business type and technology group. These terms are presented for the purpose of providing PG&E with detailed customer retrofit performance during the critical on-peak hour.

Exhibit B-13
Commercial Sector Summer On-Peak CDOF's

Program and Technology Group \ Business Type	Office	Retail	College/Univ	School	Grocery	Restaurant	Health Care	Hotel/Motel	Warehouse	Misc.
	Commercial Sector Summer On-Peak CDOF Results									
Indoor Lighting										
Retrofit Express Program										
Compact Fluorescent	0.70	0.59	0.48	0.40	0.61	0.59	0.60	0.58	0.57	0.54
Standard Fluorescent	0.78	0.94	0.62	0.46	0.92	0.79	0.80	0.78	0.76	0.71
High Intensity Discharge	0.84	0.85	0.66	0.58	0.85	0.85	0.85	0.81	0.81	0.76
Halogen	0.85	0.84	0.66	0.57	0.86	0.84	0.85	0.83	0.80	0.75
Exit Signs	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Exterior Lighting										
Retrofit Express Exterior HID	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15

We cannot recommend at this time that CDOF results, which were derived at the technology group and business type level, be transferred to other retrofit customers based upon this study alone.

B.6.7 HVAC Impact Results

Exhibit B-14 presents commercial sector mean HVAC energy and summer on-peak demand adjustment factors by business type that describe the ratio of total fixture and HVAC impact to fixture-only impact. These adjustments could be applied by business type to future estimates of technology-only lighting impacts, yielding estimates of total impacts that include the HVAC component.

Exhibit B-14
Commercial Sector HVAC Adjustments

Industry Group	Indoor Lighting HVAC Adjustments: Energy Adjustment	Indoor Lighting HVAC Adjustments: Demand Adjustment
Office	1.14	1.24
Retail	1.08	1.16
College/University	1.19	1.32
School	1.12	1.22
Grocery	1.12	1.23
Restaurant	1.13	1.26
Health Care/Hospital	1.12	1.22
Hotel/Motel	1.16	1.27
Warehouse	1.05	1.10
Miscellaneous	1.10	1.16

B.6.7 Customized Incentives Methodology

Hard copy application forms for Customized program participants were obtained from PG&E, providing a critical source of information used to derive program impacts. Key engineering data from the forms were entered into a database to classify each impact by technology group, and to generate critical information regarding the retrofit system installed and the existing system removed. Classifying impacts was an important part of this analysis, since impacts tracked in the MDSS for Customized program measures are often not categorized. The method used to generate impacts (for most of the technology groups) required an estimate of the change in connected load for each measure retrofit. With these two parameters and any customer-specific schedule information, impacts were estimated using methods that are consistent with those used for the measures in the RE program. In the absence of hard copy form data, it was found that the MDSS demand impact could be used to approximate change in fixture connected load. In all cases investigated (with the exception of exterior HID lights, refrigerator case door anti-sweat devices, and EMS systems), change in connected load was tracked in the MDSS variable PKW1.

However, some of the items retrofit did not fit into a category associated with the RE measures, as described in the following cases:

- Traffic signal retrofits using red LED arrays were assumed to have a 50 percent probability of operation during every hour of the year, which is a conservative estimate. The MDSS estimates for summer on-peak were undiversified change in connected load, as was typical for most Customized measures.

- EMS system energy estimates, taken either from the application forms or the MDSS, were used, and simply applied evenly to every hour of the year.

- Supermarket refrigerator case doors were equipped with sensors (controlled by a new EMS system) to limit the run-time of anti-sweat heat strip devices. These impacts were tracked in the MDSS under the lighting program, even though these impacts are really the result of refrigeration measures. Consideration should be given in the future to tracking these impacts under another end-use category.

B.7 Indoor Impact Profiles by Business Type and Costing Period

To conclude this engineering appendix, hourly / daytype unadjusted gross energy profiles are presented for selected business types. by costing period, for all indoor lighting technologies installed under the RE program. The following profiles demonstrate the detailed information supplied to PG&E through the application of engineering estimates on an hourly basis.

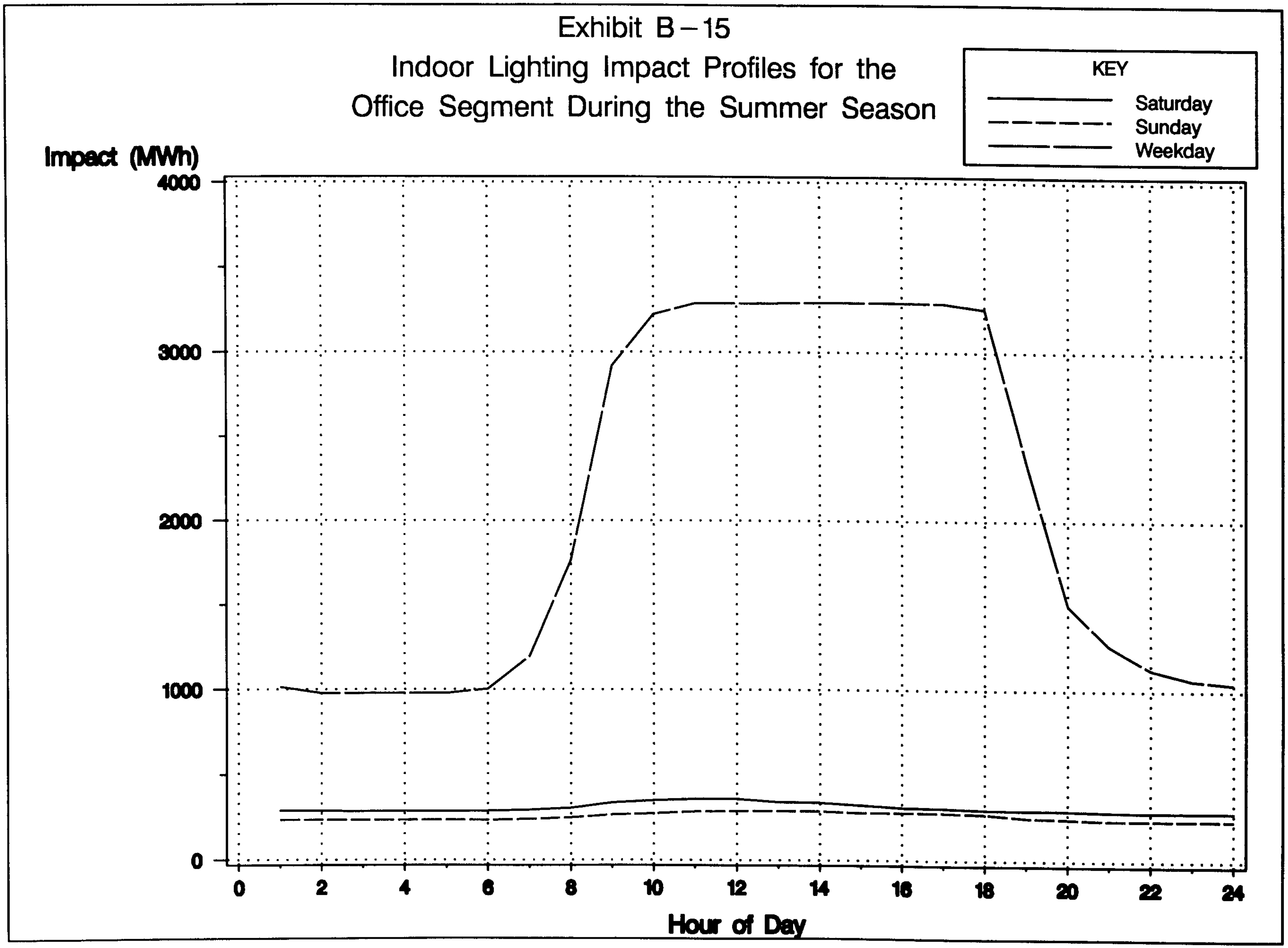


Exhibit B – 15
Indoor Lighting Impact Profiles for the
Office Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
4000
3000
2000
1000
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

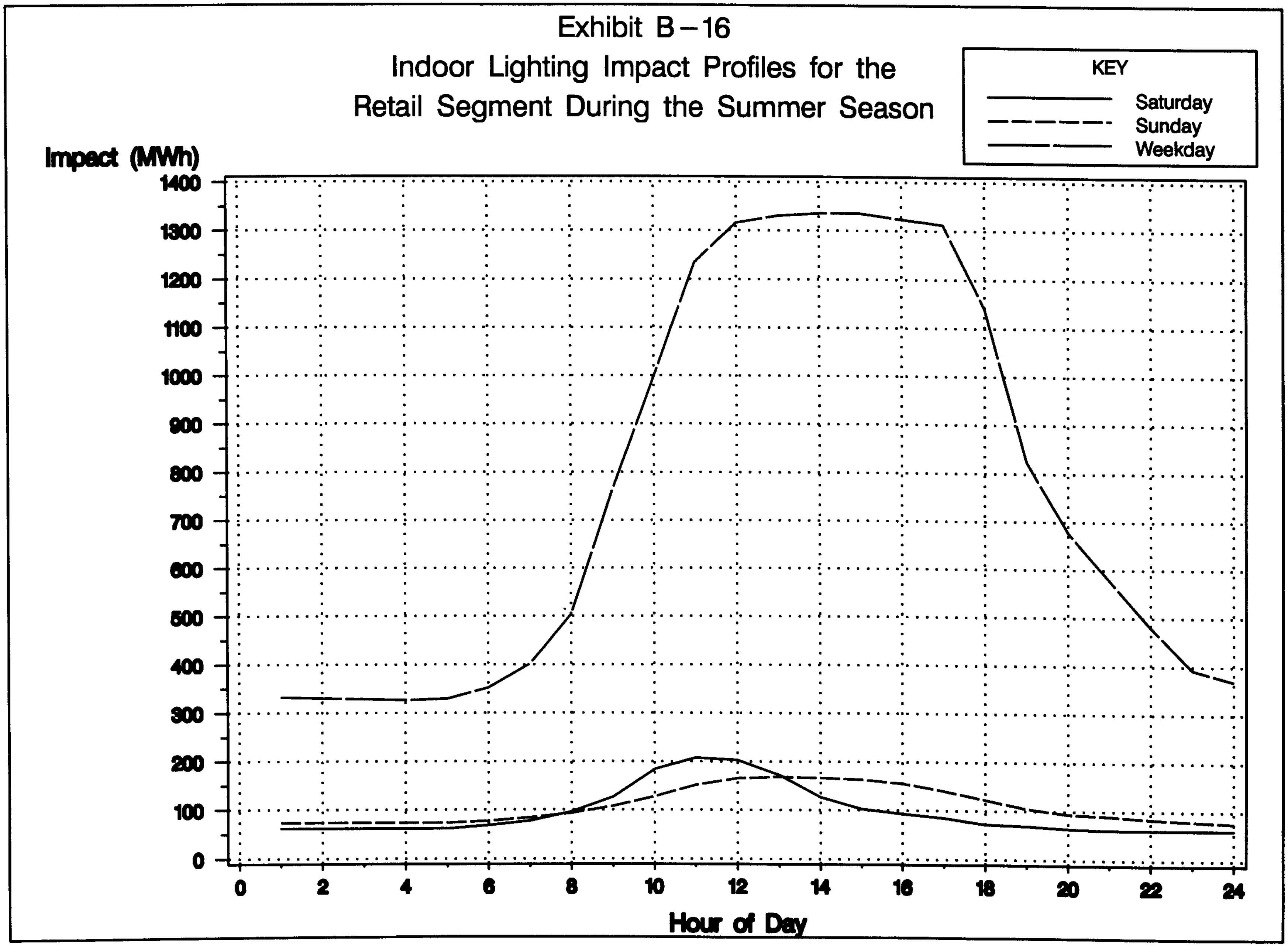


Exhibit B–16
Indoor Lighting Impact Profiles for the
Retail Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

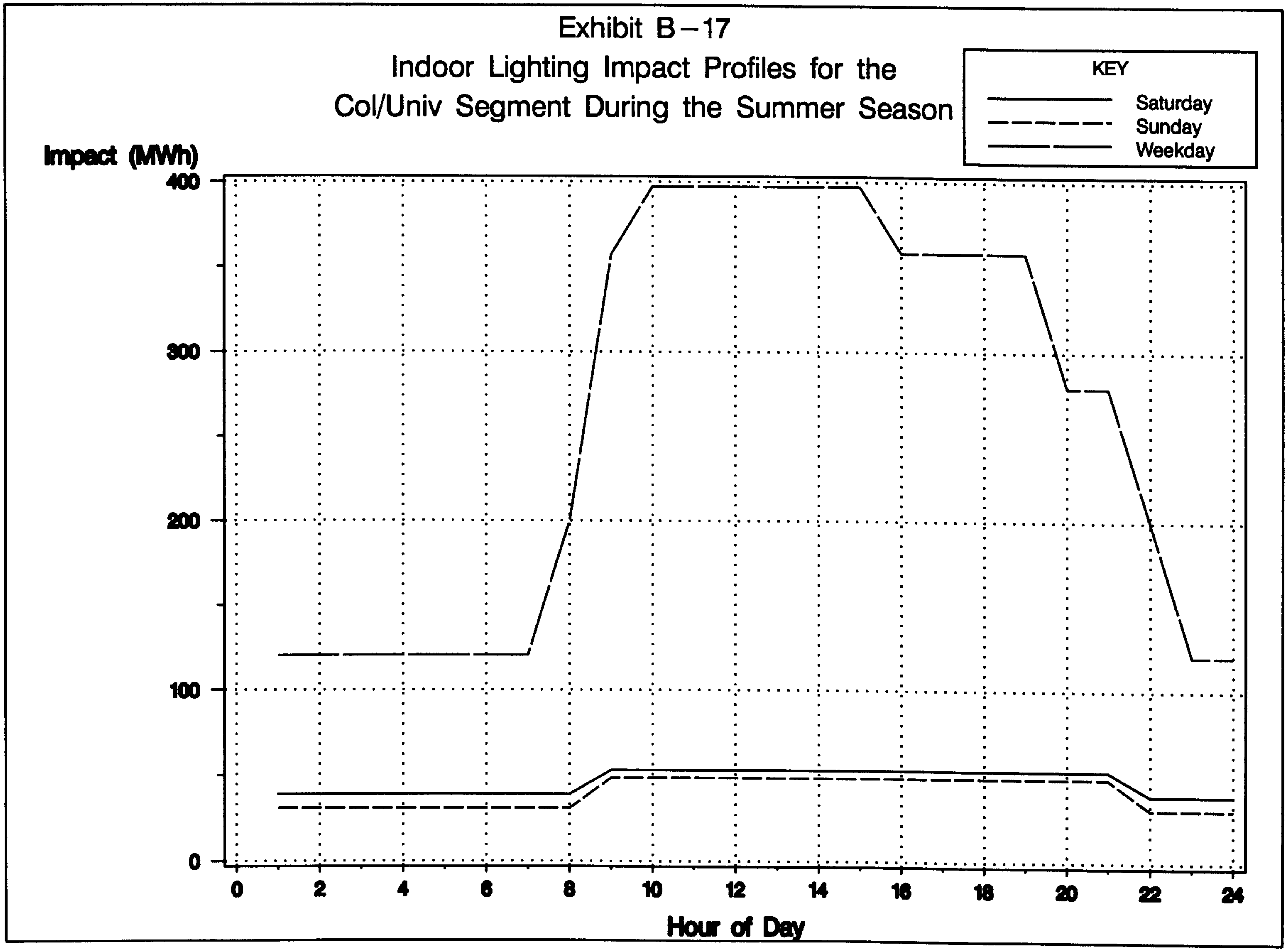


Exhibit B-17
Indoor Lighting Impact Profiles for the
Col/Univ Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

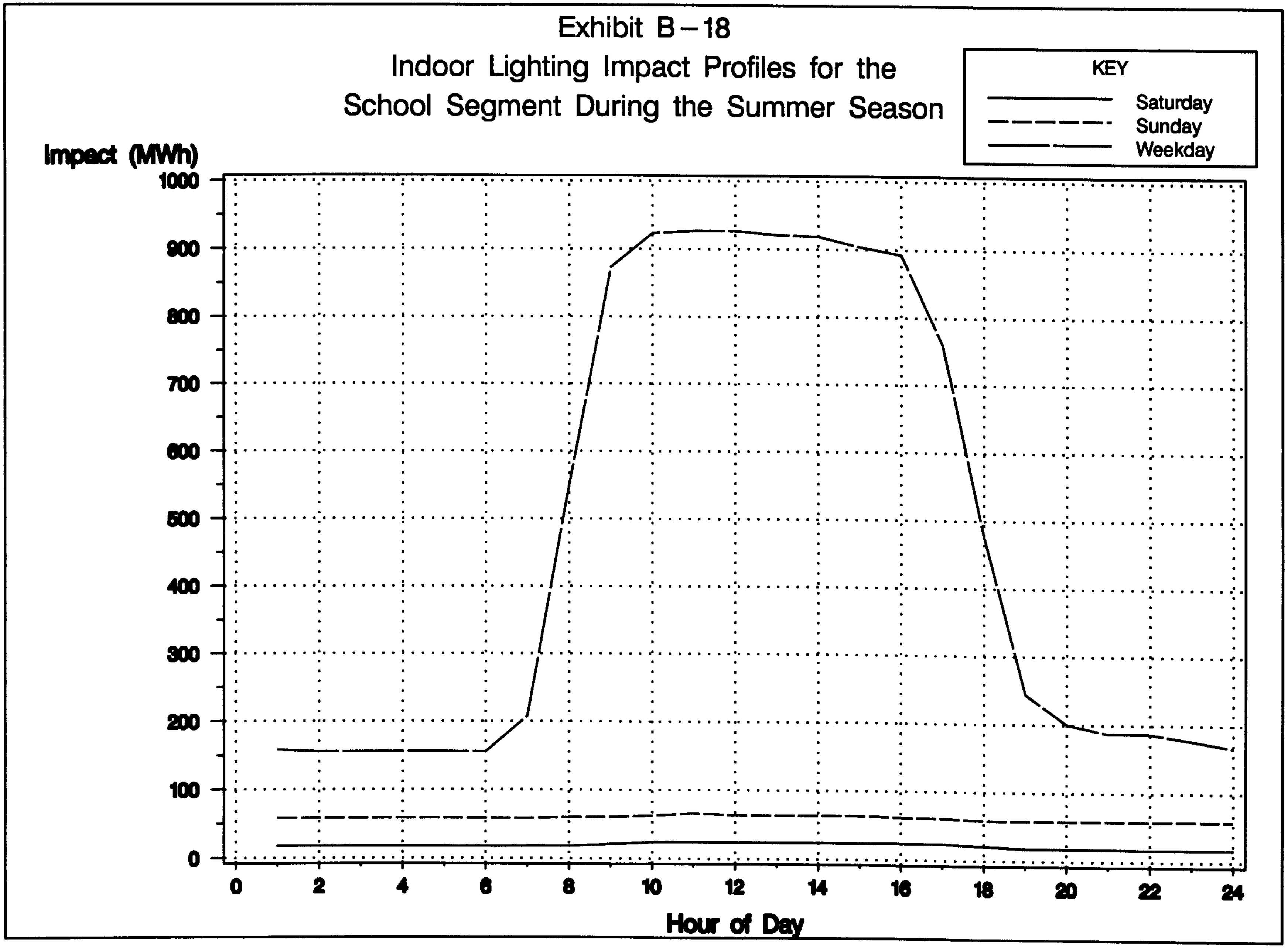
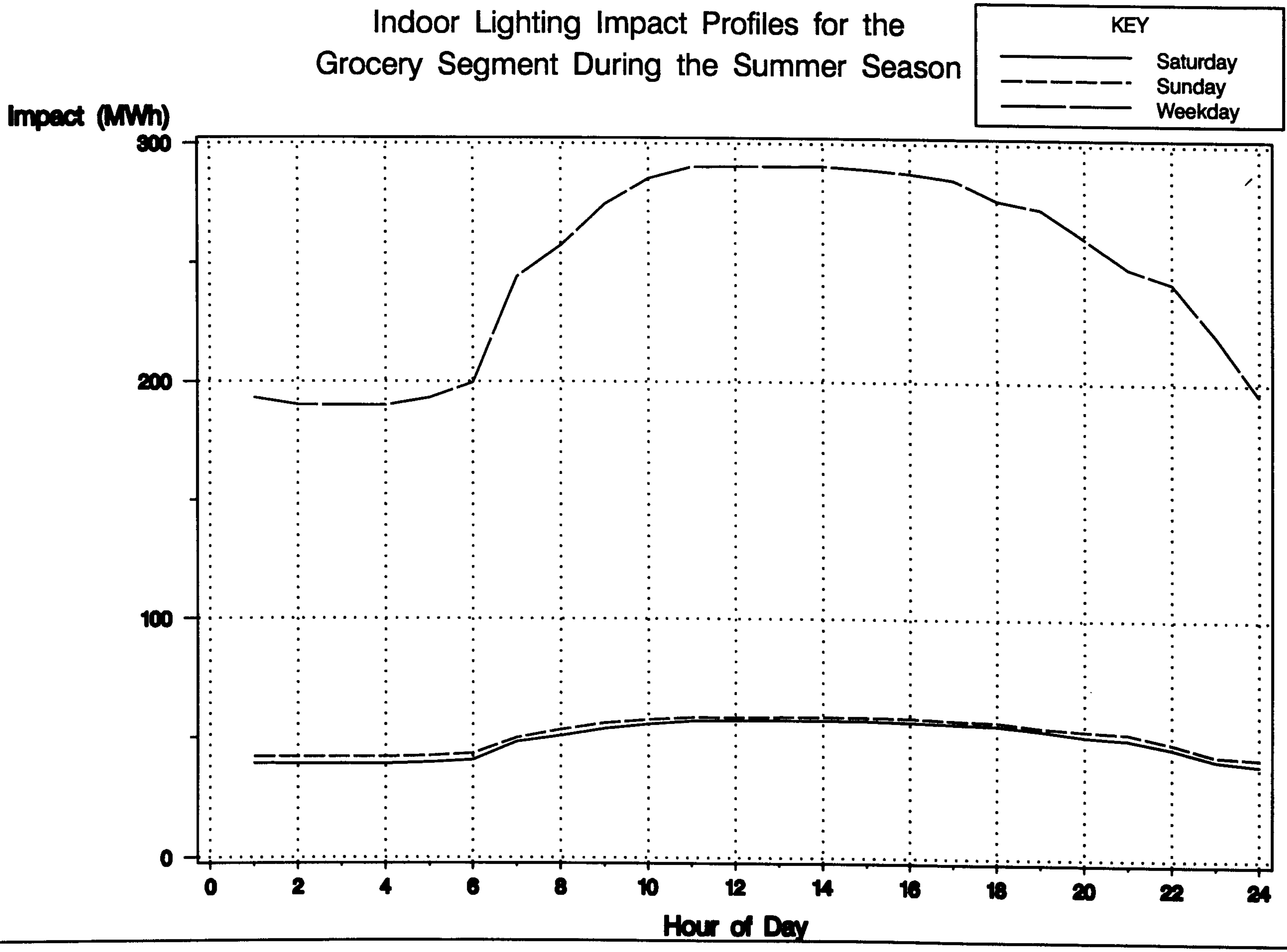


Exhibit B-18
Indoor Lighting Impact Profiles for the
School Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
1000
900
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

Exhibit B-19

Indoor Lighting Impact Profiles for the Grocery Segment During the Summer Season



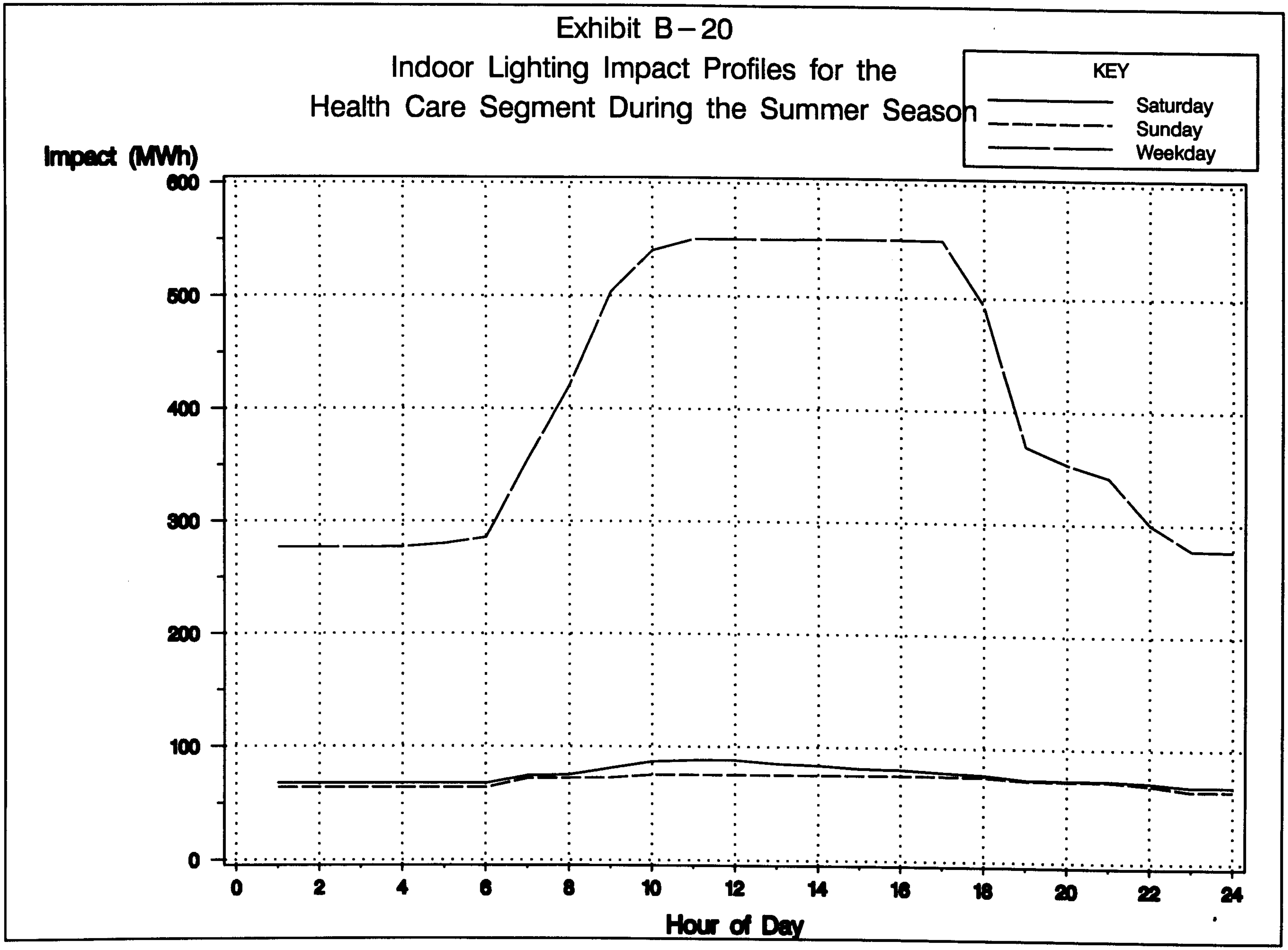


Exhibit B-20
Indoor Lighting Impact Profiles for the
Health Care Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

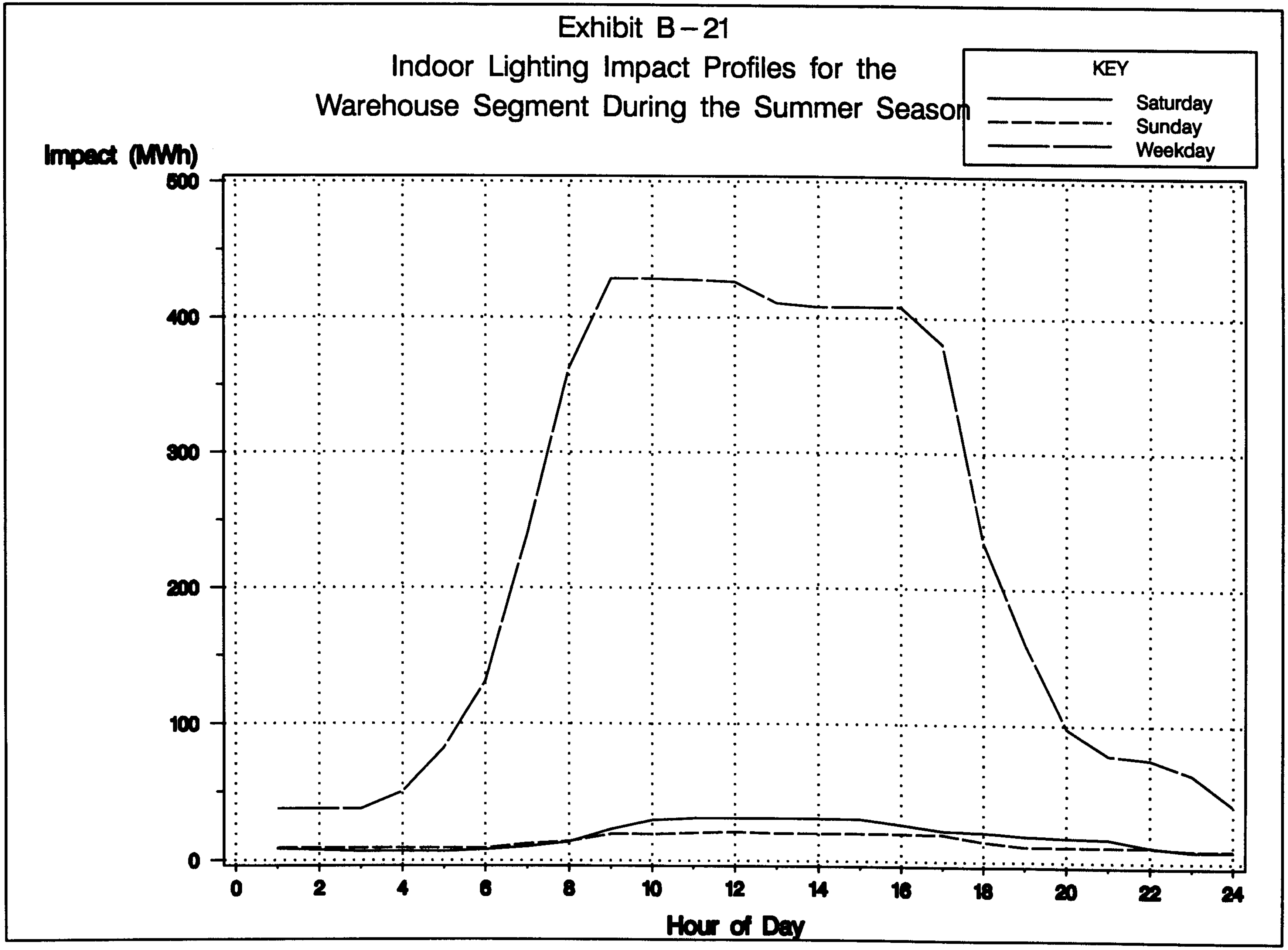


Exhibit B-21
Indoor Lighting Impact Profiles for the
Warehouse Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
500
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

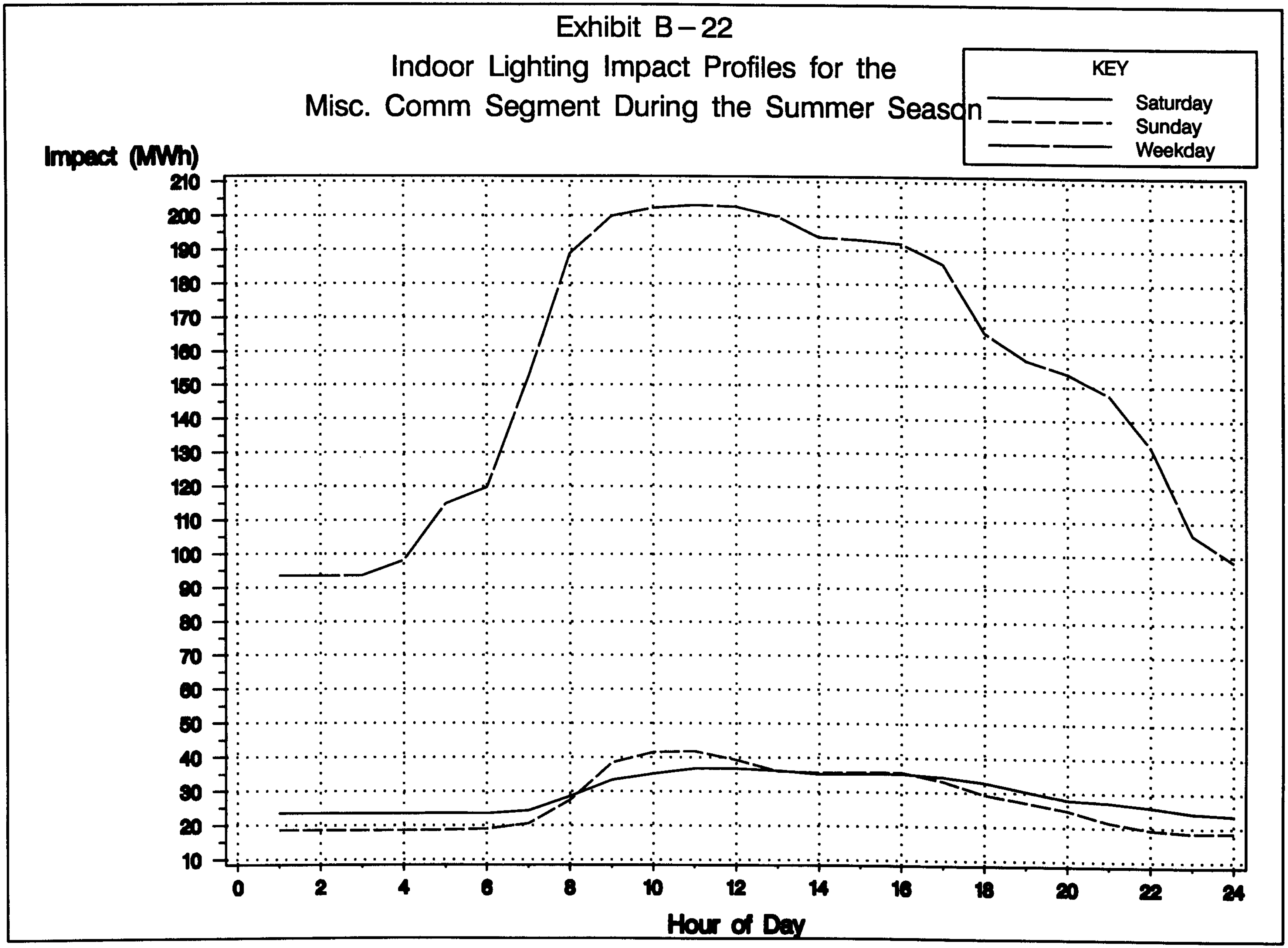


Exhibit B-22
Indoor Lighting Impact Profiles for the
Misc. Comm Segment During the Summer Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

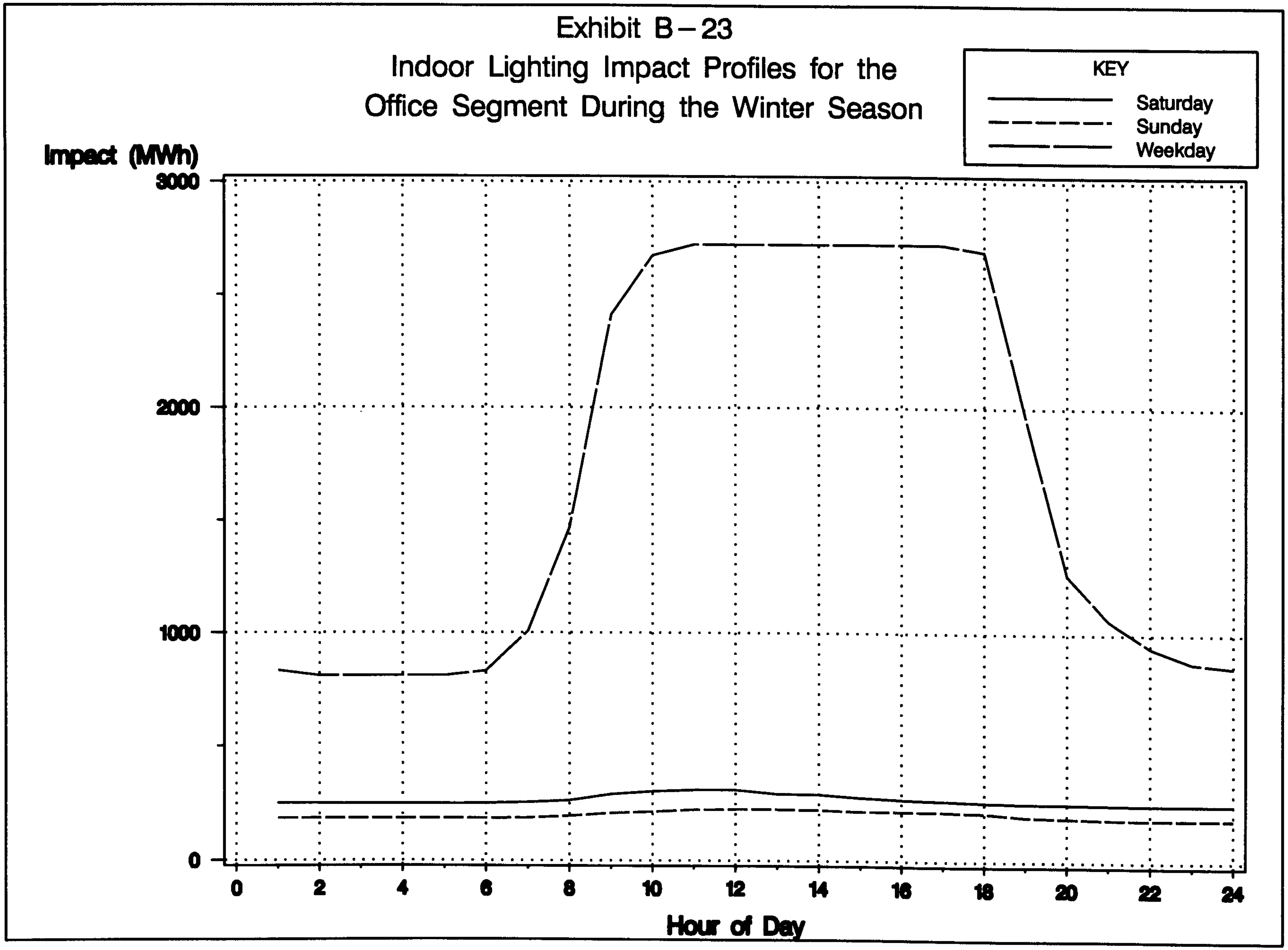


Exhibit B-23
Indoor Lighting Impact Profiles for the
Office Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
3000
2000
1000
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

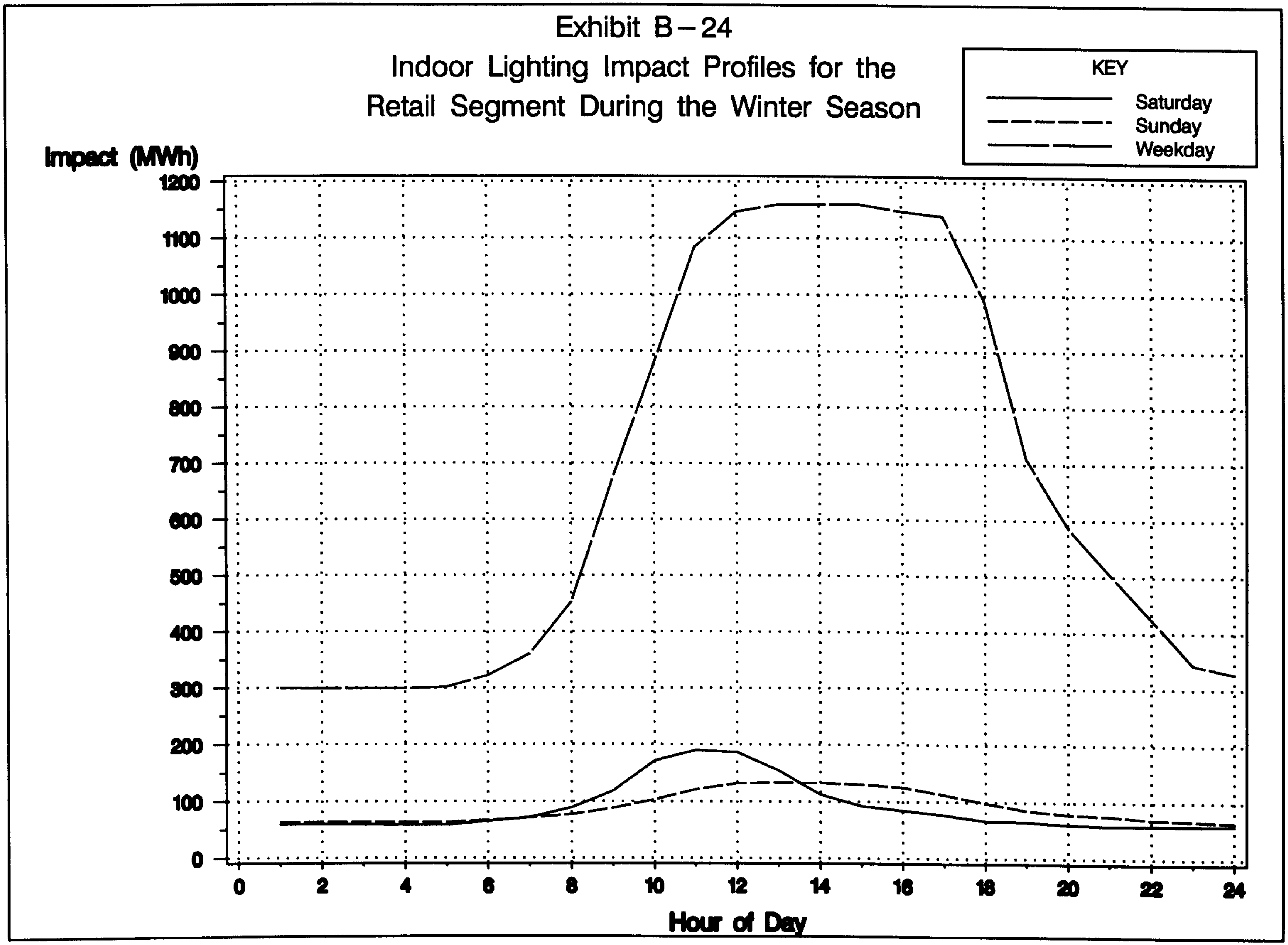


Exhibit B-24
Indoor Lighting Impact Profiles for the
Retail Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
0
100
200
300
400
500
600
700
800
900
1000
1100
1200
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

Exhibit B – 25

Indoor Lighting Impact Profiles for the Col/Univ Segment During the Winter Season

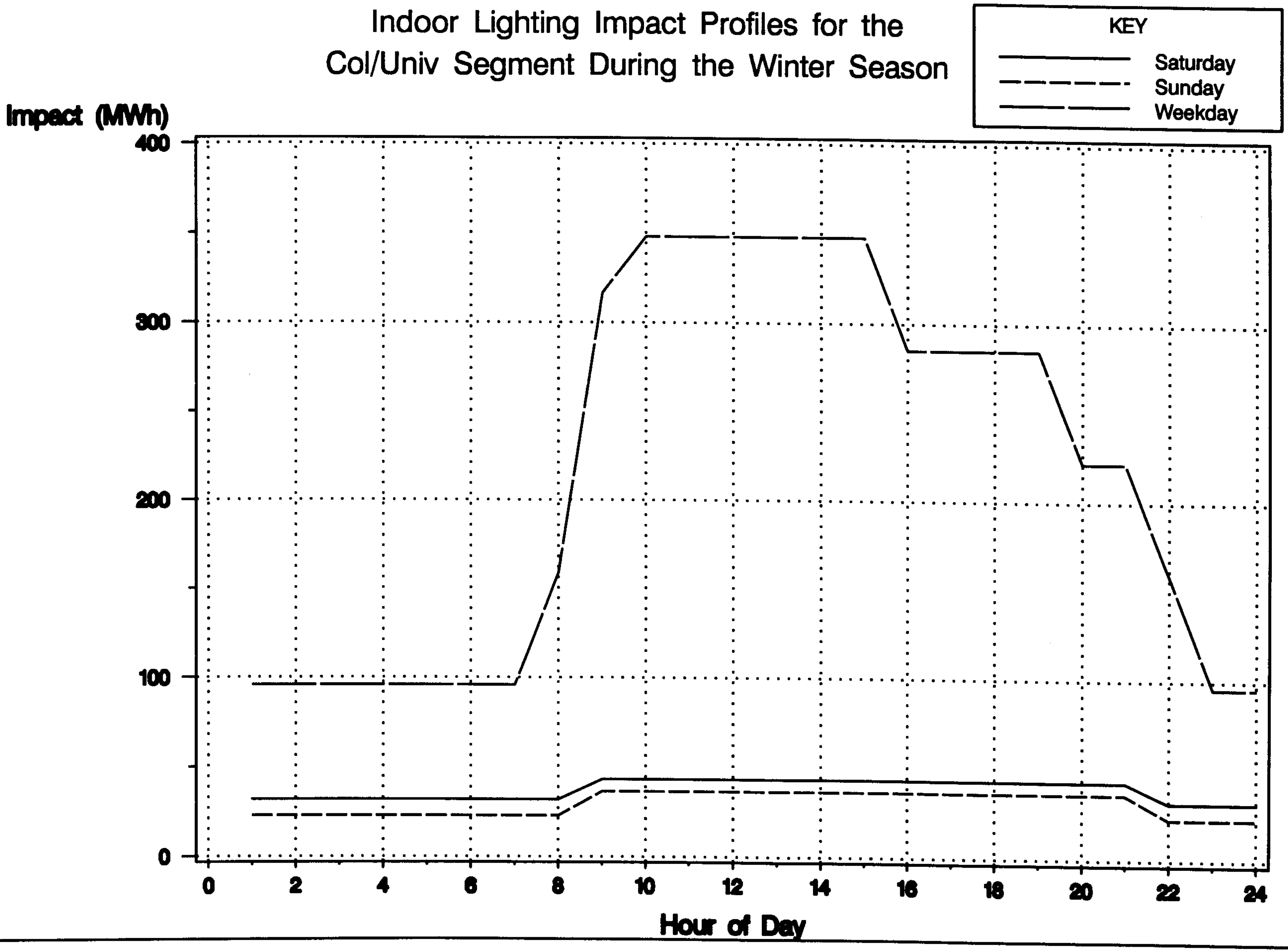
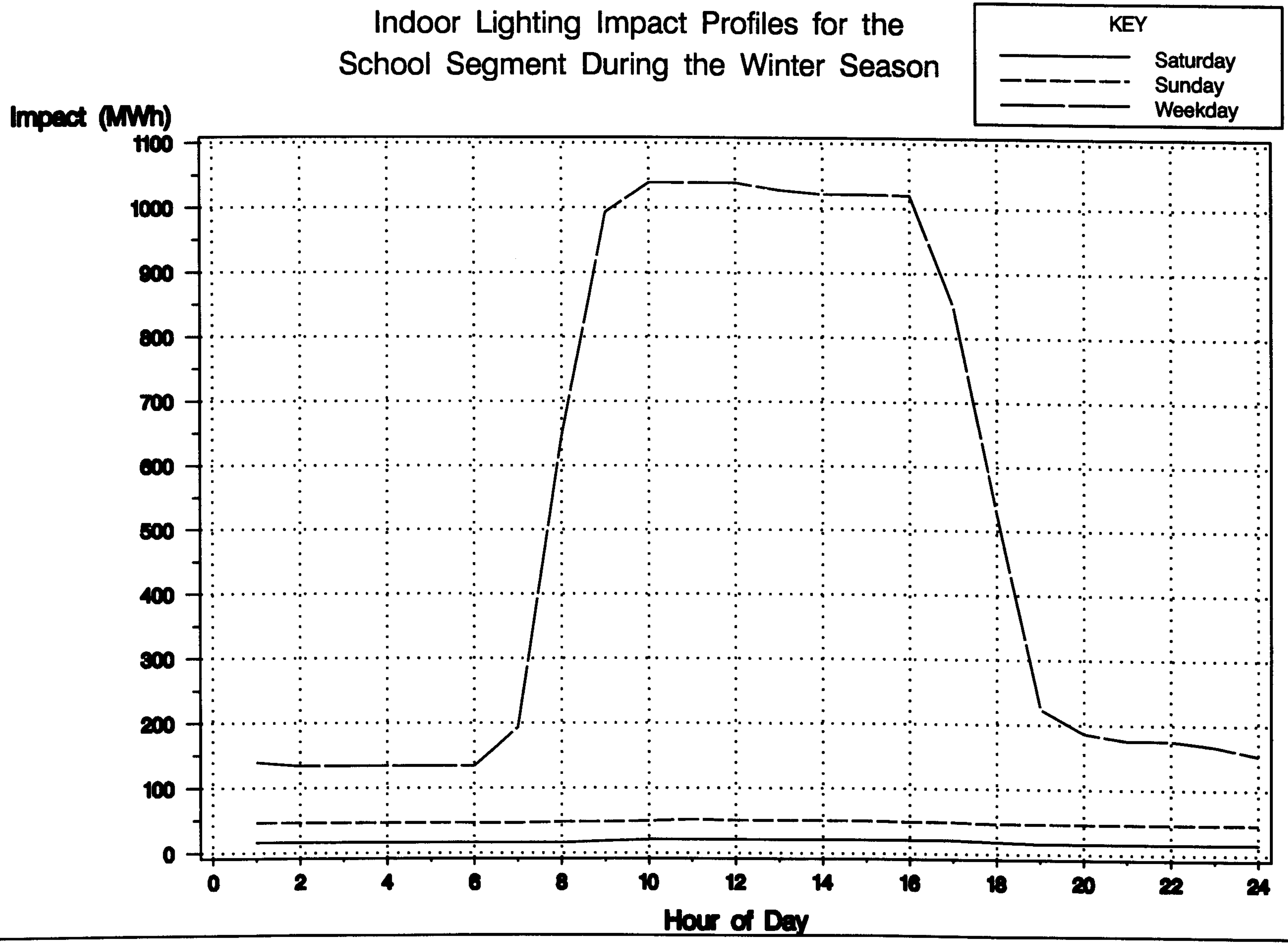


Exhibit B-26

Indoor Lighting Impact Profiles for the School Segment During the Winter Season



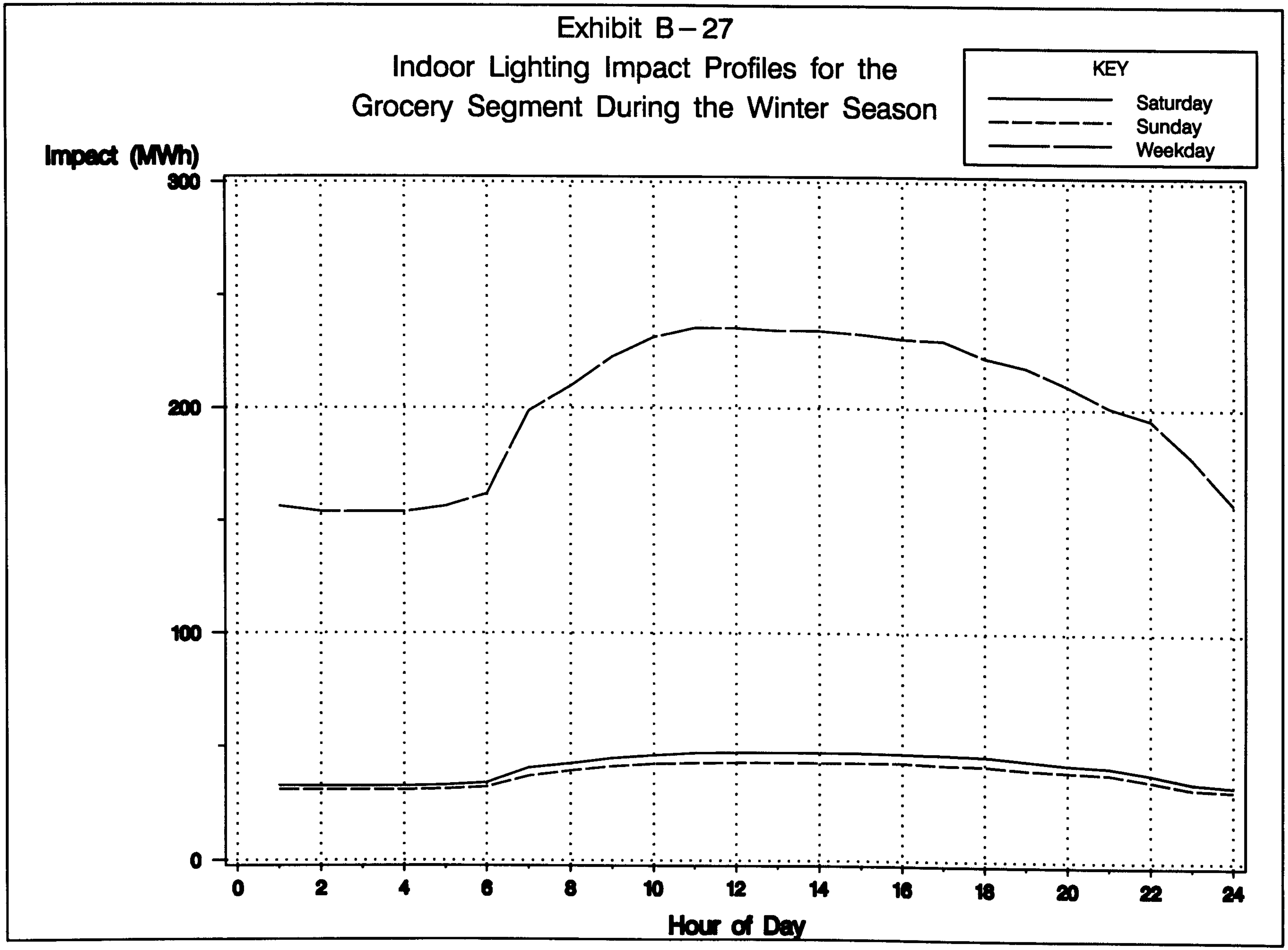


Exhibit B – 27
Indoor Lighting Impact Profiles for the
Grocery Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

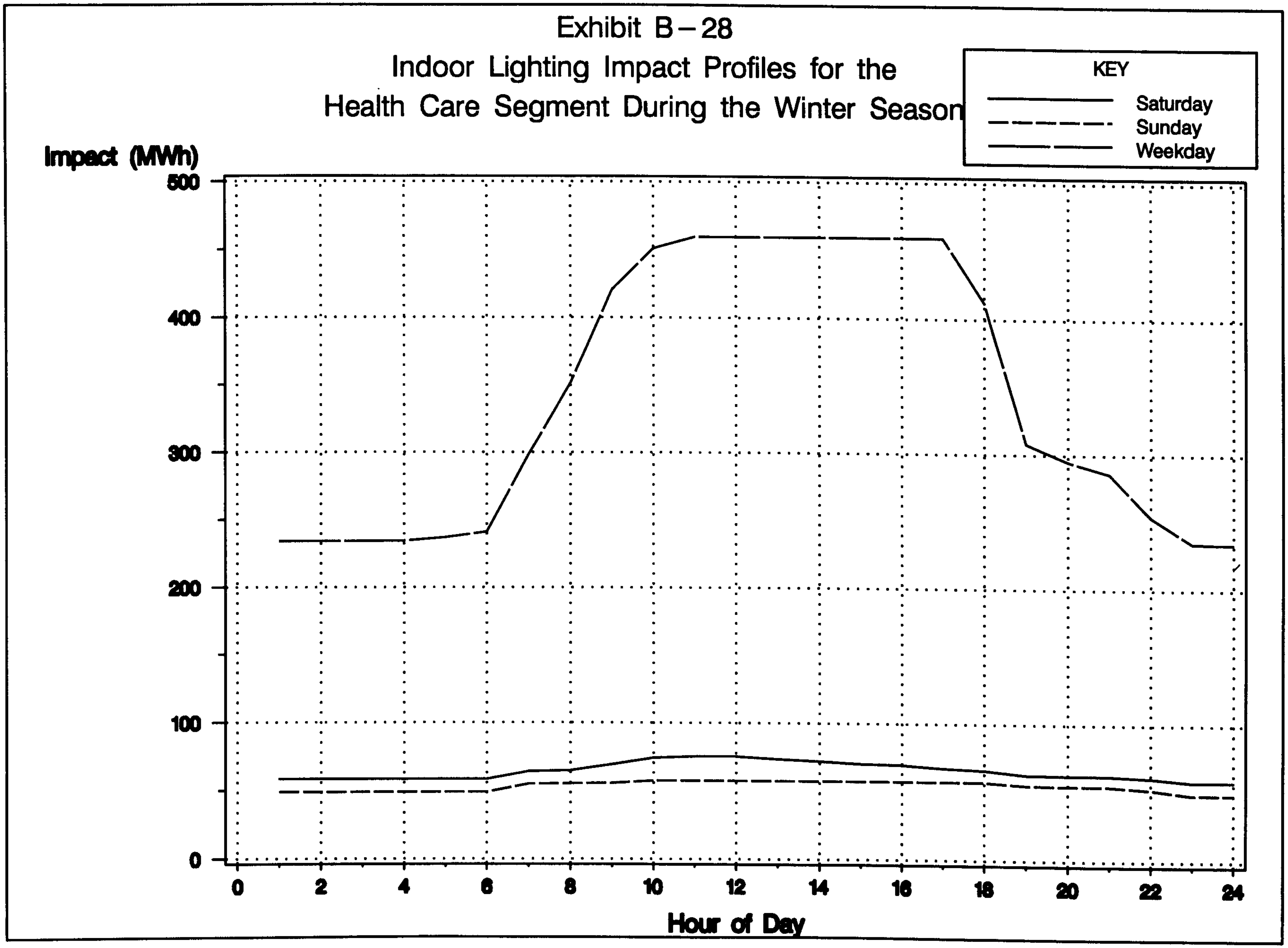


Exhibit B–28
Indoor Lighting Impact Profiles for the
Health Care Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
0
100
200
300
400
500
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

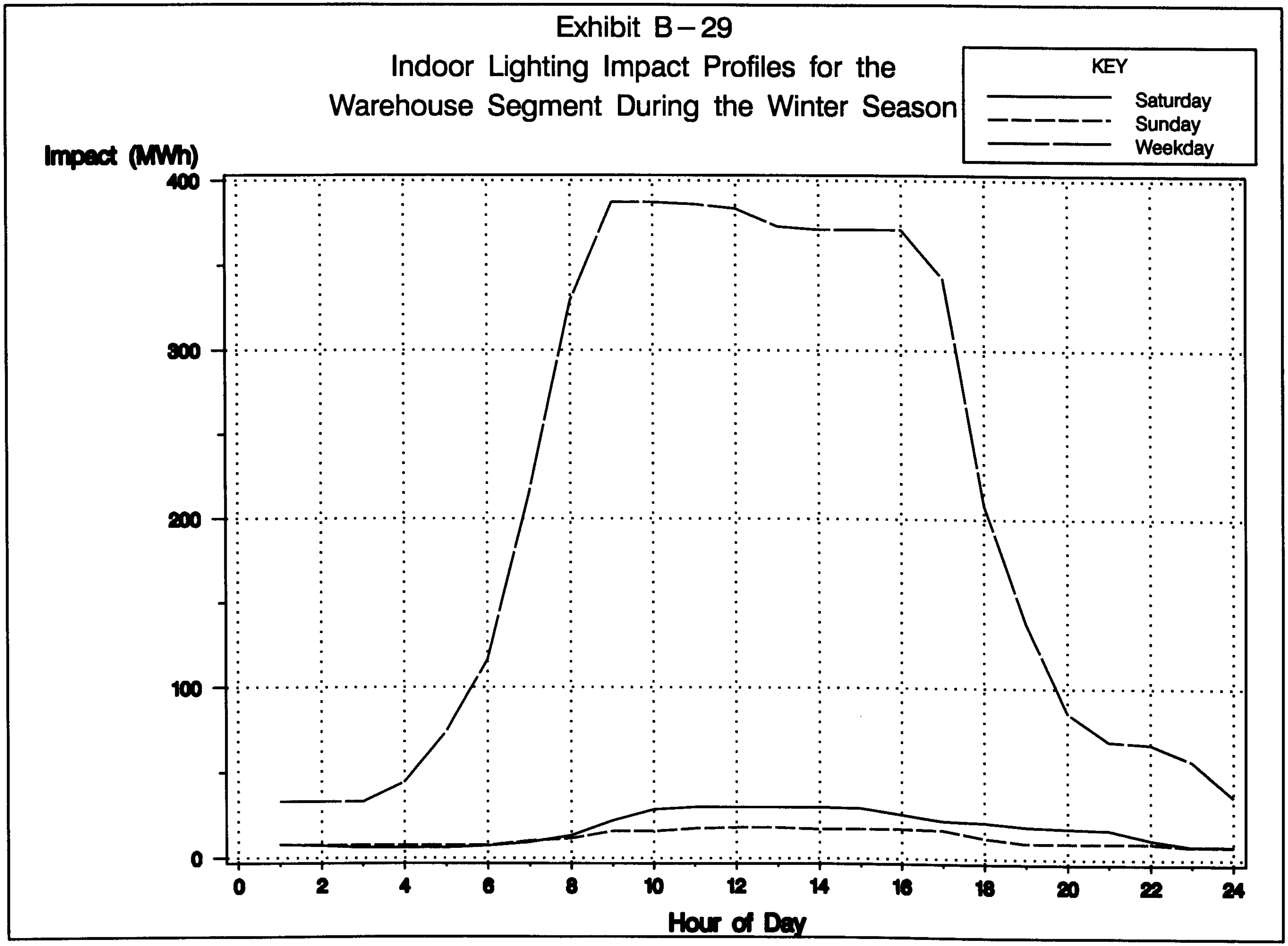


Exhibit B – 29
Indoor Lighting Impact Profiles for the
Warehouse Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
400
300
200
100
0
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

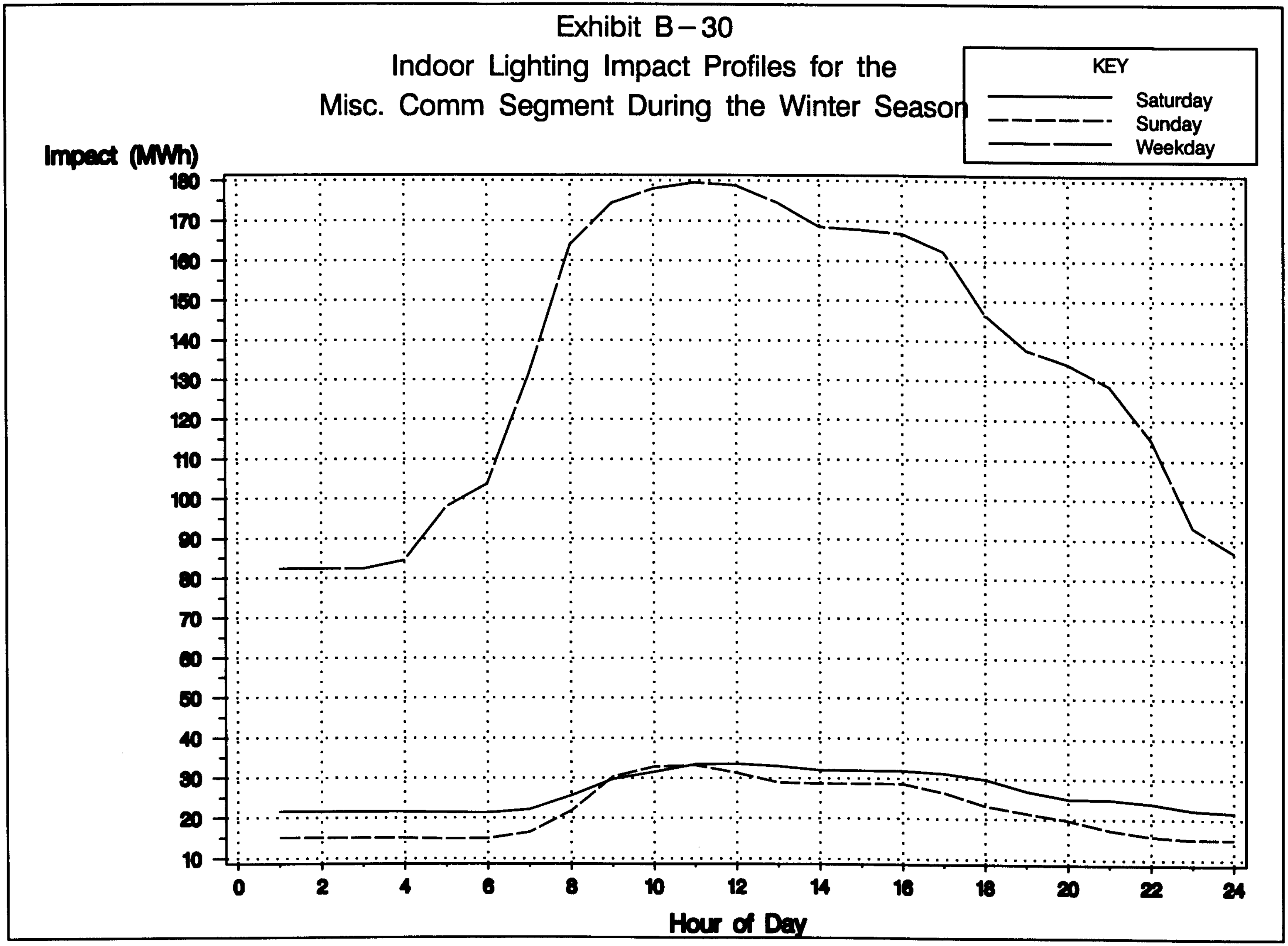


Exhibit B-30
Indoor Lighting Impact Profiles for the
Misc. Comm Segment During the Winter Season
KEY
Saturday
Sunday
Weekday
Impact (MWh)
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
2
4
6
8
10
12
14
16
18
20
22
24
Hour of Day

Appendix C

DETAILED STATISTICAL IMPACT ANALYSIS APPROACH AND RESULTS

Appendix C

BILLING REGRESSION ANALYSIS

This appendix documents the detailed analytical steps undertaken in the billing regression analysis of Pacific Gas and Electric Company's (PG&E's) 1994 Commercial Lighting Technologies Evaluation It begins with a discussion of analysis periods and data sources used in the billing regression analysis and then presents the regression model specification and SAE realization rate. The presentation of relative precision calculation procedures and results concludes the appendix.

C.1 Overview

The billing regression analysis of the Commercial Lighting Technologies Evaluations an integrated part of the overall net and gross impact evaluation. The key objective of the analysis is to determine the first-year program energy impacts. A statistical analysis is employed to model the differences of customers' energy usage between pre- and post-installation periods. The model is specified using actual customer billing data and independent variables that explain changes in customers' energy usage including engineering estimates of program participation. This statistically adjusted engineering (SAE) analysis is consistent with the requirements of the Load Impact Regression Model (LIRM) defined in the California Public Utilities Commission's (CPUC's) Measurement and Evaluation Protocols (the Protocols).

The results of the billing regression analysis are estimated as ratios, termed "realization rates," of realized impacts to engineering impact estimates. Realized impacts represent the fractions of the engineering estimates actually "observed" or "detected" in the statistical analysis of actual billing data. The realization rates estimated as coefficients in the SAE regression models are relative to the results of the evaluation-based engineering estimates, not the PG&E Program ex ante estimates. The SAE realization rates, the estimation of which is the topic of this appendix, are then used to estimate program impacts and realization rates relative to the ex ante estimates.

C.2 Data Sources for Billing Regression Analysis

The billing regression analysis for the 1994 Commercial Lighting Programs Evaluation uses data from four primary data sources: the PG&E Management Decision Support System (MDSS) tracking database, the billing database, the telephone survey data, and the engineering estimates of changes of usage between the pre- and post-installation periods. It also utilizes weather data tapes from PG&E's load research weather sites. A summary of the data elements used in the regression analysis are presented below.

C.2.1 Program Participant Tracking System.

The participant tracking system for the Retrofit Express (RE) and Customized Incentives (Customized) programs was maintained as part of the MDSS. It contains program applications, rebate and technical information about installed measures, including measure description, quantity, rebate amount, and ex ante demand, and energy and therm saving estimates. The MDSS database is linked to the billing database and other program databases through PG&E's customers control numbers.

C.2.2 PG&E Billing Data.

For this evaluation, the PG&E billing data were obtained from two different data sources within PG&E. The original nonresidential billing dataset contains monthly energy usage for all nonresidential accounts in PG&E's service territory, and was used in the sample design as described in *Appendix A*. The second billing dataset, which consists only of customer accounts in the surveyed dataset, was later obtained from PG&E Load Data Services.[1] Since the second billing dataset has many useful fields that were not included in the first dataset, a decision was made to use the second billing dataset to conduct the statistical billing analysis. The billing series used in the analysis is the PG&E pro-rated monthly usage data, a series calculated by PG&E for each calendar month, from January 1991 to September 1995.

C.2.3 Weather Data

The hourly dry bulb temperature collected for 25 PG&E load research weather sites was used in the billing regression analysis to calculate total monthly cooling and heating degree days for each month in the analysis period. For each customer in the analysis dataset, the appropriate weather site was linked to that customer by using the PG&E-defined weather site to PG&E local office mapping.

C.2.4 Telephone Survey Data

Two telephone survey samples of 479 participant and 458 nonparticipant commercial customers were collected for the evaluation. The data collected in the telephone survey supplies information on energy-related changes at each site for the billing period covered by the billing regression analysis. For a detailed discussion of the telephone survey sample design and the final sample distribution, see *Appendix C.*

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[1] A preliminary analysis has concluded that the monthly usage and bill read date information in these two datasets was consistent.

C.2.5 Final Analysis Sample

As discussed earlier, this evaluation utilizes a nested sample design approach. The on-site audit sample and lighting logger sample were collected as part of the telephone survey, with the exception of a few customers who completed an on-site audit and later declined to be telephone surveyed. The final analysis sample size of 480 commercial participant customers represents 325 customers who were surveyed only by telephone, 154 customers who were surveyed by telephone and on-site audited, and one customer who was on-site audited, but later refused to complete a telephone survey. This sample includes a total of 432 RE program indoor lighting participants, 20 Customized program indoor lighting participants, and 28 participants who installed only outdoor lighting measures under either the RE or Customized program. It is important to mention that various program or technology participant populations are not mutually exclusive. For example, a customer can participate both RE and Customized programs and receive rebates for both indoor and outdoor lighting measures in the same year. The following decision rules were used to define each participant population: 1) customers who received rebates for both indoor and outdoor lighting measures are classified as indoor lighting participants; and 2) customers who participated both RE and Customized programs are classified as Customized participants if there is at least one Customized lighting measure installed. The final analysis sample distribution, by business type, program, and indoor/outdoor measures, is presented in Exhibit C-1.

Exhibit C-1
Analysis Sample Distribution
By Program, End Use and Business Type

Business Type	**Participants**			**Comparison Group**	**Total**
	Indoor		**Outdoor**		
	RE	**Customized**	**RE/Customized**		
Office	106	2	6	138	252
Retail	105	3	14	104	226
Coll/Univ	1	0	0	3	4
School	61	1	3	33	98
Grocery	27	11	0	30	68
Restaurant	20	0	2	29	51
Health Care	33	0	1	20	54
Hotel/Motel	14	1	0	36	51
Warehouse	32	1	1	32	66
Commercial Misc.	33	1	1	33	68
TOTAL	432	20	28	458	938

In order to estimate independent realization rates at the business type and technology level, the lighting technologies were further grouped into seven categories, as shown in

Exhibit C-2. Among those technology categories, the Standard-Efficiency Fluorescent group accounts for the largest share of impact, with approximately 65 percent of the total engineering impact estimate for energy. The second largest technology group is the Interior HID and Halogen, which accounts for about 11 percent of the impacts, followed by the Customized measures (7 percent) and the Compact Fluorescent Lamps (7 percent). The outdoor lighting measures account for approximately 5.6 percent of the total impacts.

Exhibit C-2
Analysis Sample Distribution by Technology

Lighting Technology	Description of Technology	Sample Size *
RE Program: Interior HID and Halogen	All Halogen Wattages, All Indoor HID Measures	65
RE Program: Compact Fluorescent Lamps	All Compact Fluorescent Measures	175
RE Program: Exit Signs	All Exit Sign Retrofit Measures	59
RE Program: Standard-Efficiency Fluorescent	Incandescent to Fluorescent Fixtures, Efficient Ballast Changeouts, T-8 Lamps and Electronic Ballasts, Delamp Fluorescent Fixtures, Reduced Wattage Lighting	351
RE Program: All Other Indoor Lighting Measures	All Controls, All Other Misc. Indoor Lighting Measures	57
Customized Program: All Indoor Measures	All Customized Incentives Lighting Measures	20
Outdoor Lighting: All Outdoor RE and Customized Measures	Exterior HPS from Mercury Vapor, Outdoor Incandescent to Fluorescent, Exterior HPS/LPS	94
* Sum may exceed the total sample size due to mutliple meassure installations.		

C.3 Data Integration and Analysis Dataset Profiles

All data elements mentioned above were linked to the final analysis database through PG&E's unique customer control number. For this evaluation, the analysis database served as a centralized tracking system for customers' billing history, program participation, and sampling status and helped reduce data problems, such as account mismatch and double counting. All participants in the survey sample were successfully merged with the MDSS database by control.

In this section, the sample distribution and key variables in the analysis dataset were examined, and the appropriate statistics were computed to ensure that the data was sufficient, both in terms of quality and quantity, to support the billing regression analysis. The findings are grouped into the following categories, based upon the nature of the variables and their respective data sources. All the statistics presented below are based upon the integrated analysis dataset of 938 observations.

C.3.1 Unadjusted Engineering Estimates

As mentioned above, there are a total of 480 participants in the final analysis database. Unadjusted engineering estimates of energy changes were calculated for all 480 customers. The difference between change and gross impact is that the change estimate accounts for the change in consumption relative to the participants' pre-existing system, and takes into account burned-out bulbs. When burned-out bulbs have been replaced by the participant, either as part of, or simultaneously with, program participation, the billing analysis detects an increase in energy usage, offsetting the gross impact of the program. For this reason, the engineering estimates account for participant and nonparticipant burn- out rates, and account for burned-out bulb replacement in the change estimates. For the impact estimates, however, we will assume that the burned-out equipment would have been replaced, and credit the program with first-year savings associated with all equipment installed under the program.

Exhibits C-3 and C-4 below present the engineering change estimates used in the billing analysis by technology category and business type.

Exhibit C-3
Engineering Change Estimates by Technology Categories

Technology Group	Customers Installing Measures	Mean Impact (kWh)	Total Impact (kWh)
Halogen and Interior HID	65	44,136	2,868,843
Compact Fluorescent	175	8,412	1,472,142
Exit Sign Retrofits	59	3,131	184,739
Standard-Efficiency Fluorescent	351	32,536	11,420,253
All Other RE Interior Technologies	57	14,464	824,466
All Interior Customized Technologies	20	87,677	1,665,871
All Outdoor Technologies	94	9,449	888,223
TOTALS*	480	40,259	19,324,537

*Total for customers is total number of customers, rather than total number of installations.

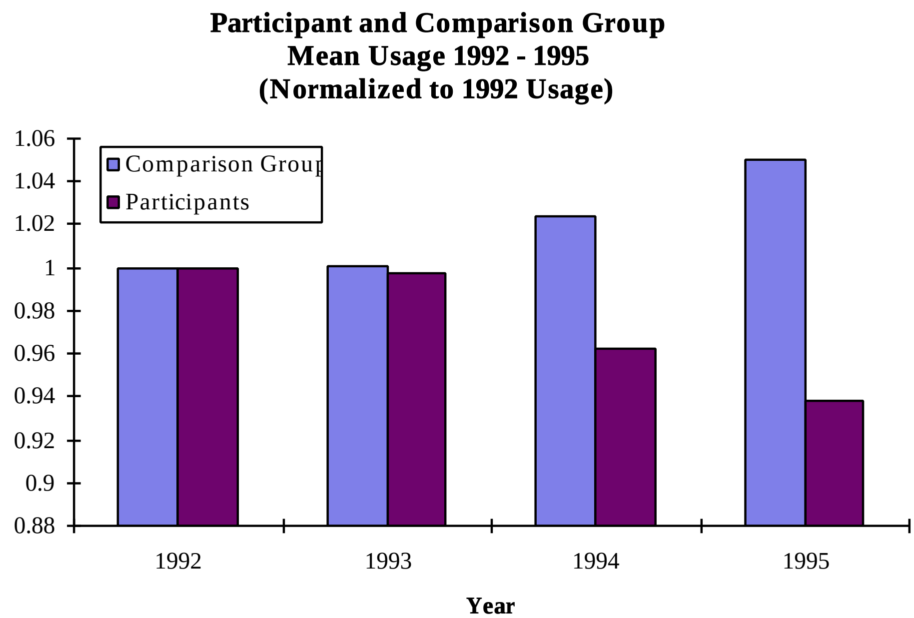
Exhibit C-4
Engineering Change Estimates by Business Type

Building Type	Number of Customers	Mean Impact (kWh)	Total Impact (kWh)
Office	114	40,892	4,661,690
Retail	122	33,257	4,057,354
College / University	1	229,912	229,912
School	65	42,193	2,742,529
Grocery	38	68,724	2,611,521
Restaurant	22	14,479	318,539
Health Care / Hospital	34	54,983	1,869,423
Hotel / Motel	15	38,717	580,757
Warehouse	34	24,904	821,837
Miscellaneous	35	40,885	1,430,974
TOTALS	480	40,259	19,324,537

C.3.2 Year-to-Year Energy Usage Change

The comparison between average consumption changes for participants and comparison group customers between pre- and post-installation periods can often provide some “indication” for the program realized impacts. Exhibit C-5 presents the average usage for participants and comparison group customers between 1992 and 1995, normalized to their 1992 average usage. It clearly shows that participants, as a group, have a lower energy growth rate when compared to the comparison group customers. In fact, the growth rate difference between participants and comparison group is approximately 13 percent,, the same saving ratio predicted by the unadjusted engineering estimates. The significance of this graph should not be overstated, however. This type of simple comparison, by itself, is inadequate to provide an accurate estimation of impacts, because other factors with the potential to affect the energy usage are not controlled in this comparison.

Exhibit C-5
Participant and Comparison Group Population Mean Usage 1992-1995



C.3.3 Model Specification and Results

The billing regression analysis for the 1994 Commercial Lighting Evaluation used two different multivariate regression models under an integrated framework of providing unbiased and robust model estimates in the commercial sector. The key feature of our approach is that it employs a simultaneous equation approach to account for both the year-to-year and cross-sectional variation in a manner that consistently and efficiently isolates program impacts.

A baseline model is initially estimated using only the comparison group sample. This model estimates a relationship that is then used to forecast the post-installation-year energy consumption for both participants and the comparison group as a function of pre-installation year usage. In this way, baseline energy usage is forecasted for participants by assuming that their usage will change, on average, in the same way that usage did for the comparison group.

The SAE impact model used in this evaluation is specified as a two-stage Least Square (2SLS) model [2]that allows for the utilization of all billing and sample data from two pre-installation periods (as described above). The estimated SAE realization rates are used to adjust the engineering estimates of expected annual energy impacts for the entire

[2] Dhrymes, P.J., *Introductory Econometrics*, Springer-Verlag, New York, 1978. pp 289 - 293.

participant population. These impacts are presented in *Section 4* and are used to compute program realization rates.

C.4 Analysis Periods

When the billing regression analysis is used to model the change of consumption attributable to the program measures, the first step is to isolate the pre- and post-installation periods for each customer in the analysis database so that the impact of these measures can be verified.

In accordance with the Protocols, participants are defined by the “paid date” instead of “installation date." Therefore, almost all customers actually installed measures in 1993 or 1994, with 1994 installations accounting for approximately 75 percent of total installations.[3]

Two comparison periods are specified so that pre-installation data from both 1992 and 1993 can be used. Two sets of analysis periods supports the joint estimation of changes relative to two years of pre-installation data, using a simultaneous equation approach described below in the model specification section. The system is estimated using the 2SLS method as follows:

- The primary analysis periods are defined in a way that maximizes the inclusion of a majority of the sample. Because the installation dates cannot be accurately determined for all customers in the analysis database, the pre-installation period (October 1991 - September 1992) and a post-installation period (October 1994 - September 1995) are defined for the entire participant sample. This definition creates a window so that billing data excluded from the analysis is wide enough to assure that all participants have the effects of program measures isolated from the pre- and post-installation periods. In this way, realization rates are not biased by errors in estimating dates of installation.

- A second analysis period is used to estimate the first stage of the 2SLS model. The first-stage model is used only to estimate customer-specific inter-year correlations, and is less sensitive to errors that may be introduced by the estimation of the installation dates. The second pair of pre- and post-installation periods compares 1993 (October 1992 - September 1993) to 1995 (October 1994 - September 1995). For these customers, pro-rated estimates of program impacts are computed to account

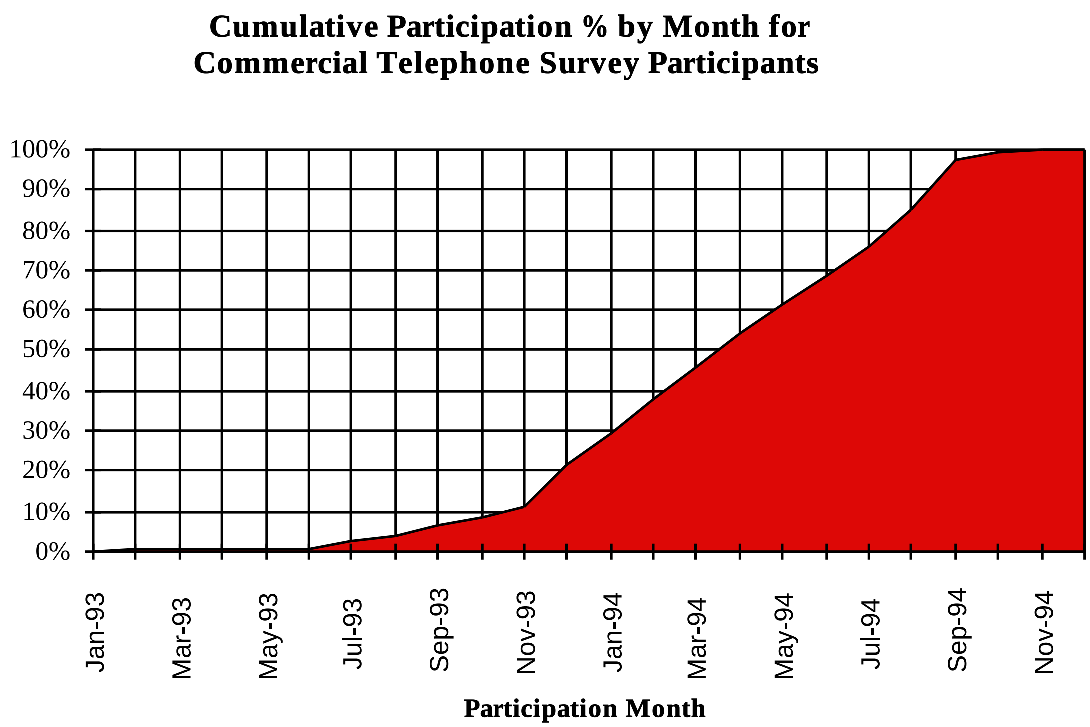
[3] As mentioned before, an accurate determination of the installation date is very difficult due to inadequate data; however, a best-effort estimate was implemented based upon the analysis of the inspection dates and check issue dates from the tracking system in combination with customers’ self-reported installation dates.

for when the installation likely occurred, if it is estimated that installation took place during a portion of the pre-installation period.

The specification of two analysis periods allows for the analysis of pre-installation periods in a manner that, through the use of the earlier pre-installation period, minimizes measurement error in the identification of installation, and retains the information of value contributed by the more recent pre-installation period. As discussed below, these analyses periods support seasonal billing data regression models. Seasonal models resulted in more stable results without artificially deflating the parameter standard errors that would be induced by autocorrelated monthly observations.

As mentioned above, it is difficult to determine the actual installation dates because they were often missing in the MDSS database. A decision rule was developed as part of the evaluation to determine the actual installation date for each participant, based upon the survey self-reported date, MDSS completion date (if not missing), pre- and post-inspection dates, and check issue date. The following exhibit presents the participant sample distribution by estimated installation date.

Exhibit C-5
Commercial Lighting Evaluation Sample Distribution
By Estimated Installation Date



C.5 Baseline Model

The baseline model explains post-installation energy usage as a function of the pre-installation energy usage, weather changes, and customer self-reports of factors that could affect energy usage. In order to isolate the program impact from the energy usage changes, only the comparison group is used to fit this model. The baseline model has the following functional form:

$$kWh_{post,i} = \sum_j \alpha_j + \beta kWh_{pre,i} + \gamma(\Delta CDD_i) * kWh_{pre,i} + \sum_k \eta_k Chg_{i,k} + \varepsilon$$

Where

$kWh_{post,i}$ and $kWh_{pre,i}$ are customer i's annualized energy usage for the post- and pre- installation periods, respectively;

ΔCDD_i is the annual change of cooling degree days (base 65°F) between post-installation year and pre-installation year;

$Chg_{i,k}$ are the customer self-reported change variables from the survey data, including adding, replacing, or removing equipment associated with major end uses, changes in number of employees and square footage;

α_j is the indicator variable (0/1) for the jth business type. It equals 1 if the customer is in that business type and 0 otherwise;

β and γ are the estimated slopes on their respective independent variables; and,

ε is the random error term of the model.

For each customer in the analysis dataset, two predicted usage values are calculated using the parameters of the baseline models estimated independently for the 1993 to 1995, and the 1992 to 1995 analysis periods. They both take the same functional form with different segment-level intercept series (α_j) and slopes (β and γ):

$$k\hat{W}h_{post,i} = F_{pre}(kWh_{pre}, \Delta CDD_{pre}) = \sum_j \alpha_j + \beta kWh_{pre,i} + \gamma(\Delta CDD_i) * kWh_{pre,i}$$

The output of the baseline models are presented in Exhibit C-7 for the 1993 to 1995 analysis periods, and in Exhibit C-8 for the 1992 to 1995 analysis periods. Outlier analysis has identified one customer with high influence on the coefficient estimate. This customer, a college/university comparison group member, has the highest usage among all comparison group customers, and t was eliminated from both models. The final functional relation estimated as follows:

Baseline Model (1993 to 1995):

$$\begin{aligned}\hat{kWh}_{95,i} = {} & 586 * OFF + 2309 * RET - 23623 * UNIV + 2374 * SCH + 545 * GRO \\ & - 6993 * RES + 1327 * HEA - 3590 * HOTEL - 18177 * WH + 1039 * MISC \\ & + 1.10 * kWh_{93,i} + 0.00071 * CDD_{95-93,i} * kWh_{93,i}\end{aligned}$$

Baseline Model (1992 to 1995):

$$\begin{aligned}\hat{kWh}_{95,i} = {} & 86 * OFF - 5393 * RET - 36239 * UNIV - 547 * SCH - 5693 * GRO \\ & - 10617 * RES - 4654 * HEA - 2520 * HOTEL - 7716 * WH + 8990 * MISC \\ & + 1.08 * kWh_{92,i} + 0.000187 * CDD_{95-92,i} * kWh_{92,i}\end{aligned}$$

C.6 SAE Model

Using the predicted post-installation usage values estimated in the baseline models, a simultaneous equation model is specified to estimate the SAE realization rates. This approach employs a 2SLS model that incorporates the billing data and engineering estimates in 1993 [4] and 1995 to fit the first (or stage 1) model. The 1992 and 1995 data are used in the final (or stage 2) model. The first stage results in an estimate of customer-specific inter-year correlation that is used as an independent variable in the final model. The SAE simultaneous system can be described as follows:

Stage 1: $$kWh_{95,i} - F_{93}(kWh_{93}, \Delta CDD_{93}) = \sum_m \beta_m Eng_m + \sum_k \eta_k Chg_{i,k} + \mu_{93}$$

Stage 2: $$kWh_{95,i} - F_{92}(kWh_{92}, \Delta CDD_{92}) = \sum_m \beta'_m Eng_m + \sum_k \eta'_k Chg_{i,k} + \mu_{92}$$

with $$\mu_{92} = \lambda \mu_{93} + \sigma$$

The last equation represents the assumption that there is correlation in usage between the two years. By including the estimated residual from the stage 1 model as an independent variable in the stage 2 model, the error term in the stage 2 model simplifies to a random error term σ and results in the estimation of a more accurate and stable final SAE model.

In the stage 1 model, the difference between predicted and actual usage in 1995 was used as the dependent variable in a SAE model. Based upon the estimated participation month, the pro-rated engineering estimates and change variables were used to explain

[4] All years mentioned in the SAE analysis, refer to a period that covers the last quarter of the previous year, and the first nine months of the current year.

the deviation of the actual usage from the predicted usage. As discussed above, the predicted usage is estimated using only the comparison group to forecast the 1995 usage as a function of 1993 usage and change of cooling degree days from 1993 to 1995. This usage prediction presents what would have happened in the absence of the program.

The stage 1 model has the same basic specification as described later for the stage 2 model. The stage 1 model was estimated on a sample of 937 observations with the same one nonparticipant sample point removed as described in the baseline model above and the only output used from this model is the model residual, which represents a customer-specific inter-year correlation. Exhibit C-7 presents the model output statistics from the stage 1 model.

Exhibit C-7
Stage 1 Model Output

Parameter Description	Parameter Estimate	t-statistic
Estimated Engineering Impacts for 1993	-0.71	17.0
Prorated Change Variables		
Cooling Equip. Additions or Replacements in 1993	-3416.55	0.3
Cooling Equip. Removal in 1993	0.00	N / A
Heating Equip. Additions or Replacements in 1993	46432.00	1.8
Heating Equip. Removal in 1993	-958.02	0.0
Other Equip. Additions or Replacements in 1993	14825.00	1.6
Other Equip. Removal in 1993	0.00	N / A
Employee Additions in 1993	27298.00	2.9
Employee Reductions in 1993	-11189.00	0.9
Square Footage Additions in 1993	4675.41	0.3
Square Footage Reductions in 1993	15529.00	0.4
Lighting Equipment Additions in 1993	14587.00	1.9
Lighting Equipment Replacements in 1993	-9353.96	0.9
Lighting Equipment Removals in 1993	-18777.00	0.7

C.7 Billing Regression Analysis Results

The coefficients of the engineering impacts in the stage 2 model are the SAE realization rates. Independent realization rates are estimated to provide PG&E with business type and technology group level results. Exhibit C-8 summarizes the final SAE model results that was estimated using 936 customers out of a total sample of 938 customers.[5] In addition to one nonparticipant removed in the baseline model, one more observation was removed due to its large usage. [6] The observation removed is a participant in the health care / hospital business type, and it has the highest usage among all participants. Exhibit C-8 summaries the independent variables used in the final stage 2 model, together with the t-statistics and the sample sizes available for each parameter estimate.

Exhibit C-8
Billing Regression Analysis Final Model Outputs

Parameter Description	Parameter Estimate	90% Confident Bounds		t-statistic	Sample Sizes
		Lower	Upper		
Customer Specific Intercept from Stage 1	0.95	0.89	1.01	25.7	936
Estimates Realization Rates					
RE Program Standard Fluorescence					
Offices	-0.94	-1.10	-0.78	10.1	90
Retails	-0.82	-1.14	-0.50	5.2	84
Others	-0.70	-0.94	-0.46	6.9	177
RE Program HIDs					
Offices	-0.94	-1.21	-0.67	6.1	10
Retails	-0.75	-1.17	-0.33	3.9	28
Others	-1.60	-1.87	-1.33	6.1	27
RE Program Compact Fluorescence	-0.62	-1.33	0.09	2.3	175
RE Program Other Indoor Measures	-0.40	-2.63	1.83	0.7	105
Customized Program Indoor Measures	-1.57	-1.71	-1.43	12.0	20
RE / Customized Outdoor Measures	-0.54	-1.61	0.53	1.5	94
Change Variables (Multiplied by Pre-Usage)					
Add Lighting	0.131	-0.122	0.384	6.5	80
Replace Lighting (Outside Program)	-0.027	-1.124	1.070	1.5	38
Remove Lighting	-0.171	-1.119	0.777	1.7	6
Replace HVAC	-0.031	-0.689	0.627	2.5	60
Replace Other Equipment	-0.057	-1.142	1.028	1.5	52
Add Employee	0.038	-0.819	0.895	1.9	103
Reduce Employee	-0.053	-0.484	0.378	3.8	90
Installed Non-Lighting Program Measures	-0.055	-0.534	0.424	3.4	18

[5] A variety of data censoring criteria were employed to identify potential outliers. Models were run without outliers, resulting in final results that were equivalent to running the model with nearly the entire sample. For this reason, the final model is based upon the largest sample possible that achieved a consistent result. In this way, data censoring criteria do not introduce a qualitative element to the final model results.

[6] Both observations have large impacts on the parameter estimates. If left in the model, the overall realization rates would be much higher and therefore the removal of these two observations represents a conservative approach to estimating program gross energy impacts.

- The dependent variable is the difference between the actual and predicted 1995 usage using the 1992 baseline model. Using the comparison between 1992 and 1995 will maximize the inclusion of the majority of the sample, as discussed in the analysis period section above.

- Customer-specific inter-year correlation is the residual term from the stage 1 model. The large t-statistics on this term suggest a strong correlation between customers' usage from one year to another. Inclusion of this term contributes to a more stable model in the sense that there is very low correlation between all the parameter estimates in the final model, especially the SAE realization rate parameters.

- Ten different realization rates are estimated corresponding to business type and technology group segments. Only those measures that have broad participation and relative high expected impacts can support a separate realization rate estimate. While all the realization rates have the right signs, some business types and technologies have much higher estimated impacts than others. All realization rate estimates are significant at the 95 percent confidence level (t-statistics greater that 2) except RE program "other indoor lighting" measures, since this segment likely has large variation and relatively low impacts. Only those realization rates that are statistically significant at the 95 percent level in the final model were used in the final gross impact calculation.

- All change variables have the expected signs. Only those change variables with a significant level greater than 0.15 were kept in the final model through a step-wise regression procedure. Variables excluded from the model include facility square footage changes, HVAC equipment removal, and participation in the 1993 programs.

While QC investigated the use of TOU and load research demand data as a means of supporting a similar SAE demand model, the load information was not available in sufficient quantity to support such an analysis. The demand analysis conducted during this evaluation is based upon engineering models calibrated to on-site audits, spot-watt measurements, lamp counts, and lighting logger data. The spot-watt data were used to calibrate new equipment manufacturers' cut sheet data based upon actual measurements. The lamp counts were used to determine operating factors and burned-out lamp rates pre- and post-installation. The lighting loggers were used to determine whether sites were actually operating in the "open" mode at the time of system peak. This was necessary, since many of the audits were conducted in the morning, and the lighting loggers confirmed the self-reports that the facility was open or closed at the time of system peak.

C.7.1 Relative Precision Calculation

Relative precision at 90 percent and 80 percent confidence levels for the adjusted gross energy impact estimates are calculated at each of the SAE analysis segments. As mentioned above, there are a total of ten analysis segments that were explicitly modeled and the relative precision estimates based upon the model output are presented in Exhibit C-9 below. In order to calculate the total program level adjusted gross impact and relative precision, the segment level results were weighted by their unadjusted engineering energy impact estimates in the following equations, and the results are presented in Exhibit C-9.

$$\text{Total Adjusted Energy Impact} = \sum_i \beta_i Eng_i$$

Where β_i and Eng_i are the SAE realization rates and unadjusted engineering impact estimates for segment i, respectively. The program level standard error can be estimated as:[7]

$$StdErr = \sqrt{\sum_i (CV_i * \beta_i * Eng_i)^2}$$

Where $CVi = (std(\beta i)/\beta i)$ is the coefficient of variation in segment i, estimated in the billing regression model. Finally, the relative precision at 90 percent and 80 percent confidence levels were calculated as

$$RP = \frac{t * StdErr}{\text{Total Adj. Energy Impact}}$$

where t equals 1.645 and 1.282 for the 90% and 80% confidence levels, respectively.

[7] This procedure assumes that the samples in different segments are independent and can be treated as strata in a stratified sampling.

Exhibit C-9
Relative Precision Calculation

SAE Analysis Level	Engineering Gros Impact Estimate (MWh)	Realiztion Rate	Relative Precision at 90%	Relative Precision at 80%
RE Program Standard Fluorescents				
Offices	93,822	94%	16%	13%
Retails	30,756	82%	32%	25%
Others	83,607	70%	24%	18%
RE Program HIDs				
Offices	8,611	94%	27%	21%
Retails	10,810	75%	42%	32%
Others	15,302	160%	27%	21%
RE Program Compact Fluorescents	23,719	62%	71%	55%
RE Program Other Indoor Measures	15,635	40%	224%	175%
Customized Program Indoor Measures	22,117	157%	14%	11%
RE/Customized Program Outdoor Mea	18,058	54%	107%	84%
TOTALS	322,437	86%	16%	12%

The realization rates presented in Exhibit C-9 above are the gross SAE realization rates, that is the gross realized impacts as compared to the gross *evaluation engineering estimates*. In order to compute the final gross realization rates, the gross evaluation estimates compared to the gross ex ante estimates, three steps must occur. First, the gross evaluation engineering estimates presented in Exhibit C-9 are multiplied by the SAE realization rates in Exhibit C-9. Second, for the segments for which the 90 percent confidence level was not achieved (outdoor lighting and other indoor measures), the evaluation calibrated model engineering estimates of impact are to be assumed as the evaluation estimates (this is the same as assuming a realization rate of 1.0 in the previous step). When these two steps have been carried out, a total gross evaluation energy impact of 295,746 MWh is achieved (see Exhibit C-9). Third, the evaluation estimate is divided by the gross ex ante estimate of impact (300,752 MWh total), resulting in the overall gross evaluation realization rate (gross evaluation estimates compared to the gross ex ante estimates) of 0.98. These steps are carried out by segment in *Section 4*, Evaluation Results Summaries, of this report.

Appendix D

FINAL PARTICIPANTS TELEPHONE SURVEY

```
&S1_____________   &S2_____________   QC: &QC__    Screen: &S_
 Name: &NAME_________________________  DCOMP: &D_   LCOMP: &L_   TCOMP: &T_
 Latest Interviewer: &LI  Interviewer 1: &I1  Date: &IDATE1_ Time 1: &TIM1
 PG&E C/I L DIVCODE &DVC_ Interviewer 2: &I2  Date: &IDATE2_ Time 2: &TIM2
 P696180  P CATI: &CN__   Interviewer 3: &I3  Date: &IDATE3_ Time 3: &TIM3
 ACCNT #: &ACCOUNT______  Interviewer 4: &I4  Date: &IDATE4_ Time 4: &TIM4
 MEASTYP: &MEASTYP        Interviewer 5: &I5  Date: &IDATE5_ Time 5: &TIM5
 Control: &CONTROL_______ Interviewer 6: &I6  Date: &IDATE6_ Time 6: &TIM6
 Business Name &BUSINESS_____________________________ BUS TYP: &BUSTYPE_____
 Name: &NAME2_____________________         Business Phone: ( &HA ) &HP - &HL_
 Address: &ADDRESS______________________      Corr. Phone: ( &CA ) &CP - &CL_
 City: &CITY______________________  Zip: &ZIP____ Contact: &CONTACT__________
 Callback Date: &CBD____  Callback Time: &CBT________________________________
 Comment: &COMMENT1__________________________________________________________
          &COMMENT2__________________________________________________________
   Res1: &R1   Res2: &R2   Res3: &R3   Res4: &R4   Res5: &R5   Res6: &R6
 1=Complete-CB OS 6=Refusal     11=Wrong #     16=T&T wrng adr 31=Comp ALL
 2=Partial/Refusd 7=Answr Mach  12=Moved       17=Other        32=Multi-Site
 3=Call Back      8=Busy Signal 13=Fax, Modem  18=Part Comp/CB 33=IND OS/CB S
 4=No Answr       9=Not Elig    14=No Dir List ONSITE RESULTS:
 5=On Vacation    10=Disconn #  15=T&T sc020   OS1: &O1  OS2: &O2  OS3: &O3

 CONTACT INFO:
 &CONIFO1_____________________________________________________________
 &CONIFO2_____________________________________________________________
 &CONIFO3_____________________________________________________________
 &CONIFO4_____________________________________________________________
 &CONIFO5_____________________________________________________________
 &CONIFO6_____________________________________________________________
 &CONIFO7_____________________________________________________________
 &CONIFO8_____________________________________________________________


   CONTACT INFO SCREEN:

   ENTER PERSON ATTEMPTING TO CONTACT:  &RESP
        1 = Initial attempt to find contact
        2 = Decision maker
        3 = Technical
        4 = Lighting
        5 = Property Manager
```

```
PARTICIPATION CONTACT &DNAME______________________
( &DAC___ )   &DPRE__  -  &DLAST__   Ext. &DEXT_____
CALLBACK DATE &DCBD__     CALLBACK TIME  &DCBT_________  Def: &DDEF_
FIRM: &DBUSNAM___________________________   (1=def callback 0=general)
&NOTED1________________________________________________________________
&NOTED2________________________________________________________________
&NOTED3________________________________________________________________
&NOTED4________________________________________________________________
&NOTED5________________________________________________________________

TECHNICAL CONTACT  &TNAME_________________________
( &TAC__ )  &TPRE__ - &TLAST__          Ext. &TEXT_____
CALLBACK DATE &TCBD___     CALLBACK TIME &TCBT_________    Def &TDEF_
FIRM &TBUSNAM______________________________  (1=Def callback 0=general)
&NOTET1________________________________________________________________
&NOTET2________________________________________________________________
&NOTET3________________________________________________________________
&NOTET4________________________________________________________________
&NOTET5________________________________________________________________
ALWAYS ENTER 1 TO SKIP FORWARD ====>  &SKIP

PROPERTY MANAGEMENT CONTACT  &PMNAME_________________________
( &PMAC__ )  &PMPRE__ - &PMLAST__       Ext. &PMEXT_____
CALLBACK DATE &PMCBD______   CALLBACK TIME &PMCBT_______    Def &PMDEF_
FIRM: &PMBUSNAM____________________________  (1=Def callback 0=general)
&NOTEPM1________________________________________________________________
&NOTEPM2________________________________________________________________
&NOTEPM3________________________________________________________________
&NOTEPM4________________________________________________________________
&NOTEPM5________________________________________________________________

LIGHTING CONTACT  &LNAME_________________________
( &LAC__ )  &LPRE__ - &LLAST__          Ext. &LEXT_____
CALLBACK DATE &LCBD___     CALLBACK TIME &LCBT_________    Def &LDEF_
FIRM: &LBUSNAM_____________________________  (1=Def callback 0=general)
&NOTEL1________________________________________________________________
&NOTEL2________________________________________________________________
&NOTEL3________________________________________________________________
&NOTEL4________________________________________________________________
&NOTEL5________________________________________________________________
ALWAYS ENTER 1 TO SKIP FORWARD ===>  &SKIP
```

Hello. This is &LI__ . I'm with Quantum Consulting, a management consulting firm in Berkeley, California. We're assisting PG&E in evaluating its (Customized Incentives / Retrofit Express) Program. We'd like to ask some general questions about your firm's participation in the program.

MN001. Before we start, I would like to inform you that for quality control purposes, this call may be monitored by my supervisor. Would this be OK with you?

&MN001
- 1 = Yes
- 0 = No
- 8 = (Refused)
- 9 = (Don't Know)

DECISION MAKER: IF RESPOND = . OR D THEN ASK: RESPOND = &RESPOND
This survey will cover equipment installed at &ADDRESS__________________ ?

SC001d. Do you own the building at &ADDRESS2___________ ?
&SC001D
1 = Yes 8 = (Refused)
0 = No --> SKIP FI002 9 = (Don't Know)

FI001d. Does your firm occupy the space at
&ADDRESS3_____________________________ ?
&FI001D 1 = Yes --> SKIP FI003
0 = No --> SKIP SC016
8 = (Refused) --> SKIP FI003
9 = (Don't Know)--> SKIP FI003

FI002d. Does your firm manage the property at &ADDRESS4___________ ?
&FI002D 1 = Yes --> SKIP FI004
0 = No --> SKIP FI003
8 = (Refused) --> SKIP FI004
9 = (Don't Know) --> SKIP FI004

TECHNICAL: ASK WHERE RESPOND = T: RESPOND = &RESPOND
This survey will cover equipment installed at
&ADDRESS_______________ .
SC001t. Do you own the building at &ADDRESS2___________ ?
&SC001T
1 = Yes 8 = (Refused)
0 = No --> SKIP FI002t 9 = (Don't Know)

FI001t. Does your firm occupy the space at
&ADDRESS3_____________________________ ?
&FI001T 1 = Yes --> SKIP SC005
0 = No --> SKIP SC016
8 = (Refused) --> SKIP SC005
9 = (Don't Know)--> SKIP SC005

FI002t. Does your firm manage the property at &ADDRESS4_______________ ?
&FI002T 1 = Yes --> SKIP FI003
0 = No --> SKIP SC005
8 = (Refused) --> SKIP SC005
9 = (Don't Know) --> SKIP SC005

LIGHTING: ASK WHERE RESPOND = L: RESPOND = &RESPOND
This survey will cover equipment installed at
&ADDRESS_______________ .
SC001l. Do you own the building at &ADDRESS2___________ ?
&SC001L
1 = Yes 8 = (Refused)
0 = No --> SKIP FI002l 9 = (Don't Know)

FI001l. Does your firm occupy the space at
&ADDRESS3_____________________________ ?
&FI001L 1 = Yes --> SKIP SC006
0 = No --> SKIP SC016
8 = (Refused) --> SKIP SC006
9 = (Don't Know)--> SKIP SC006

FI002l. Does your firm manage the property at &ADDRESS4_____________ ?
&FI002L 1 = Yes -->SC006
0 = No
8 = (Refused)
9 = (Don't Know)

ASK ONCE:

SC016. Is there a property management firm for this building?
&SC016
1 = Yes
0 = No --> SKIP FI003/SC005/SC006
8 = (Refused) --> SKIP FI003/SC005/SC006
9 = (Don't Know) --> SKIP FI003/SC005/SC006

SC017.- SC024. Could you please give me the name and telephone number of someone at the property management firm who would be able to answer questions about the building and electrical equipment at the premise?

PROPERTY CONTACT NAME: &PMNAME_____________________________________
PROPERTY CONTACT COMPANY: &PMBUSNAM_______________________________________
PROPERTY CONTACT PHONE: (&PMAC) &PMPRE - &PMLAST_ Extension: &PMEXT
PROPERTY CONTACT TITLE: &PMTITLN
1 = President/Owner
2 = Senior Manager
3 = Financial Manager
4 = Energy Manager
5 = Operations Manager
6 = Building Manager
7 = Other SPECIFY: &PMTILOTR_______________

Comment1 &PMCOM1____
Comment2 &PMCOM2____

ENTER 1 TO SKIP FORWARD ====> &SKIP

FI003. Are you the sole occupant of the building?
&FI003 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

FI004. Is any part of &ADDRESS___________ leased space?
&FI004 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

SC003. This survey will cover the equipment installed at &ADDRESS2___________ . Are you the best person to talk to about &BUSINESS_________________ 's decision to participate in the program and answer questions about economic decision making?
&SC003
1 = Yes-->SKIP TO SC005 8 = (Refused)
0 = No 9 = (Don't Know)

SC004. Who would be the best person to talk to about &BUSINESS_______________________ decision to participate in the program?

PARTICIPATION CONTACT NAME &DNAME______________________________________
PARTICIPATION CONTACT PHONE (&DAC_) &DPRE____ - &DLAST_____ Ext. &DEXT_
PARTICIPATION ORGANIZATION NAME &DBUSNAM_____________________________
PARTICIPATION CONTACT TITLE &DTITLN
1 = President/Owner
2 = Senior Manager
3 = Financial Manager
4 = Energy Manager
5 = Operations Manger

6 = Building Manger
7 = Other SPECIFY: &DTITLOTR________________
Comment1 &DCOMM1____
Comment2 &DCOMM2____
ENTER 1 TO SKIP ===> &SKIP

ASK SC005 IF SC016~=1:
SC005. Are you the best person to answer questions about the size of the facility, and the type size and age of your major electrical equipment?
&SC005
1 = Yes --> SKIP SC006
0 = No
8 = (Refused) --> SKIP SC006
9 = (Don't Know) --> SKIP SC006

```
     SC007.  Who would be the best person to talk to about
             &BUSINESS__________________ 's  major electricity end uses?
LIGHT CONTACT NAME  &LNAME_______________________________________
LIGHT CONTACT PHONE  ( &LAC_ ) &LPRE__ - &LLAST__    Ext. &LEXT_
LIGHT ORGANIZATION NAME &LBUSNAM_____________________________
LIGHT CONTACT TITLE  &LTITLF_________________________________
IF NOT LIGHT CONT ENTER 1 AND GET NEW TECH CONTACT, ELSE IF LIGHT ENTER 2
  ===>   &WHOTECH
TECHNICAL CONTACT NAME  &TNAME_______________________________________
TECHNICAL CONTACT PHONE  ( &TAC_ ) &TPRE__ - &TLAST__    Ext. &TEXT_
TECHNICAL ORGANIZATION NAME &TBUSNAM_____________________________
TECHNICAL CONTACT TITLE  &TTITLN
  1 = President/Owner      5 = Opertions Manager
  2 = Senior Manager       6 = Building Manager
  3 = Financial Manager    7 = Other SPECIFY:
  4 = Energy Manager           &TTITLOTR______________________________

Comment1: &TCOMM1______________________________________________________
Comment2: &TCOMM2______________________________________________________
ENTER 1 TO SKIP FORWARD ==> &SKIP


      ASK IF SC001~=1:
      SC006.  Are you the best person who can answer questions about the
              hours of lighting equipment operation at
              &ADDRESS_______________________ ?
              &SC006
              1 = Yes --> SKIP SC010
              0 = No --> SKIP SC008
              8 = (Refused)  --> SKIP SC010
              9 = (Don't Know) --> SKIP SC010
```

```
     SC008.  Who would be the best person on site to talk to about
             &BUSINESS_________________ 's  hours of lighting operation?

 DECIS CONTACT NAME   &DNAME_____________________________________________
 DECIS CONTACT PHONE  ( &DAC_ ) &DPRE_ - &DLAST___    Ext. &DEXT___
 DECIS ORGANIZATION NAME &DBUSNAM_____________________________
 DECIS CONTACT TITLE  &DTITLF_______________________________

 TECH CONTACT NAME   &TNAME_____________________________________________
 TECH CONTACT PHONE  ( &TAC_ ) &TPRE_ - &TLAST___    Ext. &TEXT___
 TECH ORGANIZATION NAME &TBUSNAM_____________________________
 TECH CONTACT TITLE  &TTITLF_______________________________

IF DECIS CONTACT ENTER 1, IF TECH CONTACT ENTER 2 ELSE ENTER 3 AND GET
NEW INFO ===>  &WHOLIT

 ENTER NEW LIGHTING CONTACT INFORMATION:

 HOURS CONTACT NAME   &LNAME_____________________________________________
 HOURS CONTACT PHONE  ( &LAC_ ) &LPRE_ - &LLAST___    Ext. &LEXT___
 HOURS ORGANIZATION NAME &LBUSNAM_____________________________
 HOURS CONTACT TITLE  &LTITLN
                      1 = President/Ownwer
                      2 = Senior Manager
                      3 = FInancial Manager
                      4 = Energy Manager
                      5 = Operations Manager
                      6 = Building Manager
                      7 = Other SPECIFY:  &LTITLOTR____________________

 Comment1: &LCOMM1_____________________________________________________
 Comment2: &LCOMM2_____________________________________________________
            ENTER 1 TO SKIP ===> &SKIP

I'd like to start by confirming some information in PG&E's program database.
       SC010. Our records show that &BUSINESS_________________________
              had high efficiency lighting installed at
              &ADDRESS________________________________ through PG&E's
              &PROG________________________ Program. Is this correct?
              &SC010
1 = Yes-->SKIP TO SC033/SC035  0 = No  2 = SPECIAL CASE 8 = (Ref)  9 = (DK)
(CONFIRM QUANTITIES AND MEASURES. IF RADICALLY DIFFERENT: CONFIRM ADDRESS)
 QTY     Measure
 &SCQ1 &SCM1_______________________________________________________________
 &SCQ2 &SCM2_______________________________________________________________
 &SCQ3 &SCM3_______________________________________________________________
 &SCQ4 &SCM4_______________________________________________________________
 &SCQ5 &SCM5_______________________________________________________________
 &SCQ6 &SCM6_______________________________________________________________
 &SCQ7 &SCM7_______________________________________________________________
 &SCQ8 &SCM8_______________________________________________________________
 &SCQ9 &SCM9_______________________________________________________________
       &MULTAD   ENTER 1 IF MULTIPLE ADDRESS; ELSE 0
       &MULTIM   ENTER 1 IF INSTALLED IN MULTIPLE TIME FRAMES; ELSE 0


     SC020.   Pacific Gas and Electric's (Customized Incentives/Retrofit
              Express)  Program provides rebates to encourage customers
              to install  energy-efficient lighting.  Do you recall
```

```
            &BUSINESS________________________  having lighting
            installed as part of PG&E's program?
            &SC020
            1 = Yes
            0 = No--> THANK AND TERMINATE
            8 = (Refused)-->THANK AND TERMINATE
            9 = (Don't Know)-->THANK AND TERMINATE

   SC031.   What is the correct address for the facility where
            &BUSINES2________________________ 's lighting retrofit
            occured?
            &CORRADDR_______________________ Correct Address
            &CORRCITY_________________ Correct City
            &CORRZIP__________         Correct Zip
            T&T IF ADDRESS IS COMPLETELY DIFFERENT, OTHERWISE CONTINUE
        &SC031 1 = SIMILAR ADDRESS  -->SKIP TO SC035/SC037
               0 = DIFFERENT ADDRESS ---> T&T

  DECISION MAKER:
  SC035.  When was the installation of your retrofitted lighting
          equipment completed?
          (ENTER MONYYYY)
          &SC035__ (MONYYYY)  IF NOT BETWEEN JUL1993 AND SEP1994 -> T&T
          &SC036  (8 = Refused  9 = Don't Know) --> T&T

          ALWAYS ENTER 1 TO SKIP FORWARD ====> &SKIP
 TECHNICAL:
  SC037.  When was the installation of your retrofitted lighting
          equipment completed?
          (ENTER MONYYYY)
          &SC037__ (MONYYYY)  IF NOT BETWEEN JUL1993 AND SEP1994 -> T&T
          &SC038  (8 = Refused  9 = Don't Know) --> T&T

          ALWAYS ENTER 1 TO SKIP FORWARD ====> &SKIP2
 LIGHTING:
          &SC039A__  (MONYYY)
          &SC039B    (8 = Refused  9 = DK)
          ALWAYS ENTER 1 TO SKIP FORWARD ===> &SKIP3

              ALL:
    FI005.  Does the PG&E account &ACCOUNT__ located at the service
            address &ADDRESS___________________________________   cover
            multiple buildings or does it cover only one building?
            &FI005
            1 = One Building  --> SKIP TO FI025
            2 = Multiple Buildings
            3 = Portion of a building
            8 = (Refused)--> SKIP TO FI025
            9 = (Don't Know)--> SKIP TO FI025

     FI007. Are there multiple PG&E accounts for this address?
            &FI007  1 = Yes
                    0 = No
                    8 = (Refused)
                    9 = (Don't Know)
    FI010.  How many buildings are covered under this service address?
           &FI010  #  buildings           888 = (Refused)
   IF FI010 = 1 or REF/DK SKIP FI025      999 = (Don't Know)

    FI015.  Are there separate PG&E bills for the individual buildings?
            &FI015
```

1 = Yes   8 = (Refused)
0 = No   9 = (Don't Know)

FI025. How many other firms occupy space in the building?
&FI025   Number of firms   888 = (Refused)
                                 999 = (Don't Know)

BC021. How many other locations of your business are participating in the program?
&BC021 Locations   888 = (Refused)
                                 999 = (Don't Know)

ALL

EI010. Approximately how many people are currently employed at the facility, including both full- and part-time employees?
&EI010   Number of Employees
888 = (Refused)
999 = (Don't Know)

EI020. Since January 1992, has the number of people employed at this facility changed?
&EI020
1 = Yes
0 = No--->SKIP TO FI040
8 = (Refused)--->SKIP TO FI040
9 = (Don't Know)--->SKIP TO FI040

EI030. In what month and year did this change in the number of employees occur?
(ENTER MONTH/YEAR)

EI030. &EI030___ MONYYYY
EI031. &EI031__ YYYY (8 = Refused 9 = Don't Know)
IF DK ASK FOR BEST GUESS OR YEAR

EI040. Approximately how many people were employed at this facility before the change occurred, including both full and part-time employees?
&EI040 Number of Employees
777 = Seasonal Workforce --> ENTER COMMENTS BELOW
888 = (Refused)
999 = (Don't Know)
&EI041____
&EI042____
&EI043____
ENTER 1 TO SKIP FORWARD --> &SKIP

FI040. Which of the following descriptions best characterizes your firm's organizational structure?

&FI040
1 = Chain or multifacility (owned or managed by a parent corporation operating other locations)
2 = Franchise (owns a branch or subsidiary) --> SKIP TO FI050
3 = Independent-->SKIP TO FI050

8 = (Refused) --> SKIP TO FI050
9 = (Don't Know) --> SKIP TO FI050

FI045. What is the name of your parent company?
&FI045____

FI050. What is the legal tax status of your firm, that is what is your tax status for federal tax reporting purposes?
&FI050
1 = Proprietary or investor-owned, (i.e., a for-profit organization)
2 = Public: federal, state or municipal agency
3 = 501(c3): Private, nonprofit
8 = (Refused)
9 = (Don't Know)

ASK IF FI040=1; ELSE SKIP FI060:
FI055. What is the tax status of your parent company?
&FI055
1 = Proprietary or investor-owned, (i.e., a for-profit organization)
2 = Public: federal, state or municipal agency
3 = 501(c3): Private, nonprofit
8 = (Refused)
9 = (Don't Know)

DECISION MAKER:

FI060. Where are decisions regarding energy-related investments for &BUSINESS___________________ made?
&FI060
1 = Made locally, on site
2 = Made at regional head office
3 = Made at national head office
4 = Made at international head office
5 = Made by PM firm/building owner
6 = Other FI062.
Specify: &FI062_______________________________
8 = (Refused)
9 = (Don't Know)

FI070. What were the &REVTYPE______ fiscal 1992 revenues for your firm?
&FI070
&S1_ 1 = Less than $50,000
&S2_ 2 = $50,000 to $99,999
&S3_ 3 = $100,000 to $249,999
&S4_ 4 = $250,000 to $499,999
&S5_ 5 = $500,000 to $999,999
&S6_ 6 = $1 million to $2.49 million
&S7_ 7 = $2.5 million to $4.99 million
&S8_ 8 = $5 million to $9.99 million
&S9_ 9 = $10 million to $49.99 million
&S10_ 10 = $50 million or more
88 = (Refused)
99 = (Don't Know)

RECORD LEVEL OF REVENUE:
FI075. &FI075 1 = Local 3 = National
2 = Regional 4 = Worldwide

IF LEASE=1 THEN ASK; ELSE SKIP TO EI010: LEASE = &L

FI080. Do the tenants at &ADDRESS________________ pay all, none, or a portion of their electric utilities through their lease?
&FI080
1 = ALL utilities INCLUDED in lease --> SKIP TO FI110
2 = Pay some utilities through lease and others directly to PG&E
3 = Pays ALL utilities directly to PG&E--> SKIP FI110
8 = (Refused) --> SKIP FI110
9 = (Don't Know) --> SKIP FI110

IF (LEASE=1 AND FI080 = 2): LEASE = &L FI080 = &FI080
FI090. -FI100. Which of the following utilities are paid for through the lease? (ENTER '1' FOR ALL THAT APPLY)
(8 = Refused 9 = Don't Know)

&FI090 Indoor Lighting	&FI095 Outdoor Lighting
&FI091 Heating	&FI096 Cooling
&FI092 Ventilation	&FI097 Water Heating
&FI093 Electricity to Wall Outlets	&FI098 Refrigeration
&FI094 Cooking	&FI099 Other SPECIFY:
	&FI100__________________

FI110. What is the length of the current lease at &ADDRESS______________________ ?
&FI110 Number of years 888 = (Refused)
999 = (Don't Know)

FI115. How many years are left on the lease?
&FI115 Number of years 888 = (Refused)
999 = (Don't Know)

FI120. Is this the current tenant's first lease at this address?
&FI120
1 = Yes   8 = (Refused)
0 = No   9 = (Don't Know)

Now I'd like to ask some questions about your experience with the Lighting Retrofit program.

IS001. Do you have a lighting contractor that you regularly use/rely on?
&IS001
1 = Yes
0 = No SKIP --> SKIP IS010
8 = (Refused) --> SKIP IS010
9 = (Don't Know) --> SKIP IS010

IS002. Did this person tell you about the Retrofit Lighting Program?
&IS002
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

IS010. How did you FIRST learn about the Retrofit Lighting Program?
&IS010   (DO NOT READ)
CUSTOMER APPROACHED SOMEONE:
1 = Respondent approached vendor/contractor
2 = Respondent approached PG&E concerning another matter and found out about program
SOMEONE APPROACHED THE CUSTOMER:
3 = Contacted by PG&E account rep
4 = Contacted by lighting contractor
5 = Contacted by electrical contractor
6 = PG&E Brochure in mail
7 = Bill Insert
8 = Word of mouth from friends or co-workers within the organization
9 = Word of mouth from friends or other business people outside of company
10 = Television, Radio, Newspaper ad
11 = Other SPECIFY: IS020. &IS020___________________________
88 = (Refused)   99 = (Don't Know)

PP010. Has your firm participated in any other PG&E sponsored energy conservation programs besides the Retrofit Lighting Program?
&PP010
1 = Yes
0 = No--->SKIP TO DS020
2 = Not aware of other programs--->SKIP TO DS020
8 = (Refused)--->SKIP TO DS020
9 = (Don't Know)--->SKIP TO DS020

PP020. In what year did you participate in the other program(s)?
(ENTER YEAR)
PP020. &PP020__ YYYY
(8 = Refused 9 = Don't Know)

Now I'd like to get your opinion of key aspects of the Retrofit Lighting Program.

DS020. Was the retrofit project delayed for any reasons, once you had decided to participate?
(DO NOT READ; ENTER 1 FOR ALL THAT APPLY; 0 FOR THOSE THAT DO NOT)
(8 = Refused 9 = Don't Know)
&DS019 No Delays ---> SKIP SR080
&DS020 Equipment supply problems
&DS021 Contractor delays
&DS022 Financial Limitations/Cash flow
&DS023 Delays within the organization
&DS024 Decided to spend money on something else
&DS025 Other SPECIFY: &DS026________________________________

SR080. If you had to make your equipment selection again, would you install the same equipment?
&SR080
1 = Yes --> SKIP EA010
0 = No
8 = (Refused)--> SKIP EA010
9 = (Don't Know)--> SKIP EA010

SR090. What would be your main reason for selecting other equipment?
&SR090
1 = Increase the quantity of light
2 = Improve the color rendition
3 = Reduce glare
4 = Eliminate ballast failure
5 = Other : SPECIFY : &SR091___________________
8 = (Refused)
9 = (Don't Know)

EA010. Have you altered how energy is used at the facility since you installed the new lighting?
&EA010
1 = Yes
0 = No --> SKIP PD010
8 = (Refused) --> SKIP PD010
9 = (Don't Know) --> SKIP PD010

EA020. What are you doing differently?
(ENTER 1 FOR ALL THAT APPLY ELSE ENTER 0)
&EA020 Turning on fewer lights
&EA021 Running HVAC less
&EA022 Decreased lighting hours
&EA023 Other SPECIFY: &EA024____________________________
&EA025 Other SPECIFY: &EA026____________________________
&EA027 Other SPECIFY: &EA028____________________________
&EA029 Other SPECIFY: &EA030____________________________
(8 = Refused 9 = Don't Know)

PD010. When you were making your decision to purchase new lighting equipment through the program, what was the most important factor in your decision to install the new lighting?

(READ CATEGORIES IF NECESSARY)
&PD010
1 = Acquiring the latest technology
2 = Saving money on electric bills
3 = Obtaining a rebate
4 = Replacing old or broken equipment
5 = Knowing that the program was sponsored by PG&E
6 = Improving the quality of light for employees and customers
7 = Helping to protect the environment
8 = Previous experience with other PG&E programs
9 = Obtaining advice from another branch of your firm
10 = Obtaining advice from PG&E account rep
11 = Obtaining advice from contractors
12 = Other SPECIFY: PD011: &PD011___________________________
88 = (Refused)
99 = (Don't Know)

FR100. Why had you not previously installed high efficiency lighting equipment prior to participating in the program?
(DO NOT READ LIST; ENTER 1 FOR ALL THAT APPLY, ELSE ENTER 0)
FR100. &FR100 Lack of money to invest in it.
FR101. &FR101 Payback/return on investment not attractive enough.
FR102. &FR102 Concerned that it might not save as much as claimed
FR103. &FR103 Didn't know enough about EE lighting before
FR104. &FR104 Didn't know where/how to obtain EE lighting.
FR105. &FR105 Hadn't had time.
FR106. &FR106 Concerned about light quality/brightness
FR107. &FR107 Tenants didn't want a change
FR108. &FR108 Decision made elsewhere
FR109. &FR109 Was planning to install when heard about program
FR110. &FR110 No Need/Not a Priority
FR111. &FR111 Just remodeled
FR112. &FR112 Just moved in/moving out soon
FR113. &FR113 Did it less than 5 years ago.
FR114. &FR114 Other1 SPECIFY: FR115 &FR115______________________
FR116. &FR116 (Refused)
FR117. &FR117 (Don't Know)

SR020. If you had not replaced this equipment under the program, how long would you have waited to replace it?
&SR020 Years
777 = (Would not have replaced)
888 = (Refused)
999 = (Don't Know)

FR010. How long had you been shopping for new lighting equipment before you found out about the program?
0 = (Not Shopping; approached by vendor/contractor)
&FR010 weeks (888 = Refused 999 = Don’t Know)

FR011. How many estimates or quotes did you obtain before purchasing your new equipment?
&FR011 Estimates
888 = (Refused)
999 = (Don't Know)

FR012. Had you also considered purchasing and installing standard efficiency lighting equipment?
&FR012
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

FR013. How long did it take to decide what to purchase once you found out about the program?
&FR013 weeks (0 = less than 1 week)
(888 = Refused 999 = Don't Know)

NG019. Did you delay a lighting purchase in order to participate in the Retrofit Program?
&NG019
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

FR020. Before you knew about the Lighting Program, which of the following statements best describes your company's plans to install lighting fixtures? (READ RESPONSES.)
&FR020

1 = You hadn't even considered purchasing new lighting equipment.
2 = You were interested in installing lighting equipment, but hadn't yet decided on energy efficent lighting. (I.e. you were considering all your options.)
3 = You had already decided to install HIGH efficiency lighting, but probably not within the year.
4 = You had already decided to install HIGH efficiency lighting within the year, and you had already selected equipment.
8 = (Refused)
9 = (Don't Know)

FR014. How many people were involved in the decision to participate?
&FR014 People
888 = (Refused) 999 = (Don't Know)

FR015. Were you the person who made the final decision?
&FR015
1 = Yes --> SKIP FR017
0 = No
8 = (Refused)--> SKIP FR017
9 = (Don't Know)--> SKIP FR017

FR016. What is the job title of the person who made the final decision?
&FR016N
1 = President/Owner   2 = Senior Manager
3 = Financial Manager 4 = Energy Manager
5 = Operations Manager 6 = Building Manager
7 = Other SPECIFY: &FR016OTR______________________

FR017. How long did it take to reach a decision to participate in the program?
&FR017 weeks
88 = Refused
99 = Don't Know

ASK IF LEASE=1   Lease= &L
FI065. How active a role do tenants take in making equipment purchase decisions for the property at
&ADDRESS__________________________ ?
&FI065
1 = Very active: they are involved in every aspect of the purchase and you possess veto power
2 = Somewhat active: they approve all decisions
3 = Slight role: they have a voice but it's a single vote among many
4 = None
8 = (Refused)
9 = (Don't Know)

DC010. Which of the following financial criteria do you consider when evaluating lighting investments?
(READ LIST; ENTER 1 FOR ALL THAT APPLY; ELSE ENTER 0)
(8 = (Refused) 9 = (Don't Know))
DC010. &DC010   Payback
DC011. &DC011   Internal Rate of Return
DC012. &DC012   Net Present Value
DC013. &DC013   Other SPECIFY: DC014. &DC014_______________________

IF DC010=1 THEN ASK DC020
DC020. What is the payback period you require?
&DC020
1 = 1 year or less
2 = 2 years or less
3 = 3 years or less
4 = 4 years or less
5 = 5 years or less
6 = 6 years or less
7 = 7 years or less
8 = 8 years or less
9 = 9 years or less
10 = 10 years or less
11 = Other SPECIFY: DC021. &DC021__________________________
88 = (Refused)
99 = (Don't Know)

IF DC011=1 THEN ASK DC030
DC030. What is your organization's required internal rate of return?
&DC030 Percent
888 = (Refused)
999 = (Don't Know)

IF DC012=1 THEN ASK DC040
DC040. What is the discount rate you use when determining the net present value of an investment?
&DC040 Percent
888 = (Refused)
999 = (Don't Know)

ASK ALL:
DC050. Do you use a different &CRITERIA________________________ for evaluating energy efficient equipment purchases than you use for general investments?
&DC050
1 = Yes
0 = No --> SKIP TR030
8 = (Refused) --> SKIP TR030
9 = (Don't Know) --> SKIP TR030

ASK DC051 IF DC010=1 OR DC011=1 OR DC012=1, ELSE SKIP TR030
DC051. Is the &CRITERI2______________________________ you use for energy efficent purchases &TYPE1_________________ or &TYPE2_________________ than that which you use for other general investments?
&DC051
1 = Higher/Shorter
2 = Lower/Longer
8 = (Refused)
9 = (Don't Know)

PG&E is considering redesigning some aspects of the program. I'd like to get your opinion of some possible program options.

TR030. Would you have installed the same high efficiency &EQUIP_________ equipment if rebates were eliminated, but PG&E offered financing at 1 percentage point below the prime rate?
&TR030
1 = Yes--->SKIP TO TR070
0 = No
8 = (Refused)
9 = (Don't Know)

ASK IF TR030~=1
TR040. What if the interest rate were 1.5 percentage points below the prime rate?
&TR040
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

TR050. What if rebates were reduced by 50% and PG&E offered financing at 1 percentage point below the prime rate?
&TR050
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

TR070. What if rebates were reduced by 50%, but PG&E conducted an on-site audit of the facility, and provided you with

detailed engineering analyses and recommendations?
&TR070
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

FUTURE SERVICES:

PR020. Would you be interested in having PG&E operate or maintain the lighting equipment at the facility?
(i.e. routine replacement of burned out bulbs)
&PR020
1 = Yes
0 = No
2 = Depends on price
8 = (Refused)
9 = (Don't Know)

PR040. Would you be interested in having all of the building's systems checked out to ensure proper operation and efficient use of energy? (i.e. building recommissioning)
&PR040
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

PR060. Would you be interested in having PG&E help you with any future equipment selection?
&PR060
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

PR001. How frequently do you have contact with your PG&E account rep?
-PR002 (CODE NUMBER OF TIMES AND PERIOD IT IS IN)
&PR001 Times
&PR002 Time Period --> IF NOT 0 SKIP PR090
0 = Never
1 = Day
2 = Week
3 = Month
4 = Year
8 = (Refused)
9 = (Don't Know)

PR005. Does someone else in the firm have contact with your PG&E rep?
&PR005
1 = Yes
0 = No --> SKIP PR090
8 = (Refused)--> SKIP PR090
9 = (Don't Know)--> SKIP PR090

PR010-11. How often does this person have contact with your PG&E account rep?
&PR010 Times --> IF 0, 8, 9 SKIP PR090
&PR011 Time Period
0 = Never
1 = Day

```
                2 = Week
                3 = Month
                4 = Year
                8 = (Refused)
                9 = (Don't Know)

    PR015.  What is the name, title, and phone number of this person?
   NAME:    &REPNAME____________________________
            ( &REPAC ) &REPPRE - &REPLAST  Ext &REPEXT   Phone
   TITLE:   &REPTITN
            1 = President/Owner
            2 = Senior Manager
            3 = Financial Manager
            4 = Energy Manager
            5 = Operations Manger
            6 = Building Manger
            7 = Other SPECIFY: &REPTIOTR_______________
ENTER 1 TO SKIP ===> &SKIP

   PR090.  Are there any additional services you would like to see PG&E
           provide?
           (ENTER 1 FOR ALL THAT APPLY)
           (8 = Refused  9 = Don't Know)
           &PR090  other SPECIFY: &PR091________________________________
           &PR092  other SPECIFY: &PR093________________________________
           &PR094  other SPECIFY: &PR095________________________________

    ENTER 1 TO SKIP FORWARD ===> &SKIP

 FUTURE PLANS:
      FR070.  Are you currently planning on making any further lighting
              retrofits within the next two years?
              &FR070
              1 = Yes
              0 = No --> SKIP DS070
              8 = (Refused)--> SKIP DS070
              9 = (Don't Know)--> SKIP DS070

      FR075. Will the new lighting be high or standard efficiency?
             &FR075
             1 = High efficiency
             0 = Standard efficiency
             8 = (Refused)
             9 = (Don't Know)

      FR077. Are you planning to make this change through one of PG&E's
             Retrofit programs?
             &FR077
             1 = Yes
             0 = No
             8 = (Refused)
             9 = (Don't Know)

    FR080.  What type and how many fixtures are you planning to install?
            (READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES TO BE
             CHANGED; IF NONE THEN ENTER 0)
            888 = (Refused)    999 = (Don't Know)
   (READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES TO BE ADDED)
     FR080.  &FR080   4 Foot T8 fluorescent
     FR081.  &FR081   8 Foot T8 fluorescent
     FR082.  &FR082   4 Foot Energy saver fluorescent
```

FR083. &FR083   8 Foot Energy saver fluorescent
FR084. &FR084   4 Foot T12 fluorescent
FR085. &FR085   8 Foot T12 fluorescent
FR086. &FR086   Incandescent
FR087. &FR087   Compact Fluorescent
FR088. &FR088   High pressure sodium
FR089. &FR089   Electronic Ballasts
FR090. &FR090   Magnetic Ballasts
FR091. &FR091   Metal Halide

CONTINUED ===> ENTER 1 TO SKIP ===> &SKIP

ENTER TYPE AND NUMBER OF FIXTURES PLANNING TO ADD:
IF NONE ENTER 0
888 = (Refused)   999 = (Don't Know)

FR092. &FR092   Mercury Vapor
FR093. &FR093   Quartz
FR094. &FR094   Reflectors (w/Delamping)
FR095 &FR095   LED Exit Lighting
FR096 &FR096   Watt Saver/Power Choke Devices
FR097. &FR097   Other SPECIFY: FR098. &FR098_____________________
FR099r. &FR099R (Refused)
FR099d. &FR099D (Don't Know)

ENTER 1 TO SKIP FORWARD ===> &SKIP

DS070. On a 1 to 7 scale, where 1 means Extremely DISsatisfied and 7 means Extremely Satisfied, how satisfied are you, overall, with PG&E's Lighting Program?
&DS070 (ENTER NUMBER BETWEEN 1 AND 7)
88 = (Refused)
99 = (Don't Know)

DS080. Are you DISsatisfied with the program for any reason?
&DS080
1 = Yes --> ATTEMPT TO CATEGORIZE; ELSE FILL IN OPEN ENDED
0 = No--->SKIP TO DS090
8 = (Refused)--->SKIP TO DS090
9 = (Don't Know)--->SKIP TO DS090

(DO NOT READ, ENTER 1 FOR ALL THAT APPLY; ELSE ENTER 0)
8 = (Refused)   9 = (Don't Know)
DS081 &DS081 problems with contractor
DS082 &DS082 rebate too small
DS083 &DS083 problems with equipment
DS084 &DS084 not seeing any bill savings
DS085 &DS085 unresolved problems
DS086 &DS086 problems with getting rebate in a timely manner
DS087 &DS087 problems with the contracting representative

DS088 &DS088____
DS089 &DS089____

IF NO COMMENT OR TO SKIP; ENTER 1 ===> &SKIP

DS090. Do you have any suggestions for improving PG&E's Retrofit Lighting Program?
&DS090
1 = Yes
0 = No--->SKIP TO BC011/BH010/SCREEN 137
8 = (Refused)--->SKIP TO BC011/BH010/SCREEN 137
9 = (Don't Know)--->SKIP TO BC011/BH010/SCREEN 137

(ENTER 1 FOR ALL THAT APPLY, 0 FOR THOSE THAT DO NOT; ELSE OPEN ENDED)

DS091 &DS091 Better/More Information
DS092 &DS092 Post-Installation Inspection
DS093 &DS093 Improve Quality of light
DS094 &DS094 Larger Rebates
DS095 &DS095 Smaller Rebates
DS096 &DS096 Change Qualifying Measures
DS097 &DS097 Closer Supervision of Contractors
DS100 &DS100____
DS101 &DS101____
DS102 &DS102____

IF NO COMMENT, OR TO SKIP FORWARD, ENTER 1 ====> &SKIP

The following questions refer to your "FACILITY," which means ALL the buildings and tenants SERVICED BY PG&E UNDER THE FOLLOWING
Billing Name: &BUSINESS_____________ ADDRESS: &ADDRESS________________
ACCOUNT # : &ACCOUNT_____________

BC011. What is the main business ACTIVITY at the facility?
&BC011
1 = Office 88 = (Refused)
2 = Retail (non-food) 99 = (Don't Know)
3 = Manufacturing/Assembly
4 = Warehouse
5 = Restaurant
6 = Grocery Store
7 = School
8 = Hotel or Motel
9 = Hospital
10 = College/University
11 = Health Care
12 = Municipality
13 = Industrial Process
14 = Other SPECIFY: BC012 &BC012__________________________

FC060. In what year was the facility built?
&FC060

1 = 1992-Pres	5 = 1979-1982	9 = 1950-1959
2 = 1988-1991	6 = 1975-1978	10 = 1940-1949
3 = 1986-1987	7 = 1970-1974	11 = 1930-1939
4 = 1983-1985	8 = 1960-1969	12 = 1929 or earlier

88 = (Refused)
99 = (Don't Know)

FC070. How many stories does the building have?
&FC070 Stories
88 = (Refused)
99 = (Don't Know)

FC080. What is the square footage per floor of the building at &ADDRESS__________ .
(exclude enclosed garage spaces, basements, stairwells, elevator shafts,etc)
&FC080 SQ FT
8 = (Refused)
9 = (Don't Know)

FC081. On each floor, what percentage of the space is conditioned?
&FC081 percent
888 = (Refused)
999 = (Don't Know)

FC095. Is the retrofitted area located in a conditioned space?
&FC095
1 = Yes
0 = No
2 = Split conditioned/non-conditioned
8 = (Refused)
9 = (Don't Know)

ASK FC100 IF FC095=2: ELSE SKIP FC110:
FC100. What percentage of the retrofitted area is in a conditioned space?

&FC100 percent 888 = (refused) 999 = (Don't Know)

FC110. Since January 1992, has the square footage covered by account # &ACCOUNT___________ increased, decreased, or stayed the same?
&FC110
1 = Increased floor space
2 = Decreased floor space
3 = Stayed the same-->SKIP TO FR034
8 = (Refused)-->SKIP TO FR034
9 = (Don't Know)-->SKIP TO FR034

FC120. What is the approximate area, in square feet, of this change?
&FC120   Square Feet
8 = (Refused)
9 = (Don't Know)

FC130. In what month and year did this change in floor space occur?
(ENTER MONTH/YEAR)
FC130. &FC130__   MONYYYY
FC131. &FC131   YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

ASK IF FC110=1; ELSE SKIP TO FR033

FC140. In what month and year was this additional floor space occupied?
(ENTER MONTH/YEAR)

FC140. &FC140__   MONYYYY
FC141. &FC141   YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

ASK WHERE FC110 IS NOT 1:
FR033. When was your last major space remodel?
(ENTER MONTH/YEAR IF DON'T KNOW MONTH, ASK FOR BEST GUESS AND/OR YEAR)
FR033. &FR033__ MONYYYY
FR034. &FR034   YYYY
(7 = Never Remodeled 8 = Refused 9 = Don't Know)
(IF 7, 8, or 9 THEN --> SKIP LF030/IL001)

FR035. Did this remodel include space covered by the retrofit?
&FR035
1 = Yes --> SKIP LF030/IL001
0 = No --> SKIP LF030/IL001
8 = (Refused) --> SKIP LF030/IL001
9 = (Don't Know) --> SKIP LF030/IL001

LF030. How many weekdays per year are you closed for holidays?
&LF030 Days   888 = (Refused)
999 = (Don't Know)

LF040. How many Saturdays per year are you closed for holidays?

&LF040 Days 777 = Never open on Saturdays
888 = (Refused)
999 = (Don't Know)

LF050. How many Sundays per year are you closed for holidays?
&LF050 Days 777 = Never open on Sundays
888 = (Refused)
999 = (Don't Know)

Now, I'd like to ask about operating hours at &ADDRESS_____________

BH010. Are the hours that you operate your lighting equipment different from the hours that you operate your facility?
&BH010
1 = Yes
0 = No--->SKIP TO LF001
8 = (Refused)--->SKIP TO LF001
9 = (Don't Know)--->SKIP TO LF001

BH015. Do you know the hours that you operate your lighting equipment at your facility?
&BH015
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

LF001- LF013. Could you please tell me the facility's &HOUR__________________ hours during the following times, and what percentage of the facility's lights are on at these times?
66 = On 24 Hours 888 = (Refused)
77 = Never On 999 = (Don't Know)

	Month	Day	Code	Same As	From	AM/PM	To	AM/PM	% ON
LF001.	DECEMBER	WEEK	&LF1_	&E1_	&LF1F_	&LF1M_	&LF1T_	&LF1N_	&LW1_
LF002.	DECEMBER	SAT	&LF2_	&E2_	&LF2F_	&LF2M_	&LF2T_	&LF2N_	&LW2_
LF003.	DECEMBER	SUN	&LF3_	&E3_	&LF3F_	&LF3M_	&LF3T_	&LF3N_	&LW3_
LF004.	APRIL	WEEK	&LF4_	&E4_	&LF4F_	&LF4M_	&LF4T_	&LF4N_	&LW4_
LF005.	APRIL	SAT	&LF5_	&E5_	&LF5F_	&LF5M_	&LF5T_	&LF5N_	&LW5_
LF006.	APRIL	SUN	&LF6_	&E6_	&LF6F_	&LF6M_	&LF6T_	&LF6N_	&LW6_
LF007.	AUGUST	WEEK	&LF7_	&E7_	&LF7F_	&LF7M_	&LF7T_	&LF7N_	&LW7_
LF008.	AUGUST	SAT	&LF8_	&E8_	&LF8F_	&LF8M_	&LF8T_	&LF8N_	&LW8_
LF009.	AUGUST	SUN	&LF9_	&E9_	&LF9F_	&LF9M_	&LF9T_	&LF9N_	&LW9_
LF010.	OCTOBER	WEEK	&LF10	&E10	&LF10F	&LF10M	&LF10T	&LF10N	&LW10
LF011.	OCTOBER	SAT	&LF11	&E11	&LF11F	&LF11M	&LF11T	&LF11N	&LW11
LF012.	OCTOBER	SUN	&LF12	&E12	&LF12F	&LF12M	&LF12T	&LF12N	&LW12
LF013.	HOLIDAY	ALL	&LF13	&E13	&LF13F	&LF13M	&LF13T	&LF13N	&LW13

The next questions refer to the facility's conditioned floor space. That is, the areas of the facility that are heated or cooled.

LF014. Excluding exit signs, what percent of the retrofitted lights are night lights or safety lights that remain on twenty-four hours per day?
&LF014 Percent 888 = (Refused)
999 = (Don't Know)

LF025. Again excluding exit lights, but considering night lights, saftey lights, lighting used by custodial staff, and general lighting, what percentage of the facility's indoor lights are on during NON-operating hours?
&LF025 Percent 888 = (Refused)
999 = (Don't Know)

LF017. What percent of the retrofitted lights are on during the following SUMMER WEEKDAY hours?
888 = (Refused) 999 = (Don't Know)

12 AM	&LF017X	Percent			
1 AM	&LF017A	Percent	12 PM	&LF017L	Percent
2 AM	&LF017B	Percent	1 PM	&LF017M	Percent
3 AM	&LF017C	Percent	2 PM	&LF017N	Percent
4 AM	&LF017D	Percent	3 PM	&LF017O	Percent
5 AM	&LF017E	Percent	4 PM	&LF017P	Percent
6 AM	&LF017F	Percent	5 PM	&LF017Q	Percent
7 AM	&LF017G	Percent	6 PM	&LF017R	Percent
8 AM	&LF017H	Percent	7 PM	&LF017S	Percent
9 AM	&LF017I	Percent	8 PM	&LF017T	Percent
10 AM	&LF017J	Percent	9 PM	&LF017U	Percent
11 AM	&LF017K	Percent	10 PM	&LF017V	Percent
			11 PM	&LF017W	Percent

ENTER 1 TO MOVE FORWARD ===> &SKIP

LF018. Do you follow the same schedule in the WINTER?
&LF18
1 = Yes --> SKIP IL001/SCREEN 137
0 = No
8 = (Refused)--> SKIP IL001/SCREEN 137
9 = (Don't Know)--> SKIP IL001/SCREEN 137

LF020. What percent of the retrofitted lights are on during the following WINTER WEEKDAY hours?
888 = (Refused)   999 = (Don't Know)

12 AM	&LF020X	Percent			
1 AM	&LF020A	Percent	12 PM	&LF020L	Percent
2 AM	&LF020B	Percent	1 PM	&LF020M	Percent
3 AM	&LF020C	Percent	2 PM	&LF020N	Percent
4 AM	&LF020D	Percent	3 PM	&LF020O	Percent
5 AM	&LF020E	Percent	4 PM	&LF020P	Percent
6 AM	&LF020F	Percent	5 PM	&LF020Q	Percent
7 AM	&LF020G	Percent	6 PM	&LF020R	Percent
8 AM	&LF020H	Percent	7 PM	&LF020S	Percent
9 AM	&LF020I	Percent	8 PM	&LF020T	Percent
10 AM	&LF020J	Percent	9 PM	&LF020U	Percent
11 AM	&LF020K	Percent	10 PM	&LF020V	Percent
			11 PM	&LF020W	Percent

ENTER 1 TO MOVE FORWARD TO IL001/SCREEN 137 ===> &SKIP

Now, I'd like to ask about the type of lighting equipment at your facility before and after participating in the program.

IL001. What percentage of your facility lighting equipment was replaced through the program?
&IL001   888 = (Refused)
999 = (Don't Know)

IL005. Of the bulbs that were replaced through the program, what percent were burned out or not working before the retrofit?
&IL005 Percent
888 = (Refused)
999 = (Don't Know)

SR010. What was the average age of the lighting fixtures you replaced?
&SR010 Years
888 = (Refused)
999 = (Don't Know)

IL010. Since January 1992, have you made any changes in indoor lighting at your facility other than changes through the program or routine replacement of burned out bulbs?
&IL010
1 = Yes
0 = No--->SKIP TO LP010/DS030
8 = (Refused)--->SKIP TO LP010/DS030
9 = (Don't Know)--->SKIP TO LP010/DS030

```
     IL020.  In what months and years did you make these
             changes?
             (ENTER MONTH/YEAR)
     IL020. &IL020__  MONYYYY
     IL021. &IL021    YYYY (8 = Refused 9 = Don't Know)
            (SECOND MONTH AND YEAR IF APPLICABLE)
             (ENTER MONTH/YEAR)
     IL025. &IL025__  MONYYYY
     IL026. &IL026    YYYY (8 = Refused 9 = Don't Know)
     IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
ENTER 1 TO SKIP FORWARD ===> &SKIP


     IL040.  What type and how many fixtures were affected?
     (READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES ADDED OR REMOVED,
      IF NONE THEN 0)
       888 = (Refused)  999 = (Don't Know)
          (0 = NO CHNG)
          (1 = ADDED)    NUMBER
          (2 = REMOVED)
     IL040.   &IL040     &IL040N    4 Foot T8 fluorescent
     IL041.   &IL041     &IL041N    8 Foot T8 fluorescent
     IL042.   &IL042     &IL042N    4 Foot Energy saver fluorescent
     IL043.   &IL043     &IL043N    8 Foot Energy saver fluorescent
     IL044.   &IL044     &IL044N    4 Foot T12 fluorescent
     IL045.   &IL045     &IL045N    8 Foot T12 fluorescent
     IL046.   &IL046     &IL046N    Incandescent
     IL047.   &IL047     &IL047N    Compact Fluorescent
     IL048.   &IL048     &IL048N    High pressure sodium
     IL049.   &IL049     &IL049N    Metal Halide

 CONTINUED, ENTER 1 TO MOVE FORWARD ===> &SKIP


 ENTER TYPE AND NUMBER OF FIXTURES AFFECTED, IF NONE THEN 0
 888 = (Refused)   999 = (Don't Know)
        0 = No Chng
        1 = Added    NUMBER
        2 = Removed
 IL050.   &IL050     &IL050N    Mercury Vapor
 IL051.   &IL051     &IL051N    Quartz
 IL052.   &IL052     &IL052N    Reflectors (w/Delamping)
 IL053.   &IL053     &IL053N    Electronic  Ballasts
 IL054.   &IL054     &IL054N    Magnetic  Ballasts
 IL055    &IL055     &IL055N    LED Exit Lighting
 IL056    &IL056     &IL056N    Watt Saver/Power Choke Devices
 IL057.   &IL057     &IL057N    Other  SPECIFY: IL058 &IL058______________


ENTER 1 TO SKIP FORWARD ===> &SKIP
GOTO DS030/LP010
```

ASK WHERE BALLASTS=1: &BALLAST ELSE ASK LP010

DS030. After completing the lighting retrofit, did you experience any problems with the new ballasts?
&DS030
1 = Yes
0 = No --> SKIP LP010
8 = (Refused) --> SKIP LP010
9 = (Don't Know) --> SKIP LP010

DS045. How were your equipment problems finally resolved?
&DS045
1 = Equipment was replaced by the contractor
2 = Equipment was replaced by the customer
3 = Problem still exists.
4 = Other SPECIFY: DS046: &DS046_________________________
8 = (Refused)
9 = (Don't Know)

LP010. Has any of the lighting equipment that was installed as part of the lighting program been removed?
&LP010
1 = Yes
0 = No--->SKIP TO SR050
8 = (Refused)--->SKIP TO SR050
9 = (Don't Know)--->SKIP TO SR050

LP020. In what months and years did you make these changes?
(ENTER MONTH/YEAR)
LP020. &LP020__ MONYYYY
LP021. &LP021 YYYY (8 = Refused 9 = Don't Know)
(SECOND MONTH AND YEAR)
(ENTER MONTH/YEAR)
LP025. &LP025__ MONYYYY
LP026. &LP026 YYYY (8 = Refused 9 = Don't Know)

ENTER 1 TO SKIP FORWARD ===> &SKIP

LP030. What type and how many fixtures were removed?
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES REMOVED, IF NONE THEN 0)
888 = (Refused) 999 = (Don't Know)

	NUMBER	
LP030.	&LP030	4 Foot T8 fluorescent
LP031.	&LP031	8 Foot T8 fluorescent
LP032.	&LP032	4 Foot Energy saver fluorescent
LP033.	&LP033	8 Foot Energy saver fluorescent
LP034.	&LP034	4 Foot T12 fluorescent
LP035.	&LP035	8 Foot T12 fluorescent
LP036.	&LP036	Incandescent
LP037.	&LP037	Compact Fluorescent
LP038.	&LP038	High pressure sodium
LP039.	&LP039	Metal Halide

CONTINUED, ENTER 1 TO SKIP FORWARD ===> &SKIP

ENTER NUMBER OF FIXTURES REMOVED, IF NONE THEN 0
888 = (Refused)   999 = (Don't Know)

	NUMBER	
LP040.	&LP040	Mercury Vapor
LP041.	&LP041	Quartz
LP042.	&LP042	Reflectors (w/Delamping)
LP043.	&LP043	Electronic Ballasts
LP044.	&LP044	Magnetic Ballasts
LP045	&LP045	LED Exit Lighting
LP046	&LP046	Watt Saver/Power Choke Devices
LP047.	&LP047	Other SPECIFY: LP048 &LP048______________

ENTER 1 TO SKIP FORWARD ===> &SKIP

LP050. Why did you remove the equipment?
(DO NOT READ LIST; ENTER 1 FOR ALL THAT APPLY,ELSE ENTER 0)

LP050. &LP050 Did not like light quality.
LP051. &LP051 Not enough light.
LP052. &LP052 Equipment not reliable.
LP053. &LP053 Harmonics problems.
LP054. &LP054 Ballasts Failed
LP055. &LP055 Other SPECIFY: LP056 &LP056_____________________
LP057. &LP057 (Refused)
LP058. &LP058 (Don't Know)

LP060. Did you replace the lighting equipment that you removed?
&LP060
1 = Yes
0 = No--->SKIP TO SR050
8 = (Refused)--->SKIP TO SR050
9 = (Don't Know)--->SKIP TO SR050

LP070. What type and how many fixtures replaced the equipment that was removed?   888 = (Refused) 999 = (Don't Know)
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES ADDED)

LP070. &LP070 4 Foot T8 fluorescent
LP071. &LP071 8 Foot T8 fluorescent
LP072. &LP072 4 Foot Energy saver fluorescent
LP073. &LP073 8 Foot Energy saver fluorescent
LP074. &LP074 4 Foot T12 fluorescent
LP075. &LP075 8 Foot T12 fluorescent
LP076. &LP076 Incandescent
LP077. &LP077 Compact Fluorescent
LP078. &LP078 High pressure sodium
LP079. &LP079 Electronic Ballasts
LP080. &LP080 Magnetic Ballasts
LP081. &LP081 Metal Halide

CONTINUED, ENTER 1 TO SKIP FORWARD ==> &SKIP

ENTER TYPE AND NUMBER OF FIXTURE WHICH REPLACED THOSE REMOVED
0 = NONE OF THAT TYPE
888 = (Refused)   999 = (Don't Know)

LP082. &LP082 Mercury Vapor
LP083. &LP083 Quartz
LP084. &LP084 Reflectors (W/ Delamping)
LP085 &LP085 LED Exit Lighting
LP086 &LP086 Watt Saver/Power Choke Devices
LP087. &LP087 Other SPECIFY: LP088. &LP088____________________

ENTER 1 TO SKIP FORWARD ===> &SKIP

SR050. Compared to the old lighting equipment, would you say the amount of light has increased, decreased, or remained the same?
&SR050
1 = Increased --->SKIP TO SR070
2 = Decreased
3 = Same --->SKIP TO SR070
8 = (Refused)--->SKIP TO SR070
9 = (Don't Know)--->SKIP TO SR070

IF SR050 = 2 ASK:
SR060. Are you turning on more lights to compensate?
&SR060
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

SR070. Compared to the old lighting equipment, would you say the color rendition is better, worse, or the same?
&SR070
1 = Better
2 = Worse
3 = Same
8 = (Refused)
9 = (Don't Know)

SR075. Compared to the old lighting equipment, would you say the new lighting gives off less, more or the same amount of glare?
&SR075
1 = Less
2 = More
3 = Same
8 = (Refused)
9 = (Don't Know)

OL010. Is OUTDOOR lighting included on the facility's utility bill?
&OL010
1 = Yes
0 = No--->SKIP TO CE010
8 = (Refused)--->SKIP TO CE010
9 = (Don't Know)--->SKIP TO CE010

OL020. Since January 1992, have you made any changes in OUTDOOR lighting at your facility?
&OL020
1 = Yes
0 = No--->SKIP TO CE010
8 = (Refused)--->SKIP TO CE010

9 = (Don't Know)--->SKIP TO CE010

OL030. In what month and year did you make these changes?
(ENTER MONTH/YEAR)
OL030 &OL030__ MONYYYY
&OL031 YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OL040. Did you ADD TO, REPLACE, or REMOVE outdoor lighting?
&OL040
1 = Added lighting
2 = Replaced lighting
3 = Added AND Replaced lighting
4 = Removed
8 = (Refused)
9 = (Don't Know)

COOLING EQUIPMENT:

The next series of questions pertain to the cooling equipment at the facility.

CE010. What type of system is used to air condition this facility? [If there is more than one system, enter the one used to cool the largest portion of this facility.]
&CE010
0 = No A/C--->SKIP TO CE080
1 = Central plant
2 = Small Packaged Systems (i.e. Rooftop or Ground)
3 = Wall or window units
4 = Heat pump
5 = Other SPECIFY: CE011 &CE011____________________________
8 = (Refused)
9 = (Don't Know)

CE015. What is the primary fuel used to cool your facility?
&CE015
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE016. &CE016____________________________
8 = (Refused)
9 = (Don't Know)

CE030. Does this system include an economizer?
&CE030
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

CE050. What percent of the facility is air conditioned at 4PM on Summer weekdays?
(ASK OPEN ENDED, THEN PROBE WITH CATEGORIES)
&CE050 Percent

100=100%	222=60-79%	444=20-39%	0=0%	888 = (Refused)
111=80-99%	333=40-59%	555=1-19%		999 = (Don't Know)

CE060. During what months is the cooling system operated?
(READ LIST IF NECESSARY; ENTER NUMBER 1 FOR ALL THAT APPLY)

CE059. &CE059   All Year --> SKIP CE080
CE060. &CE060   January
CE061. &CE061   February
CE062. &CE062   March
CE063. &CE063   April
CE064. &CE064   May
CE065. &CE065   June
CE066. &CE066   July
CE067. &CE067   August
CE068. &CE068   September
CE069. &CE069   October
CE070. &CE070   November
CE071. &CE071   December
CE072. &CE072   (Refused)
CE073. &CE073   (Don't Know)
TO SKIP FORWARD ENTER 1: ===> &SKIP

CE080. Since January 1992, have you ADDED TO, REMOVED, or REPLACED an older cooling system?
&CE080
0 = No Change-->SKIP TO HE015
1 = Added
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)-->SKIP TO HE015
9 = (Don't Know)-->SKIP TO HE015

CE090. In what month and year did you make these changes?
(ENTER MONTH/YEAR)

CE090. &CE090__ MONYYYY
CE091. &CE091 YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

IF CE080=1 THEN SKIP TO CE120; ELSE ASK:

CE110. What fuel was used to power the old system?
&CE110
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE111. &CE111_________________________
8 = (Refused)
9 = (Don't Know)

IF CE080=2 or 4 THEN SKIP TO HE015
CE120. What fuel does the cooling system addition use?
&CE120
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE121. &CE121___________________________
8 = (Refused)
9 = (Don't Know)

HEATING EQUIPMENT

HE015. What is the main type of heating system used to heat your facility?
&HE015
1 = Central electric furnace   19 = None
2 = Central heat pump   88 = (Refused)

3 = Central gas furnace 99 = (Don't Know)
4 = Gas boiler
5 = Electric boiler
6 = Fuel oil furnace or boiler
7 = Electric strip heat
8 = Baseboard electric heating
9 = Room or wall AC with electric strip heat
10 = Permanent, non-electric room heaters
11 = Whole-house wall or floor electric furnace
12 = Whole-house wall or floor gas furnace
13 = Portable electric heater
14 = Portable kerosene heater
15 = Wood or coal burning stove or fireplace
16 = Solar collector
17 = Propane heating system
18 = Other HE016. &HE016____________________________________

HE020. What is the primary fuel used to heat your facility?
&HE020
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: HE021 &HE021___________________________
8 = (Refused)
9 = (Don't Know)

HE050. What percent of your facility is heated at 8AM
on WINTER weekdays?
(ASK OPEN ENDED, THEN PROBE WITH CATEGORIES)
&HE050 Percent

100=100%	222=60-79%	444=20-39%	0=0%	888 = (Refused)
111=80-99%	333=40-59%	555=1-19%		999 = (Don't Know)

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HE060.  During what months is the heating system operated?
(READ LIST IF NECESSARY; ENTER NUMBER 1 FOR ALL THAT APPLY)
HE059. &HE059   All Year ---> SKIP HE080
HE060. &HE060   January
HE061. &HE061   February
HE062. &HE062   March
HE063. &HE063   April
HE064. &HE064   May
HE065. &HE065   June
HE066. &HE066   July
HE067. &HE067   August
HE068. &HE068   September
HE069. &HE069   October
HE070. &HE070   November
HE071. &HE071   December
HE072. &HE072   (Refused)
HE073. &HE073   (Don't Know)
     TO SKIP FORWARD ENTER 1: ==> &SKIP


HE080.  Since January 1992, have you ADDED TO, REPLACED, OR REMOVED
        an older heating system?
        &HE080
        0 = No Change-->SKIP TO OE010
        1 = Added
        2 = Replaced
        3 = Added and Replaced
        4 = Removed
        8 = (Refused)-->SKIP TO OE010
        9 = (Don't Know)-->SKIP TO OE010

HE090.  In what month and year did you make these changes?
        (ENTER MONTH/YEAR)
HE090.   &HE090__   MONYYYY
HE091.   &HE091     YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

IF HE080=1 THEN SKIP TO HE120, ELSE ASK:

HE110.  What fuel was used to power the old system?
        &HE110
        1 = Natural Gas
        2 = Propane or Bottled Gas
        3 = Oil
        4 = Steam
        5 = Electricity
        6 = Other  SPECIFY: HE111. &HE111__________________________
        8 = (Refused)
        9 = (Don't Know)

IF HE080=2 OR 4 THEN SKIP TO OE010
```

HE120. What fuel does the heating system addition use?
&HE120
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: HE121. &HE121___________________________
8 = (Refused)
9 = (Don't Know)

OTHER EQUIPMENT:

OE010. Since January 1992, have you changed other equipment that makes up 10% or more of the facility's annual electric bill?
&OE010
1 = Yes
0 = No-->SKIP TO OC010
8 = (Refused)-->SKIP TO OC010
9 = (Don't Know)-->SKIP TO OC010

OE011. Which of the following types of equipment were changed?
(READ FIRST THREE THEN ASK FOR OTHER)
(READ LIST; ENTER 1 FOR ALL THAT APPLY)
OE012. &OE012 Water heating
OE013. &OE013 Cooking
OE014. &OE014 Refrigeration
Were there any other end uses changed? (RECORD BELOW)
OE015. &OE015 Other1 SPECIFY: OE016. &OE016_____________________
OE017. &OE017 Other2 SPECIFY: OE018. &OE018_____________________
OE019. &OE019 (Refused) ---> SKIP to OC010
OE011. &OE011 (Don't Know) ---> SKIP TO OC010

ASK OE020-OE050 IF OE012=1
OE020. In what month and year did you change your water heating equipment?
(ENTER MONTH/YEAR)
OE020. &OE020__ MONYYYY
OE021. &OE021 YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE030. Did you ADD TO, REMOVE, or REPLACE water heating equipment?
&OE030
1 = Added--->SKIP TO OE050
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE060/OE100/OE140/OE180/OC010
9 = (Don't Know)--->SKIP TO OE060/OE100/OE140/OE180/OC010

OE040. What fuel was used to power the old water heating equipment?
&OE040
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE041. &OE041___________________________
8 = (Refused)
9 = (Don't Know)

IF OE030= 4 THEN SKIP TO OE060/OE100/OE140/OE180/OC010

OE050. What fuel does the water heating equipment addition use?
&OE050
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE051. &OE051____________________________
8 = (Refused)
9 = (Don't Know)

ASK OE060-OE090 IF OE013=1

OE060. In what month and year did you change your cooking equipment?
(ENTER MONYYYY)

OE060. &OE060__ MONYYYY
OE061. &OE061 YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE070. Did you ADD TO, REMOVE, or REPLACE cooking equipment?
&OE070
1 = Added--->SKIP TO OE090
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE100/OE140/OE180/OC010
9 = (Don't Know)--->SKIP TO OE100/OE140/OE180/OC010

OE080. What fuel was used to power the old cooking equipment?
&OE080
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE081. &OE081____________________________
8 = (Refused)
9 = (Don't Know)

IF OE070= 4 THEN SKIP TO OE100/OE140/OE180/OC010

OE090. What fuel does the cooking equipment addition use?

&OE090
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE091. &OE091___________________________
8 = (Refused)
9 = (Don't Know)

ASK OE100-OE130 IF OE014=1
OE100. In what month and year did you change your refrigeration equipment?
(ENTER MONTH/YEAR)

OE100. &OE100__ MONYYYY
OE101. &OE101 YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE110. Did you ADD TO, REMOVE, or REPLACE refrigeration equipment?
&OE110
1 = Added--->SKIP TO OE130
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE140/OE180/OC010
9 = (Don't Know)--->SKIP TO OE140/OE180/OC010

OE120. What fuel was used to power the old refrigeration equipment?
&OE120
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE121. &OE121______________________________
8 = (Refused)
9 = (Don't Know)

IF OE110=2 OR 4 THEN SKIP TO OE140/OE180/OC010

OE130. What fuel does the refrigeration equipment addition use?
&OE130
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE131. &OE131___________________________
8 = (Refused)
9 = (Don't Know)

ASK OE140-OE170 IF OE015=1
OE140. In what month and year did you change your &EQUIP__________
(ENTER MONTH/YEAR)

OE140. &OE140__ MONYYYY
OE141. &OE141 YYYY (8 = Refused 9 = Don't Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE150. Did you ADD TO, REMOVE, or REPLACE &EQUIP2_______________ equipment?
&OE150
1 = Added--->SKIP TO OE170
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE180/OC010
9 = (Don't Know)--->SKIP TO OE180/OC010

OE160. What fuel was used to power the old &EQUIP__________________ equipment?
&OE160
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE161. &OE161____________________________
8 = (Refused)
9 = (Don't Know)

IF OE150=2 OR 4 THEN SKIP TO OE180/OC010

OE170. What fuel does the &EQUIP___________________ equipment addition use?
&OE170
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE171. &OE171___________________________
8 = (Refused)
9 = (Don't Know)

ASK OE180-OE210 IF OE017=1

OE180. In what month and year did you change your &EQUIP___________________________________ equipment?
(ENTER MONTH/YEAR)
OE180. &OE180__ MONYYYY
OE181. &OE181 YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE190. Did you ADD TO, REMOVE, or REPLACE &EQUIP2_______________ equipment?
&OE190
1 = Added--->SKIP TO OE202
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OC010
9 = (Don't Know)--->SKIP TO OC010

OE200. What fuel was used to power the old &EQUIP________________ equipment?
&OE200
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE201. &OE201___________________________
8 = (Refused)
9 = (Don't Know)

IF OE190=2 OR 4 THEN SKIP TO OC010

OE202. What fuel does the &EQUIP_______________ equipment addition use?
&OE202
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE203. &OE203__________________________
8 = (Refused)
9 = (Don't Know)

OC010. Since January 1992, have you made any other changes that would affect energy usage at this facility?
&OC010
1 = Yes
0 = No--->SKIP TO EM010
8 = (Refused)--->SKIP TO EM010
9 = (Don't Know)---> SKIP TO EM010

OC020. What type of changes were made?
&OC020____
&OC021____

OC030. In what month and year were these changes made?
(ENTER MONTH/YEAR)
OC030. &OC030__ MONYYYY
OC031. &OC031 YYYY (8 = Refused 9 = Don't Know)
IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

EM010. Do you have an in-house Energy Management System at this facility?
&EM010
1 = Yes
0 = No-->SKIP TO CP010
8 = (Refused)-->SKIP TO CP010
9 = (Don't Know)-->SKIP TO CP010

EM020. In what month and year was the Energy Management System installed?
(ENTER MONTH/YEAR)
EM020. &EM020__ MONYYYY
EM021. &EM021 YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

CP010. Do you have a cogeneration plant at this facility?
&CP010
1 = Yes
0 = No --> SKIP
8 = (Refused) --> SKIP
9 = (Don't Know) --> SKIP

CP020. In what month and year did the cogeneration plant begin operating?
(ENTER MONTH/YEAR)

CP020. &CP020__ MONYYYY
CP021. &CP021 YYYY (8 = Refused 9 = Don’t Know)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

Those are all of the questions I have for you at this time. Before you go I'd like to get your job title.
USE JOB KEY TO CODE ALL:

1 = President/Owner	2 = Senior Manager
3 = Financial Manager	4 = Energy Manager
5 = Operations Manager	6 = Building Manager
7 = Other SPECIFY	

DECISION TITLE CF009. Job Title: &DTITLN
SPECIFY: &DTITLOTR____________
TECHNICAL TITLE CF010. Job Title: &TTITLN
SPECIFY: &TTITLOTR____________
LIGHTING TITLE CF011. Job Title &LTITLN
SPECIFY: &LTITLOTR____________
==> &DIV_COD2 <== ==> &SERVCITY <== ==> &OSFLAG <== 1 = OK OS
0 = NO OS
TO SKIP TO ON-SITE RECRUITMENT ENTER 1: MEASTYP: &MEASTYP
TO SKIP TO COMMENT FIELDS ENTER 2: BUSTYP: &BUSTYP
TO SKIP FORWARD ENTER 1 OR 2 HERE ==> &SKIP

DE1. Do you have any additional comments at this time?
&DE1 1 = Yes 0 = No 8 = (Refused) 9 = (Don't Know)
&DECOMM1____
&DECOMM2____
&DECOMM3____
IF THERE ARE ANY COMMENTS ABOUT THE ANSWERS WITHIN THIS SURVEY
ENTER 1 HERE, THEN ENTER YOUR COMMENTS==> &COMM

&NOTE1____
&NOTE2____
&NOTE3____
&NOTE4____
&NOTE5____
&NOTE6____

IF THE RESPONDENT ASK FOR PG&E REP'S PHONE # ENTER 1, AND THEN REASON &REP

&NOTREP1____
&NOTREP2____

Those are all the questions I have for today. On behalf of Pacific Gas and Electric, thank you very much for your time and cooperation.

F4 TO FIRST SCREEN AND CODE RESULT

At present we are surveying PG&E customers who HAVE participated in the Efficient Indoor Lighting Program. Since you have not participated in this PG&E program, we have no further questions for you at this time. On behalf of PG&E, I'd like to thank you very much for your cooperation today.

At present we are surveying PG&E customers who had their equipment installed between Jan 1994 and Sep 1994, and who's equipment was installed in an area cover by only one account. On behalf of PG&E, I'd like to thank you for your time.

(F4 TO FIRST SCREEN AND CODE RESULT)

BEGIN ON SITE RECRUITMENT. ASK OF PARTICIPATION CONTACT:

A subsample of customers who complete telephone surveys are being asked to participate in an additional on-site follow up visit. Your site has been selected for one of these follow up visits. These on-site visits provide additional data that is used to evaluate and verify the savings achieved by the new lighting equipment. Would you be interested in having one of our qualified technicians come and conduct an on-site inspection?

OS001. &OS001
1 = Respondent will continue
0 = Respondent will not continue

OS005. Are you the best person who can allow us access to physically inspect the retrofitted electrical equipment?
&OS005
1 = Yes --> SKIP TO 2nd CONTACT
0 = No
8 = (Refused)
9 = (Don't Know)

Who would be the best person who could allow us access to physically inspect the retrofitted electrical equipment?
READ CONTACTS, OR GET ADDITIONAL CONTACT INFO:

DECIS NAME: &DNAME____
DECIS TITLE: &DTITLF____
DECIS BUSINESS: &DBUSNAM______________________________________
DECIS PHONE: (&DAC_) &DPRE - &DLAST Ext: &DEXT

TECH NAME: &TNAME____

```
   TECH TITLE:     &TTITLF________________________________________
   TECH BUSINESS:  &TBUSNAM______________________________________
   TECH PHONE:   ( &TAC_ )  &TPRE - &TLAST  Ext: &TEXT

   LIGHT NAME:     &LNAME________________________________________
   LIGHT TITLE:    &LTITLF_______________________________________
   LIGHT BUSINESS: &LBUSNAM______________________________________
   LIGHT PHONE:  ( &LAC_ ) &LPRE - &LLAST  Ext:  &LEXT
IF DECIS ENTER 1, ELSE IF TECH ENTER 2, ELSE IF LIGHT ENTER 3,
ELSE IF NEW ON-SITE CONTACT ENTER 4: ===> &WHOOS


 ENTER INFO FOR ON-SITE CONTACT:


   OS NAME:        &OSNAME_______________________________________
   OS BUSINESS:    &OSBUSNAM_____________________________________
   OS PHONE:     ( &OSAC ) &OSPRE - &OSLAST Ext: &OSEXT
   OS TITLE:       &OSTITLN
                   1 = President/Owner
                   2 = Senior Manager
                   3 = Financial Manager
                   4 = Energy Manager
                   5 = Operations Manager
                   6 = Building Manager
                   7 = Other SPECIFY: &OSTILOTR_______________________


ENTER 1 TO SKIP FORWARD:  ==> &SKIP


Who would be an additional person who can allow us access and be
knowlegable about the electrical equipment at the facility?
READ CONTACT NAMES, IF NOT ONE OF THESE, GET ADDITIONAL CONTACT INFO:

 DECIS NAME:     &DNAME______________________________________________
 DECIS TITLE:    &DTITLF_____________________________________________
 DECIS BUSINESS: &DBUSNAM____________________________________________
 DECIS PHONE:  ( &DAC )  &DPRE - &DLAST  Ext:  &DEXT

 TECH NAME:     &TNAME______________________________________________
 TECH TITLE:    &TTITLF_____________________________________________
 TECH BUSINESS: &TBUSNAM____________________________________________
 TECH PHONE:  ( &TAC )  &TPRE - &TLAST  Ext:  &TEXT

 LIGHT NAME:     &LNAME______________________________________________
 LIGHT TITLE:    &LTITLF_____________________________________________
 LIGHT BUSINESS: &LBUSNAM____________________________________________
 LIGHT PHONE:  ( &LAC )  &LPRE - &LLAST  Ext:  &LEXT
IF DECIS ENTER 1, ELSE IF TECH ENTER 2 , ELSE IF LIGHT ENTER 3
IF OTHER THAN THESE THEN ENTER 4 ===>  &WHOOS2

GET SECONDARY ON-SITE CONTACT INFORMATION;

SECOND CONTACT NAME      &OSNAM2______________________________________
SECOND CONTACT BUSINESS: &OSBUSNM2____________________________________
SECOND CONTACT PHONE:  ( &OSAC2 )  &OSPRE2 - &OSLAST2  EXT: &OSEXT2
SECOND CONTACT TITLE:    &OSTITN2
                         1 = President/Owner
                         2 = Senior Manager
```

3 = Financial Manager
4 = Energy Manager
5 = Operations Manager
6 = Building Manager
7 = Other SPECIFY: &OSTIL2OT________________

COMMENTS: &OSCOM21____
COMMENTS: &OSCOM22____
ENTER 1 TO SKIP FORWARD ==> &SKIP

IF YOU WISH TO SCHEDULE AN APPOINTMENT WITH THE PERSON ON THE PHONE ENTER 1, ELSE READ BELOW THEN ENTER 2 AND CODE OS RESULT;

===> &SKIP

Those are all of the questions I have for you at this time. I will contact &OSNAME________________________ to schedule the on-site audit. On behalf of PG&E, thank you for your time and cooperation.

At this time, we would like to schedule an appointment for one of our representatives to meet with you at your facility to conduct the survey and inspect the building's new lighting equipment.

OS020. Can we schedule a time now for one of our representatives to meet with you at your facility?
&OS020
1 = Yes --> SKIP OS030
0 = No
8 = (Refused)
9 = (Don't Know)

OS030. How high off the floor is the highest lighting which was retrofitted under the program?
&OS030 feet (ENTER ESTMATED LIGHTING HEIGHT)
888 = (Refused)
999 = (Don't Know)

OS040. Do you have ladders at the facility high enough to reach this height, which could be available to the auditor?
&OS040
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

OS045. What is the closest cross street to the facility at &ADDRESS_________________________________ ?

Cross Street: &XSTREET_____________________________________

ENTER 1 TO SKIP FORWARD: &SKIP

ENTER DAY: &VISDAY___ DISTRICT: &DIV_COD2
ENTER DATE: &VISDAT2__ BUSTYPE: &BUSTYPE____________
ENTER START TIME: &VISTIM1 WHO: 1 = Kevin Shovah CODE: &MAILV____
END TIME: &VISTIM2 2 = Joe O'Mally
ENTER WHO: &VISWHO 3 = Paul William
IS THE INFORMATION CORRECT &CORR 4 = Denis Ley
USE 24HR CLOCK!!!! 1 = Yes 5 = Chuck Bennett
0 = No

I'll give you the following 800 number, should you need to reschedule or cancel the appointment. The number is 1-800-540-7201.
If at the time of the audit, you could have a recent PG&E bill available for the auditor, it would be very helpful.

DO NOT READ
Did the customer ask us to provide a Certificate of Insurance, or Proof of Insurance?
&INSURE 1 = Yes 0 = No

Did the customer have any concerns about sensitive issues or processes at their facility?
&TIPTOE 1 = Yes 0 = No

Appendix E

FINAL NONPARTICIPANTS TELEPHONE SURVEY

```
&S1________________   &S2________________   QC: &QC__     Screen: &S_
 Name: &NAME_________________________  DCOMP: &D_   LCOMP: &L_   TCOMP: &T_
 Latest Interviewer: &LI  Interviewer 1: &I1  Date: &IDATE1_ Time 1: &TIM1
 PG&E C/I L DIVCODE &DVC_ Interviewer 2: &I2  Date: &IDATE2_ Time 2: &TIM2
 Non-Part   CATI: &CN__   Interviewer 3: &I3  Date: &IDATE3_ Time 3: &TIM3
 ACCNT #: &ACCOUNT______  Interviewer 4: &I4  Date: &IDATE4_ Time 4: &TIM4
 MEASTYP: &MEASTYP        Interviewer 5: &I5  Date: &IDATE5_ Time 5: &TIM5
 Control: &CONTROL_______ Interviewer 6: &I6  Date: &IDATE6_ Time 6: &TIM6
 Business Name &BUSINESS______________________________ BUS TYP: &BUSTYPE_____
 Name: &NAME2_____________________         Business Phone: ( &HA ) &HP - &HL_
 Address: &ADDRESS______________________      Corr. Phone: ( &CA ) &CP - &CL_
 City: &CITY______________________  Zip: &ZIP____ Contact: &CONTACT__________
 Callback Date: &CBD____  Callback Time: &CBT________________________________
 Comment: &COMMENT1__________________________________________________________
          &COMMENT2__________________________________________________________
   Res1: &R1   Res2: &R2   Res3: &R3   Res4: &R4   Res5: &R5   Res6: &R6
 1=Complete-CB OS 6=Refusal     11=Wrong #     16=T&T wrng adr 31=Comp ALL
 2=Partial/Refusd 7=Answr Mach  12=Moved       17=Other        32=Multi-Site
 3=Call Back      8=Busy Signal 13=Fax, Modem  18=Part Comp/CB
 4=No Answr       9=Not Elig    14=No Dir List ONSITE RESULTS:
 5=On Vacation    10=Disconn #  15=T&T sc020   OS1: &O1  OS2: &O2  OS3: &O3


  CONTACT INFO:
  &CONIFO1_____________________________________________________________
  &CONIFO2_____________________________________________________________
  &CONIFO3_____________________________________________________________
  &CONIFO4_____________________________________________________________
  &CONIFO5_____________________________________________________________
  &CONIFO6_____________________________________________________________
  &CONIFO7_____________________________________________________________
  &CONIFO8_____________________________________________________________

  CONTACT INFO SCREEN:

  ENTER PERSON ATTEMPTING TO CONTACT:  &RESP
       1 = Initial attempt to find contact
       2 = Decision maker
       3 = Technical
       4 = Lighting
       5 = Property Manager

  PARTICIPATION CONTACT &DNAME______________________
  ( &DAC )   &DPRE  -  &DLAST   Ext. &DEXT_____
  CALLBACK DATE &DCBD__     CALLBACK TIME  &DCBT_________  Def: &DDEF_
  FIRM: &DBUSNAM___________________________   (1=def callback 0=general)
  &NOTED1________________________________________________________________
  &NOTED2________________________________________________________________
  &NOTED3________________________________________________________________
  &NOTED4________________________________________________________________
  &NOTED5________________________________________________________________

  TECHNICAL CONTACT  &TNAME_________________________
  ( &TAC )  &TPRE - &TLAST      Ext. &TEXT_____
  CALLBACK DATE &TCBD___     CALLBACK TIME &TCBT_________    Def &TDEF_
  FIRM &TBUSNAM______________________________  (1=Def callback 0=general)
  &NOTET1________________________________________________________________
  &NOTET2________________________________________________________________
  &NOTET3________________________________________________________________
  &NOTET4________________________________________________________________
  &NOTET5________________________________________________________________
  ALWAYS ENTER 1 TO SKIP FORWARD ====>  &SKIP

  PROPERTY MANAGEMENT CONTACT  &PMNAME_________________________
  ( &PAC )  &PPRE - &PLAST     Ext. &PMEXT_____
  CALLBACK DATE &PMCBD______   CALLBACK TIME &PMCBT_______    Def &PMDEF_
```

FIRM: &PMBUSNAM_____________________________ (1=Def callback 0=general)
&NOTEPM1____
&NOTEPM2____
&NOTEPM3____
&NOTEPM4____
&NOTEPM5____

LIGHTING CONTACT &LNAME_________________________
(&LAC) &LPRE - &LLAST Ext. &LEXT_____
CALLBACK DATE &LCBD___ CALLBACK TIME &LCBT_________ Def &LDEF_
FIRM: &LBUSNAM______________________________ (1=Def callback 0=general)
&NOTEL1____
&NOTEL2____
&NOTEL3____
&NOTEL4____
&NOTEL5____
ALWAYS ENTER 1 TO SKIP FORWARD ===> &SKIP

Hello. This is &LI__ . I'm with Quantum Consulting, a management consulting firm in Berkeley, California. We're assisting PG&E in evaluating its (Customized Incentives / Retrofit Express) Program. Although you are not participating in this program, we'd like to ask you some general questions about your firm's energy related decisions, and we'd like to collect some specific technical information on your major electricity end uses.

MN001. Before we start, I would like to inform you that for quality control purposes, this call may be monitored by my supervisor. Would this be OK with you?
&MN001 1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

DECISION MAKER: IF RESPOND = . OR D THEN ASK: RESPOND = &RESPOND
This survey will cover the facility at &ADDRESS__________________ ?

SC001d. Does your firm own the building at &ADDRESS2___________ ?
&SC001D
1 = Yes 8 = (Refused)
0 = No --> SKIP FI002 9 = (Don't Know)

FI001d. Does your firm occupy the space at
&ADDRESS3_____________________________ ?
&FI001D 1 = Yes --> SKIP FI003
0 = No --> SKIP SC016
8 = (Refused) --> SKIP FI003
9 = (Don't Know)--> SKIP FI003

FI002d. Does your firm manage the property at &ADDRESS4___________ ?
&FI002D 1 = Yes --> SKIP FI004
0 = No --> SKIP FI003
8 = (Refused) --> SKIP FI004
9 = (Don't Know) --> SKIP FI004

TECHNICAL: ASK WHERE RESPOND = T: RESPOND = &RESPOND
This survey will cover the facility &ADDRESS__________________________ .

SC001T. Do you own the building at &ADDRESS2___________ ?
&SC001T
1 = Yes 8 = (Refused)

```
        0 = No --> SKIP FI002t   9 = (Don't Know)

FI001T. Does your firm occupy the space at
        &ADDRESS3_____________________________ ?
        &FI001T    1 = Yes --> SKIP SC005
                   0 = No  --> SKIP SC016
                   8 = (Refused)   --> SKIP SC005
                   9 = (Don't Know)--> SKIP SC005

FI002T. Does your firm manage the property at &ADDRESS4_______________ ?
        &FI002T   1 = Yes --> SKIP FI003
                  0 = No --> SKIP SC005
                  8 = (Refused) --> SKIP SC005
                  9 = (Don't Know) --> SKIP SC005

LIGHTING:  ASK WHERE RESPOND = L: RESPOND = &RESPOND
This survey will cover equipment installed at &ADDRESS__________________ .

SC001L. Do you own the building at &ADDRESS2___________ ?
        &SC001L
        1 = Yes                    8 = (Refused)
        0 = No --> SKIP FI002l     9 = (Don't Know)

FI001L. Does your firm occupy the space at
        &ADDRESS3_____________________________ ?
        &FI001L    1 = Yes --> SKIP SC006
                   0 = No --> SKIP SC016
                   8 = (Refused)   --> SKIP SC006
                   9 = (Don't Know)--> SKIP SC006

FI002L. Does your firm manage the property at &ADDRESS4_____________ ?
        &FI002L  1 = Yes -->SC006
                 0 = No
                 8 = (Refused)
                 9 = (Don't Know)

ASK ONCE:

SC016.   Is there a property management firm for this building?
         &SC016
                 1 = Yes
                 0 = No --> SKIP SC003/SC005/SC006
                 8 = (Refused) --> SKIP SC003/SC005/SC006
                 9 = (Don't Know)  --> SKIP SC003/SC005/SC006
```

SC017.- Could you please give me the name and telephone
SC024. number of someone at the property management firm who
would be able to answer questions about the building and
electrical equipment at the premise?

PROPERTY CONTACT NAME: &PMNAME____________________________________
PROPERTY CONTACT COMPANY: &PMBUSNAM______________________________________
PROPERTY CONTACT PHONE: (&PMAC) &PMPRE - &PMLAST_ Extension: &PMEXT
PROPERTY CONTACT TITLE: &PMTITLN
1 = President/Owner
2 = Senior Manager
3 = Financial Manager
4 = Energy Manager
5 = Operations Manager
6 = Building Manager
7 = Other SPECIFY: &PMTILOTR_______________

Comment1 &PMCOM1____
Comment2 &PMCOM2____
ENTER 1 TO SKIP FORWARD ====> &SKIP

FI003. Are you the sole occupant of the building?
&FI003 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

FI004. Is any part of &ADDRESS___________ leased space?
&FI004 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

SC003. This survey will cover the equipment installed at
&ADDRESS2__________ . Are you the best person to talk to
about &BUSINESS_________________ 's energy related decisions.
These questions cover such topics as awareness of PG&E programs
and energy-efficiency improvements.
&SC003 1 = Yes-->SKIP TO SC005 8 = (Refused)
0 = No 9 = (Don't Know)

SC004. Who would be the best person to talk to about
&BUSINESS_______________________ energy related decisions?

ENERGY DECISIONS NAME: &DNAME______________________________________
ENERGY DECISIONS PHONE (&DAC) &DPRE - &DLAST Ext. &DEXT_
ENERGY DECISIONS ORGANIZATION NAME &DBUSNAM_____________________________
ENERGY DECISIONS CONTACT TITLE &DTITLN
1 = President/Owner
2 = Senior Manager
3 = Financial Manager
4 = Energy Manager
5 = Operations Manger
6 = Building Manger
7 = Other SPECIFY: &DTITLOTR____________

Comment1 &DCOMM1____
Comment2 &DCOMM2____
ENTER 1 TO SKIP ===> &SKIP

ASK SC005 IF SC016~=1:

SC005. Are you the best person to answer questions about the size of the facility, and the type size and age of your major electrical equipment?
&SC005   1 = Yes --> SKIP SC006
0 = No
8 = (Refused) --> SKIP SC006
9 = (Don't Know) --> SKIP SC006

SC007. Who would be the best person to talk to about &BUSINESS__________________ 's major electricity end uses?
LIGHT CONTACT NAME &LNAME_______________________________________
LIGHT CONTACT PHONE (&LAC_) &LPRE__ - &LLAST__ Ext. &LEXT_
LIGHT ORGANIZATION NAME &LBUSNAM_____________________________
LIGHT CONTACT TITLE &LTITLF_________________________________
IF NOT LIGHT CONT ENTER 1 AND GET NEW TECH CONTACT, ELSE IF LIGHT ENTER 2
===> &WHOTECH
TECHNICAL CONTACT NAME &TNAME_______________________________________
TECHNICAL CONTACT PHONE (&TAC_) &TPRE__ - &TLAST__ Ext. &TEXT_
TECHNICAL ORGANIZATION NAME &TBUSNAM_____________________________
TECHNICAL CONTACT TITLE &TTITLN
1 = President/Owner   5 = Opertions Manager
2 = Senior Manager   6 = Building Manager
3 = Financial Manager   7 = Other SPECIFY:
4 = Energy Manager   &TTITLOTR______________________________

Comment1: &TCOMM1____
Comment2: &TCOMM2____
ENTER 1 TO SKIP FORWARD ==> &SKIP

ASK IF SC001~=1:

SC006. Are you the best person who can answer questions about the hours of lighting equipment operation at &ADDRESS_______________________ ?
&SC006 1 = Yes --> SKIP SC010
0 = No --> SKIP SC008
8 = (Refused) --> SKIP SC010
9 = (Don't Know) --> SKIP SC010

SC008. Who would be the best person on site to talk to about &BUSINESS_________________ 's hours of lighting operation?

DECIS CONTACT NAME &DNAME____
DECIS CONTACT PHONE (&DAC_) &DPRE_ - &DLAST___ Ext. &DEXT___
DECIS ORGANIZATION NAME &DBUSNAM_____________________________
DECIS CONTACT TITLE &DTITLF_______________________________

TECH CONTACT NAME &TNAME____
TECH CONTACT PHONE (&TAC_) &TPRE_ - &TLAST___ Ext. &TEXT___
TECH ORGANIZATION NAME &TBUSNAM_____________________________
TECH CONTACT TITLE &TTITLF_______________________________

IF DECIS CONTACT ENTER 1, IF TECH CONTACT ENTER 2 ELSE ENTER 3 AND GET NEW INFO ===> &WHOLIT

ENTER NEW LIGHTING CONTACT INFORMATION:

HOURS CONTACT NAME: &LNAME____

HOURS CONTACT PHONE: (&LAC_) &LPRE_ - &LLAST___   Ext. &LEXT___
HOURS ORGANIZATION NAME: &LBUSNAM_____________________________
HOURS CONTACT TITLE &LTITLN
1 = President/Ownwer
2 = Senior Manager
3 = FInancial Manager
4 = Energy Manager
5 = Operations Manager
6 = Building Manager
7 = Other SPECIFY: &LTITLOTR____________________

Comment1: &LCOMM1____
Comment2: &LCOMM2____
ENTER 1 TO SKIP ===> &SKIP

SC020. Pacific Gas and Electric's Customized Incentives and Retrofit Express Programs provide rebates to encourage customers to convert their standard lighting systems to more efficient. Do you recall &BUSINESS___________________ having lighting installed as part of PG&E's program?

&SC020__ 1 = Yes -->THANK AND TERMINATE
0 = No
8 = (Refused) --> THANK AND TERMINATE
9 = (Don't Know) --> THANK AND TERMINATE

SC021. Was your lighing installed through the program before or after January of 1992?

&SC021__ 1 = Before January 1992
0 = After January 1992 -->THANK AND TERMINATE
8 = (Refused) -->THANK AND TERMINATE
9 = (Don't Know) -->THANK AND TERMINATE

IL010. Since January 1992, have you made any changes in indoor lighting at your facility other than routine replacement of burned out bulbs?

&IL010 1 = Yes   8 = (Refused)-->SKIP TO FI005
0 = No--->SKIP TO FI005   9 = (Don't Know)-->SKIP TO FI005

IL020. In what months and years did you make these changes?
(ENTER MONTH/YEAR)
&IL020__ MONYYYY (e.g. JUN1960)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR ENTER 1 TO SKIP
IL021. &IL021 YYYY (8 = Refused 9 = Don't Know)

SECOND MONTH AND YEAR, IF APPLICABLE:
(ENTER MONTH/YEAR)
&IL025__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR ENTER 1 TO SKIP
IL026. &IL026 YYYY (8 = Refused 9 = Don't Know)

ENTER '1' TO SKIP FORWARD ===> &SKIP

IL040. What type and how many fixtures were affected?
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES ADDED OR REMOVED, IF NONE THEN 0)
888 = (Refused) 999 = (Don't Know)
(0 = NO CHNG)
(1 = ADDED) NUMBER

```
     (2 = REMOVED)
IL040.   &IL040     &IL040N    4 Foot T8 fluorescent
IL041.   &IL041     &IL041N    8 Foot T8 fluorescent
IL042.   &IL042     &IL042N    4 Foot Energy saver fluorescent
IL043.   &IL043     &IL043N    8 Foot Energy saver fluorescent
IL044.   &IL044     &IL044N    4 Foot T12 fluorescent
IL045.   &IL045     &IL045N    8 Foot T12 fluorescent
IL046.   &IL046     &IL046N    Incandescent
IL047.   &IL047     &IL047N    Compact Fluorescent
IL048.   &IL048     &IL048N    High pressure sodium
IL049.   &IL049     &IL049N    Metal Halide

CONTINUED, ENTER 1 TO MOVE FORWARD ===> &SKIP
```

ENTER TYPE AND NUMBER OF FIXTURES AFFECTED, IF NONE THEN ENTER 0:

```
        0 = No Change
        1 = Added           NUMBER
        2 = Removed
      888 = (Refused)
      999 = (Don't Know)

IL050.  &IL050             &IL050N    Mercury Vapor
IL051.  &IL051             &IL051N    Quartz
IL052.  &IL052             &IL052N    Reflectors (w/ Delamping)
IL053.  &IL053             &IL053N    Electronic Ballasts
IL054.  &IL054             &IL054N    Magnetic Ballasts
IL055.  &IL055             &IL055N    LED Exit Lighting
IL056.  &IL056             &IL056N    Watt Saver/Power Choke Devices
IL057.  &IL057             &IL057N    Other  SPECIFY:
                                             IL058. &IL058________________

Name: &NAME______________________  Screen: &S_   Last: &P_  QC: &QC__

ALL:

FI005.  Does the PG&E account &ACCOUNT__ located at the service
        &ADDRESS___________________________________   cover
        multiple buildings or does it cover only one building?
        &FI005 1 = One Building --> SKIP TO FI020
               2 = Multiple Buildings
               3 = Portion of a building
               8 = (Refused)--> SKIP TO FI020
               9 = (Don't Know)--> SKIP TO FI020


FI007. Are there multiple PG&E accounts for this address?
       &FI007  1 = Yes
               0 = No
               8 = (Refused)
               9 = (Don't Know)

FI010.  How many buildings are covered under this service address?
        &FI010  #  buildings           888 = (Refused)
                                       999 = (Don't Know)

IF FI010 = 1 or REF/DK SKIP FI025:

FI015.  Are there separate PG&E bills for the individual buildings?
        &FI015  1 = Yes
                0 = No
                8 = (Refused)
                9 = (Don't Know)

FI020.  Do any other firms occupy space in the building?
        &FI020  1 = Yes
```

0 = No --> SKIP TO FI040
8 = (Refused) --> SKIP TO FI040
9 = (Don't Know) --> SKIP TO FI040

FI025. How many other firms occupy space in the building?
&FI025 Number of firms 888 = (Refused)
999 = (Don't Know)

FI040. Which of the following descriptions best characterizes your firm's organizational structure?
&FI040
1 = Chain or multifacility (owned or managed by a parent corporation operating other locations)
2 = Franchise (owns a branch or subsidiary) --> SKIP TO FI050
3 = Independent-->SKIP TO FI050
8 = (Refused) --> SKIP TO FI050
9 = (Don't Know) --> SKIP TO FI050

FI045. What is the name of your parent company?
&FI045____

FI050. What is the legal tax status of your firm, that is what is your tax status for federal tax reporting purposes?
&FI050
1 = Proprietary or investor-owned, (i.e. a for-profit organization)
2 = Public: federal, state or municipal agency
3 = 501(c3): Private, nonprofit
8 = (Refused)
9 = (Don't Know)

DECISION MAKER:

FI060. Where are decisions regarding energy-related investments for &BUSINESS___________________ made?
&FI060
1 = Made locally, on site
2 = Made at regional head office
3 = Made at national head office
4 = Made at international head office
5 = Made by PM firm/building owner
6 = Other FI062.
Specify: &FI062_______________________________
8 = (Refused)
9 = (Don't Know)

EI010. Approximately how many people are currently employed at the facility, including both full- and part-time employees?
&EI010 Number of Employees 888 = (Refused)
999 = (Don't Know)

EI020. Since January 1992, has the number of people employed at this facility changed?
&EI020 1 = Yes
0 = No--->SKIP TO FI080
8 = (Refused)--->SKIP TO FI080
9 = (Don't Know)--->SKIP TO FI080

EI030. In what month and year did this change in the number of employees occur? (ENTER MONTH/YEAR)
&EI030___ MONYYYY

IF DON'T KNOW ASK FOR BEST GUESS OR YEAR:
EI031. &EI031__ YYYY 8 = (Refused) 9 = (Don't Know)

EI040. Approximately how many people were employed at this facility before the change occurred, including both full and part-time employees?
&EI040 Number of Employees

777 = Seasonal Workforce --> ENTER COMMENTS BELOW
888 = (Refused)
999 = (Don't Know)
&EI041____
&EI042____
&EI043____
ENTER 1 TO SKIP FORWARD --> &SKIP

IF LEASE=1 THEN ASK; ELSE SKIP TO EI010: LEASE = &L

FI080. Do the tenants at &ADDRESS________________ pay all, none, or a portion of their electric utilities through their lease?
&FI080
1 = ALL utilities INCLUDED in lease --> SKIP TO FI110
2 = Pay some utilities through lease and others directly to PG&E
3 = Pays ALL utilities directly to PG&E--> SKIP FI110
8 = (Refused) --> SKIP FI110
9 = (Don't Know) --> SKIP FI110

IF (LEASE=1 AND FI080 = 2): LEASE = &L FI080 = &FI080

FI090- FI100. Which of the following utilities are paid for through the lease? (ENTER '1' FOR ALL THAT APPLY)

8 = (Refused)
9 = (Don't Know)

&FI090 Indoor Lighting	&FI095 Outdoor Lighting
&FI091 Heating	&FI096 Cooling
&FI092 Ventilation	&FI097 Water Heating
&FI093 Electricity to Wall Outlets	&FI098 Refrigeration
&FI094 Cooking	&FI099 Other SPECIFY:
	&FI100__________________

FI120. Is this the current tenant's first lease at this address?
&FI120 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

IS001. Do you have a lighting contractor that you regularly use/rely on?
&IS001 1 = Yes

0 = No SKIP --> SKIP AW005
8 = (Refused) --> SKIP AW005
9 = (Don't Know) --> SKIP AW005

IS002. Did the contractor that you use/rely on tell you about the Retrofit Lighting Program?
&IS002 1 = Yes   8 = (Refused)
0 = No   9 = (Don't Know)

AW005. Have you heard of PG&E's Customized Lighting or Retrofit Express Express Programs?
&AW005 1 = Yes
0 = No -->SKIP TO PP010
8 = (Refused) -->SKIP TO PP010
9 = (Don't Know) -->SKIP TO PP010

AW010. When did you first become aware of PG&E's Customized Incentives or Retrofit Express Programs?
&AW010 MONYYYY (i.e. JUN1960)

IF DON'T KNOW MONTH AND YEAR, ASK FOR BEST GUESS YEAR AND CODE BELOW:

&AW011 YYYY   8 = (Refused)
9 = (Don't Know)

ASK IF RETRO=1 AND AW011=REFUSED OR DON'T KNOW; ELSE SKIP TO IS010:
AW015. Did you find out about the Retrofit Express Program BEFORE or AFTER you made the decision to purchase your new lighting?
&AW015 1 = Before Purchase Decision
0 = After Purchase Decision
8 = (Refused)
9 = (Don't Know)

ASK IF IS002~=1; ELSE SKIP TO PP010:
IS010. How did you FIRST learn about the Retrofit Lighting Program
&IS010 (DO NOT READ)
CUSTOMER APPROACHED SOMEONE:
1 = Respondent approached vendor/contractor
2 = Respondent approached PG&E concerning another matter and found out about program
SOMEONE APPROACHED THE CUSTOMER:
3 = Contacted by PG&E account rep
4 = Contacted by lighting contractor
5 = Contacted by electrical contractor
6 = PG&E Brochure in mail
7 = Bill Insert
8 = Word of mouth from friends or co-workers within the organization
9 = Word of mouth from friends or other business people outside of company
10 = Television, Radio, Newspaper ad
11 = Other SPECIFY: IS020. &IS020___________________________
88 = (Refused)   99 = (Don't Know)

PP010. Has your firm participated in any PG&E sponsored energy conservation programs?
&PP010
1 = Yes
0 = No--->SKIP TO PD010/TR030
2 = Not aware of other programs--->SKIP TO PD010/TR030

8 = (Refused)--->SKIP TO PD010/TR030
9 = (Don't Know)--->SKIP TO PD010/TR030

PP020. In what year did you participate in the program(s)?
(ENTER YEAR)

&PP020__ YYYY   8 = (Refused)
9 = (Don't Know)

ASK IF RETRO=1; ELSE SKIP TO TR030:

PD010. When you were making your decision to purchase new lighting equipment, what was the most important factor in your decision to the new lighting? (READ CATEGORIES IF NECESSARY)
&PD010 1 = Acquiring the latest technology
2 = Saving money on electric bills
4 = Replacing old or broken equipment
6 = Improving the quality of light for employees and customers
7 = Helping to protect the environment
9 = Obtaining advice from another branch of your firm
10 = Obtaining advice from PG&E account rep
11 = Obtaining advice from contractors
12 = Other SPECIFY: PD011: &PD011___________________________
88 = (Refused)
99 = (Don't Know)

ASK IF RETRO=1, AND AWARE OF PROGRAM PRIOR TO RETROFIT:

FR100. Why did you choose to purchase your equipment outside of the program? (DO NOT READ LIST: ENTER 1 IF APPLIES, 0 IF NOT)
FR100. &FR100 Lack of money to invest in it.
FR101. &FR101 Payback/return on investment not attractive enough.
FR102. &FR102 Concerned that it might not save as much as claimed
FR103. &FR103 Didn't know enough about EE lighting before
FR104. &FR104 Didn't know where/how to obtain EE lighting.
FR105. &FR105 Hadn't had time.
FR106. &FR106 Concerned about light quality/brightness
FR107. &FR107 Tenants didn't want a change
FR108. &FR108 Decision made elsewhere
FR109. &FR109 Was planning to install when heard about program
FR110. &FR110 Program participation seemed like to much of a hassle
FR114. &FR114 Other1 SPECIFY: FR115 &FR115______________________
FR116. &FR116 (Refused)
FR117. &FR117 (Don't Know)

FR011. How many estimates or quotes did you obtain before purchasing your new equipment?
&FR011 Estimates   888 = (Refused)
999 = (Don't Know)

FR012. Did you obtain estimates for both high efficiency and standard efficiency lighting equipment?
&FR012 1 = Both standard and high efficiency
2 = Standard efficiency only
3 = High efficiency only
8 = (Refused)
9 = (Don't Know)

FR014. How many people were involved in the decision to install your new lighting?
&FR014 People 888 = (Refused)
999 = (Don't Know)

FR015. Were you the person who made the final decision?
&FR015
1 = Yes --> SKIP FR017
0 = No
8 = (Refused)--> SKIP FR017
9 = (Don't Know)--> SKIP FR017

FR016. What is the job title of the person who made the final decision?
&FR016________________________ Title

ASK IF LEASE=1 Lease= &L:

FI065. How active a role do tenants take in making equipment purchase decisions for the property at
&ADDRESS___________________________ ?
&FI065
1 = Very active: they are involved in every aspect of the purchase and you possess veto power
2 = Somewhat active: they approve all decisions
3 = Slight role: they have a voice but it's a single vote among many
4 = None
8 = (Refused)
9 = (Don't Know)

TR030. Would you consider a retrofit of your &TYPE__ lighting with T-8 high efficiency equipment if PG&E offered financing at 1 percentage point below the prime rate?
&TR030
1 = Yes--->SKIP TO TR070
0 = No
8 = (Refused)
9 = (Don't Know)

ASK IF TR030~=1:

TR040. What if the interest rate were 1.5 percentage points below the prime rate?
&TR040
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

TR050. What if PG&E offered a rebate of $15 per fixture, and financing at 1 percentage point below the prime rate?
&TR050
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

IF TR040=1 or TR050=1 THEN SKIP TO TR070

TR070. What you consider a retrofit of your current lighting with T-8 high-efficiency fluorescent fixtures if PG&E offered rebates of $15 per fixture, but conducted an on-site audit of the facility, and provided you with detailed engineering analyses and recommendations?
&TR070
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

FUTURE SERVICES:

PG&E is currently planning on offering some new services to its commercial and industrial customers...

PR020. Would you be interested in having PG&E operate or maintain the lighting equipment at the facility? (i.e. routine replacement of burned out bulbs)
&PR020
1 = Yes
0 = No
2 = Depends on price
8 = (Refused)
9 = (Don't Know)

PR040. Would you be interested in having all of the building's systems checked out to ensure proper operation and efficient use of energy? (i.e. building recommissioning)
&PR040 1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

PR060. Would you be interested in having PG&E help you with any future equipment selection?
&PR060
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

PR001- PR002. How frequently do you have contact with your PG&E account rep? (CODE NUMBER OF TIMES AND PERIOD IT IS IN)
&PR001 Times
&PR002 Time Period --> IF NOT 0 SKIP PR090
0 = Never
1 = Day
2 = Week
3 = Month
4 = Year
8 = (Refused)
9 = (Don't Know)

PR005. Does someone else in the firm have contact with your PG&E rep?
&PR005 1 = Yes
0 = No --> SKIP PR090

8 = (Refused)--> SKIP PR090
9 = (Don't Know)--> SKIP PR090

PR010- PR011. How often does this person have contact with your PG&E account rep?

&PR010 Times --> IF 0, 8, 9 SKIP PR090
&PR011 Time Period
0 = Never
1 = Day
2 = Week
3 = Month
4 = Year
8 = (Refused)
9 = (Don't Know)

PR015. What is the name, title, and phone number of this person?

&REPNAME____________________________ Name
&REPTITLE____________________________ Title
(&RAC) &RPRE - &RLAST Ext &REPEXT Phone

ENTER 1 TO SKIP FORWARD ===> &SKIP

PR090. Are there any additional services you would like to see PG&E provide?

(ENTER 1 FOR ALL THAT APPLY)
8 = (Refused)
9 = (Don't Know)
&PR090 other SPECIFY: &PR091________________________________
&PR092 other SPECIFY: &PR093________________________________
&PR094 other SPECIFY: &PR095________________________________

ENTER 1 TO SKIP FORWARD ===> &SKIP

DC010. Which of the following financial criteria do you consider when evaluating lighting investments?

(READ LIST; ENTER 1 FOR ALL THAT APPLY; ELSE ENTER 0)
8 = (Refused)
9 = (Don't Know)

DC010. &DC010 Payback
DC011. &DC011 Internal Rate of Return
DC012. &DC012 Net Present Value
DC013. &DC013 Other SPECIFY: DC014. &DC014_______________________

IF DC010=1 THEN ASK DC020

DC020. What is the payback period you require?
&DC020
1 = 1 year or less
2 = 2 years or less
3 = 3 years or less
4 = 4 years or less
5 = 5 years or less
6 = 6 years or less
7 = 7 years or less
8 = 8 years or less
9 = 9 years or less
10 = 10 years or less
11 = Other SPECIFY: DC021. &DC021__________________________
88 = (Refused)
99 = (Don't Know)

IF DC011=1 THEN ASK DC030:

DC030. What is your organization's required internal rate of return?
&DC030 Percent 888 = (Refused)
999 = (Don't Know)

IF DC012=1 THEN ASK DC040:

DC040. What is the discount rate you use when determining the net present value of an investment?
&DC040 Percent 888 = (Refused)
999 = (Don't Know)

ASK ALL:

DC050. Do you use a different &CRITERIA_______________________ for evaluating energy efficient equipment purchases than you use for general investments?
&DC050 1 = Yes
0 = No --> SKIP BC021
8 = (Refused) --> SKIP BC021
9 = (Don't Know) --> SKIP BC021

ASK DC051 IF DC010=1 OR DC011=1 OR DC012=1; ELSE SKIP BC021:

DC051. Is the &CRITERI2_____________________________ you use for energy efficent purchases &TYPE1_________________ or &TYPE2__________________ than that which you use for other general investments?
&DC051
1 = Higher/Shorter
2 = Lower/Longer
8 = (Refused)
9 = (Don't Know)

BC021. Are any other locations of your business participating in the Customized Incentives or Retrofit Express Programs?
&BC021 1 = Yes 8 = (Refused)
0 = No 9 = (Don't Know)

BC022. How many of your other locations are participating in the Customized Incentives or Retrofit Express Programs?
&BC022 Locations 888 = (Refused)
999 = (Don't Know)

FUTURE PLANS:

FR070. Are you currently planning on making any lighting retrofits within the next two years?
&FR070
1 = Yes
0 = No --> SKIP PR020
8 = (Refused) --> SKIP PR020
9 = (Don't Know) --> SKIP PR020

FR075. Will the new lighting be high or standard efficiency?
&FR075
1 = High efficiency
0 = Standard efficiency
8 = (Refused)
9 = Don't Know)

FR077. Are you planning to make this change through one of PG&E's Retrofit programs?
&FR077
1 = Yes
0 = No
8 = (Refused)
9 = (Don't Know)

FR080. What type and how many fixtures are you planning to install?
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES TO BE CHANGED; IF NONE THEN ENTER 0)
888 = (Refused)   999 = (Don't Know)
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES TO BE ADDED)

FR080.	&FR080	4 Foot T8 fluorescent
FR081.	&FR081	8 Foot T8 fluorescent
FR082.	&FR082	4 Foot Energy saver fluorescent
FR083.	&FR083	8 Foot Energy saver fluorescent
FR084.	&FR084	4 Foot T12 fluorescent
FR085.	&FR085	8 Foot T12 fluorescent
FR086.	&FR086	Incandescent
FR087.	&FR087	Compact Fluorescent
FR088.	&FR088	High pressure sodium
FR089.	&FR089	Electronic Ballasts
FR090.	&FR090	Magnetic Ballasts
FR091.	&FR091	Metal Halide

CONTINUED ===> ENTER 1 TO SKIP ===> &SKIP

ENTER TYPE AND NUMBER OF FIXTURES PLANNING TO ADD:
IF NONE ENTER 0
888 = (Refused)
999 = (Don't Know)

FR092.	&FR092	Mercury Vapor
FR093.	&FR093	Quartz
FR094.	&FR094	Reflectors (w/Delamping)
FR095	&FR095	LED Exit Lighting
FR096	&FR096	Watt Saver/Power Choke Devices
FR097.	&FR097	Other SPECIFY: FR098. &FR098_____________________
FR099r.	&FR099R	(Refused)
FR099d.	&FR099D	(Don't Know)

ENTER 1 TO SKIP FORWARD ===> &SKIP

The following questions refer to your "FACILITY," which means ALL the buildings and tenants SERVICED BY PG&E UNDER THE FOLLOWING

```
    BILLING NAME: &BUSINESS____________  ADDRESS: &ADDRESS_______________
    ACCOUNT #: &ACCOUNT____________
BC011.  What is the main business ACTIVITY at the facility?
        &BC011
        1  =  Office                     88 = (Refused)
        2  =  Retail (non-food)          99 = (Don't Know)
        3  =  Manufacturing/Assembly
        4  =  Warehouse
        5  =  Restaurant
        6  =  Grocery Store
        7  =  School
        8  =  Hotel or Motel
        9  =  Hospital
        10 =  College/University
        11 =  Health Care
        12 =  Municipality
        13 =  Industrial Process
        14 =  Other  SPECIFY: BC012 &BC012_________________________

FC110.  Since January 1992, has the square footage covered by
        account # &ACCOUNT___________ increased, decreased, or
        stayed the same?
        &FC110  1 = Increased floor space
                2 = Decreased floor space
                3 = Stayed the same-->SKIP TO FR033
                8 = (Refused)-->SKIP TO FR033
                9 = (Don't Know)-->SKIP TO FR033

FC120.  What is the approximate area, in square feet, of this
        change?
        &FC120   Square Feet       8 = (Refused)
                                   9 = (Don't Know)

FC130.  In what month and year did this change in floor space occur?
        (ENTER MONTH/YEAR)
        &FC130__   MONYYYY

        IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR:
FC131.  &FC131     YYYY  (8 = Refused 9 = Don't Know)


IF FC110=1; ELSE SKIP TO BH010

FC140.  In what month and year was this additional floor space occupied?
        (ENTER MONTH/YEAR)
        &FC140__   MONYYYY

        IF DOESN'T KNOW, ASK FOR BEST GUESS, AND/OR YEAR:
FC141.  &FC141     YYYY (8 = Refused 9 = Don't Know)

ASK WHERE FC110 IS NOT 1:

FR033.  When was your last major space remodel?
        (ENTER MONTH/YEAR)
        &FR033__  MONYYYY    (e.g. JUN1960)
```

IF DON'T KNOW ASK FOR BEST GUESS AND/OR YEAR:

FR034. &FR034 YYYY 7 = Never Remodeled
8 = (Refused)
9 = (Don't Know)

IF 7, 8, or 9 THEN --> SKIP BH010/IL001:

FR035. Did this remodel include space covered by the retrofit?
&FR035 1 = Yes --> SKIP LF001/IL001
0 = No --> SKIP LF001/IL001
8 = (Refused) --> SKIP LF001/IL001
9 = (Don't Know) --> SKIP LF001/IL001

LF001- LF013. Could you please tell me the facility's &HOUR__________________ hours during the following times, and what percentage of the facility's lights are on at these times?
66 = On 24 Hours 888 = (Refused)
77 = Never On 999 = (Don't Know)

	Month	Day	Code	Same As	From	AM/PM	To	AM/PM	% ON
LF001.	DECEMBER	WEEK	&LF1_	&E1_	&LF1F_	&LF1M_	&LF1T_	&LF1N_	&LW1_
LF002.	DECEMBER	SAT	&LF2_	&E2_	&LF2F_	&LF2M_	&LF2T_	&LF2N_	&LW2_
LF003.	DECEMBER	SUN	&LF3_	&E3_	&LF3F_	&LF3M_	&LF3T_	&LF3N_	&LW3_
LF004.	APRIL	WEEK	&LF4_	&E4_	&LF4F_	&LF4M_	&LF4T_	&LF4N_	&LW4_
LF005.	APRIL	SAT	&LF5_	&E5_	&LF5F_	&LF5M_	&LF5T_	&LF5N_	&LW5_
LF006.	APRIL	SUN	&LF6_	&E6_	&LF6F_	&LF6M_	&LF6T_	&LF6N_	&LW6_
LF007.	AUGUST	WEEK	&LF7_	&E7_	&LF7F_	&LF7M_	&LF7T_	&LF7N_	&LW7_
LF008.	AUGUST	SAT	&LF8_	&E8_	&LF8F_	&LF8M_	&LF8T_	&LF8N_	&LW8_
LF009.	AUGUST	SUN	&LF9_	&E9_	&LF9F_	&LF9M_	&LF9T_	&LF9N_	&LW9_
LF010.	OCTOBER	WEEK	&LF10	&E10	&LF10F	&LF10M	&LF10T	&LF10N	&LW10
LF011.	OCTOBER	SAT	&LF11	&E11	&LF11F	&LF11M	&LF11T	&LF11N	&LW11
LF012.	OCTOBER	SUN	&LF12	&E12	&LF12F	&LF12M	&LF12T	&LF12N	&LW12
LF013.	HOLIDAY	ALL	&LF13	&E13	&LF13F	&LF13M	&LF13T	&LF13N	&LW13

The next questions refer to the facility's conditioned floor space. That is, the areas of the facility that are heated or cooled.

LF015. What percentage of the facility's conditioned floor space is lighted during business hours?
&LF015 Percent 888 = (Refused)
999 = (Don't Know)

Now, I'd like to ask about the type of lighting equipment at your facility before you changed your lighting.

SR010. What was the average age of the lighting fixtures you replaced?
&SR010 Years 888 = (Refused)
999 = (Don't Know)

SR100. What is the average age of the existing lighting equipment at your facility?
&SR100 Years 888 = (Refused)
999 = (Don't Know)

ASK WHERE RETRO = 1; ELSE SKIP TO OL010:

LP010. Has any of the lighting equipment that was installed been removed?
&LP010 1 = Yes
0 = No--->SKIP TO OL010
8 = (Refused)--->SKIP TO OL010
9 = (Don't Know)--->SKIP TO OL010

LP020. In what months and years did you make these changes?

(ENTER MONTH/YEAR)
&LP020__ MONYYYY
LP021. &LP021 YYYY 8 = Refused 9 = Don't Know

SECOND MONTH AND YEAR: (ENTER MONTH/YEAR)
&LP025__ MONYYYY
LP026. &LP026 YYYY 8 = Refused 9 = Don't Know

ENTER 1 TO SKIP FORWARD ===> &SKIP

LP030. What type and how many fixtures were removed?
(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES REMOVED, IF NONE THEN 0)

888 = (Refused)
999 = (Don't Know)

	NUMBER	
LP030.	&LP030	4 Foot T8 fluorescent
LP031.	&LP031	8 Foot T8 fluorescent
LP032.	&LP032	4 Foot Energy saver fluorescent
LP033.	&LP033	8 Foot Energy saver fluorescent
LP034.	&LP034	4 Foot T12 fluorescent
LP035.	&LP035	8 Foot T12 fluorescent
LP036.	&LP036	Incandescent
LP037.	&LP037	Compact Fluorescent
LP038.	&LP038	High pressure sodium
LP039.	&LP039	Metal Halide

CONTINUED, ENTER 1 TO SKIP FORWARD ===> &SKIP

ENTER NUMBER OF FIXTURES REMOVED, IF NONE THEN 0

888 = (Refused)
999 = (Don't Know)

	NUMBER	
LP040.	&LP040	Mercury Vapor
LP041.	&LP041	Quartz
LP042.	&LP042	Reflectors (w/Delamping)
LP043.	&LP043	Electronic Ballasts
LP044.	&LP044	Magnetic Ballasts
LP045	&LP045	LED Exit Lighting
LP046	&LP046	Watt Saver/Power Choke Devices
LP047.	&LP047	Other SPECIFY: LP048 &LP048______________

ENTER 1 TO SKIP FORWARD ===> &SKIP

LP070. What type and how many fixtures replaced the equipment that was removed? 888 = (Refused)
999 = (Don't Know)

(READ LIST IF NECESSARY; ENTER NUMBER OF FIXTURES ADDED)

LP070. &LP070 4 Foot T8 fluorescent
LP071. &LP071 8 Foot T8 fluorescent
LP072. &LP072 4 Foot Energy saver fluorescent
LP073. &LP073 8 Foot Energy saver fluorescent
LP074. &LP074 4 Foot T12 fluorescent
LP075. &LP075 8 Foot T12 fluorescent
LP076. &LP076 Incandescent
LP077. &LP077 Compact Fluorescent
LP078. &LP078 High pressure sodium
LP079. &LP079 Electronic Ballasts
LP080. &LP080 Magnetic Ballasts
LP081. &LP081 Metal Halide

CONTINUED, ENTER 1 TO SKIP FORWARD ==> &SKIP

ENTER TYPE AND NUMBER OD FIXTURE WHICH REPLACED THOSE REMOVED

0 = NONE OF THAT TYPE
888 = (Refused)
999 = (Don't Know)

NUMBER

LP082. &LP082 Mercury Vapor
LP083. &LP083 Quartz
LP084. &LP084 Reflectors (W/ Delamping)
LP085 &LP085 LED Exit Lighting
LP086 &LP086 Watt Saver/Power Choke Devices
LP087. &LP087 Other SPECIFY: LP088. &LP088____________________

ENTER 1 TO SKIP FORWARD ===> &SKIP

OL010. Is OUTDOOR lighting included on the facility's utility bill?
&OL010
1 = Yes
0 = No--->SKIP TO CE010
8 = (Refused)--->SKIP TO CE010
9 = (Don't Know)--->SKIP TO CE010

OL020. Since January 1992, have you made any changes in OUTDOOR lighting at your facility?
&OL020
1 = Yes
0 = No--->SKIP TO CE010
8 = (Refused)--->SKIP TO CE010
9 = (Don't Know)--->SKIP TO CE010

OL030. In what month and year did you make these changes?
(ENTER MONTH/YEAR)
&OL030__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR:
OL031. &OL031 YYYY 8 = (Refused)
9 = (Don't Know)

OL040. Did you ADD TO, REPLACE, or REMOVE outdoor lighting?
&OL040
1 = Added lighting

2 = Replaced lighting
3 = Added AND Replaced lighting
4 = Removed
8 = (Refused)
9 = (Don't Know)

COOLING EQUIPMENT:

The next series of questions pertain to the cooling equipment at the facility.

CE010. What type of system is used to air condition this facility? [If there is more than one system, enter the one used to cool the largest portion of this facility.]
&CE010
0 = No A/C--->SKIP TO CE080
1 = Central plant
2 = Small Packaged Systems (i.e. Rooftop or Ground)
3 = Wall or window units
4 = Heat pump
5 = Other SPECIFY: CE011 &CE011________________________
8 = (Refused)
9 = (Don't Know)

CE015. What is the primary fuel used to cool your facility?
&CE015
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE016. &CE016________________________
8 = (Refused)
9 = (Don't Know)

CE060. During what months is the cooling system operated?
(READ LIST IF NECESSARY; ENTER NUMBER 1 FOR ALL THAT APPLY)
CE059. &CE059 All Year --> SKIP CE080
CE060. &CE060 January
CE061. &CE061 February
CE062. &CE062 March
CE063. &CE063 April
CE064. &CE064 May
CE065. &CE065 June
CE066. &CE066 July
CE067. &CE067 August
CE068. &CE068 September
CE069. &CE069 October
CE070. &CE070 November
CE071. &CE071 December
CE072. &CE072 (Refused)
CE073. &CE073 (Don't Know)

TO SKIP FORWARD ENTER 1: ===> &SKIP

CE080. Since January 1992, have you ADDED TO, REMOVED, or REPLACED an older cooling system?

&CE080 0 = No Change-->SKIP TO HE015
1 = Added
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)-->SKIP TO HE015
9 = (Don't Know)-->SKIP TO HE015

CE090. In what month and year did you make these changes? (ENTER MONTH/YEAR)

&CE090__ MONYYYY (i.e. JUN1960)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

CE091. &CE091 YYYY (8 = Refused 9 = Don't Know)

IF CE080=1 THEN SKIP TO CE120; ELSE ASK:

CE110. What fuel was used to power the old system?

&CE110
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE111. &CE111_________________________
8 = (Refused)
9 = (Don't Know)

IF CE080 = 4 THEN SKIP TO HE015

CE120. What fuel does the cooling system addition use?

&CE120
1 = Electricity
2 = Natural Gas
3 = Other SPECIFY: CE121. &CE121___________________________
8 = (Refused)
9 = (Don't Know)

HEATING EQUIPMENT:

HE015. What is the main type of heating system used to heat your facility?

&HE015
1 = Central electric furnace
2 = Central heat pump
3 = Central gas furnace
4 = Gas boiler
5 = Electric boiler
6 = Fuel oil furnace or boiler
7 = Electric strip heat
8 = Baseboard electric heating
9 = Room or wall AC with electric strip heat
10 = Permanent, non-electric room heaters
11 = Whole-house wall or floor electric furnace
12 = Whole-house wall or floor gas furnace
13 = Portable electric heater
14 = Portable kerosene heater
15 = Wood or coal burning stove or fireplace
16 = Solar collector
17 = Propane heating system
18 = Other HE016. &HE016_________________________________
19 = None
88 = (Refused)
99 = (Don't Know)

HE020. What is the primary fuel used to heat your facility?

&HE020

1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: HE021 &HE021____________________________
8 = (Refused)
9 = (Don't Know)

HE060. During what months is the heating system operated?
(READ LIST IF NECESSARY; ENTER NUMBER 1 FOR ALL THAT APPLY)
HE059. &HE059 All Year ---> SKIP HE080
HE060. &HE060 January
HE061. &HE061 February
HE062. &HE062 March
HE063. &HE063 April
HE064. &HE064 May
HE065. &HE065 June
HE066. &HE066 July
HE067. &HE067 August
HE068. &HE068 September
HE069. &HE069 October
HE070. &HE070 November
HE071. &HE071 December
HE072. &HE072 (Refused)
HE073. &HE073 (Don't Know)

TO SKIP FORWARD ENTER 1: ==> &SKIP

HE080. Since January 1992, have you ADDED TO, REPLACED, or REMOVED an older heating system?
&HE080 0 = No Change-->SKIP TO OE010
1 = Added
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)-->SKIP TO OE010
9 = (Don't Know)-->SKIP TO OE010

HE090. In what month and year did you make these changes?
(ENTER MONTH/YEAR)
&HE090__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
HE091. &HE091 YYYY (8 = Refused 9 = Don t Know)

IF HE080=1 THEN SKIP TO HE120, ELSE ASK:

HE110. What fuel was used to power the old system?
&HE110
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Steam
5 = Electricity
6 = Other SPECIFY: HE111. &HE111____________________________
8 = (Refused)
9 = (Don't Know)

IF HE080 = 4 THEN SKIP TO OE010:

HE120. What fuel does the heating system addition use?
&HE120
1 = Natural Gas
2 = Propane or Bottled Gas

3 = Oil
4 = Electricity
5 = Other SPECIFY: HE121. &HE121____________________________
8 = (Refused)
9 = (Don't Know)

OTHER EQUIPMENT:

OE010. Since January 1992, have you changed other equipment that makes up 10% or more of the facility's annual electric bill?
&OE010
1 = Yes
0 = No-->SKIP TO OC010
8 = (Refused)-->SKIP TO OC010
9 = (Don't Know)-->SKIP TO OC010

OE011. Which of the following types of equipment were changed?
(READ FIRST THREE THEN ASK FOR OTHER)
(READ LIST; ENTER 1 FOR ALL THAT APPLY)

OE012. &OE012 Water heating
OE013. &OE013 Cooking
OE014. &OE014 Refrigeration

Were there any other end uses changed? (RECORD BELOW)
OE015. &OE015 Other1 SPECIFY: OE016. &OE016______________________
OE017. &OE017 Other2 SPECIFY: OE018. &OE018______________________
OE019. &OE019 (Refused) ---> SKIP to OC010
OE011. &OE011 (Don't Know) ---> SKIP TO OC010

ASK OE020-OE050 IF OE012=1
OE020. In what month and year did you change your water heating equipment?
(ENTER MONTH/YEAR)
&OE020__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
OE021. &OE021 YYYY (8 = Refused 9 = Don't Know)

OE030. Did you ADD TO, REMOVE, or REPLACE water heating equipment?
&OE030 1 = Added -->SKIP TO OE050
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE060
9 = (Don't Know)--->SKIP TO OE060

OE040. What fuel was used to power the old water heating equipment?
&OE040
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE041. &OE041___________________________

8 = (Refused)
9 = (Don't Know)

IF OE030 = 4 THEN SKIP TO OE060:

OE050. What fuel does the water heating equipment addition use?
&OE050
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE051. &OE051___________________________
8 = (Refused)
9 = (Don't Know)

ASK OE060-OE090 IF OE013=1

OE060. In what month and year did you change your cooking equipment?
(ENTER MONYYYY)
&OE060__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
OE061. &OE061 YYYY (8 = Refused 9 = Don't Know)

OE070. Did you ADD TO, REMOVE, or REPLACE cooking equipment?
&OE070
1 = Added--->SKIP TO OE090
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE100
9 = (Don't Know)--->SKIP TO OE100

OE080. What fuel was used to power the old cooking equipment?
&OE080
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE081. &OE081___________________________
8 = (Refused)
9 = (Don't Know)

IF OE070 = 4 THEN SKIP TO OE100:

OE090. What fuel does the cooking equipment addition use?
&OE090
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE091. &OE091__________________________
8 = (Refused)
9 = (Don't Know)

ASK OE100-OE130 IF OE014=1

OE100. In what month and year did you change your refrigeration equipment?
(ENTER MONTH/YEAR)
&OE100__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
OE101. &OE101 YYYY (8 = Refused 9 = Don t Know)

OE110. Did you ADD TO, REMOVE, or REPLACE refrigeration equipment?
&OE110
1 = Added--->SKIP TO OE130

2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE140
9 = (Don't Know)--->SKIP TO OE140

OE120. What fuel was used to power the old refrigeration equipment?
&OE120
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE121. &OE121__________________________
8 = (Refused)
9 = (Don't Know)

IF OE110 = 4 THEN SKIP TO OE140

OE130. What fuel does the refrigeration equipment addition use?
&OE130
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE131. &OE131__________________________
8 = (Refused)
9 = (Don't Know)

ASK OE140-OE170 IF OE015=1
OE140. In what month and year did you change your &EQUIP__________
(ENTER MONTH/YEAR)
&OE140__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
OE141. &OE141 YYYY (8 = Refused 9 = Don't Know)

OE150. Did you ADD TO, REMOVE, or REPLACE &EQUIP2_______________
equipment?
&OE150
1 = Added--->SKIP TO OE170
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OE180
9 = (Don't Know)--->SKIP TO OE180

OE160. What fuel was used to power the old &EQUIP__________________
equipment?
&OE160
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE161. &OE161____________________________
8 = (Refused)
9 = (Don't Know)

IF OE150 = 4 THEN SKIP TO OE180
OE170. What fuel does the &EQUIP___________________ equipment
addition use?
&OE170

1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE171. &OE171___________________________
8 = (Refused)
9 = (Don't Know)

ASK OE180-OE210 IF OE017=1:

OE180. In what month and year did you change your &EQUIP___________________________________ equipment?
(ENTER MONTH/YEAR)
&OE180__ MONYYYY (JUN1960)

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OE181. &OE181 YYYY (8 = Refused 9 = Don't Know)

OE190. Did you ADD TO, REMOVE, or REPLACE &EQUIP2_______________ equipment?
&OE190
1 = Added--->SKIP TO OE202
2 = Replaced
3 = Added and Replaced
4 = Removed
8 = (Refused)--->SKIP TO OC010
9 = (Don't Know)--->SKIP TO OC010

OE200. What fuel was used to power the old &EQUIP________________ equipment?
&OE200
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE201. &OE201___________________________
8 = (Refused)
9 = (Don't Know)

IF OE190 = 4 THEN SKIP TO OC010

OE202. What fuel does the &EQUIP_______________ equipment addition use?
&OE202
1 = Natural Gas
2 = Propane or Bottled Gas
3 = Oil
4 = Electricity
5 = Other SPECIFY: OE203. &OE203__________________________
8 = (Refused)
9 = (Don't Know)

OC010. Since January 1992, have you made any other changes that would affect energy usage at this facility?
&OC010
1 = Yes
0 = No--->SKIP TO EM010
8 = (Refused)--->SKIP TO EM010
9 = (Don't Know)---> SKIP TO EM010

OC020. What type of changes were made?
&OC020____
&OC021____

OC030. In what month and year were these changes made?
(ENTER MONTH/YEAR)
&OC030__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR

OC031. &OC031 YYYY (8 = Refused 9 = Don't Know)

EM010. Do you have an in-house Energy Management System at this facility?
&EM010
1 = Yes
0 = No-->SKIP TO CP010
8 = (Refused)-->SKIP TO CP010
9 = (Don't Know)-->SKIP TO CP010

EM020. In what month and year was the Energy Management System installed?
(ENTER MONTH/YEAR)
&EM020__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
EM021. &EM021 YYYY 8 = (Refused)
9 = (Don't Know)

CP010. Do you have a cogeneration plant at this facility?
&CP010
1 = Yes
0 = No --> SKIP
8 = (Refused) --> SKIP
9 = (Don't Know) --> SKIP

CP020. In what month and year did the cogeneration plant begin operating?
(ENTER MONTH/YEAR)

&CP020__ MONYYYY

IF DOESN'T KNOW, ASK FOR BEST GUESS AND/OR YEAR
CP021. &CP021 YYYY (8 = Refused 9 = Don t Know)

Those are all of the questions I have for you at this time. Before
you go I'd like to get your job title.
USE JOB KEY TO CODE ALL:

1 = President/Owner	2 = Senior Manager
3 = Financial Manager	4 = Energy Manager
5 = Operations Manager	6 = Building Manager
7 = Other SPECIFY	

DECISION TITLE CF009. Job Title: &DTITLN
SPECIFY: &DTITLOTR____________
TECHNICAL TITLE CF010. Job Title: &TTITLN
SPECIFY: &TTITLOTR____________
LIGHTING TITLE CF011. Job Title: &LTITLN
SPECIFY: &LTITLOTR____________
==> &DIV_COD2 <== ==> &SERVCITY <== ==> &OSFLAG <== 1 = OK OS
0 = NO OS
TO SKIP TO ON-SITE RECRUITMENT ENTER 1: MEASTYP: &MEASTYP
TO SKIP TO COMMENT FIELDS ENTER 2: BUSTYP: &BUSTYP
TO SKIP FORWARD ENTER 1 OR 2 HERE ==> &SKIP

DE1. Do you have any additional comments at this time?
&DE1 1 = Yes 0 = No 8 = (Refused) 9 = (Don't Know)
&DECOMM1____
&DECOMM2____
&DECOMM3____
IF THERE ARE ANY COMMENTS ABOUT THE ANSWERS WITHIN THIS SURVEY
ENTER 1 HERE, THEN ENTER YOUR COMMENTS==> &COMM
&NOTE1____
&NOTE2____
&NOTE3____
&NOTE4____
&NOTE5____
&NOTE6____

IF THE RESPONDENT ASK FOR PG&E REP'S PHONE # ENTER 1, AND THEN REASON &REP
&NOTREP1____
&NOTREP2____

Those are all the questions I have for today. On behalf of Pacific Gas and Electric, thank you very much for your time and cooperation.

F4 TO FIRST SCREEN AND CODE RESULT

A subsample of customers who complete telephone surveys are being asked to participate in an additional on-site follow up visit. Your site has been selected for one of these follow up visits. These on-site visits provide additional data that is used to evaluate and verify the savings achieved by the new lighting equipment. Would you be interested in having one of our qualified technicians come and conduct an on-site inspection?

OS001. &OS001
1 = Respondent will continue
0 = Respondent will not continue

OS005. Are you the best person who can allow us access to physically inspect the retrofitted electrical equipment?
&OS005
1 = Yes --> SKIP TO 2nd CONTACT
0 = No
8 = (Refused)
9 = (Don't Know)

Who would be the best person who could allow us access to physically inspect the retrofitted electrical equipment?
READ CONTACTS, OR GET ADDITIONAL CONTACT INFO:

DECIS NAME: &DNAME____
DECIS TITLE: &DTITLF____
DECIS BUSINESS: &DBUSNAM____
DECIS PHONE: (&DAC_) &DPRE - &DLAST Ext: &DEXT

TECH NAME: &TNAME____
TECH TITLE: &TTITLF____
TECH BUSINESS: &TBUSNAM____
TECH PHONE: (&TAC_) &TPRE - &TLAST Ext: &TEXT

LIGHT NAME: &LNAME____
LIGHT TITLE: &LTITLF____
LIGHT BUSINESS: &LBUSNAM____
LIGHT PHONE: (&LAC_) &LPRE - &LLAST Ext: &LEXT

IF DECIS ENTER 1, ELSE IF TECH ENTER 2, ELSE IF LIGHT ENTER 3, ELSE IF NEW ON-SITE CONTACT ENTER 4: ===> &WHOOS

ENTER INFO FOR ON-SITE CONTACT:

OS NAME: &OSNAME____
OS BUSINESS: &OSBUSNAM____
OS PHONE: (&OSA) &OSP - &OSL Ext: &OSEXT
OS TITLE: &OSTITLN

1 = President/Owner
2 = Senior Manager
3 = Financial Manager
4 = Energy Manager
5 = Operations Manager
6 = Building Manager
7 = Other SPECIFY: &OSTILOTR_______________________

ENTER 1 TO SKIP FORWARD: ==> &SKIP

Who would be an additional person who can allow us access and be knowlegable about the electrical equipment at the facility?
READ CONTACT NAMES, IF NOT ONE OF THESE, GET ADDITIONAL CONTACT INFO:

DECIS NAME: &DNAME____
DECIS TITLE: &DTITLF____
DECIS BUSINESS: &DBUSNAM____
DECIS PHONE: (&DAC) &DPRE - &DLAST Ext: &DEXT

TECH NAME: &TNAME____
TECH TITLE: &TTITLF____
TECH BUSINESS: &TBUSNAM____
TECH PHONE: (&TAC) &TPRE - &TLAST Ext: &TEXT

LIGHT NAME: &LNAME____
LIGHT TITLE: &LTITLF____
LIGHT BUSINESS: &LBUSNAM____
LIGHT PHONE: (&LAC) &LPRE - &LLAST Ext: &LEXT

```
IF DECIS ENTER 1, ELSE IF TECH ENTER 2 , ELSE IF LIGHT ENTER 3
IF OTHER THAN THESE THEN ENTER 4 ===>  &WHOOS2


 GET SECONDARY ON-SITE CONTACT INFORMATION;

 SECOND CONTACT NAME      &OSNAM2_______________________________________
 SECOND CONTACT BUSINESS: &OSBUSNM2_____________________________________
 SECOND CONTACT PHONE:  ( &OA2 )  &OP2 - &OL2  EXT: &OSEXT2
 SECOND CONTACT TITLE:    &OSTITN2
                          1 = President/Owner
                          2 = Senior Manager
                          3 = Financial Manager
                          4 = Energy Manager
                          5 = Operations Manager
                          6 = Building Manager
                          7 = Other SPECIFY: &OSTIL2OT_________________


 COMMENTS:  &OSCOM21_________________________________________________
 COMMENTS:  &OSCOM22_________________________________________________

 ENTER 1 TO SKIP FORWARD ==> &SKIP

 IF YOU WISH TO SCHEDULE AN APPOINTMENT WITH THE PERSON ON THE PHONE
 ENTER 1, ELSE READ BELOW THEN ENTER 2 AND CODE OS RESULT;

 ===> &SKIP

 Those are all of the questions I have for you at this time.
 I will contact &OSNAME________________________  to schedule
 the on-site audit.  On behalf of PG&E, thank you for your time
 and cooperation.

 At this time, we would like to schedule an appointment for one of
 our our representatives to meet with you at your facility to
 conduct the survey and inspect the building's new lighting
 equipment.


 OS020.  Can we schedule a time now for one of our representatives
         to meet with you at your facility?
         &OS020     1 = Yes --> SKIP OS030
                    0 = No
                    8 = (Refused)
                    9 = (Don't Know)
```

OS045. What is the closest cross street to the facility at
&ADDRESS________________________________ ?

Cross Street: &XSTREET____________________________________

ENTER 1 TO SKIP FORWARD: &SKIP

```
ENTER DAY:  &VISDAY___                DISTRICT: &DIV_COD2
ENTER DATE: &VISDAT2__                BUSTYPE:  &BUSTYPE____________
ENTER START TIME: &VISTIM1      WHO:  1 = Kevin Shovah  CODE: &MAILV____
END TIME:         &VISTIM2            2 = Joe O'Mally
ENTER WHO:  &VISWHO                   3 = Paul William
IS THE INFORMATION CORRECT  &CORR     4 = Denis Ley
USE 24HR CLOCK!!!!          1 = Yes   5 = Chuck Bennett
                            0 = No
```

I'll give you the following 800 number, should you need to reschedule or cancel the appointment. The number is 1-800-540-7201.
If at the time of the audit, you could have a recent PG&E bill available for the auditor, it would be very helpful.

DO NOT READ
Did the customer ask us to provide a Certificate of Insurance, or Proof of Insurance?
&INSURE 1 = Yes 0 = No

Did the customer have any concerns about sensitive issues or processes at their facility?
&TIPTOE 1 = Yes 0 = No

Let me just confirm this information with you:

```
    YOUR NAME IS:     &NEWNAME2___________________________________
    AT:               &NEWBUS2____________________________________
    YOUR TITLE IS:    &NEWTITL2___________________________________
    YOUR ADDRESS IS:  &NEWADD2____________________________________
    YOUR PHONE NUMBER IS:  ( &N1_ ) &N2_ - &N3__  EXTENSION: &NEXT
```

OS050. Is this information correct?
&OS050 1 = Yes 0 = No 8 = (Refused) 9 = (Don't Know)

CORRECTED INFO: ENTER ALL INFORMATION

```
    NAME:       &NEWNAME5_______________________________________
    BUSINESS:   &NEWBUS5________________________________________
    ADDRESS:    &NEWADD5________________________________________
    PHONE:      ( &N51 )  &N52  -  &N53_ EXT:  &NEXT5
    TITLE:      &NEWTITN5   SPECIFY: &NEWTIOTR__________________
```

1 = President/Owner 2 = Senior Manager 3 = Financial Manager
4 = Energy Manager 5 = Operations Manager 6 = Building Manager
7 = Other SPECIFY

Thank you very much. I will contact &NEWNAME3__________________ .
On behalf of Pacific Gas and Electric, thank you for your time today.
GO TO SC150 AND CODE RESULT: ALWAYS ENTER '1': &SKIP

Appendix F

FINAL PARTICIPANTS ON-SITE INSTRUMENT

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***OVERALL FACILITY CHARACTERISTICS*** Sheet 1 of __

Is this a logger site? __*<Yes/No>*____ **Inspector:** _____________________________
Appointment date: __<Sched. Date>__ **Appointment Time:** ___*<Sched. Time>*___
Company name: ___*<Co. Name>*___ **On-Site Date**___________________________
Company Address: ___*<Add & Num>*___
City and Zip: ___*<City & Zip>*___
Contact name: __*<Sched. Contact>*__ **Contact title:** ___________________________
Contact phone no: __*<Sched. Phone No.>*___
Alternate Contact: __*<Sched. Contact2>*__ **Alternate title:** __________________________
Alternate phone no: __*<Sched. Phone No.2>*__
Actual Contact: _______________ **Actual title:** ____________________________
Actual phone no: ____________________
Facility function description: __*<Bustype>*__ **Facility function update:** __**PD#1-1**_____
PG&E account no.: __*<Acc. No.>*__ **Verify account no.:** ___**PD#1-2**_________
PG&E control no.: __*<Cntrl No.>*__ **Verify control no.:** ___**PD#1-3**_________
No. PG&E accounts for retrofit area?: __*<No. Accts>*__ **Verify no. accnts:** ___**PD#1-4**____
PG&E cntrl 1: ______________ **PG&E cntrl 2:** _______________ **PG&E cntrl 3:** _______________
%Retro cntrl 1: _**PD#1-5**_ **%Retro cntrl 2:** _**PD#1-6**_ **%Retro cntrl 3:** _**PD#1-7**_

S.I.C. Code: __*<SIC>*__ **Verify SIC:** __**PD#1-8**__
No. of stories: _____ **Year built** ______ **Total sq. ft.:** _______ **No. of people @ 4:00 PM:** ___
Sq. ft. heated: ____________ **Sq. ft. air cond:** _________ **Sq. ft. of Retrofit:** _________
Is retrofitted area heated? __**PD#1-9**__ **Is retrofitted area air conditioned?** __**PD#1-10**_
Primary function of retro. area: __**PD#1-11**__ **% of all lights retrofitted:** _**PD#1-12**_

Heating fuel: __**PD#1-13**__ **Heating system type:** ___**PD#1-14**_________
Cooling fuel: __**PD#1-15**__ **Cooling system type:** ___**PD#1-16**_________
% of retrofit on outer 15' perimeter: __**PD#1-17**__ **Economizer?:** ___**PD#1-18**__

Does the facility replace all fluorescent lamps routinely (relamp)? __**PD#1-19**__
If yes, how often does complete relamping occur? __**PD#1-20**__ **(months)**
How often are burned out lamps replaced? __**PD#1-21**___

Comments? ____

UTD = Unable to determine.

On-site ID: _____ ***SCHEDULE GROUP WORKSHEET FORM*** Sheet 2 of __

Date: __**PD#2-1**__

Total tenant square footage: __**PD#2-2**__ **sq. ft.**

Group 2 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 2 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 2 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 2 Primary Use:** __**PD#2-12**__

Group 3 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 3 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 3 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 3 Primary Use:** __**PD#2-12**__

Group 4 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 4 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 4 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 4 Primary Use:** __**PD#2-12**__

Group 5 thru N Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 5 thru N Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 5 thru N Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 5 Primary Use:** __**PD#2-12**__

Group 1 -- "Exit Lights" on a Twenty-Four Hour per Day Schedule
Percent of Tenant Square Footage.: __**PD#2-10**__

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***RETENTION PANEL WORKSHEET FORM*** Sheet 3 of __

Date: __**PD#3-1**__

Building Plans Secured?: __**PD#3-2**__

 # Room Schd Use Area Count Count Count

Descr Grp <Techn Grp><Techn Grp><Techn Grp>

<Meas Desc><Meas Desc><Meas Desc>

<L??> <L??> <L??>

<No.> Install. <No.> Install. <No.>

Install.

1		*#3-3*	*#3-4*			
2		*#3-3*	*#3-4*			
3		*#3-3*	*#3-4*			
4		*#3-3*	*#3-4*			
5		*#3-3*	*#3-4*			
6		*#3-3*	*#3-4*			
7		*#3-3*	*#3-4*			
8		*#3-3*	*#3-4*			
9		*#3-3*	*#3-4*			
10		*#3-3*	*#3-4*			
11		*#3-3*	*#3-4*			
12		*#3-3*	*#3-4*			
13		*#3-3*	*#3-4*			
14		*#3-3*	*#3-4*			
15		*#3-3*	*#3-4*			
16		*#3-3*	*#3-4*			
17		*#3-3*	*#3-4*			
18		*#3-3*	*#3-4*			
19		*#3-3*	*#3-4*			
20		*#3-3*	*#3-4*			
21		*#3-3*	*#3-4*			
22		*#3-3*	*#3-4*			
23		*#3-3*	*#3-4*			
24		*#3-3*	*#3-4*			
25		*#3-3*	*#3-4*			
26		*#3-3*	*#3-4*			
27		*#3-3*	*#3-4*			

28 _______ *#3-3* *#3-4* ____________ ____________ ____________

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***NEW TECHNOLOGY INSPECTION SHEET*** Sheet __ of __

Technology Group __*<generic group>*_ **Measure Description:** __*<specific descr.>*__
Measure Code: ______*<L??>*_______ **No. Inst.:** __*<No.>*__ **Verified No.?:** _**PD#0**_
Watts per Fixture: ___*<watts new>*___ **Fixture Location:** _____*<location>*______
Location/Measure Notes: ____

Ballast Brand: ______**PD#1**_______ **Ballast Model #:** _______________________
Volts: _**PD#2**_ **Amps*:** _**PD#3**_ **Power Factor:** _**PD#4**_
Wiring: __**PD#5**__ **Ballast Notes:** __**PD#6**___
No. of Ballasts/ Fixture: ___**PD#7**___ **Dual Switching:** __**PD#8**__

Lamp Brand: _______**PD#9**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#10**__ **Watts per Lamp:** _**PD#11**_
Lamp Type: __**PD#12**__ **Lamp Notes:** __**PD#13___

Total Lamps Insp.: ___________ **Lamps On:** ___________ **Lamps Off:** ______________
No. of Lamps in Burned out Fixt's. _______ **No. of Burned out Lamps‡‡:** ______________

Instantaneous Load Meas. 1: _____ **No. of Fixtures 1:** ____ **Power Factor 1:** __**PD#4**__
Instantaneous Load Meas. 2: _____ **No. of Fixtures 2:** ____ **Power Factor 2:** __**PD#4**__
Instantaneous Load Meas. 3: _____ **No. of Fixtures 3:** ____ **Power Factor 3:** __**PD#4**__

% of <L??> in Schd. Group 1: __**PD#1-5**__ **% of <L??> in Schd. Group 2:** __**PD#1-5**__
% of <L??> in Schd. Group 3: __**PD#1-5**__ **% of <L??> in Schd. Grp 4 thru N:** _*PD#1-5*_

LOGID1: __**PD#20**__ **Primary Use Area:** __**PD#21**__ **Prim. Schd Grp:** _**PD#22**_
Date Initiated: __**PD#24**__ **Hour Initiated:** __**PD#25**__ **Occ. Sensor?:** __**PD#26**__
Logger placement Description: ___________________________ **Floor #:** __**PD#27**__

LOGID2 thru N: _**PD#20**_ **Prim Use Area:** _**PD#21**_ **Prim Schd Grp:** _**PD#22**_
Date Initiated: __**PD#24**__ **Hour Initiated:** __**PD#25**__ **Occ. Sensor?:** __**PD#26**__
Logger placement Description: ___________________________ **Floor #:** __**PD#27**__

Additional Comments: ____

*Line amps if stated, not 430 or 460 ma lamp current.

‡‡No. of burned out lamps must be counted separately and exclusive of burned out fixtures.

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***EXISTING TECHNOLOGY INSPECTION SHEET*** Sheet __ of __

Technology Group __**PD#E-1**_ **Measure Description:** __**PD#E-2**__
More Descr: ____________________ **Replaced?:** __**PD#E-3**__
Fixture Length: ___**PD#E-4**__
Location/Measure Notes: ____

Ballast Brand: ______**PD#E-5**_______ **Ballast Model #:** _______________________
Volts: _**PD#E-6**_ **Amps*:** _**PD#E-7**_ **Power Factor:** _**PD#E-8**_
Wiring: __**PD#E-9**__ **Ballast Notes:** __**PD#10**___
No. of Ballasts/ Fixture: ___**PD#E-11**___ **Dual Switching:** __**PD#E-12**__

Second. Ballast: ______**PD#E-5**_______ **Ballast Model #:** _______________________
Volts: _**PD#E-6**_ **Amps*:** _**PD#E-7**_ **Power Factor:** _**PD#E-8**_
Wiring: __**PD#E-9**__ **Ballast Notes:** __**PD#10**___
No. of Ballasts/ Fixture: ___**PD#E-11**___ **Dual Switching:** __**PD#E-12**__

Lamp Brand: _______**PD#E-13**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#E-14**__ **Watts per Lamp:** _**PD#E-15**_
Lamp Type: __**PD#E-16**__ **Lamp Notes:** ____**PD#E-17**__

Secondary Lamp: _______**PD#E-13**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#E-14**__ **Watts per Lamp:** _**PD#E-15**_
Lamp Type: __**PD#E-16**__ **Lamp Notes:** ___**PD#E-17**___

Total Lamps Insp.: ___________ **Lamps On:** ___________ **Lamps Off:** ______________
No. of Lamps in Burned out Fixt's. _______ **No. of Burned out Lamps‡‡:** ______________

Instantaneous Load Meas. 1: _____ **No. of Fixtures 1:** ____ **Power Factor 1:** __**PD#4**__
Instantaneous Load Meas. 2: _____ **No. of Fixtures 2:** ____ **Power Factor 2:** __**PD#4**__
Instantaneous Load Meas. 3: _____ **No. of Fixtures 3:** ____ **Power Factor 3:** __**PD#4**__

Additional Comments: ____

*****Line amps if stated, not 430 or 460 ma lamp current.

‡‡No. of burned out lamps must be counted separately and exclusive of burned out fixtures.

On-site ID: _____ **ADDITIONAL COMMENTS** Sheet __ of ___

Appendix G

FINAL NONPARTICIPANTS ON-SITE INSTRUMENT

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***OVERALL FACILITY CHARACTERISTICS*** Sheet 1 of __

Is this a logger site? __*<Yes/No>*____ **Inspector:** ______________________________

Appointment date: __<Sched. Date>__ **Appointment Time:** ___*<Sched. Time>*___

Company name: ___*<Co. Name>*___ **On-Site Date**___________________________

Company Address: ___*<Add & Num>*___

City and Zip: ___*<City & Zip>*___

Contact name: __*<Sched. Contact>*__ **Contact title:** ___________________________

Contact phone no: __*<Sched. Phone No.>*___

Alternate Contact: __*<Sched. Contact2>*__ **Alternate title:** __________________________

Alternate phone no: __*<Sched. Phone No.2>*__

Actual Contact: _______________ **Actual title:** ____________________________

Actual phone no: ____________________

Facility function description: __*<Bustype>*__ **Facility function update:** __**PD#1-1**_____

PG&E account no.: __*<Acc. No.>*__ **Verify account no.:** ___**PD#1-2**_________

PG&E control no.: __*<Cntrl No.>*__ **Verify control no.:** ___**PD#1-3**_________

No. PG&E accounts for retrofit area?: __*<No. Accts>*__ **Verify no. accnts:** ___**PD#1-4**____

PG&E cntrl 1: ______________ **PG&E cntrl 2:** _______________ **PG&E cntrl 3:** _______________

%Retro cntrl 1: _**PD#1-5**_ **%Retro cntrl 2:** _**PD#1-6**_ **%Retro cntrl 3:** _**PD#1-7**_

S.I.C. Code: __*<SIC>*__ **Verify SIC:** __**PD#1-8**__

No. of stories: _____ **Year built** ______ **Total sq. ft.:** _______ **No. of people @ 4:00 PM:** ___

Sq. ft. heated: ____________ **Sq. ft. air cond:** _________ **Sq. ft. of Retrofit:** _________

Is retrofitted area heated? __**PD#1-9**__ **Is retrofitted area air conditioned?** __**PD#1-10**_

Primary function of retro. area: __**PD#1-11**__ **% of all lights retrofitted:** _**PD#1-12**_

Heating fuel: __**PD#1-13**__ **Heating system type:** ___**PD#1-14**_________

Cooling fuel: __**PD#1-15**__ **Cooling system type:** ___**PD#1-16**_________

% of retrofit on outer 15' perimeter: __**PD#1-17**__ **Economizer?:** ___**PD#1-18**__

Does the facility replace all fluorescent lamps routinely (relamp)? __**PD#1-19**__

If yes, how often does complete relamping occur? __**PD#1-20**__ **(months)**

How often are burned out lamps replaced? __**PD#1-21**___

Comments? ____

UTD = Unable to determine.

On-site ID: _____ ***SCHEDULE GROUP WORKSHEET FORM***

Date: __**PD#2-1**__
Total tenant square footage: __**PD#2-2**__ **sq. ft.**

Group 2 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 2 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 2 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 2 Primary Use:** __**PD#2-12**__

Group 3 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 3 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 3 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 3 Primary Use:** __**PD#2-12**__

Group 4 Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 4 Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 4 Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 4 Primary Use:** __**PD#2-12**__

Group 5 thru N Weekday Lights Sched.: From __**PD#2-3**__ **to** __**PD#2-4**__
Group 5 thru N Saturday Lights Sched.: From __**PD#2-5**__ **to** __**PD#2-6**__
Group 5 thru N Sunday Lights Sched.: From __**PD#2-7**__ **to** __**PD#2-8**__
Percent of Tenant Square Footage.: __**PD#2-10**__
Percent Night or Safety Lights.: __**PD#2-11**__ **Group 5 Primary Use:** __**PD#2-12**__

Group 1 -- "Exit Lights" on a Twenty-Four Hour per Day Schedule
Percent of Tenant Square Footage.: __**PD#2-10**__

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***RETENTION PANEL WORKSHEET FORM*** Sheet 3 of __

Date: __**PD#3-1**__

Building Plans Secured?: __**PD#3-2**__

#	Room Schd Descr	Use Area Grp	Count	Count <Techn Grp> <Meas Desc> <L??> <No.> Install.	Count <Techn Grp> <Meas Desc> <L??> <No.> Install.	<Techn Grp> <Meas Desc> <L??> <No.> Install.
1	_______	*#3-3*	*#3-4*	____________	____________	____________
2	_______	*#3-3*	*#3-4*	____________	____________	____________
3	_______	*#3-3*	*#3-4*	____________	____________	____________
4	_______	*#3-3*	*#3-4*	____________	____________	____________
5	_______	*#3-3*	*#3-4*	____________	____________	____________
6	_______	*#3-3*	*#3-4*	____________	____________	____________
7	_______	*#3-3*	*#3-4*	____________	____________	____________
8	_______	*#3-3*	*#3-4*	____________	____________	____________
9	_______	*#3-3*	*#3-4*	____________	____________	____________
10	_______	*#3-3*	*#3-4*	____________	____________	____________
11	_______	*#3-3*	*#3-4*	____________	____________	____________
12	_______	*#3-3*	*#3-4*	____________	____________	____________
13	_______	*#3-3*	*#3-4*	____________	____________	____________
14	_______	*#3-3*	*#3-4*	____________	____________	____________
15	_______	*#3-3*	*#3-4*	____________	____________	____________
16	_______	*#3-3*	*#3-4*	____________	____________	____________
17	_______	*#3-3*	*#3-4*	____________	____________	____________
18	_______	*#3-3*	*#3-4*	____________	____________	____________
19	_______	*#3-3*	*#3-4*	____________	____________	____________
20	_______	*#3-3*	*#3-4*	____________	____________	____________
21	_______	*#3-3*	*#3-4*	____________	____________	____________
22	_______	*#3-3*	*#3-4*	____________	____________	____________
23	_______	*#3-3*	*#3-4*	____________	____________	____________
24	_______	*#3-3*	*#3-4*	____________	____________	____________
25	_______	*#3-3*	*#3-4*	____________	____________	____________
26	_______	*#3-3*	*#3-4*	____________	____________	____________
27	_______	*#3-3*	*#3-4*	____________	____________	____________

28 ______ *#3-3* *#3-4* ____________ ____________ ____________

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: _____ ***NEW TECHNOLOGY INSPECTION SHEET*** Sheet __ of __

Technology Group __*<generic group>*_ **Measure Description:** __*<specific descr.>*__
Measure Code: ______*<L??>*_______ **No. Inst.:** __*<No.>*__ **Verified No.?:** _**PD#0**_
Watts per Fixture: ___*<watts new>*___ **Fixture Location:** _____*<location>*______
Location/Measure Notes: ____

Ballast Brand: ______**PD#1**_______ **Ballast Model #:** _______________________
Volts: _**PD#2**_ **Amps*:** _**PD#3**_ **Power Factor:** _**PD#4**_
Wiring: __**PD#5**__ **Ballast Notes:** __**PD#6**___
No. of Ballasts/ Fixture: ___**PD#7**___ **Dual Switching:** __**PD#8**__

Lamp Brand: _______**PD#9**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#10**__ **Watts per Lamp:** _**PD#11**_
Lamp Type: __**PD#12**__ **Lamp Notes:** __**PD#13___

Total Lamps Insp.: ___________ **Lamps On:** ___________ **Lamps Off:** ______________
No. of Lamps in Burned out Fixt's. _______ **No. of Burned out Lamps‡‡:** ______________

Instantaneous Load Meas. 1: _____ **No. of Fixtures 1:** ____ **Power Factor 1:** __**PD#4**__
Instantaneous Load Meas. 2: _____ **No. of Fixtures 2:** ____ **Power Factor 2:** __**PD#4**__
Instantaneous Load Meas. 3: _____ **No. of Fixtures 3:** ____ **Power Factor 3:** __**PD#4**__

% of <L??> in Schd. Group 1: __**PD#1-5**__ **% of <L??> in Schd. Group 2:** __**PD#1-5**__
% of <L??> in Schd. Group 3: __**PD#1-5**__ **% of <L??> in Schd. Grp 4 thru N:** _*PD#1-5*_

LOGID1: __**PD#20**__ **Primary Use Area:** __**PD#21**__ **Prim. Schd Grp:** _**PD#22**_
Date Initiated: __**PD#24**__ **Hour Initiated:** __**PD#25**__ **Occ. Sensor?:** __**PD#26**__
Logger placement Description: ___________________________ **Floor #:** __**PD#27**__

LOGID2 thru N: _**PD#20**_ **Prim Use Area:** _**PD#21**_ **Prim Schd Grp:** _**PD#22**_
Date Initiated: __**PD#24**__ **Hour Initiated:** __**PD#25**__ **Occ. Sensor?:** __**PD#26**__
Logger placement Description: ___________________________ **Floor #:** __**PD#27**__

Additional Comments: ____

*Line amps if stated, not 430 or 460 ma lamp current.

‡‡No. of burned out lamps must be counted separately and exclusive of burned out fixtures.

PG&E COMMERCIAL AND INDUSTRIAL LIGHTING TECHNOLOGIES EVALUATION

On-site ID: ____ ***EXISTING TECHNOLOGY INSPECTION SHEET*** Sheet __ of __

Technology Group __**PD#E-1**_ **Measure Description:** __**PD#E-2**__
More Descr: ____________________ **Replaced?:** __**PD#E-3**__
Fixture Length: ___**PD#E-4**__
Location/Measure Notes: ____

Ballast Brand: ______**PD#E-5**_______ **Ballast Model #:** _______________________
Volts: _**PD#E-6**_ **Amps*:** _**PD#E-7**_ **Power Factor:** _**PD#E-8**_
Wiring: __**PD#E-9**__ **Ballast Notes:** __**PD#10**___
No. of Ballasts/ Fixture: ___**PD#E-11**___ **Dual Switching:** __**PD#E-12**__

Second. Ballast: ______**PD#E-5**_______ **Ballast Model #:** _______________________
Volts: _**PD#E-6**_ **Amps*:** _**PD#E-7**_ **Power Factor:** _**PD#E-8**_
Wiring: __**PD#E-9**__ **Ballast Notes:** __**PD#10**___
No. of Ballasts/ Fixture: ___**PD#E-11**___ **Dual Switching:** __**PD#E-12**__

Lamp Brand: _______**PD#E-13**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#E-14**__ **Watts per Lamp:** _**PD#E-15**_
Lamp Type: __**PD#E-16**__ **Lamp Notes:** ____**PD#E-17**__

Secondary Lamp: _______**PD#E-13**________ **Lamp Model #:** _______________________
Lamps Per Fixture: __**PD#E-14**__ **Watts per Lamp:** _**PD#E-15**_
Lamp Type: __**PD#E-16**__ **Lamp Notes:** ___**PD#E-17**___

Total Lamps Insp.: ___________ **Lamps On:** ___________ **Lamps Off:** ______________
No. of Lamps in Burned out Fixt's. _______ **No. of Burned out Lamps‡‡:** ______________

Instantaneous Load Meas. 1: _____ **No. of Fixtures 1:** ____ **Power Factor 1:** __**PD#4**__
Instantaneous Load Meas. 2: _____ **No. of Fixtures 2:** ____ **Power Factor 2:** __**PD#4**__
Instantaneous Load Meas. 3: _____ **No. of Fixtures 3:** ____ **Power Factor 3:** __**PD#4**__

Additional Comments: ____

*Line amps if stated, not 430 or 460 ma lamp current.

‡‡No. of burned out lamps must be counted separately and exclusive of burned out fixtures.

On-site ID: _____ ***ADDITIONAL COMMENTS*** Sheet __ of ___

Appendix H

PARTICIPANTS TELEPHONE SURVEY RESPONSE FREQUENCIES

audit OK?

MN001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	1	0.2	1	0.2
Yes	468	99.8	469	100.0

Frequency Missing = 10

Own building?/Decis

SC001D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	188	39.9	188	39.9
Yes	283	60.1	471	100.0

Frequency Missing = 8

Firm occupies space/Decis

FI001D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	13	4.3	13	4.3
Yes	291	95.7	304	100.0

Frequency Missing = 175

Firm manages prop/Decis

FI002D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	107	56.0	107	56.0
Yes	84	44.0	191	100.0

Frequency Missing = 288

Own building?/Tech

SC001T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	15	41.7	15	41.7
Yes	21	58.3	36	100.0

Frequency Missing = 443

Firm occupies space/Tech

FI001T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	1	4.8	1	4.8
Yes	20	95.2	21	100.0

Frequency Missing = 458

Firm manages prop/Tech

FI002T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	9	56.3	9	56.3
Yes	7	43.8	16	100.0

Frequency Missing = 463

Own building?/Light

SC001L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	2	25.0	2	25.0
Yes	6	75.0	8	100.0

Frequency Missing = 471

Firm occupies space/Light

FI001L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	6	100.0	6	100.0

Frequency Missing = 473

Firm manages prop/Light

FI002L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	3	100.0	3	100.0

Frequency Missing = 476

Is there a PM firm?

SC016	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	9	75.0	9	75.0
Yes	3	25.0	12	100.0

Frequency Missing = 467

Are you the sole occupant?

FI003	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	150	31.8	150	31.8
Yes	322	68.2	472	100.0

Frequency Missing = 7

Is any part of building leased?

FI004	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	35	17.5	35	17.5
Yes	165	82.5	200	100.0

Frequency Missing = 279

Is person decision maker

SC003	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	7	1.5	7	1.5
Yes	464	98.5	471	100.0

Frequency Missing = 8

Is person Tech person

SC005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	17	3.6	17	3.6
Yes	453	96.4	470	100.0

Frequency Missing = 9

Is person Light person

SC006	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	11	2.3	11	2.3
Yes	461	97.7	472	100.0

Frequency Missing = 7

Date of installation - Decision Maker

SC035	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JUL1993	13	2.8	13	2.8
AUG1993	8	1.7	21	4.6
SEP1993	10	2.2	31	6.8
OCT1993	11	2.4	42	9.2
NOV1993	12	2.6	54	11.8
DEC1993	32	7.0	86	18.7
JAN1994	23	5.0	109	23.7
FEB1994	31	6.8	140	30.5
MAR1994	17	3.7	157	34.2
APR1994	36	7.8	193	42.0
MAY1994	33	7.2	226	49.2
JUN1994	54	11.8	280	61.0
JUL1994	43	9.4	323	70.4
AUG1994	53	11.5	376	81.9
SEP1994	81	17.6	457	99.6
DEC1994	2	0.4	459	100.0

Frequency Missing = 20

Date of installation - Technical

SC037	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JUL1993	3	7.1	3	7.1
OCT1993	1	2.4	4	9.5
DEC1993	2	4.8	6	14.3
JAN1994	4	9.5	10	23.8
MAR1994	2	4.8	12	28.6
APR1994	3	7.1	15	35.7
MAY1994	4	9.5	19	45.2
JUN1994	6	14.3	25	59.5
JUL1994	4	9.5	29	69.0
AUG1994	8	19.0	37	88.1
SEP1994	5	11.9	42	100.0

Frequency Missing = 437

Date of installation - Lighting

SC039A	Frequency	Percent	Cumulative Frequency	Cumulative Percent
SEP1993	2	12.5	2	12.5
OCT1993	1	6.3	3	18.8
DEC1993	1	6.3	4	25.0
JAN1994	1	6.3	5	31.3
FEB1994	1	6.3	6	37.5
MAR1994	1	6.3	7	43.8
APR1994	1	6.3	8	50.0
MAY1994	1	6.3	9	56.3
JUN1994	2	12.5	11	68.8
JUL1994	1	6.3	12	75.0
AUG1994	1	6.3	13	81.3
SEP1994	3	18.8	16	100.0

Frequency Missing = 463

Single/Multiple/Portion of Building

FI005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
One building	325	73.7	325	73.7
Multiple bldng	101	22.9	426	96.6
Portion of a bldng	15	3.4	441	100.0

Frequency Missing = 38

Multiple accnts for addr?

FI007	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	63	53.4	63	53.4
Yes	55	46.6	118	100.0

Frequency Missing = 361

Num buildings covered by address

FI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	1.8	2	1.8
1	15	13.2	17	14.9
2	23	20.2	40	35.1
3	11	9.6	51	44.7
4	4	3.5	55	48.2
5	5	4.4	60	52.6
6	3	2.6	63	55.3
7	5	4.4	68	59.6
8	5	4.4	73	64.0
9	4	3.5	77	67.5
10	3	2.6	80	70.2
11	3	2.6	83	72.8
12	3	2.6	86	75.4
13	4	3.5	90	78.9
14	4	3.5	94	82.5
15	3	2.6	97	85.1
16	2	1.8	99	86.8
17	3	2.6	102	89.5
18	3	2.6	105	92.1
19	1	0.9	106	93.0
20	1	0.9	107	93.9
21	2	1.8	109	95.6
22	3	2.6	112	98.2
23	1	0.9	113	99.1
37	1	0.9	114	100.0

Frequency Missing = 365

Separate bills for buildings?

FI015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	85	85.9	85	85.9
Yes	14	14.1	99	100.0

Frequency Missing = 380

Number other firms in building

FI025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	298	67.3	298	67.3
0.1	1	0.2	299	67.5
1	48	10.8	347	78.3
2	26	5.9	373	84.2
3	10	2.3	383	86.5
4	10	2.3	393	88.7
5	10	2.3	403	91.0
6	6	1.4	409	92.3
7	4	0.9	413	93.2
8	8	1.8	421	95.0
9	3	0.7	424	95.7
10	6	1.4	430	97.1
12	2	0.5	432	97.5
13	1	0.2	433	97.7
15	1	0.2	434	98.0
16	1	0.2	435	98.2
18	1	0.2	436	98.4
20	2	0.5	438	98.9
21	1	0.2	439	99.1
24	1	0.2	440	99.3
30	1	0.2	441	99.5
40	1	0.2	442	99.8
50	1	0.2	443	100.0

Frequency Missing = 36

Any locats of bisns part n RE/CI

BC021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	226	52.8	226	52.8
1	58	13.6	284	66.4
2	29	6.8	313	73.1
3	15	3.5	328	76.6
4	7	1.6	335	78.3
5	9	2.1	344	80.4
7	4	0.9	348	81.3
8	1	0.2	349	81.5
9	2	0.5	351	82.0
10	1	0.2	352	82.2
11	7	1.6	359	83.9
12	2	0.5	361	84.3
13	2	0.5	363	84.8
14	1	0.2	364	85.0
16	2	0.5	366	85.5
17	13	3.0	379	88.6
18	18	4.2	397	92.8
20	10	2.3	407	95.1
25	7	1.6	414	96.7
29	1	0.2	415	97.0
43	9	2.1	424	99.1
1000	4	0.9	428	100.0

Frequency Missing = 51

Number people currently employed

EI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7	1.6	7	1.6
1	14	3.2	21	4.9
2	14	3.2	35	8.1
3	17	3.9	52	12.1
4	14	3.2	66	15.3
5	25	5.8	91	21.1
6	17	3.9	108	25.1
7	13	3.0	121	28.1
8	12	2.8	133	30.9
9	12	2.8	145	33.6
10	10	2.3	155	36.0
11	5	1.2	160	37.1
12	4	0.9	164	38.1
13	3	0.7	167	38.7
14	11	2.6	178	41.3
15	26	6.0	204	47.3
16	4	0.9	208	48.3
17	4	0.9	212	49.2
18	7	1.6	219	50.8
19	1	0.2	220	51.0
20	8	1.9	228	52.9
21	1	0.2	229	53.1
22	5	1.2	234	54.3
23	4	0.9	238	55.2
24	4	0.9	242	56.1
25	11	2.6	253	58.7
26	1	0.2	254	58.9
28	1	0.2	255	59.2
29	1	0.2	256	59.4
30	14	3.2	270	62.6
31	2	0.5	272	63.1
32	2	0.5	274	63.6
33	2	0.5	276	64.0
34	1	0.2	277	64.3
35	7	1.6	284	65.9
36	2	0.5	286	66.4
37	5	1.2	291	67.5
38	2	0.5	293	68.0
39	1	0.2	294	68.2
40	9	2.1	303	70.3
42	5	1.2	308	71.5
43	1	0.2	309	71.7
45	5	1.2	314	72.9
46	1	0.2	315	73.1
47	2	0.5	317	73.5
49	1	0.2	318	73.8
50	15	3.5	333	77.3
53	1	0.2	334	77.5
54	1	0.2	335	77.7
55	3	0.7	338	78.4

Number people currently employed

EI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
60	10	2.3	348	80.7
65	3	0.7	351	81.4
70	5	1.2	356	82.6
71	1	0.2	357	82.8
75	4	0.9	361	83.8
80	6	1.4	367	85.2
95	1	0.2	368	85.4
100	12	2.8	380	88.2
115	1	0.2	381	88.4
120	2	0.5	383	88.9
125	1	0.2	384	89.1
130	1	0.2	385	89.3
140	1	0.2	386	89.6
150	21	4.9	407	94.4
163	1	0.2	408	94.7
165	1	0.2	409	94.9
180	1	0.2	410	95.1
185	1	0.2	411	95.4
200	7	1.6	418	97.0
205	1	0.2	419	97.2
220	1	0.2	420	97.4
250	2	0.5	422	97.9
300	2	0.5	424	98.4
330	1	0.2	425	98.6
350	1	0.2	426	98.8
600	1	0.2	427	99.1
1000	2	0.5	429	99.5
1400	1	0.2	430	99.8
1500	1	0.2	431	100.0

Frequency Missing = 48

Any change in number of employees?

EI020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	333	76.0	333	76.0
Yes	105	24.0	438	100.0

Frequency Missing = 41

Mon/Year of change in employees

EI030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1992	1	2.4	1	2.4
MAR1992	1	2.4	2	4.9
APR1992	1	2.4	3	7.3
SEP1992	1	2.4	4	9.8
JAN1993	1	2.4	5	12.2
JUN1993	3	7.3	8	19.5
JUL1993	1	2.4	9	22.0
DEC1993	1	2.4	10	24.4
JAN1994	2	4.9	12	29.3
FEB1994	1	2.4	13	31.7
MAR1994	2	4.9	15	36.6
JUL1994	3	7.3	18	43.9
AUG1994	3	7.3	21	51.2
SEP1994	5	12.2	26	63.4
OCT1994	3	7.3	29	70.7
NOV1994	2	4.9	31	75.6
JAN1995	3	7.3	34	82.9
FEB1995	1	2.4	35	85.4
MAR1995	2	4.9	37	90.2
APR1995	2	4.9	39	95.1
MAY1995	2	4.9	41	100.0

Frequency Missing = 438

Year of change in employees

EI031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	4	13.3	4	13.3
1993	8	26.7	12	40.0
1994	16	53.3	28	93.3
1995	2	6.7	30	100.0

Frequency Missing = 449

Number people employed B4 chng

EI040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	2.2	2	2.2
2	5	5.4	7	7.6
3	5	5.4	12	13.0
4	5	5.4	17	18.5
5	6	6.5	23	25.0
6	4	4.3	27	29.3
7	3	3.3	30	32.6
8	3	3.3	33	35.9
9	2	2.2	35	38.0
10	2	2.2	37	40.2
11	3	3.3	40	43.5
12	2	2.2	42	45.7
13	2	2.2	44	47.8
14	2	2.2	46	50.0
15	4	4.3	50	54.3
16	1	1.1	51	55.4
18	2	2.2	53	57.6
19	1	1.1	54	58.7
20	1	1.1	55	59.8
22	6	6.5	61	66.3
24	1	1.1	62	67.4
25	3	3.3	65	70.7
28	2	2.2	67	72.8
30	3	3.3	70	76.1
31	1	1.1	71	77.2
33	1	1.1	72	78.3
40	2	2.2	74	80.4
45	1	1.1	75	81.5
50	1	1.1	76	82.6
51	1	1.1	77	83.7
60	1	1.1	78	84.8
65	1	1.1	79	85.9
70	1	1.1	80	87.0
80	2	2.2	82	89.1
100	2	2.2	84	91.3
112	1	1.1	85	92.4
145	1	1.1	86	93.5
250	2	2.2	88	95.7
325	1	1.1	89	96.7
Season Workforce	3	3.3	92	100.0

Frequency Missing = 387

OBS	EI041
1	APPROX. 50 EXTRA EMPLOYEES FOR HOLIDAYS
2	WINTERTIME MORE

Organizational Structure

FI040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Chain/Multifacil	100	22.4	100	22.4
Franchise	31	6.9	131	29.3
Independant	316	70.7	447	100.0

Frequency Missing = 32

OBS	FI045
1	MAIL BOXES ETC.
2	GREAT WESTERN
3	PRIMARY PLUS
4	GREAT WESTERN
5	MASONS
6	DEPARTMENT OF INTERIOR
7	US BANK
8	US BANK
9	GREAT WESTERN
10	US BANK
11	WELLS FARGO BANK
12	US BANK
13	US BANK
14	US BANK
15	SERVICE CORP. INTERNTL
16	MOTHER LODE HOLDING CO
17	GREAT WESTERN
18	SARATOGA BAN CORP
19	COUNTY OF SANTA BARBARA
20	CITY OF MANTECA
21	CITY OF SAN MATEO
22	CHEVRON
23	AIR TOUCH
24	UNION PACIFIC CORPORATION
25	SCOTTY RENTS INC
26	PARADISE RECR AN PARK DISTRICT.
27	MUFARRAH ENTERPRISE
28	VALU8ES INC.
29	ROLLINS LEASING CORP.
30	CARE PHARMACIES INCORPORATED
31	KUMAR JEWELERS, INC.
32	AUTO PARTS WHOLESALE
33	KAISER FOUNDATION
34	TOYS R US, INC.
35	COIT SERVICES INC.
36	BROADWAY STORES INC.
37	FUJI FILM.
38	AMERICAN LINEN
39	BROADWAY STORES INC.
40	CALIFORNIA FAIRS
41	PETCO ANIMAL SUPPLIES
42	SAFEGUARD SCIENTIFIC
43	PETROLEUM SALES INC.
44	PETCO ANIMAL SUPPLIES
45	N. CAL CON. OF 7TH DAY ADVENT.
46	FAIRFEILD SUSUIN UNIFIED SCHOOL DISTRICT
47	PRINCETON JOINT UNIFIED SCHOOLS
48	LEMORE ELEMENTARY SCHOOL DISTRICT
49	LOS LOMITAS SCHOOL DISTRICT
50	MARIPOSA COUNTY SCHOOL DIST.
51	MARIPOSA COUNTY SCHOOL DIST.
52	OAKLAND DIOCESES
53	SCHOOL DIST.

OBS	FI045
54	AMERICAN STORES .
55	AMERICAN STORES .
56	AMERICAN STORES .
57	AMERICAN STORES .
58	AMERICAN STORES .
59	AMERICAN STORES .
60	AMERICAN STORES .
61	AMERICAN STORES .
62	AMERICAN STORES .
63	AMERICAN STORES .
64	AMERICAN STORES .
65	AMERICAN STORES .
66	AMERICAN STORES .
67	AMERICAN STORES .
68	AMERICAN STORES .
69	AMERICAN STORES .
70	AMERICAN STORES .
71	AMERICAN STORES .
72	WENDYS INT.
73	NATIONS FOOD SERVICE
74	NATIONS FOOD SERVICE
75	SPECTURM FOODS
76	TRANSAMERICA
77	LYONS REST.
78	WENDYS INT.
79	LYONS REST.
80	LYONS REST.
81	KASIER PERMANENTE
82	ADVENTISIT HEALTH SYSTEMS WEST.
83	ADVENTISIT HEALTH SYSTEMS WEST.
84	HILLSDALE GROUP
85	MAIN STREET ATHLETICS
86	INDEPENDENT QUALITY CARE
87	NORTHERN CAL 7 DAY ADVEN.
88	HEALTH CARE MANAGEMENT
89	CLUB CORP OF AMERICA
90	KAISER FOUNDATION
91	CHAMA INC
92	KASIER FOUNDATION HOSPITAL .
93	CATHOLIC HEALTH CARE WEST
94	GUIDE DOGS FOR THE BLIND
95	KEMPTON GROUP
96	NORCAL ELECTRIC
97	PUBLIC STORAGE MANAGEMENT INC.
98	UNITED STATES COMPANY
99	GRAYBAR ELECTRIC INC.
100	NETCO FOODS INC
101	CITY OF MANTECA

Legal Tax Status

FI050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
For-Profit	301	66.3	301	66.3
Public	82	18.1	383	84.4
501(c3)Non-proft	71	15.6	454	100.0

Frequency Missing = 25

Tax status of parent company

FI055	Frequency	Percent	Cumulative Frequency	Cumulative Percent
For-Profit	70	72.2	70	72.2
Public	14	14.4	84	86.6
501(c3)Non-proft	13	13.4	97	100.0

Frequency Missing = 382

Where are energy decisions made

FI060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Locally on site	331	72.4	331	72.4
Regional head	89	19.5	420	91.9
National head	22	4.8	442	96.7
PM firm/build owner	4	0.9	446	97.6
Other	4	0.9	450	98.5
Local owner	3	0.7	453	99.1
Board Of Supervisors	4	0.9	457	100.0

Frequency Missing = 22

OBS	FI062
1	DON'T MAKE INVESTMENTS
2	DIST. BOARD OF DIRECTORS
3	H.P. SEARS& MERCHANT ASSOC TOGETHER
4	DISTRICT OFFICE
5	DIST OFFICE (UNDER REGIONAL)
6	MADE AT OWNER'S OFFICE
7	CO. BOARD OF SUPES
8	DEPARTMENT SITE
9	BOARD OF SUPERVISOR
10	LOCAL SCHOOL BOARD.
11	DEPENDS ON DIFFERNET SITUATIONS.
12	LOCAL NOT ON SITE.
13	OWNER

Fiscal 1992 revenues

FI070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
< 50000	9	4.0	9	4.0
50000<99999	8	3.5	17	7.5
100000<249999	22	9.7	39	17.3
250000<499999	26	11.5	65	28.8
500000<999999	30	13.3	95	42.0
1 mil<2.49 mil	27	11.9	122	54.0
2.5 mil<4.99 mil	21	9.3	143	63.3
5 mil<9.99 mil	13	5.8	156	69.0
10 mil<49.99 mil	26	11.5	182	80.5
>10 mil	44	19.5	226	100.0

Frequency Missing = 253

Level of revenue

FI075	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Local	159	70.4	159	70.4
Regional	59	26.1	218	96.5
National	7	3.1	225	99.6
Worldwide	1	0.4	226	100.0

Frequency Missing = 253

Are utilities payed thru lease?

FI080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
All included	53	26.8	53	26.8
Some included	14	7.1	67	33.8
All paid direct	131	66.2	198	100.0

Frequency Missing = 281

Indoor Light paid thru lease

FI090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	41.7	5	41.7
Yes	7	58.3	12	100.0

Frequency Missing = 467

Heat paid thru lease

FI091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 467

Ventilation paid thru lease

FI092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	54.5	6	54.5
Yes	5	45.5	11	100.0

Frequency Missing = 468

Elec to outlets paid thru lease

FI093	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 467

Cooking paid thru lease

FI094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	10	83.3	10	83.3
Yes	2	16.7	12	100.0

Frequency Missing = 467

Outdoor Light paid thru lease

FI095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	4	30.8	4	30.8
Yes	9	69.2	13	100.0

Frequency Missing = 466

Cooling paid thru lease

FI096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	7	58.3	7	58.3
Yes	5	41.7	12	100.0

Frequency Missing = 467

H2O heat paid thru lease

FI097	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 467

Refridgeration paid thru lease

FI098	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	8	66.7	8	66.7
Yes	4	33.3	12	100.0

Frequency Missing = 467

Other paid thru lease

FI099	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	12	92.3	12	92.3
Yes	1	7.7	13	100.0

Frequency Missing = 466

OBS	FI100
1	VARIES BY TENANT.
2	COMMON AREA LIGHTING

Length of current lease

FI110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	31	18.9	31	18.9
1	8	4.9	39	23.8
1.5	1	0.6	40	24.4
2	8	4.9	48	29.3
3	10	6.1	58	35.4
5	54	32.9	112	68.3
7	4	2.4	116	70.7
8	1	0.6	117	71.3
8.5	1	0.6	118	72.0
9	1	0.6	119	72.6
10	28	17.1	147	89.6
12	1	0.6	148	90.2
15	3	1.8	151	92.1
20	6	3.7	157	95.7
22	2	1.2	159	97.0
25	1	0.6	160	97.6
30	1	0.6	161	98.2
40	1	0.6	162	98.8
60	1	0.6	163	99.4
74	1	0.6	164	100.0

Frequency Missing = 315

Years left on lease

FI115	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	45	29.4	45	29.4
0.5	2	1.3	47	30.7
1	10	6.5	57	37.3
1.5	1	0.7	58	37.9
2	24	15.7	82	53.6
3	13	8.5	95	62.1
4	13	8.5	108	70.6
5	14	9.2	122	79.7
7	6	3.9	128	83.7
7.5	2	1.3	130	85.0
8	5	3.3	135	88.2
9	3	2.0	138	90.2
10	3	2.0	141	92.2
12	1	0.7	142	92.8
14	2	1.3	144	94.1
15	3	2.0	147	96.1
18	2	1.3	149	97.4
19	2	1.3	151	98.7
24	1	0.7	152	99.3
60	1	0.7	153	100.0

Frequency Missing = 326

Is it first lease?

FI120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	95	54.6	95	54.6
Yes	79	45.4	174	100.0

Frequency Missing = 305

Have a regular light contr?

IS001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	303	65.9	303	65.9
Yes	157	34.1	460	100.0

Frequency Missing = 19

Reg Light Contr inform bout prog?

IS002	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	65	42.8	65	42.8
Yes	87	57.2	152	100.0

Frequency Missing = 327

How first learned of Prog

IS010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Resp aproch vendor	17	3.9	17	3.9
Resp aproch PG&E	11	2.5	28	6.4
Contd by acct rep	147	33.5	175	39.9
Contd by lit cont	82	18.7	257	58.5
Contd by elec cont	31	7.1	288	65.6
Brochure n mail	49	11.2	337	76.8
Bill insert	3	0.7	340	77.4
Word of mouth in org	27	6.2	367	83.6
Word of mouth out org	58	13.2	425	96.8
TV/Radio/News	3	0.7	428	97.5
Other	11	2.5	439	100.0

Frequency Missing = 40

OBS	IS020
1	BY MEANS OF HIS JOB-ESI ENERGY SY
2	CONTRACTOR
3	TRIBAL GRANT
4	NATIONAL OFFICE
5	NATIONAL OFFICE
6	VARIES, PO WATCHES FOR PROGRAMS
7	NATIONAL OFFICE
8	NATIONAL OFFICE
9	NATIONAL OFFICE
10	NATIONAL OFFICE
11	WORKSHOP IN CONCORD
12	THROUGH A CUSTOMER
13	CLIENT IN THE FIRM NOTIFIED
14	COMPANY SUGESSTED IT
15	TRADE MAGAZINES
16	ELECTRICAL SUPPLIER
17	TRADE MAGAZINES
18	PCIFIC UTILITIESM CONSULTANTS
19	ENERGY MASTERS CO.
20	ENERGY MASTERS CO.
21	ENERGY MASTERS CO.
22	KNEW ABOUT IT
23	ENERGY MASTERS CO.
24	GRAINGER /BILL HEALD
25	GENERAL CONTRACTOR
26	ENERGY MASTERS CO.
27	ENERGY MASTERS CO.
28	GENERAL CONTRACTOR
29	GENERAL CONTRACTOR
30	STATE BULLETEN
31	GENERAL CONTRACTOR
32	STATE BULLETEN
33	GENERAL CONTRACTOR
34	GENERAL CONTRACTOR
35	GENERAL CONTRACTOR
36	ENERGY MASTERS CO.
37	ENERGY MASTERS CO.
38	ENERGY MASTER/ENERGY CONSULTANTS
39	ENERGY MASTERS CO.
40	PG&E INTERNS(?)
41	ELECTRICIANS RECOMMENDED IT
42	REC'D A FLYER IN MAIL...
43	PACIFIC ENERGY CENTER
44	PACIFIC ENERGY CENTER
45	DONE AS GENERAL IMPROVEMENT
46	LIGHTBULB SALESPERSON
47	SELL THE LIGHTING EQUIPMENT
48	HE IS PROMOTER OF PROGRAM

Firm Part in any PG&E prog?

PP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	276	61.6	276	61.6
Yes	170	37.9	446	99.6
Not awar othrs	2	0.4	448	100.0

Frequency Missing = 31

Year firm part in PG_E prog

PP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1982	2	1.4	2	1.4
1984	5	3.5	7	4.9
1985	2	1.4	9	6.3
1987	1	0.7	10	7.0
1988	1	0.7	11	7.7
1989	11	7.7	22	15.4
1990	9	6.3	31	21.7
1991	23	16.1	54	37.8
1992	14	9.8	68	47.6
1993	22	15.4	90	62.9
1994	28	19.6	118	82.5
1995	25	17.5	143	100.0

Frequency Missing = 336

No delays with retro project

DS019	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	12.2	55	12.2
1	397	87.8	452	100.0

Frequency Missing = 27

Equipment supply probs

DS020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	40	57.1	40	57.1
1	30	42.9	70	100.0

Frequency Missing = 409

Contractor delays

DS021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	57	83.8	57	83.8
1	11	16.2	68	100.0

Frequency Missing = 411

Financial limitations

DS022	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	63	94.0	63	94.0
1	4	6.0	67	100.0

Frequency Missing = 412

Delays within the organization

DS023	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	60	85.7	60	85.7
1	10	14.3	70	100.0

Frequency Missing = 409

Decided to spend money on something else

DS024	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	69	100.0	69	100.0

Frequency Missing = 410

Other delay

DS025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	63	88.7	63	88.7
1	8	11.3	71	100.0

Frequency Missing = 408

OBS	DS026
1	WEATHER
2	COMMUNICATION PROBLEMS
3	WEATHER
4	COMMUNICATION DELAY
5	WEATHER
6	WEATHER
7	COMPLICATIONS
8	DELIVERY OF EQUIP.
9	REBATES WERE DELAYED 2-3 MONTHS

Weather complications

DS027	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	100.0	4	100.0

Frequency Missing = 475

Choose same equipment if buying again?

SR080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	45	10.1	45	10.1
Yes	400	89.9	445	100.0

Frequency Missing = 34

Reason for choosing other equipment

SR090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
incrs quality lighting	8	17.4	8	17.4
elmnat ballst fallout	10	21.7	18	39.1
other	12	26.1	30	65.2
incrs genernal equip	6	13.0	36	78.3
cheaper equipment	10	21.7	46	100.0

Frequency Missing = 433

OBS	SR091
1	QUALITY OF EQUIPMENT
2	COST
3	HIGH MAINTENANC4E
4	NO COVERS ON LIGHTS
5	NOT GETTING CREDIT
6	LEAVE THE WAY IT WAS
7	EARLY BURN OUT OF LAMPS
8	WOULD NOT SELECT OTHER EQ
9	WOULD HAVE RETROFIT MORE
10	DIDN'T SAVE ANY MONEY
11	DIFF. FOR PAINT SHOP
12	FLIMSY EQUIPMENT, FAILURE
13	ECO.OF SCREW IN REPLACEME
14	ECO.OF SCREW IN REPLACEME
15	ECO.OF SCREW IN REPLACEME
16	ECO.OF SCREW IN REPLACEME
17	ECO.OF SCREW IN REPLACEME
18	ECO.OF SCREW IN REPLACEME
19	ECO.OF SCREW IN REPLACEME
20	ECO.OF SCREW IN REPLACEME
21	NEW EQUIP BETTER
22	ECO.OF SCREW IN REPLACEME
23	EASILY STOLEN
24	NOT AS DEPENDABLE
25	THERE IS BETTER EQUIPMENT
26	THERE IS BETTER EQUIPMENT
27	TOO EXPENSIVE
28	MORE CONSER.CHOICE

Altered energy use since retrofit?

EA010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	374	83.7	374	83.7
Yes	73	16.3	447	100.0

Frequency Missing = 32

Turning on fewer lights

EA020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	41	68.3	41	68.3
1	19	31.7	60	100.0

Frequency Missing = 419

Running HVAC less

EA021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	94.8	55	94.8
1	3	5.2	58	100.0

Frequency Missing = 421

Decreased lighting hours

EA022	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	50	80.6	50	80.6
1	12	19.4	62	100.0

Frequency Missing = 417

Energy change other1

EA023	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	27	38.0	27	38.0
1	44	62.0	71	100.0

Frequency Missing = 408

OBS	EA024
1	TRYING TO CAREFUL ON USEAGE
2	NEW METER
3	REMOVED REFRIGERATION
4	USING LESS ENERGY
5	BILL AND USAGE INCREASED
6	HAD TO ISTALL MORE LIGHTS
7	MOTION DETECTION
8	COMP ENERGY MGT SYSTEM
9	LIGHTS INSTALLED ARE MORE EFFICIEN
10	INCREASED LIGHTING HOURS
11	INCREASED LIGHTING HOURS
12	PUTTING IN NEW LIGHTS
13	INSTALLED MOYTON SENSORS
14	INSTALLED SKYLIGHTS
15	NEW MOTORS ARE NOW EFFICIENT
16	INSTALLED CONVEYER SYSTEM
17	MOTION DET. ALOW LESS LIGHT AND TI
18	MORE LIGHTING HOURS
19	TIME CLOCKS USED
20	REDUCED HOURS
21	TIME CLOCKS USED
22	TIMERS FOR LIGHT TURN ON
23	TIME CLOCKS USED
24	TIME CLOCKS USED
25	TIME CLOCKS USED
26	TIME CLOCKS USED
27	TIME CLOCKS USED
28	TIME CLOCKS USED
29	TIME CLOCKS USED
30	TIME CLOCKS USED
31	TIME CLOCKS USED
32	TIME CLOCKS USED
33	ADDED MORE LIGHTING
34	MOTION DET. ALOW LESS LIGHT AND TI
35	TIME CLOCKS USED
36	INSTALLED AC FOR THE FIRST TIME WH
37	ENERGY MAN. SYS. INSTALLED
38	INSTALLED MOYTON SENSORS
39	MORE ENERGY CONSERVATION
40	DECREASED UTILITY BILLS
41	USING MORE LIGHTING HOURS BECAUSE
42	MORE LIGHTING
43	CUT DOWN LIGHTING HRS W\BROODER
44	INSTALLATION OF OCCUPANCY SENSORS
45	INSTALLED LESS EFFICIENT REFRIGERA

Energy change other2

EA025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	57	86.4	57	86.4
1	9	13.6	66	100.0

Frequency Missing = 413

OBS	EA026
1	" " " NUMBER OF LIGHTS IN USE.
2	INSTALLED TIMERS FOR LIGHTS
3	HEAT/AIR COND. PUT ON AUTOMATIC.
4	LINKED LIGHTS TO MOTION SENSORS
5	ME OF OPER. NEW ELECTRONIC THERM.
6	ME OF OPER. NEW ELECTRONIC THERM.
7	WHEN RETRO WAS DONE
8	OF TIMING OVERLAP W/INCREASING DAY
9	ADDED 16 HVAC UNITS
10	TION

Energy change other3

EA027	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	63	98.4	63	98.4
1	1	1.6	64	100.0

Frequency Missing = 415

OBS	EA028
1	LIGHT

Energy change other4

EA029	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	69	98.6	69	98.6
1	1	1.4	70	100.0

Frequency Missing = 409

OBS	EA030
1	ADDED OTHER EQUIP.

Added equipment

EA031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.0	5	100.0

Frequency Missing = 474

More hours

EA032	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	7	100.0	7	100.0

Frequency Missing = 472

Control devices

EA033	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	19	100.0	19	100.0

Frequency Missing = 460

General conservation

EA045	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	100.0	4	100.0

Frequency Missing = 475

Most important changeout factor

PD010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Get latest tech	19	4.2	19	4.2
Save $ on bills	276	60.7	295	64.8
Get rebate	37	8.1	332	73.0
Replc old/brokn	20	4.4	352	77.4
Imprv qual lite	50	11.0	402	88.4
Help protct environ	7	1.5	409	89.9
Prev prog expern	1	0.2	410	90.1
Obtn Advce act r	1	0.2	411	90.3
Other	11	2.4	422	92.7
Energy Effiecien	7	1.5	429	94.3
New Lighting Qua	13	2.9	442	97.1
Short Payback Pe	3	0.7	445	97.8
Attractive Finan	1	0.2	446	98.0
Combination	9	2.0	455	100.0

Frequency Missing = 24

OBS	PD011
1	DURIBILITY OF FIXUTRES
2	LOOKING FOR TAMPER RESISTENCE EQU
3	PAYBACK PERIOD/ MONEY
4	GOOOD TIMING NEEDED THE WORK
5	EASE OF MAINTENANCE
6	COULD PAY W/SAVINGS
7	2,3,5
8	2,3,5
9	HAD ALREADY PURCHASED EQUIP PRIOR
10	2,3,5
11	2,3,5
12	COMBINATION OF 2,3, 6
13	HIGHEST RATE OF PAYBACK
14	ALL OF THE ABOVE
15	COMBINATION 2,4
16	UPGRADING TO NEW TECHNOLOGY
17	SECURITY
18	ENERGY CONSERVATION
19	REDUCE HEAT IN THE STORE
20	TO LIGHT UP THE LOT
21	IT WAS A GOOD SAFETY DECISION
22	COST OF INSTALLATION
23	BETTER STORE APPEREANCE
24	MAKING THE LIGHTING EFFICIENT
25	CHEAP INSTALLATION & REBATE
26	THE REBATES
27	WANTED TO IMPROVE LIGHTING
28	SAVE MONEY & HAVE GOOD LIGHTS
29	ADVICE FROM PG&E
30	MOST RELIABLE EQUIP.
31	LOW INTEREST LOAN
32	SAVING ENERGY
33	LOGEVITY AND QUALITY
34	MOST RELIABLE EQUIP.
35	LOGEVITY AND QUALITY
36	LOGEVITY AND QUALITY
37	LOGEVITY AND QUALITY
38	LOGEVITY AND QUALITY
39	LOGEVITY AND QUALITY
40	LOGEVITY AND QUALITY
41	ENERGY EFF.
42	ENERGY EFF.
43	MORE ENERGY EFFICIENT
44	FINANCING & REBATE
45	CONFIDENCE IN CONTRACTOR
46	RELIABILITY OF THE PRODUCT.
47	ENERGY EFFICIENT
48	OBTAINING INSTANT START FLOUR.
49	OBTAINING INSTANT START FLOUR.
50	SAVE MONEY AND IMPROVE LIGHT
51	RELIBILITY OF LIGHTING
52	QUALITY OF PRODUCT
53	HIGHEST RATE OF PAYBACK

Didn't do prior/Lack $

FR100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	327	74.0	327	74.0
Yes	115	26.0	442	100.0

Frequency Missing = 37

Didn't do prior/payback not enuf

FR101	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	418	94.6	418	94.6
Yes	24	5.4	442	100.0

Frequency Missing = 37

Didn't do prior/not save as much

FR102	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	435	98.4	435	98.4
Yes	7	1.6	442	100.0

Frequency Missing = 37

Didn't do prior/unaware about EE light

FR103	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	303	68.6	303	68.6
Yes	139	31.4	442	100.0

Frequency Missing = 37

Didn't do prior/didn't know where/how

FR104	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	417	94.3	417	94.3
Yes	25	5.7	442	100.0

Frequency Missing = 37

Didn't do prior/hadn't had time

FR105	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	422	95.5	422	95.5
Yes	20	4.5	442	100.0

Frequency Missing = 37

Didn't do prior/concern w/ bright

FR106	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	434	98.2	434	98.2
Yes	8	1.8	442	100.0

Frequency Missing = 37

Didn't do prior/tenants didn't want

FR107	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	437	98.9	437	98.9
Yes	5	1.1	442	100.0

Frequency Missing = 37

Didn't do prior/decision made elsewhere

FR108	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	440	99.3	440	99.3
Yes	3	0.7	443	100.0

Frequency Missing = 36

Didn't do prior/was planning to do

FR109	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	438	99.1	438	99.1
Yes	4	0.9	442	100.0

Frequency Missing = 37

Didn't do prior/2 part 2 big a hassle

FR110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	395	89.4	395	89.4
Yes	47	10.6	442	100.0

Frequency Missing = 37

Didn't do prior/just remodeled

FR111	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	435	98.4	435	98.4
Yes	7	1.6	442	100.0

Frequency Missing = 37

Didn't do prior/moving soon

FR112	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	431	97.5	431	97.5
Yes	11	2.5	442	100.0

Frequency Missing = 37

Didn't do prior/did it <5 years ago

FR113	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	441	100.0	441	100.0

Frequency Missing = 38

Didn't do prior/Other specified

FR114	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	365	82.6	365	82.6
Yes	77	17.4	442	100.0

Frequency Missing = 37

OBS	FR115
1	WAS NOT AT THIS OFFICE YET
2	INVEST IN ORDER TO SAVE
3	HADN'T HEARD ABOUT IT
4	NEEDED TO UPGRADE
5	NEEDED TO UPGRADE
6	NEVER HEARD OF IT
7	LOWERD CEILING SO NEEDED NEW
8	REPLACING BALLASTS
9	TOO EXPENSIVE
10	OTHER SYSTEM WAS OK
11	NEEDED TO UPGRADE
12	GOT TIRED OF OLD EQUIPMENT
13	NEEDED TO UPGRADE
14	CO. BUERACRACY
15	IT IS A NEW BUILDING
16	WOULD NOT BE COST EFFECTIVE
17	CONCERNED WITH QUALITY OF BA
18	0
19	DIDN'T KNOW SHE COULD
20	1
21	UNHELPFUL PEOPLE AT OTHER CO
22	DDID NOT KNOW OF THE PROGRAM
23	OLD BLDNG,NOT KNOW CAN DO
24	NEVER HEARD OF PROGRAM
25	WAS EXPENSIVE AT THE TIME
26	NEVER THOUGHT ABOUT IT
27	DIDN'T THINK ABOUT IT
28	DID NOT KNOW ABOUT PROGRAM
29	BLDNG TOO OLD
30	DID NOT OF REBATE
31	NEVER OFFERED
32	NOT ENOUGH INCENTIVE/TIME
33	0
34	IMPROVEMENT ON IMPROVEMENT
35	LIGHTING IS DIFFERENT
36	DID NOT KNOW ABOUT PROGRAM
37	CONSTANTLY UPDATING FOR EE
38	DID NOT KNOW ABOUT REBATES
39	DID NOT KNOW ABOUT PROGRAM
40	OLD BUILDING AND WASN'T OPT.
41	HE HAD NEVER HEARD OF IT
42	CASH FLOW PROBLEM
43	0
44	ALWAYS GROUP RELAMP
45	ALWAYS GROUP RELAMP
46	ALWAYS GROUP RELAMP
47	ALWAYS GROUP RELAMP
48	ALWAYS GROUP RELAMP
49	ALWAYS GROUP RELAMP
50	ALWAYS GROUP RELAMP
51	ALWAYS GROUP RELAMP
52	ALWAYS GROUP RELAMP
53	ALWAYS GROUP RELAMP

OBS	FR115
54	ALWAYS GROUP RELAMP
55	ALWAYS GROUP RELAMP
56	ALWAYS GROUP RELAMP
57	ALWAYS GROUP RELAMP
58	ALWAYS GROUP RELAMP
59	ALWAYS GROUP RELAMP
60	ALWAYS GROUP RELAMP
61	ALWAYS GROUP RELAMP
62	NOTHING AVAILABLE
63	MORE E.E.
64	MORE E.E.
65	WAS NOT AWARE OF ANY PRO.
66	NO SPECIAL REASON
67	MATURE INDUSTRY
68	WASN'T AWARE OF PROGRAM
69	GOV WOULD REQ.
70	WASN'T REQUIRED
71	PRODUCT REFINED AND RELIABLT
72	EQUIPMENT COSTS A LOT OF $
73	DID IT BEFORE PROGRAM TOO
74	0
75	POSSIBLY WAS MOVING
76	0
77	WEREN'T AWARE OF REBATE
78	NEVER HEARD OF THE PROGRAM
79	WORRIED ABOUTQUALITY
80	0

Didn't do prior/Refused

FR116	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	378	100.0	378	100.0

Frequency Missing = 101

Didn't do prior/Don't Know

FR117	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	425	93.2	425	93.2
Yes	31	6.8	456	100.0

Frequency Missing = 23

How long would have waited to replace?

SR020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	7.6	24	7.6
0.5	1	0.3	25	7.9
1	49	15.5	74	23.4
2	36	11.4	110	34.8
3	7	2.2	117	37.0
4	4	1.3	121	38.3
5	16	5.1	137	43.4
7	3	0.9	140	44.3
10	7	2.2	147	46.5
15	4	1.3	151	47.8
20	1	0.3	152	48.1
777	164	51.9	316	100.0

Frequency Missing = 163

How long shopping for equipment?

FR010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	336	78.3	336	78.3
1	8	1.9	344	80.2
2	3	0.7	347	80.9
3	2	0.5	349	81.4
4	14	3.3	363	84.6
8	9	2.1	372	86.7
12	8	1.9	380	88.6
13	1	0.2	381	88.8
15	1	0.2	382	89.0
16	1	0.2	383	89.3
20	1	0.2	384	89.5
24	8	1.9	392	91.4
25	1	0.2	393	91.6
32	3	0.7	396	92.3
48	1	0.2	397	92.5
50	1	0.2	398	92.8
52	14	3.3	412	96.0
96	1	0.2	413	96.3
98	1	0.2	414	96.5
100	5	1.2	419	97.7
150	9	2.1	428	99.8
200	1	0.2	429	100.0

Frequency Missing = 50

How many estimates or quotes B4 purchase

FR011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	95	21.7	95	21.7
1	105	24.0	200	45.8
2	85	19.5	285	65.2
3	116	26.5	401	91.8
4	22	5.0	423	96.8
5	3	0.7	426	97.5
6	3	0.7	429	98.2
8	1	0.2	430	98.4
10	3	0.7	433	99.1
13	1	0.2	434	99.3
23	2	0.5	436	99.8
50	1	0.2	437	100.0

Frequency Missing = 42

Get est 4 bth high and stand eff lights?

FR012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	335	75.6	335	75.6
Yes	108	24.4	443	100.0

Frequency Missing = 36

How to purchase once aware?

FR013	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	135	31.5	135	31.5
1	47	11.0	182	42.4
2	54	12.6	236	55.0
3	17	4.0	253	59.0
4	58	13.5	311	72.5
5	1	0.2	312	72.7
6	5	1.2	317	73.9
8	41	9.6	358	83.4
9	1	0.2	359	83.7
10	2	0.5	361	84.1
12	19	4.4	380	88.6
16	8	1.9	388	90.4
20	1	0.2	389	90.7
24	7	1.6	396	92.3
26	4	0.9	400	93.2
32	1	0.2	401	93.5
52	26	6.1	427	99.5
70	1	0.2	428	99.8
100	1	0.2	429	100.0

Frequency Missing = 50

Delay purchase to participate?

NG019	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	421	93.1	421	93.1
Yes	31	6.9	452	100.0

Frequency Missing = 27

Plans prior to awareness

FR020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Hdnt consdrd	207	45.7	207	45.7
Hdnt yet decd EE	119	26.3	326	72.0
Decd EE nt w/in	64	14.1	390	86.1
Decd nd selctd E	63	13.9	453	100.0

Frequency Missing = 26

number people involved in decision

FR014	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0.3	1	0.2	1	0.2
1	120	26.6	121	26.8
2	147	32.6	268	59.4
3	67	14.9	335	74.3
4	23	5.1	358	79.4
5	9	2.0	367	81.4
6	25	5.5	392	86.9
7	7	1.6	399	88.5
8	12	2.7	411	91.1
9	3	0.7	414	91.8
10	9	2.0	423	93.8
11	1	0.2	424	94.0
12	7	1.6	431	95.6
15	3	0.7	434	96.2
20	13	2.9	447	99.1
23	1	0.2	448	99.3
25	3	0.7	451	100.0

Frequency Missing = 28

Is this person final decision maker

FR015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	192	41.9	192	41.9
Yes	266	58.1	458	100.0

Frequency Missing = 21

Job title of final decision maker

FR016N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	6	31.6	6	31.6
7	13	68.4	19	100.0

Frequency Missing = 460

OBS	FR016OTR
1	BOARD
2	JOINT DECISION BY COMMIT
3	BOARD
4	BOARD
5	VP
6	BOARD
7	CEO
8	BOARD
9	CEO
10	DON'T KNOW
11	?
12	NONE
13	CONTROLLER

job title of final decision maker

FR017	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	160	36.5	160	36.5
0.6999998093	1	0.2	161	36.8
1	100	22.8	261	59.6
2	49	11.2	310	70.8
3	15	3.4	325	74.2
4	46	10.5	371	84.7
6	4	0.9	375	85.6
8	25	5.7	400	91.3
12	18	4.1	418	95.4
16	4	0.9	422	96.3
20	1	0.2	423	96.6
24	4	0.9	427	97.5
26	3	0.7	430	98.2
36	2	0.5	432	98.6
52	4	0.9	436	99.5
100	2	0.5	438	100.0

Frequency Missing = 41

Group Relamps

FR118	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	18	100.0	18	100.0

Frequency Missing = 461

Not Aware of Program

FR119	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	13	100.0	13	100.0

Frequency Missing = 466

Didn't know if qualified

FR120	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

How active a role do tenants have in dec

FI065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Very active	102	51.3	102	51.3
Somewhat active	21	10.6	123	61.8
Slight role	18	9.0	141	70.9
None	58	29.1	199	100.0

Frequency Missing = 280

Financial Criteria/Payback

DC010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	109	24.5	109	24.5
Yes	335	75.5	444	100.0

Frequency Missing = 35

Financial Criteria/Internal ROR

DC011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	337	76.4	337	76.4
Yes	104	23.6	441	100.0

Frequency Missing = 38

Financial Criteria/Net Pres Value

DC012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	381	86.6	381	86.6
Yes	59	13.4	440	100.0

Frequency Missing = 39

Financial Criteria/Other

DC013	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	416	93.1	416	93.1
Yes	31	6.9	447	100.0

Frequency Missing = 32

OBS	DC014
1	DONTCAREWEMAKETENANTSHAPPY
2	COST OF OPERATION
3	REBATE AND LOWER RATES
4	UPKEEP& SAVINGS
5	NONE
6	DONTCAREWEMAKETENANTSHAPPY
7	ENERGY SAVINGS
8	POTENTIAL SAVINGS IN FUTURE
9	MAINTENANCE AND COST
10	OPERATING COST EFFICIENCY
11	NEED FOR LIGHTING
12	HOW WELL WE ASSUME IT WILL WK
13	AFFORDABILITY
14	ENVIRONMENTAL.QUALITY, COST
15	LONGEVITY & EFFICIENCY
16	EASY TO USE, QUIET
17	SAVINGS ON FUTURE COSTS
18	EFFICIENT POWER USE
19	SAVINGS
20	SAVINGS
21	LOOK AT OUT OF POCKET COST
22	CONSERVATION
23	OVER ALL SAVINGS IN POWER
24	QUALITY COMPARISON SAMPLES
25	INITIAL COST OF EQUIPMENT
26	OVER ALL SAVINGS IN POWER
27	LOWER BILLS; REBATE
28	COST PER USE
29	NONE - ONLY CUSTOMER IMPACT
30	LABOR COST FOR REPLACEMENT
31	DEPENDS ON IF YOU GET MONEY

Savings

DC015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	12	100.0	12	100.0

Frequency Missing = 467

Initial cost

DC016	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	100.0	3	100.0

Frequency Missing = 476

Operating cost

DC017	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	100.0	2	100.0

Frequency Missing = 477

What is payback period

DC020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1 yr or <	108	36.1	108	36.1
2 yr or <	80	26.8	188	62.9
3 yr or <	42	14.0	230	76.9
4 yr or <	13	4.3	243	81.3
5 yr or <	26	8.7	269	90.0
7 yr or <	6	2.0	275	92.0
9 yr or <	2	0.7	277	92.6
10 yr or <	13	4.3	290	97.0
Other	9	3.0	299	100.0

Frequency Missing = 180

OBS	DC021
1	BASED ON ROI
2	EVAL'D BY EACH PROJECT, BUT 2 YR
3	15 YEARS OR LESS
4	MAIN CONCERN WAS ENVIRONMENTAL
5	NO SET STANDARD
6	NONE
7	NO STANDARD.
8	NONE REQUIRED; HE DIDN'T FIGURE.
9	DEPENDS ON SITUATION

What is IROR

DC030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	5	15.2	5	15.2
1	1	3.0	6	18.2
2	1	3.0	7	21.2
3	2	6.1	9	27.3
7	1	3.0	10	30.3
10	1	3.0	11	33.3
11	2	6.1	13	39.4
12	2	6.1	15	45.5
15	7	21.2	22	66.7
17	1	3.0	23	69.7
20	1	3.0	24	72.7
25	2	6.1	26	78.8
30	2	6.1	28	84.8
40	1	3.0	29	87.9
50	3	9.1	32	97.0
100	1	3.0	33	100.0

Frequency Missing = 446

What is discount rate

DC040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	11.8	2	11.8
5	1	5.9	3	17.6
6	1	5.9	4	23.5
8	3	17.6	7	41.2
10	2	11.8	9	52.9
12	1	5.9	10	58.8
15	4	23.5	14	82.4
20	1	5.9	15	88.2
25	1	5.9	16	94.1
35	1	5.9	17	100.0

Frequency Missing = 462

Use diff financl critera for EE vs other

DC050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	240	63.2	240	63.2
Yes	140	36.8	380	100.0

Frequency Missing = 99

EE critera high/short or lower/long

DC051	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Higher/Shorter	66	59.5	66	59.5
Lower/Longer	45	40.5	111	100.0

Frequency Missing = 368

Retorft if 0 rebate/1%<prime financing

TR030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	264	64.9	264	64.9
Yes	143	35.1	407	100.0

Frequency Missing = 72

Retorft if 0 rebate/1.5%<prime financing

TR040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	240	91.3	240	91.3
Yes	23	8.7	263	100.0

Frequency Missing = 216

Retorft if 50% rebate/1%<prime financing

TR050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	157	68.6	157	68.6
Yes	72	31.4	229	100.0

Frequency Missing = 250

Retorft if 50% rebate/on-site audit

TR070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	139	34.2	139	34.2
Yes	268	65.8	407	100.0

Frequency Missing = 72

Intrstd in operate/maintain lights

PR020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	307	70.3	307	70.3
Yes	56	12.8	363	83.1
Depends on price	74	16.9	437	100.0

Frequency Missing = 42

Intrstd in building recommissioning

PR040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	128	29.3	128	29.3
Yes	309	70.7	437	100.0

Frequency Missing = 42

Intrstd in future equip selection hlp

PR060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	86	19.1	86	19.1
Yes	365	80.9	451	100.0

Frequency Missing = 28

Times have contact w/ account rep

PR001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	198	45.9	198	45.9
0.2	1	0.2	199	46.2
0.5	1	0.2	200	46.4
1	155	36.0	355	82.4
2	40	9.3	395	91.6
3	10	2.3	405	94.0
4	14	3.2	419	97.2
5	5	1.2	424	98.4
6	6	1.4	430	99.8
7	1	0.2	431	100.0

Frequency Missing = 48

time period have contact w/ account rep

PR002	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Never	201	45.9	201	45.9
Day	9	2.1	210	47.9
Week	30	6.8	240	54.8
Month	58	13.2	298	68.0
Year	140	32.0	438	100.0

Frequency Missing = 41

Someone else have contact w/ acct rep

PR005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	178	88.6	178	88.6
Yes	23	11.4	201	100.0

Frequency Missing = 278

Times other has contact w/ account rep

PR010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	6.3	1	6.3
1	2	12.5	3	18.8
2	10	62.5	13	81.3
3	2	12.5	15	93.8
4	1	6.3	16	100.0

Frequency Missing = 463

time period othr has contct w/ acct rep

PR011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Month	10	66.7	10	66.7
Year	5	33.3	15	100.0

Frequency Missing = 464

Any other services would like

PR090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	308	81.3	308	81.3
Yes	71	18.7	379	100.0

Frequency Missing = 100

Any other services would like

PR092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	339	94.2	339	94.2
Yes	21	5.8	360	100.0

Frequency Missing = 119

Any other services would like

PR094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	330	92.2	330	92.2
Yes	28	7.8	358	100.0

Frequency Missing = 121

OBS	PR091
1	ENERGY INFO/SAVING UPDATES(NEWSLETTER)
2	LOWER RATES;
3	COME OUT AND CHECK EQUIP. TO SEE IF IT
4	INFORM ABOUT HIGH-TECH EQUIPMENT
5	SEMI ANNUAL REPORT ON EFFECIANCY
6	OTHER IDEAS ON HOW TO SAVE ENERGY
7	SEMI ANNUAL REPORT ON EFFECIANCY
8	MORE ADVERTISEMENT OF PROGRAMS
9	BETTER SERVICE AND INFORMATION IN
10	CLARIFY ENERGY AUDIT SERVICES
11	INTERESTED IN PROGRAM FOR HEATING
12	INFO RE ELEC USAGE/SQ. FT. HVAC/LIGHTS
13	SEMI ANNUAL REPORT ON EFFECIANCY
14	QUICKER RESPONSE TO DOWNED WIRES
15	SEMI ANNUAL REPORT ON EFFECIANCY
16	INTERESTED IN SIMILAR PROGRAM FOR GAS
17	RECYCLING
18	METERING UPGRADES, OR SUBMETERING
19	LOWER RATES
20	GET RID OF 800#
21	CLOSER MONITORING AND FEEDBACK OF
22	MORE INTERFACING W/CUSTOMER
23	BETTER ACCESS TO KNOWLEDGE ABOUT POWER
24	GOOD TECH. SUPPORT.
25	MORE PRE-INSTALL ADVICE ON ENERGY USIN
26	WOULD LIKE TO HAVE THE METERS CHECKED
27	COMPETITIVE PRICING
28	ADVICE ON ELECTRICAL EQUIP (HVAC)
29	RE-INSTATE LAST YEARS REBATE
30	LOWER RATES
31	WOULD LIKE FOR THEM TO CHECK
32	MORE DETAILED INFORMATION FROM PG&E
33	CONSOLIDATED BILLING FOR SAME LOCATION
34	ENGINEERING HELP IN LIGHTING
35	GET ELECTRICITY ON QUICKER WHEN IT GOE
36	ANNUAL ON-SITE AUDIT
37	FREE ELECTRICITY
38	GETTING ON SAME STREET CIRCUIT AS
39	CONTINUE SAME SERVICE
40	ANALYSIS OF WHICH RATE PLAN IS BEST
41	CLASSROOM EDUCATION
42	MAINTAIN REBATES
43	CONTINUE SAME SERVICE
44	MORE FREE HELP LIKE THE OLD DADYS
45	MORE FREE HELP LIKE THE OLD DADYS
46	MORE ON SITE AUDITS
47	CONSOLIDATE BILLING FOR ENTIRE DIST.
48	BETTER SERVICE OF THEIR AUDIT, OF ALL
49	NO ADDITIONAL FEES FOR SUGGESTED WORKS
50	LOWER RATES
51	WANTS PG&E TO BE ACCOUTABLE FOR MONEY
52	KNOW EFFICIENCY OF REFRIDERATION UNITS
53	PAY ALITTLE MORE ATTENTION TO CUSTOMER

OBS	PR091
54	CHECK VOLTAGE COMING INTO BUILDING
55	KITCHEN MONITOR-BRING IT BACK
56	KITCHEN MONITOR-BRING IT BACK
57	KITCHEN MONITOR-BRING IT BACK
58	KNOWLEDGE OF TIME USE METERS AVAILABLE
59	BETTER BILLING INFO AND BUILDING DATA
60	CHECKING EFFICIENCY
61	MORE PRO-ACTIVE IN CONSERVING ENERGY
62	CONSULTANTION AS TO WHERE TO GET THE E
63	EVALUATE EQUIPMENT FOR RELIABILITY
64	METER ANALYSIS EFFICIENCY RATING OF
65	VISIT BUSINESSES AND OFFER ENERGY
66	ENERGY AUDIT AND EQUIPMENT INFO
67	LESS EXPENSIVE SERVICES
68	CONTINUE REBATE PROGRAM AS IS
69	INFARED TESTING
70	CUSTOME REBATE PROGRAM EASIER TO DEAL
71	MAKE IT EASIER ON BUSINESSES LIKE MINE

OBS	PR093
1	ENERGY EFFICIENT
2	POWER OUTAGE SITUATIONS
3	AND COOLING
4	IN LAKE COUNTY, IT'S TERRIBLE.
5	POWER USAGE AND RATES
6	OUTAGES
7	DEVICES
8	TO BE SURE SHE'S NOT PAYING FOR
9	CHANGE CLOSING DATE STRUCTURE
10	SYSTEM EFFICIENCY
11	S OUT
12	OTHER BUSINESSES ON THE STREET.
13	KEEP GIVING OUT LITURATURE
14	DETAILS ABOUT THE PROGRAM
15	THEY SPEND
16	AND DOLLAR VALUE TO RUN
17	POWER EFFIENCY.
18	EQUIP TO PROTECT SMALL BUSINESSES
19	AND ANALYSES ENERGY USAGE IN ELECTRONI
20	QUIPMENT, PRICES VARY W/DIFFERENT STOR
21	MAJOR ITEMS FOR REPLACEMENT & CHANGI G
22	SAVINGS ADVICE
23	PCB TESTING
24	WITH ESPECIALLY IN REFRIGERATION
25	AND STAY A MONOPOLY DO NOT SPLIT UP

OBS	PR095
1	CHECK THE HOMES FOR INSPECTIONS.
2	POST INSTALLATION BUG CORRECTION
3	NEIGHBOR'S ELECTRICITY
4	BETTER COMMUNICATION ON PROGRAM REQ
5	CONSOLIDATE BILLS OF ALL BUSINESS.
6	SMALL BU. EDUCATION OF PROGRAMS
7	MORE INFO ABOUT RETROFIT PROGRAM
8	TRAINING IN ELEC. CALCULATIONS.
9	TRAINING IN ELEC. CALCULATIONS.
10	TRAINING IN ELEC. CALCULATIONS.
11	TRAINING IN ELEC. CALCULATIONS.
12	TRAINING IN ELEC. CALCULATIONS.
13	TRAINING IN ELEC. CALCULATIONS.
14	TRAINING IN ELEC. CALCULATIONS.
15	TRAINING IN ELEC. CALCULATIONS.
16	TRAINING IN ELEC. CALCULATIONS.
17	TRAINING IN ELEC. CALCULATIONS.
18	TRAINING IN ELEC. CALCULATIONS.
19	TRAINING IN ELEC. CALCULATIONS.
20	TRAINING IN ELEC. CALCULATIONS.
21	TRAINING IN ELEC. CALCULATIONS.
22	TRAINING IN ELEC. CALCULATIONS.
23	TRAINING IN ELEC. CALCULATIONS.
24	TRAINING IN ELEC. CALCULATIONS.
25	TRAINING IN ELEC. CALCULATIONS.
26	FORMAT
27	ES
28	EQUIPMENT DECISIONS
29	FOLLOW UP ON REBATE PROGRAM

More EE info and energy audits

PR096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	26	100.0	26	100.0

Frequency Missing = 453

Planning any future retrofits

FR070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	274	62.8	274	62.8
Yes	162	37.2	436	100.0

Frequency Missing = 43

Future lights/high or standard EE

FR075	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Standard EE	3	2.0	3	2.0
High EE	148	98.0	151	100.0

Frequency Missing = 328

Future retofit though program?

FR077	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	8	5.3	8	5.3
Yes	144	94.7	152	100.0

Frequency Missing = 327

Future Lights/4' T-8

FR080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	31	40.3	31	40.3
1	8	10.4	39	50.6
2	1	1.3	40	51.9
5	1	1.3	41	53.2
8	1	1.3	42	54.5
10	1	1.3	43	55.8
12	1	1.3	44	57.1
16	2	2.6	46	59.7
25	1	1.3	47	61.0
40	3	3.9	50	64.9
43	1	1.3	51	66.2
50	1	1.3	52	67.5
98	1	1.3	53	68.8
120	1	1.3	54	70.1
140	1	1.3	55	71.4
200	3	3.9	58	75.3
250	1	1.3	59	76.6
300	2	2.6	61	79.2
398	1	1.3	62	80.5
600	1	1.3	63	81.8
700	2	2.6	65	84.4
900	1	1.3	66	85.7
1000	11	14.3	77	100.0

Frequency Missing = 402

Future Lights/8' T-8

FR081	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	84	89.4	84	89.4
1	4	4.3	88	93.6
12	2	2.1	90	95.7
60	1	1.1	91	96.8
200	1	1.1	92	97.9
600	1	1.1	93	98.9
1000	1	1.1	94	100.0

Frequency Missing = 385

Future Lights/4' ES Fluor

FR082	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	87	92.6	87	92.6
9	1	1.1	88	93.6
12	1	1.1	89	94.7
20	1	1.1	90	95.7
30	1	1.1	91	96.8
50	1	1.1	92	97.9
100	2	2.1	94	100.0

Frequency Missing = 385

Future Lights/8' ES Fluor

FR083	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	89	94.7	89	94.7
1	3	3.2	92	97.9
12	1	1.1	93	98.9
344	1	1.1	94	100.0

Frequency Missing = 385

Future Lights/4' T-12

FR084	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	89	96.7	89	96.7
2	1	1.1	90	97.8
4	1	1.1	91	98.9
8	1	1.1	92	100.0

Frequency Missing = 387

Future Lights/8' T-12

FR085	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	92	97.9	92	97.9
1	1	1.1	93	98.9
9	1	1.1	94	100.0

Frequency Missing = 385

Future Lights/Incandescent

FR086	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	90	93.8	90	93.8
4	1	1.0	91	94.8
8	1	1.0	92	95.8
12	2	2.1	94	97.9
75	1	1.0	95	99.0
100	1	1.0	96	100.0

Frequency Missing = 383

Future Lights/Compact Fluor

FR087	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	89	89.0	89	89.0
1	3	3.0	92	92.0
10	1	1.0	93	93.0
15	1	1.0	94	94.0
16	1	1.0	95	95.0
72	1	1.0	96	96.0
200	2	2.0	98	98.0
350	1	1.0	99	99.0
1000	1	1.0	100	100.0

Frequency Missing = 379

Future Lights/High pres sodium

FR088	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	87	87.0	87	87.0
1	3	3.0	90	90.0
4	1	1.0	91	91.0
10	1	1.0	92	92.0
12	3	3.0	95	95.0
20	1	1.0	96	96.0
24	1	1.0	97	97.0
30	1	1.0	98	98.0
100	1	1.0	99	99.0
200	1	1.0	100	100.0

Frequency Missing = 379

Future Lights/Elec Ballasts

FR089	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	85	88.5	85	88.5
1	1	1.0	86	89.6
10	1	1.0	87	90.6
30	1	1.0	88	91.7
40	1	1.0	89	92.7
120	2	2.1	91	94.8
300	1	1.0	92	95.8
700	1	1.0	93	96.9
1000	3	3.1	96	100.0

Frequency Missing = 383

Future Lights/Magnetic Ballasts

FR090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	96	99.0	96	99.0
8	1	1.0	97	100.0

Frequency Missing = 382

Future Lights/Metal Halide

FR091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	89	91.8	89	91.8
1	1	1.0	90	92.8
4	1	1.0	91	93.8
6	1	1.0	92	94.8
8	1	1.0	93	95.9
12	1	1.0	94	96.9
20	1	1.0	95	97.9
50	1	1.0	96	99.0
63	1	1.0	97	100.0

Frequency Missing = 382

Future Lights/Mercury Vapor

FR092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	96	94.1	96	94.1
1	1	1.0	97	95.1
20	2	2.0	99	97.1
1000	3	2.9	102	100.0

Frequency Missing = 377

Future Lights/Quartz

FR093	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	95	94.1	95	94.1
1	4	4.0	99	98.0
7	1	1.0	100	99.0
12	1	1.0	101	100.0

Frequency Missing = 378

Future Lights/Reflectors

FR094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	98	98.0	98	98.0
5	1	1.0	99	99.0
398	1	1.0	100	100.0

Frequency Missing = 379

Future Lights/LED Exit Lights

FR095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	99	97.1	99	97.1
20	1	1.0	100	98.0
24	1	1.0	101	99.0
100	1	1.0	102	100.0

Frequency Missing = 377

Future Lights/Watt Saver-Power Choke

FR096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	102	100.0	102	100.0

Frequency Missing = 377

Future Lights/Other

FR097	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	97	91.5	97	91.5
1	6	5.7	103	97.2
100	1	0.9	104	98.1
500	2	1.9	106	100.0

Frequency Missing = 373

OBS	FR098
1	PHOTOCELL CONTROL
2	EXTERIOR / PARKING LOT
3	MOTION SENSORS, 300 E\REXT.
4	HIHG PRESS. SODIUM
5	HALOGEN
6	T8 FLOUR
7	AMBIENT FLURORECENTS
8	80
9	MR16=2600
10	6-400 WATT METAL HALIDE
11	MR16=2600
12	MR16=2600
13	MOST RECENT ENERGY-EFFICI.
14	HIHG PRESS. SODIUM

Future Lights/Refused

FR099R	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	101	100.0	101	100.0

Frequency Missing = 378

Future Lights/Don't Know

FR099D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	98	100.0	98	100.0

Frequency Missing = 381

Program satisfaction: 1-7 scale

DS070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	5	1.1	5	1.1
3	7	1.5	12	2.7
4	14	3.1	26	5.8
5	80	17.7	106	23.5
6	152	33.6	258	57.1
7	194	42.9	452	100.0

Frequency Missing = 27

Dissatisfied for any reason?

DS080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	381	84.1	381	84.1
Yes	72	15.9	453	100.0

Frequency Missing = 26

Problems with contractor

DS081	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	49	76.6	49	76.6
1	15	23.4	64	100.0

Frequency Missing = 415

Rebate too small

DS082	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	52	81.3	52	81.3
1	12	18.8	64	100.0

Frequency Missing = 415

Problems with equipment

DS083	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	84.6	55	84.6
1	10	15.4	65	100.0

Frequency Missing = 414

Not seeing any bill savings

DS084	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	54	84.4	54	84.4
1	10	15.6	64	100.0

Frequency Missing = 415

Unresolved problems

DS085	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	58	90.6	58	90.6
1	6	9.4	64	100.0

Frequency Missing = 415

Problems with getting rebate

DS086	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	84.6	55	84.6
1	10	15.4	65	100.0

Frequency Missing = 414

Problems with the contract rep

DS087	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	59	89.4	59	89.4
1	7	10.6	66	100.0

Frequency Missing = 413

OBS	DS088
1	MORE CONTACT W/ PGE REP
2	THOUGHT IT WAS A "REAL HASSLE"
3	COTRACTER TOOK TO LONG UNRELIABLE.
4	RECIEVED A QUOTE FOR REBATE, BUT FINAL REBATE WAS LESS THAN
5	DIFFICULT DUE TO COMMUNICATION BARRIERS, LOT OF QUESTIONS ASK
6	APPLICATION FORMS ARE CONFUSING
7	NEW LIGHTS INTERFERE W/ INFRA-RED REMOTES AND PG&E KEEPS
8	GETTING THE REBATE REFUNDED IN A TIMELY MANNER.
9	INCONSISTENCY OF REBATES AND SUPPORT OF PROGRAM
10	PROGRAM DIED BEFORE NEXT INSTALLATION, THERE.
11	BALLASTS ARE DEFECTIVE ON A CONTINUING BASIS.
12	UNHAPPY W/PGE REP HANDLED MISUNDERSTANDING ON CLOSING DATE
13	DIDN'T GET THE FORMS FOR REBATE OUT QUICK ENUOGH, TO THE REPS
14	0
15	LIGHTING COULD BE BRIGHTER
16	AT TIMES IT'S HARD TO KNOW WHERE TO GO TO GET INFO
17	GOT DOUBLE REBATE AMOUNT, HAD TO HAVE OVERAGE SENT BACK.
18	INSUFFICIENT "COVERAGE": TOO MANY RESTRICTIONS...
19	POOR PLANNING AND ATTN. TO DETAIL
20	POOR PLANNING AND ATTN. TO DETAIL
21	POOR PLANNING AND ATTN. TO DETAIL
22	SALES PERSON WAS WRONG ABOUT REPLACEMENT COSTS COST US MONEY
23	POOR SENSOR DOES NOT OPERATE PROPERTY
24	PROBLEM WITH BALLEST
25	POOR PLANNING AND ATTN. TO DETAIL
26	POOR PLANNING AND ATTN. TO DETAIL
27	PROGRAM DEADLINES VERY INCONVENIENT TO FIT WITH INSTALLATION
28	POOR PLANNING AND ATTN. TO DETAIL
29	1 REQUIREMENTS ARE GETTING MORE TECHNICAL.
30	POOR PLANNING AND ATTN. TO DETAIL
31	POOR PLANNING AND ATTN. TO DETAIL
32	20 % OF THE REBATE NOT YET RECEIVED
33	POOR PLANNING AND ATTN. TO DETAIL
34	OFFER BETTER INFO & REBATES, RARELY RECEIVE INFO ABOUT RETRIF
35	NEED WORKING SAMPLES TO DEDIDE WHICH WORKS BEST IN A SITUATIO
36	HELP FINDING H. EFF. LIGHTING
37	HELP FINDING H. EFF. LIGHTING
38	PAPER WORK REDUCTION FOR MULTI SITES
39	PAPER WORK REDUCTION FOR MULTI SITES
40	PAPER WORK REDUCTION FOR MULTI SITES
41	TOOK TO LONG TO RECEIVE REBATE.
42	REBATE SHOULD BE STRUCTURED ON BASIS OF ACTUAL ENERGY SAVINGS
43	GET LITTLE INFO ON PROGRAMS
44	0
45	0
46	UNRESPONSIVE
47	REBATE CUTS
48	PROBLEM WITH THE ACCOUNT REP THEY WERE NOT QUITE SURE WHO WAS
49	THE REBATE IS NOT AVAIABLE FOR CERTAIN THINGS THAT HE WANTS
50	GETTING ALOT OF "LEAKY" INFORMATION.ABOUT REBATES BEING CUTT

OBS	DS089
1	QUOTED
2	ED FOR PROGRAM DID NOT APPLY TO THE CHURCH SPECIFICALLY.
3	SAYING THEY'LL DO SOMETHING---THEN THEY DISAPPEAR
4	TIMING
5	AND NO LOCAL OFFICE KNOWLEDGE.
6	0
7	0
8	POOR AUDITING WITHIN PG&E ???
9	WE NEEDED ADVICE FROM PGE
10	SCHEDULE
11	IT, ESPECIALLY FOR COMMERCIAL ACCOUNTS
12	N; NEEDS WATTAGE HOURS FOR LIGHT AMOUNT AND COST
13	NO LOCAL CONTACT
14	0
15	0
16	0
17	RESPONSIBLE
18	TO DO
19	GIVE OUT KNOWLEDGEABLE INFOMATION TO CUSTOMERS.

Suggestion for improving program?

DS090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	267	59.9	267	59.9
Yes	179	40.1	446	100.0

Frequency Missing = 33

Better/More Information

DS091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	94	61.8	94	61.8
1	58	38.2	152	100.0

Frequency Missing = 327

Post-Installation Inspection

DS092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	128	97.0	128	97.0
1	4	3.0	132	100.0

Frequency Missing = 347

Improve Quality of light

DS093	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	127	96.9	127	96.9
1	4	3.1	131	100.0

Frequency Missing = 348

Larger Rebates

DS094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	67	48.2	67	48.2
1	72	51.8	139	100.0

Frequency Missing = 340

Smaller Rebates

DS095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	132	100.0	132	100.0

Frequency Missing = 347

Change Qualifying Measures

DS096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	132	98.5	132	98.5
1	2	1.5	134	100.0

Frequency Missing = 345

Closer Supervision of Contractors

DS097	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	120	88.2	120	88.2
1	16	11.8	136	100.0

Frequency Missing = 343

OBS	DS100
1	IMPROVE GENERAL EFFIECIENCY
2	MORE EQUIPMENT ADVICE
3	OUTREACH IS IMPORTANT ESPECIALLY FOR SMALLER FACILITIES
4	1 LESS PAPERWORK
5	0
6	WOULD LIKE TO SEE OLD FIXTURES REPLACED
7	EXTEND TO PROPERTY IN LODI
8	BETTER COMMUNICATION ABOUT SUCH PROGRAMS
9	MORE INCENTIVES FOR NONPROFIT ORGANIZATIONS, CURRENTLY HAVE
10	0
11	PG&E SHOULD DROP REBATES BECAUSE IT KEEPS GETTING SMALLER
12	PG&E SHOULD DROP REBATES BECAUSE IT KEEPS GETTING SMALLER
13	MORE ON SIGHT HELP AND RECOMENDATIONS
14	0
15	MAKE INFO MORE ACCESSIBLE TO ALL TYPES OF GROUPS
16	PG&E SHOULD DROP REBATES BECAUSE IT KEEPS GETTING SMALLER
17	MORE GUIDANCE IN EQUIPMENT SELECTION
18	PROGRAM MISREPRESENTED IN RELATION TO SAVINGS ATTAINABLE
19	MORE PEOPLE DELIVERING MORE INFO TO BUSINESSE
20	0
21	NEED TO HAV EMORE ADVERTISING FOR THE PROGRAM
22	BETTER ADVERTISING TO LET PEOPLE KNOW OF PROGRAM
23	0
24	0
25	KEEP IT AVAILABLE !!!!!
26	PG&E SHOULD DROP REBATES BECAUSE IT KEEPS GETTING SMALLER
27	SIMPLIFY AND LEAVE ROOM FOR FLEXIBILITY IN REBATES
28	0
29	MORE TIMELY AND PRECISE INFO
30	GIVE CUSTOMER TOUR OF ENERY SYSTEM IN SF
31	PROVIDE BETTER ENGINEERING CRITERA AND SUPPORT, ALCO HIGHE
32	FOLLOW UP COULD BE A LITTLE BIT STRONGER.
33	KEEP THE REBATE GOING..THE WAY IT IS
34	JUST CONTINUE THE PROGRAM
35	SEND SURVEY BY MAIL
36	NO ONE TOLD HIM HOW MANY LUMENS ARE NEEDED FOR EVERY SQ. FT.
37	PAY MORE QUICKLY
38	BETTER ADVERTISING OF PROGRAM
39	MORE\BETTER ADVERTISING
40	WOULD LIKE TO SEE A DEMONSTRATION AREA WHERE PG&E COULD DEMON
41	MORE INFO ABOUT THE EQUIPMENT ITSELF.
42	0
43	0
44	NO ONE TOLD HIM HOW MANY LUMENS ARE NEEDED FOR EVERY SQ. FT.
45	PROGRAM DIDN'T STIPULATE CERTAIN LAMP CONFIGURATIONS PRESENT
46	SHORTEN THE SURVEY
47	MAINTAIN SAME AMOUNT OF REBATE
48	0
49	KEEP IT GOING
50	BIAX LAMP SHOULD BE INCLUDED IN RETROFIT PACKAGE
51	GO BACK AND PROVE THAT THE SAVINGS WERE THERE; FOLLOW UP.
52	WOULD LIKE MORE ENGINEERING ADVICE ON THE RETROFITS.
53	KEEP IT GOING

OBS	DS100
54	0
55	0
56	0
57	0
58	0
59	FIX SENSORS
60	0
61	0
62	KEEP IT GOING
63	TIMELY REBATE -- REBATE WAS LATE
64	0
65	0
66	0
67	0
68	0
69	PG&E SHOULD GET MORE INVOLVED IN INFO ABOUT EQUIP. SELECTION
70	HAVE PROGRAM RUN ALL YEAR WITHUT CUTOFF DATES
71	0
72	SPECIFY EQUIPMENT THAT YOU GET REBATES ON
73	FORMS CONFUSING NEED TO BE RE-WRITTEN
74	BETTER CONTACT W/ENGINEERS WHO CAN ANSWER TECHNICAL QUESTIONS
75	CONTRACTOR BROKE LIGHTS LEADING TO BUS. CLOSING, NOT POLITE
76	BETTER REBATES FOR COMMERCIAL ACCOUNTS, DIDN'T SAVE MUCH FR
77	ANALYSIS OF BEST RETURN FOR PARTICULAR BUILDING
78	FOLLOW-UP FROM PG&E AFTER INSTALLATION OF EQUIPMENT, AND
79	NOT SURE IF SUGGESTION INVOLVES PG&E AND EFFICIENCY PROGRAM.
80	KEP PROGRAMS GOING
81	KEP PROGRAMS GOING
82	KEP PROGRAMS GOING
83	KEP PROGRAMS GOING
84	KEP PROGRAMS GOING
85	KEP PROGRAMS GOING
86	KEP PROGRAMS GOING
87	KEP PROGRAMS GOING
88	KEP PROGRAMS GOING
89	KEP PROGRAMS GOING
90	KEP PROGRAMS GOING
91	KEP PROGRAMS GOING
92	KEP PROGRAMS GOING
93	KEP PROGRAMS GOING
94	KEP PROGRAMS GOING
95	KEP PROGRAMS GOING
96	REDUCE RATES
97	KEP PROGRAMS GOING
98	KEP PROGRAMS GOING
99	BRING WORKING SAMPLES
100	DON'T CHANGE IT
101	MAKE IT EASYER TO APPLY FOR PROGRAMS
102	MAKE IT EASYER TO APPLY FOR PROGRAMS
103	SURVEY TOO LONG
104	CONCENTRATE ON RENDITION AND LOOKS FOR RETAIL
105	EDUCATE AS TO WHAT IS AVAILABLE
106	CONCENTRATE ON RENDITION AND LOOKS FOR RETAIL

OBS	DS100
107	CONCENTRATE ON RENDITION AND LOOKS FOR RETAIL
108	PUT THIS SURVEY IN WRITTEN FORM.
109	DON'T REDUCE THE REBATES
110	KEEP IT GOING
111	KEEP PROGRAM IN PLACE AND EXPAND; REBATES EXCELLANT WAY TO GO
112	FASTER RECEIPT OF REBATE CHECKS
113	0
114	SHOWROOM TO SEE ALL YOUR OPTIONS & FIXTURES THAT WOULD BE
115	BETTER CONTACT WITH REP
116	REBATE IS GOOD INCENTIVE
117	0
118	SOME REBATES ARE NOT APPLICABLE TO ENCOURAGE PPL TO USE HIGH
119	BETTER TRAINED EMPLOYEES
120	MORE ENGINEERING SUPPORT. BETTER STATISTICS ON PAYBACK PERIOD
121	GO BACK TO THE 1991 REBATE PROGRAM
122	LARGER PARTICIPATION IN HELPING COMPANIES SELLECT EQUIPMENT
123	MAKE THE PROGRAM MORE FLEXIBLE
124	1

OBS	DS101
1	0
2	PRIVATE CONTRACTOR & HAVE HAD COMMUNICATION DIFFICULTY
3	0
4	0
5	0
6	0
7	0
8	0
9	R REBATES
10	STRATE RELATIVE LIGHTING
11	0
12	0
13	IN THE MARKET PLACE, MAKING THE RETROFIT A HASSLE
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	0
24	0
25	0
26	0
27	[G&E COULD GIVE UNBIASED OPINION, CONTRACTORS ARE PROFIT MOTI
28	0
29	OM PROGRAM, NOT MUCH IMPROVEMENT SEEN, NOT DOING MUCH FOR THE
30	PROOF OF SAVINGS.
31	0
32	COMPATIABLE W/OLD BULIDINGS
33	0
34	EFFICIENCY PRODUCTS
35	0
36	0
37	ADVERTISE TO COMPANIES BETTER

OBS	DS102
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0
22	0
23	VATED
24	0
25	M, WASN'T WORTH THE MONEY, BILL STILL TOO HIGH
26	1
27	0
28	0
29	0
30	0

Main business activity

BC011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Office	59	12.6	59	12.6
Retail (no-food)	82	17.6	141	30.2
Manuf/Assmbly	8	1.7	149	31.9
Warehouse	10	2.1	159	34.0
Restaurant	22	4.7	181	38.8
Grocery Store	26	5.6	207	44.3
School	69	14.8	276	59.1
Hotel/Motel	14	3.0	290	62.1
Hospital	10	2.1	300	64.2
Collg/Univ	1	0.2	301	64.5
Health Care	18	3.9	319	68.3
Municipalty	3	0.6	322	69.0
Indust procss	1	0.2	323	69.2
Other	144	30.8	467	100.0

Frequency Missing = 12

OBS	BC012
1	REAL ESTATE AND PROP. MNG.
2	CHURCH
3	RELIGIOUS
4	FLIGHT TRAINING, SALES
5	INS. COMPANY
6	POST OFFICE
7	CREDIT UNION
8	CHURCH
9	RECREATIONAL FACILITY
10	CHURCH
11	LEGAL AIDE OFFICE
12	LAW PRACTICE
13	CHURCH
14	CHURCH
15	CHURCH
16	LOCAL UNION
17	COMMUNITY SERVICE ORGANIZATION
18	REAL ESTATE CONTRACTOR
19	MAIL AND BUSS. SERV
20	CHURCH
21	FINANCIAL PLANNING
22	CHURCH
23	TRADE AND SERVICE ORGANIZATION
24	BANKS
25	MAIL SERVICES
26	FINIANCIAL INSTITUTION
27	FINIANCIAL INSTITUTION
28	RETAIL BANKING
29	RETAIL BANKING
30	COMMERCIAL BANK
31	YOUTH SERVICES
32	MAIL SERVICES
33	MEETING HALL
34	BANKING
35	TEMPLE
36	FINANICIAL INSTITUTION
37	FINANICIAL INSTITUTION
38	BANKS
39	CHURCH
40	RETAIL BANKING
41	FIRE DEPARTMENT
42	POST OFFICE
43	FINANICIAL INSTITUTION
44	BRANCH BANKING
45	FINANICIAL INSTITUTION
46	BANKS
47	CHURCH
48	BANKING FACILITY
49	FIRE PROTECTION
50	AIRPORYT
51	BANK
52	FINIANCIAL INSTITUTION
53	FINIANCIAL INSTITUTION

OBS	BC012
54	FINANICIAL INSTITUTION
55	LAW ENFORCEMENT
56	BANKING FACILITY
57	FINANICIAL INSTITUTION
58	FIRE PROTECTION DISTRICT
59	FUNERAL
60	C. P. A.
61	BANKS
62	CO. OFFICES,/STATE& FED
63	CHURCH
64	MAIL SERVICES
65	ACCOUNTING
66	RETAIL BANKING
67	CONGRESS. OFFICE
68	COMMERCIAL BANK
69	CHURCH
70	ACCOUNTING
71	LIBRARY
72	MAIL SERVICES
73	CREDIT UNION
74	WIRELESS COMMUNICATIONS
75	COMBIN. OF 1,2,3
76	YMCA
77	CABLE COMPANY
78	LAW FIRM
79	ELEC. COMPONENT TESTING HOUSE
80	AUTOMOBILES SALES
81	RENTAL EQUIPMENT
82	COIN LAUNDRY
83	AUTO PAINT SUPPLIES
84	RETAIL STATIONERS
85	AUTO REPAIR
86	LIBRARY
87	ORDTDHODONTIC LAB
88	CHURCH
89	LANDSCAPE ARCITECHTURE
90	BEAUTY SALON
91	AUTOMOTIVE
92	VIDEO RENTALS
93	AUTOMOTIVE REPAIR
94	LAUNDROMAT
95	FURNITURE SHOWROOM
96	RECREATION
97	AUTO REPAIR SERVICE
98	LAUNDROMAT & DRY CLEANERS
99	GROCERY, RETAIL, ETC.
100	MORTUARY
101	AUTO BODY REPAIR
102	LAUNDERMAT
103	COIN LAUNDRY
104	SERVICE ORIENTED
105	SERVICE ORIENTED
106	AUTO BODY REPAIR

OBS	BC012
107	AMUSEMENT PARK
108	CAR WASH
109	COURT REPORTING
110	SERVICE DONE IN CUST'S HOME
111	FILM PROCESSING
112	RENTAL 4 UNIFORMS
113	BOWLING CENTER
114	VEGETABLE SEED PRODUCTION COMP.
115	PACKAGE DISTRIBUTION
116	EDUCATION
117	CHURCH ,OFFICES AND PRESCHOOL.
118	LIQUOR STORE
119	WINERY
120	LIQUOR STORE
121	RETAIL, FOOD
122	DENTAL OFFICE
123	DENTISTRY
124	ATHLETIC GYM
125	HEALTH CLUB
126	HEALTH CLUB
127	PHYSICIAN OFFICES
128	GOLF COURSE\
129	TENNIS CLUB
130	HEALTH CLUB
131	AUTO REPAIRS
132	SALES AND SERVICE
133	SELF STORAGE
134	ELECTRICAL WHOLESALE SUPPLY
135	WHOLESALE
136	INDIVIDUAL SELF STORAGE UNITS
137	MULTIPLE USES
138	TRCATOR SALES REPAIRS
139	WINE STORAGE WAREHOUSE
140	ELECTRICAL DATA WHOLESALE
141	WHOLE SALE DISTRIBUTER
142	SELL SEMI CUNDUCTER MAN. EQUIP.
143	OCF FACILITY AND WAREHOUSING
144	CD&TAPE DISTRIBUTOR

Year facility built

FC060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992-Pres	3	0.8	3	0.8
1988-1991	31	7.8	34	8.5
1986-1987	26	6.5	60	15.0
1983-1985	27	6.8	87	21.8
1979-1982	36	9.0	123	30.8
1975-1978	36	9.0	159	39.8
1970-1974	53	13.3	212	53.0
1960-1969	71	17.8	283	70.8
1950-1959	47	11.8	330	82.5
1940-1949	32	8.0	362	90.5
1930-1939	16	4.0	378	94.5
1929 or B4	22	5.5	400	100.0

Frequency Missing = 79

Stories of facility

FC070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	330	73.7	330	73.7
1.5	2	0.4	332	74.1
2	78	17.4	410	91.5
3	22	4.9	432	96.4
4	9	2.0	441	98.4
5	3	0.7	444	99.1
6	1	0.2	445	99.3
7	2	0.4	447	99.8
12	1	0.2	448	100.0

Frequency Missing = 31

Univariate Procedure

Variable=FC080 Square footage/floor of facility

Moments

N	390	Sum Wgts	390
Mean	23646.08	Sum	9221970
Std Dev	48154.68	Variance	2.3189E9
Skewness	5.673287	Kurtosis	42.98696
USS	1.12E12	CSS	9.02E11
CV	203.6477	Std Mean	2438.407
T:Mean=0	9.697345	Pr>|T|	0.0001
Num ^= 0	390	Num > 0	390
M(Sign)	195	Pr>=|M|	0.0001
Sgn Rank	38122.5	Pr>=|S|	0.0001

Quantiles(Def=5)

100% Max	520539	99%	263000
75% Q3	26976	95%	85000
50% Med	8000	90%	46750
25% Q1	3000	10%	1500
0% Min	45	5%	1000
		1%	416
Range	520494		
Q3-Q1	23976		
Mode	5000		

Extremes

Lowest	Obs	Highest	Obs
45(	39)	216000(	450)
161(	376)	263000(	246)
300(	23)	299968(	288)
416(	373)	393299(	291)
500(	151)	520539(	272)

Missing Value	D
Count	61
% Count/Nobs	13.53

Square footage/floor of AC space

FC081	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	27	6.1	27	6.1
1	4	0.9	31	7.0
2	1	0.2	32	7.2
3	1	0.2	33	7.4
5	2	0.5	35	7.9
6	1	0.2	36	8.1
9	2	0.5	38	8.6
10	3	0.7	41	9.3
15	3	0.7	44	9.9
20	7	1.6	51	11.5
25	7	1.6	58	13.1
30	2	0.5	60	13.5
35	1	0.2	61	13.8
40	1	0.2	62	14.0
45	1	0.2	63	14.2
50	14	3.2	77	17.4
57	1	0.2	78	17.6
60	4	0.9	82	18.5
65	5	1.1	87	19.6
66	3	0.7	90	20.3
70	7	1.6	97	21.9
75	13	2.9	110	24.8
80	8	1.8	118	26.6
85	2	0.5	120	27.1
90	18	4.1	138	31.2
95	7	1.6	145	32.7
97	1	0.2	146	33.0
98	3	0.7	149	33.6
99	2	0.5	151	34.1
100	289	65.2	440	99.3
800	1	0.2	441	99.5
3500	1	0.2	442	99.8
30000	1	0.2	443	100.0

Frequency Missing = 36

Retrofit located in a AC space?

FC095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	71	15.9	71	15.9
1	344	77.0	415	92.8
2	32	7.2	447	100.0

Frequency Missing = 32

% of Retrofit located in AC space

FC100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	16.2	6	16.2
3	1	2.7	7	18.9
5	1	2.7	8	21.6
15	2	5.4	10	27.0
20	1	2.7	11	29.7
25	1	2.7	12	32.4
33	1	2.7	13	35.1
50	5	13.5	18	48.6
60	2	5.4	20	54.1
70	2	5.4	22	59.5
75	2	5.4	24	64.9
80	4	10.8	28	75.7
90	2	5.4	30	81.1
95	1	2.7	31	83.8
99	3	8.1	34	91.9
100	3	8.1	37	100.0

Frequency Missing = 442

Since Jan1992, size changed

FC110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Increasd space	46	10.3	46	10.3
Decreasd space	2	0.4	48	10.8
Stayed same	397	89.2	445	100.0

Frequency Missing = 34

Area of size change

FC120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	1.9	1	1.9
1	5	9.4	6	11.3
150	1	1.9	7	13.2
350	1	1.9	8	15.1
450	1	1.9	9	17.0
700	1	1.9	10	18.9
800	1	1.9	11	20.8
1000	2	3.8	13	24.5
1200	1	1.9	14	26.4
1600	1	1.9	15	28.3
1800	1	1.9	16	30.2
2000	14	26.4	30	56.6
2500	1	1.9	31	58.5
3000	3	5.7	34	64.2
3500	3	5.7	37	69.8
4000	8	15.1	45	84.9
5000	2	3.8	47	88.7
5800	1	1.9	48	90.6
6000	1	1.9	49	92.5
7000	3	5.7	52	98.1
10000	1	1.9	53	100.0

Frequency Missing = 426

Month/Year of area change

FC130	Frequency	Percent	Cumulative Frequency	Cumulative Percent
OCT1992	1	4.8	1	4.8
NOV1992	1	4.8	2	9.5
AUG1993	2	9.5	4	19.0
SEP1993	1	4.8	5	23.8
JAN1994	1	4.8	6	28.6
FEB1994	2	9.5	8	38.1
APR1994	2	9.5	10	47.6
MAY1994	2	9.5	12	57.1
JUN1994	1	4.8	13	61.9
JUL1994	3	14.3	16	76.2
AUG1994	2	9.5	18	85.7
DEC1994	1	4.8	19	90.5
APR1995	1	4.8	20	95.2
JUN1995	1	4.8	21	100.0

Frequency Missing = 458

Year of area change

FC131	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	6	18.2	6	18.2
1993	23	69.7	29	87.9
1994	4	12.1	33	100.0

Frequency Missing = 446

Month/Year of area increase occupied

FC140	Frequency	Percent	Cumulative Frequency	Cumulative Percent
OCT1992	1	5.0	1	5.0
NOV1992	1	5.0	2	10.0
AUG1993	1	5.0	3	15.0
SEP1993	2	10.0	5	25.0
FEB1994	2	10.0	7	35.0
APR1994	2	10.0	9	45.0
MAY1994	1	5.0	10	50.0
JUN1994	2	10.0	12	60.0
JUL1994	1	5.0	13	65.0
AUG1994	1	5.0	14	70.0
SEP1994	1	5.0	15	75.0
NOV1994	1	5.0	16	80.0
DEC1994	1	5.0	17	85.0
JAN1995	1	5.0	18	90.0
APR1995	1	5.0	19	95.0
JUN1995	1	5.0	20	100.0

Frequency Missing = 459

Year of area increase occupied

FC141	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	6	20.0	6	20.0
1993	21	70.0	27	90.0
1994	3	10.0	30	100.0

Frequency Missing = 449

Month/Year of last major space remodel

FR033	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1970	1	1.6	1	1.6
MAR1970	1	1.6	2	3.2
SEP1975	1	1.6	3	4.8
DEC1980	1	1.6	4	6.5
JUN1984	1	1.6	5	8.1
OCT1984	1	1.6	6	9.7
MAR1985	1	1.6	7	11.3
NOV1985	1	1.6	8	12.9
DEC1985	1	1.6	9	14.5
FEB1986	1	1.6	10	16.1
APR1986	1	1.6	11	17.7
JUN1986	1	1.6	12	19.4
JUN1987	2	3.2	14	22.6
NOV1987	1	1.6	15	24.2
DEC1987	1	1.6	16	25.8
AUG1988	1	1.6	17	27.4
JUN1989	1	1.6	18	29.0
SEP1989	1	1.6	19	30.6
OCT1989	1	1.6	20	32.3
NOV1989	1	1.6	21	33.9
DEC1989	1	1.6	22	35.5
MAR1990	1	1.6	23	37.1
MAY1990	1	1.6	24	38.7
OCT1990	1	1.6	25	40.3
JAN1991	1	1.6	26	41.9
JUL1991	1	1.6	27	43.5
JUN1992	1	1.6	28	45.2
AUG1992	1	1.6	29	46.8
JUN1993	1	1.6	30	48.4
AUG1993	1	1.6	31	50.0
SEP1993	2	3.2	33	53.2
NOV1993	1	1.6	34	54.8
JAN1994	2	3.2	36	58.1
FEB1994	2	3.2	38	61.3
MAR1994	2	3.2	40	64.5
APR1994	2	3.2	42	67.7
MAY1994	1	1.6	43	69.4
JUN1994	1	1.6	44	71.0
JUL1994	2	3.2	46	74.2
SEP1994	1	1.6	47	75.8
OCT1994	1	1.6	48	77.4
NOV1994	2	3.2	50	80.6
DEC1994	2	3.2	52	83.9
JAN1995	4	6.5	56	90.3
FEB1995	1	1.6	57	91.9
MAR1995	1	1.6	58	93.5
MAY1995	4	6.5	62	100.0

Frequency Missing = 417

Year of last major space remodel

FR034	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.3	1	0.3
Never remodled	204	61.8	205	62.1
1955	1	0.3	206	62.4
1960	1	0.3	207	62.7
1961	1	0.3	208	63.0
1964	1	0.3	209	63.3
1965	3	0.9	212	64.2
1967	1	0.3	213	64.5
1970	1	0.3	214	64.8
1972	1	0.3	215	65.2
1974	2	0.6	217	65.8
1976	1	0.3	218	66.1
1979	2	0.6	220	66.7
1980	9	2.7	229	69.4
1981	3	0.9	232	70.3
1983	1	0.3	233	70.6
1984	2	0.6	235	71.2
1985	3	0.9	238	72.1
1986	3	0.9	241	73.0
1987	5	1.5	246	74.5
1988	7	2.1	253	76.7
1989	9	2.7	262	79.4
1990	15	4.5	277	83.9
1991	12	3.6	289	87.6
1992	13	3.9	302	91.5
1993	6	1.8	308	93.3
1994	17	5.2	325	98.5
1995	5	1.5	330	100.0

Frequency Missing = 149

Did remodel cover space retrofitted

FR035	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	42	22.2	42	22.2
Yes	147	77.8	189	100.0

Frequency Missing = 290

Weekdays per year closed for holidays

LF030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	66	16.5	66	16.5
1	27	6.8	93	23.3
2	22	5.5	115	28.8
3	20	5.0	135	33.8
4	17	4.3	152	38.1
5	34	8.5	186	46.6
6	29	7.3	215	53.9
7	38	9.5	253	63.4
8	20	5.0	273	68.4
9	8	2.0	281	70.4
10	48	12.0	329	82.5
11	6	1.5	335	84.0
12	22	5.5	357	89.5
13	5	1.3	362	90.7
14	1	0.3	363	91.0
15	5	1.3	368	92.2
16	1	0.3	369	92.5
18	1	0.3	370	92.7
20	3	0.8	373	93.5
22	2	0.5	375	94.0
23	7	1.8	382	95.7
24	1	0.3	383	96.0
25	10	2.5	393	98.5
30	1	0.3	394	98.7
35	1	0.3	395	99.0
45	1	0.3	396	99.2
52	1	0.3	397	99.5
62	1	0.3	398	99.7
105	1	0.3	399	100.0

Frequency Missing = 80

Saturdays per year closed for holidays

LF040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	169	44.7	169	44.7
1	7	1.9	176	46.6
2	26	6.9	202	53.4
3	6	1.6	208	55.0
4	3	0.8	211	55.8
5	2	0.5	213	56.3
6	3	0.8	216	57.1
7	2	0.5	218	57.7
9	1	0.3	219	57.9
10	1	0.3	220	58.2
11	1	0.3	221	58.5
12	2	0.5	223	59.0
13	1	0.3	224	59.3
14	1	0.3	225	59.5
20	1	0.3	226	59.8
25	2	0.5	228	60.3
32	1	0.3	229	60.6
36	1	0.3	230	60.8
48	1	0.3	231	61.1
50	1	0.3	232	61.4
52	6	1.6	238	63.0
Never open	140	37.0	378	100.0

Frequency Missing = 101

Sundays per year closed for holidays

LF050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	144	36.5	144	36.5
1	9	2.3	153	38.8
2	10	2.5	163	41.4
3	1	0.3	164	41.6
5	1	0.3	165	41.9
6	1	0.3	166	42.1
7	1	0.3	167	42.4
9	1	0.3	168	42.6
10	2	0.5	170	43.1
11	1	0.3	171	43.4
12	2	0.5	173	43.9
45	1	0.3	174	44.2
52	6	1.5	180	45.7
Never open	214	54.3	394	100.0

Frequency Missing = 85

Lighting hours different from operating?

BH010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	308	67.2	308	67.2
Yes	150	32.8	458	100.0

Frequency Missing = 21

Aware of lighting hours

BH015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	149	100.0	149	100.0

Frequency Missing = 330

light hours/from: Dec Week

LF1F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	49	10.5	49	10.5
4:00	4	0.9	53	11.3
4:30	2	0.4	55	11.8
5:00	9	1.9	64	13.7
5:15	1	0.2	65	13.9
5:30	5	1.1	70	15.0
5:45	1	0.2	71	15.2
6:00	47	10.0	118	25.2
6:30	17	3.6	135	28.8
7:00	79	16.9	214	45.7
7:30	41	8.8	255	54.5
7:45	1	0.2	256	54.7
8:00	108	23.1	364	77.8
8:15	1	0.2	365	78.0
8:30	17	3.6	382	81.6
9:00	52	11.1	434	92.7
9:30	7	1.5	441	94.2
10:00	14	3.0	455	97.2
10:30	1	0.2	456	97.4
11:00	5	1.1	461	98.5
12:00	1	0.2	462	98.7
16:00	2	0.4	464	99.1
16:30	1	0.2	465	99.4
17:00	2	0.4	467	99.8
19:00	1	0.2	468	100.0

Frequency Missing = 11

light hours/from: Dec Sat

LF2F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	227	48.9	227	48.9
4:00	1	0.2	228	49.1
4:30	1	0.2	229	49.4
5:00	8	1.7	237	51.1
5:15	1	0.2	238	51.3
5:30	1	0.2	239	51.5
6:00	30	6.5	269	58.0
6:30	2	0.4	271	58.4
7:00	19	4.1	290	62.5
7:30	15	3.2	305	65.7
7:45	1	0.2	306	65.9
8:00	55	11.9	361	77.8
8:30	5	1.1	366	78.9
8:45	1	0.2	367	79.1
9:00	52	11.2	419	90.3
9:30	4	0.9	423	91.2
10:00	25	5.4	448	96.6
11:00	5	1.1	453	97.6
11:30	1	0.2	454	97.8
12:00	1	0.2	455	98.1
13:00	1	0.2	456	98.3
14:00	1	0.2	457	98.5
16:00	2	0.4	459	98.9
16:30	1	0.2	460	99.1
17:00	2	0.4	462	99.6
17:30	1	0.2	463	99.8
20:00	1	0.2	464	100.0

Frequency Missing = 15

light hours/from: Dec Sun

LF3F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	314	67.5	314	67.5
4:00	1	0.2	315	67.7
4:30	1	0.2	316	68.0
5:00	3	0.6	319	68.6
5:30	1	0.2	320	68.8
6:00	23	4.9	343	73.8
6:30	2	0.4	345	74.2
7:00	10	2.2	355	76.3
7:30	5	1.1	360	77.4
8:00	35	7.5	395	84.9
8:30	2	0.4	397	85.4
9:00	21	4.5	418	89.9
9:30	1	0.2	419	90.1
10:00	18	3.9	437	94.0
10:30	2	0.4	439	94.4
11:00	14	3.0	453	97.4
11:30	1	0.2	454	97.6
12:00	4	0.9	458	98.5
13:00	2	0.4	460	98.9
16:00	2	0.4	462	99.4
16:30	1	0.2	463	99.6
17:00	1	0.2	464	99.8
20:00	1	0.2	465	100.0

Frequency Missing = 14

light hours/from: Apr Week

LF4F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	48	10.5	48	10.5
4:00	4	0.9	52	11.3
4:30	1	0.2	53	11.5
5:00	10	2.2	63	13.7
5:15	1	0.2	64	13.9
5:30	5	1.1	69	15.0
5:45	1	0.2	70	15.3
6:00	50	10.9	120	26.1
6:30	16	3.5	136	29.6
7:00	79	17.2	215	46.8
7:30	39	8.5	254	55.3
7:45	1	0.2	255	55.6
8:00	103	22.4	358	78.0
8:15	1	0.2	359	78.2
8:30	17	3.7	376	81.9
9:00	49	10.7	425	92.6
9:30	7	1.5	432	94.1
10:00	16	3.5	448	97.6
10:30	1	0.2	449	97.8
11:00	4	0.9	453	98.7
12:00	1	0.2	454	98.9
16:00	1	0.2	455	99.1
17:00	1	0.2	456	99.3
19:00	3	0.7	459	100.0

Frequency Missing = 20

light hours/from: Apr Sat

LF5F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	219	48.0	219	48.0
4:00	1	0.2	220	48.2
5:00	9	2.0	229	50.2
5:15	1	0.2	230	50.4
5:30	1	0.2	231	50.7
6:00	32	7.0	263	57.7
6:30	1	0.2	264	57.9
7:00	22	4.8	286	62.7
7:30	15	3.3	301	66.0
7:45	1	0.2	302	66.2
8:00	54	11.8	356	78.1
8:30	5	1.1	361	79.2
8:45	1	0.2	362	79.4
9:00	50	11.0	412	90.4
9:30	4	0.9	416	91.2
10:00	26	5.7	442	96.9
11:00	4	0.9	446	97.8
11:30	1	0.2	447	98.0
12:00	1	0.2	448	98.2
13:00	1	0.2	449	98.5
14:00	1	0.2	450	98.7
16:00	1	0.2	451	98.9
17:00	1	0.2	452	99.1
17:30	1	0.2	453	99.3
19:00	2	0.4	455	99.8
20:00	1	0.2	456	100.0

Frequency Missing = 23

light hours/from: Apr Sun

LF6F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	303	66.6	303	66.6
4:00	1	0.2	304	66.8
5:00	4	0.9	308	67.7
5:30	1	0.2	309	67.9
6:00	29	6.4	338	74.3
6:30	1	0.2	339	74.5
7:00	11	2.4	350	76.9
7:30	6	1.3	356	78.2
8:00	30	6.6	386	84.8
8:30	2	0.4	388	85.3
9:00	24	5.3	412	90.5
9:30	1	0.2	413	90.8
10:00	16	3.5	429	94.3
10:30	2	0.4	431	94.7
11:00	14	3.1	445	97.8
11:30	1	0.2	446	98.0
12:00	3	0.7	449	98.7
13:00	2	0.4	451	99.1
16:00	1	0.2	452	99.3
19:00	2	0.4	454	99.8
20:00	1	0.2	455	100.0

Frequency Missing = 24

light hours/from: Aug Week

LF7F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	79	17.3	79	17.3
4:00	4	0.9	83	18.2
4:30	2	0.4	85	18.6
5:00	10	2.2	95	20.8
5:15	1	0.2	96	21.1
5:30	5	1.1	101	22.1
5:45	1	0.2	102	22.4
6:00	47	10.3	149	32.7
6:30	7	1.5	156	34.2
7:00	63	13.8	219	48.0
7:30	39	8.6	258	56.6
7:45	1	0.2	259	56.8
8:00	93	20.4	352	77.2
8:15	1	0.2	353	77.4
8:30	18	3.9	371	81.4
9:00	51	11.2	422	92.5
9:30	7	1.5	429	94.1
10:00	16	3.5	445	97.6
10:30	1	0.2	446	97.8
11:00	3	0.7	449	98.5
12:00	1	0.2	450	98.7
14:00	1	0.2	451	98.9
16:00	1	0.2	452	99.1
17:00	1	0.2	453	99.3
19:00	1	0.2	454	99.6
20:30	1	0.2	455	99.8
21:00	1	0.2	456	100.0

Frequency Missing = 23

light hours/from: Aug Sat

LF8F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	222	48.9	222	48.9
4:00	1	0.2	223	49.1
4:30	1	0.2	224	49.3
5:00	8	1.8	232	51.1
5:15	1	0.2	233	51.3
5:30	1	0.2	234	51.5
6:00	30	6.6	264	58.1
6:30	1	0.2	265	58.4
7:00	20	4.4	285	62.8
7:30	15	3.3	300	66.1
7:45	1	0.2	301	66.3
8:00	53	11.7	354	78.0
8:30	6	1.3	360	79.3
8:45	1	0.2	361	79.5
9:00	50	11.0	411	90.5
9:30	4	0.9	415	91.4
10:00	25	5.5	440	96.9
11:00	3	0.7	443	97.6
11:30	1	0.2	444	97.8
12:00	1	0.2	445	98.0
13:00	1	0.2	446	98.2
14:00	2	0.4	448	98.7
16:00	1	0.2	449	98.9
17:00	1	0.2	450	99.1
17:30	1	0.2	451	99.3
19:00	1	0.2	452	99.6
20:00	1	0.2	453	99.8
21:00	1	0.2	454	100.0

Frequency Missing = 25

light hours/from: Aug Sun

LF9F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	305	66.9	305	66.9
4:00	1	0.2	306	67.1
4:30	1	0.2	307	67.3
5:00	3	0.7	310	68.0
5:30	1	0.2	311	68.2
6:00	28	6.1	339	74.3
6:30	1	0.2	340	74.6
7:00	11	2.4	351	77.0
7:30	6	1.3	357	78.3
8:00	30	6.6	387	84.9
8:30	3	0.7	390	85.5
9:00	23	5.0	413	90.6
9:30	1	0.2	414	90.8
10:00	16	3.5	430	94.3
10:30	2	0.4	432	94.7
11:00	13	2.9	445	97.6
11:30	1	0.2	446	97.8
12:00	3	0.7	449	98.5
13:00	2	0.4	451	98.9
14:00	1	0.2	452	99.1
16:00	1	0.2	453	99.3
19:00	1	0.2	454	99.6
20:00	1	0.2	455	99.8
21:00	1	0.2	456	100.0

Frequency Missing = 23

light hours/from: Oct Week

LF10F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	47	10.3	47	10.3
4:00	4	0.9	51	11.2
4:30	1	0.2	52	11.4
5:00	10	2.2	62	13.6
5:15	1	0.2	63	13.8
5:30	5	1.1	68	14.9
5:45	1	0.2	69	15.1
6:00	47	10.3	116	25.4
6:30	16	3.5	132	28.9
7:00	78	17.1	210	46.1
7:30	40	8.8	250	54.8
7:45	1	0.2	251	55.0
8:00	103	22.6	354	77.6
8:15	1	0.2	355	77.9
8:30	17	3.7	372	81.6
9:00	49	10.7	421	92.3
9:30	7	1.5	428	93.9
10:00	15	3.3	443	97.1
10:30	1	0.2	444	97.4
11:00	4	0.9	448	98.2
12:00	1	0.2	449	98.5
16:00	2	0.4	451	98.9
16:30	1	0.2	452	99.1
17:00	1	0.2	453	99.3
18:00	1	0.2	454	99.6
19:00	2	0.4	456	100.0

Frequency Missing = 23

light hours/from: Oct Sat

LF11F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	222	48.9	222	48.9
4:00	1	0.2	223	49.1
5:00	9	2.0	232	51.1
5:15	1	0.2	233	51.3
5:30	1	0.2	234	51.5
6:00	30	6.6	264	58.1
6:30	1	0.2	265	58.4
7:00	19	4.2	284	62.6
7:30	15	3.3	299	65.9
7:45	1	0.2	300	66.1
8:00	54	11.9	354	78.0
8:30	5	1.1	359	79.1
8:45	1	0.2	360	79.3
9:00	49	10.8	409	90.1
9:30	4	0.9	413	91.0
10:00	25	5.5	438	96.5
11:00	4	0.9	442	97.4
11:30	1	0.2	443	97.6
12:00	1	0.2	444	97.8
13:00	1	0.2	445	98.0
14:00	1	0.2	446	98.2
16:00	2	0.4	448	98.7
16:30	1	0.2	449	98.9
17:00	1	0.2	450	99.1
17:30	1	0.2	451	99.3
18:00	1	0.2	452	99.6
19:00	1	0.2	453	99.8
20:00	1	0.2	454	100.0

Frequency Missing = 25

light hours/from: Oct Sun

LF12F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	306	67.1	306	67.1
4:00	1	0.2	307	67.3
5:00	4	0.9	311	68.2
5:30	1	0.2	312	68.4
6:00	28	6.1	340	74.6
6:30	1	0.2	341	74.8
7:00	10	2.2	351	77.0
7:30	6	1.3	357	78.3
8:00	30	6.6	387	84.9
8:30	2	0.4	389	85.3
9:00	22	4.8	411	90.1
9:30	1	0.2	412	90.4
10:00	16	3.5	428	93.9
10:30	2	0.4	430	94.3
11:00	14	3.1	444	97.4
11:30	1	0.2	445	97.6
12:00	3	0.7	448	98.2
13:00	2	0.4	450	98.7
16:00	2	0.4	452	99.1
16:30	1	0.2	453	99.3
18:00	1	0.2	454	99.6
19:00	1	0.2	455	99.8
20:00	1	0.2	456	100.0

Frequency Missing = 23

light hours/from: Holiday

LF13F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	358	79.6	358	79.6
5:00	2	0.4	360	80.0
5:15	1	0.2	361	80.2
5:30	2	0.4	363	80.7
6:00	23	5.1	386	85.8
6:30	1	0.2	387	86.0
7:00	7	1.6	394	87.6
7:30	5	1.1	399	88.7
8:00	20	4.4	419	93.1
8:30	3	0.7	422	93.8
9:00	8	1.8	430	95.6
9:30	1	0.2	431	95.8
10:00	9	2.0	440	97.8
10:30	1	0.2	441	98.0
11:00	4	0.9	445	98.9
12:00	1	0.2	446	99.1
16:00	1	0.2	447	99.3
16:30	1	0.2	448	99.6
17:00	1	0.2	449	99.8
19:00	1	0.2	450	100.0

Frequency Missing = 29

light hours/am or pm: Dec Week

LF1M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	460	96.4	460	96.4
D	10	2.1	470	98.5
P	7	1.5	477	100.0

Frequency Missing = 2

light hours/am or pm: Dec Sat

LF2M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	453	95.4	453	95.4
D	12	2.5	465	97.9
P	10	2.1	475	100.0

Frequency Missing = 4

light hours/am or pm: Dec Sun

LF3M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	453	95.4	453	95.4
D	11	2.3	464	97.7
P	11	2.3	475	100.0

Frequency Missing = 4

light hours/am or pm: Apr Week

LF4M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	453	96.6	453	96.6
D	10	2.1	463	98.7
P	6	1.3	469	100.0

Frequency Missing = 10

light hours/am or pm: Apr Sat

LF5M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	446	95.5	446	95.5
D	12	2.6	458	98.1
P	9	1.9	467	100.0

Frequency Missing = 12

light hours/am or pm: Apr Sun

LF6M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	445	95.7	445	95.7
D	11	2.4	456	98.1
P	9	1.9	465	100.0

Frequency Missing = 14

light hours/am or pm: Aug Week

LF7M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	448	96.3	448	96.3
D	10	2.2	458	98.5
P	7	1.5	465	100.0

Frequency Missing = 14

light hours/am or pm: Aug Sat

LF8M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	443	95.3	443	95.3
D	12	2.6	455	97.8
P	10	2.2	465	100.0

Frequency Missing = 14

light hours/am or pm: Aug Sun

LF9M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	445	95.5	445	95.5
D	11	2.4	456	97.9
P	10	2.1	466	100.0

Frequency Missing = 13

light hours/am or pm: Oct Week

LF10M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	447	96.1	447	96.1
D	10	2.2	457	98.3
P	8	1.7	465	100.0

Frequency Missing = 14

light hours/am or pm: Oct Sat

LF11M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	442	95.1	442	95.1
D	12	2.6	454	97.6
P	11	2.4	465	100.0

Frequency Missing = 14

light hours/am or pm: Oct Sun

LF12M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	444	95.3	444	95.3
D	11	2.4	455	97.6
P	11	2.4	466	100.0

Frequency Missing = 13

light hours/am or pm: Holiday

LF13M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	444	95.7	444	95.7
D	15	3.2	459	98.9
P	5	1.1	464	100.0

Frequency Missing = 15

light hours/to: Dec Week

LF1T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	1	0.2	1	0.2
1:00	1	0.2	2	0.4
1:30	1	0.2	3	0.6
2:00	1	0.2	4	0.9
3:00	1	0.2	5	1.1
5:00	1	0.2	6	1.3
6:00	2	0.4	8	1.7
7:00	2	0.4	10	2.1
7:30	1	0.2	11	2.3
9:00	1	0.2	12	2.6
11:00	6	1.3	18	3.8
12:00	3	0.6	21	4.5
13:00	3	0.6	24	5.1
14:30	1	0.2	25	5.3
15:00	19	4.1	44	9.4
15:30	7	1.5	51	10.9
16:00	19	4.1	70	14.9
16:15	1	0.2	71	15.1
16:30	18	3.8	89	19.0
17:00	81	17.3	170	36.2
17:30	25	5.3	195	41.6
18:00	86	18.3	281	59.9
18:30	5	1.1	286	61.0
19:00	29	6.2	315	67.2
19:30	5	1.1	320	68.2
20:00	18	3.8	338	72.1
20:30	3	0.6	341	72.7
20:45	1	0.2	342	72.9
21:00	19	4.1	361	77.0
21:30	5	1.1	366	78.0
22:00	25	5.3	391	83.4
22:30	2	0.4	393	83.8
23:00	9	1.9	402	85.7
23:30	2	0.4	404	86.1
23:58	1	0.2	405	86.4
24:00	62	13.2	467	99.6
24:30	2	0.4	469	100.0

Frequency Missing = 10

light hours/to: Dec Sat

LF2T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	181	39.0	181	39.0
1:00	1	0.2	182	39.2
1:30	1	0.2	183	39.4
2:00	1	0.2	184	39.7
3:00	1	0.2	185	39.9
5:00	1	0.2	186	40.1
6:00	1	0.2	187	40.3
7:00	1	0.2	188	40.5
7:30	1	0.2	189	40.7
9:00	1	0.2	190	40.9
11:00	5	1.1	195	42.0
11:30	1	0.2	196	42.2
12:00	16	3.4	212	45.7
13:00	6	1.3	218	47.0
13:30	1	0.2	219	47.2
14:00	5	1.1	224	48.3
14:30	1	0.2	225	48.5
15:00	13	2.8	238	51.3
15:30	1	0.2	239	51.5
16:00	7	1.5	246	53.0
16:30	1	0.2	247	53.2
17:00	36	7.8	283	61.0
17:30	9	1.9	292	62.9
17:45	1	0.2	293	63.1
18:00	39	8.4	332	71.6
18:30	3	0.6	335	72.2
19:00	17	3.7	352	75.9
20:00	10	2.2	362	78.0
20:30	2	0.4	364	78.4
21:00	9	1.9	373	80.4
21:30	4	0.9	377	81.2
22:00	17	3.7	394	84.9
22:30	1	0.2	395	85.1
23:00	5	1.1	400	86.2
23:30	1	0.2	401	86.4
23:58	1	0.2	402	86.6
24:00	60	12.9	462	99.6
24:30	2	0.4	464	100.0

Frequency Missing = 15

light hours/to: Dec Sun

LF3T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	265	57.0	265	57.0
1:00	1	0.2	266	57.2
1:30	1	0.2	267	57.4
2:00	1	0.2	268	57.6
3:00	1	0.2	269	57.8
5:00	1	0.2	270	58.1
6:00	1	0.2	271	58.3
7:00	1	0.2	272	58.5
7:30	1	0.2	273	58.7
9:00	1	0.2	274	58.9
11:00	11	2.4	285	61.3
12:00	8	1.7	293	63.0
13:00	4	0.9	297	63.9
14:00	4	0.9	301	64.7
15:00	1	0.2	302	64.9
15:30	1	0.2	303	65.2
16:00	4	0.9	307	66.0
16:30	1	0.2	308	66.2
16:45	1	0.2	309	66.5
17:00	22	4.7	331	71.2
17:30	2	0.4	333	71.6
18:00	22	4.7	355	76.3
18:30	1	0.2	356	76.6
19:00	11	2.4	367	78.9
20:00	8	1.7	375	80.6
20:30	4	0.9	379	81.5
21:00	7	1.5	386	83.0
21:30	1	0.2	387	83.2
22:00	13	2.8	400	86.0
22:30	1	0.2	401	86.2
23:00	4	0.9	405	87.1
23:58	1	0.2	406	87.3
24:00	57	12.3	463	99.6
24:30	2	0.4	465	100.0

Frequency Missing = 14

light hours/to: Apr Week

LF4T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	1	0.2	1	0.2
1:00	1	0.2	2	0.4
1:30	1	0.2	3	0.7
2:00	1	0.2	4	0.9
3:00	1	0.2	5	1.1
5:00	1	0.2	6	1.3
5:45	1	0.2	7	1.5
6:00	3	0.7	10	2.2
6:30	1	0.2	11	2.4
7:00	1	0.2	12	2.6
9:00	1	0.2	13	2.8
10:30	1	0.2	14	3.0
11:00	6	1.3	20	4.3
12:00	3	0.7	23	5.0
13:00	2	0.4	25	5.4
14:30	1	0.2	26	5.7
15:00	18	3.9	44	9.6
15:30	7	1.5	51	11.1
16:00	19	4.1	70	15.2
16:15	1	0.2	71	15.4
16:30	18	3.9	89	19.3
17:00	79	17.2	168	36.5
17:30	23	5.0	191	41.5
18:00	80	17.4	271	58.9
18:30	5	1.1	276	60.0
19:00	29	6.3	305	66.3
19:30	5	1.1	310	67.4
20:00	20	4.3	330	71.7
20:30	3	0.7	333	72.4
21:00	20	4.3	353	76.7
21:30	5	1.1	358	77.8
22:00	21	4.6	379	82.4
22:30	2	0.4	381	82.8
23:00	12	2.6	393	85.4
23:30	3	0.7	396	86.1
23:58	1	0.2	397	86.3
24:00	61	13.3	458	99.6
24:30	2	0.4	460	100.0

Frequency Missing = 19

light hours/to: Apr Sat

LF5T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	174	38.2	174	38.2
1:00	1	0.2	175	38.4
1:30	1	0.2	176	38.6
2:00	1	0.2	177	38.8
3:00	1	0.2	178	39.0
5:00	1	0.2	179	39.3
5:45	1	0.2	180	39.5
6:00	2	0.4	182	39.9
6:30	1	0.2	183	40.1
9:00	1	0.2	184	40.4
10:30	1	0.2	185	40.6
11:00	5	1.1	190	41.7
11:30	1	0.2	191	41.9
12:00	16	3.5	207	45.4
13:00	5	1.1	212	46.5
13:30	1	0.2	213	46.7
14:00	6	1.3	219	48.0
14:30	1	0.2	220	48.2
15:00	12	2.6	232	50.9
15:30	1	0.2	233	51.1
16:00	8	1.8	241	52.9
16:30	1	0.2	242	53.1
17:00	35	7.7	277	60.7
17:30	8	1.8	285	62.5
17:45	1	0.2	286	62.7
18:00	38	8.3	324	71.1
18:30	3	0.7	327	71.7
19:00	17	3.7	344	75.4
20:00	12	2.6	356	78.1
20:30	2	0.4	358	78.5
21:00	8	1.8	366	80.3
21:30	4	0.9	370	81.1
22:00	14	3.1	384	84.2
22:30	1	0.2	385	84.4
23:00	8	1.8	393	86.2
23:30	1	0.2	394	86.4
23:58	1	0.2	395	86.6
24:00	59	12.9	454	99.6
24:30	2	0.4	456	100.0

Frequency Missing = 23

light hours/to: Apr Sun

LF6T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	257	56.5	257	56.5
1:00	1	0.2	258	56.7
1:30	1	0.2	259	56.9
2:00	1	0.2	260	57.1
3:00	1	0.2	261	57.4
5:00	1	0.2	262	57.6
5:45	1	0.2	263	57.8
6:00	2	0.4	265	58.2
6:30	1	0.2	266	58.5
9:00	1	0.2	267	58.7
10:30	1	0.2	268	58.9
11:00	6	1.3	274	60.2
12:00	8	1.8	282	62.0
13:00	4	0.9	286	62.9
14:00	4	0.9	290	63.7
15:00	2	0.4	292	64.2
15:30	1	0.2	293	64.4
16:00	3	0.7	296	65.1
16:30	1	0.2	297	65.3
16:45	1	0.2	298	65.5
17:00	20	4.4	318	69.9
17:30	2	0.4	320	70.3
18:00	21	4.6	341	74.9
18:30	1	0.2	342	75.2
19:00	12	2.6	354	77.8
20:00	8	1.8	362	79.6
20:30	4	0.9	366	80.4
21:00	7	1.5	373	82.0
21:30	1	0.2	374	82.2
22:00	11	2.4	385	84.6
22:30	1	0.2	386	84.8
23:00	7	1.5	393	86.4
23:58	1	0.2	394	86.6
24:00	59	13.0	453	99.6
24:30	2	0.4	455	100.0

Frequency Missing = 24

light hours/to: Aug Week

LF7T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	35	7.7	35	7.7
1:00	1	0.2	36	7.9
1:30	1	0.2	37	8.1
2:00	1	0.2	38	8.3
2:30	1	0.2	39	8.5
3:00	1	0.2	40	8.8
5:00	1	0.2	41	9.0
5:30	1	0.2	42	9.2
6:00	3	0.7	45	9.8
6:30	1	0.2	46	10.1
7:00	1	0.2	47	10.3
9:00	1	0.2	48	10.5
11:00	6	1.3	54	11.8
12:00	4	0.9	58	12.7
13:00	5	1.1	63	13.8
14:30	1	0.2	64	14.0
15:00	5	1.1	69	15.1
15:30	5	1.1	74	16.2
16:00	12	2.6	86	18.8
16:15	1	0.2	87	19.0
16:30	6	1.3	93	20.4
17:00	81	17.7	174	38.1
17:30	24	5.3	198	43.3
18:00	80	17.5	278	60.8
18:30	5	1.1	283	61.9
19:00	28	6.1	311	68.1
19:30	5	1.1	316	69.1
20:00	17	3.7	333	72.9
20:30	3	0.7	336	73.5
21:00	19	4.2	355	77.7
21:30	5	1.1	360	78.8
22:00	19	4.2	379	82.9
22:30	2	0.4	381	83.4
23:00	11	2.4	392	85.8
23:30	3	0.7	395	86.4
23:58	1	0.2	396	86.7
24:00	59	12.9	455	99.6
24:30	2	0.4	457	100.0

Frequency Missing = 22

light hours/to: Aug Sat

LF8T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	179	39.4	179	39.4
1:00	1	0.2	180	39.6
1:30	1	0.2	181	39.9
2:00	2	0.4	183	40.3
3:00	1	0.2	184	40.5
5:00	1	0.2	185	40.7
5:45	1	0.2	186	41.0
6:00	2	0.4	188	41.4
6:30	1	0.2	189	41.6
9:00	1	0.2	190	41.9
11:00	5	1.1	195	43.0
11:30	1	0.2	196	43.2
12:00	16	3.5	212	46.7
13:00	5	1.1	217	47.8
13:30	1	0.2	218	48.0
14:00	5	1.1	223	49.1
14:30	1	0.2	224	49.3
15:00	12	2.6	236	52.0
15:30	1	0.2	237	52.2
16:00	8	1.8	245	54.0
16:30	1	0.2	246	54.2
17:00	34	7.5	280	61.7
17:30	9	2.0	289	63.7
17:45	1	0.2	290	63.9
18:00	36	7.9	326	71.8
18:30	3	0.7	329	72.5
19:00	16	3.5	345	76.0
20:00	11	2.4	356	78.4
20:30	2	0.4	358	78.9
21:00	9	2.0	367	80.8
21:30	4	0.9	371	81.7
22:00	14	3.1	385	84.8
22:30	1	0.2	386	85.0
23:00	8	1.8	394	86.8
23:30	1	0.2	395	87.0
23:58	1	0.2	396	87.2
24:00	56	12.3	452	99.6
24:30	2	0.4	454	100.0

Frequency Missing = 25

light hours/to: Aug Sun

LF9T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	259	56.8	259	56.8
1:00	1	0.2	260	57.0
1:30	1	0.2	261	57.2
2:00	1	0.2	262	57.5
3:00	1	0.2	263	57.7
5:00	1	0.2	264	57.9
5:45	1	0.2	265	58.1
6:00	2	0.4	267	58.6
6:30	1	0.2	268	58.8
9:00	1	0.2	269	59.0
11:00	6	1.3	275	60.3
12:00	9	2.0	284	62.3
13:00	3	0.7	287	62.9
14:00	4	0.9	291	63.8
15:00	2	0.4	293	64.3
15:30	1	0.2	294	64.5
16:00	3	0.7	297	65.1
16:30	1	0.2	298	65.4
16:45	1	0.2	299	65.6
17:00	20	4.4	319	70.0
17:30	3	0.7	322	70.6
18:00	20	4.4	342	75.0
18:30	1	0.2	343	75.2
19:00	11	2.4	354	77.6
20:00	8	1.8	362	79.4
20:30	4	0.9	366	80.3
21:00	7	1.5	373	81.8
21:30	1	0.2	374	82.0
22:00	11	2.4	385	84.4
22:30	1	0.2	386	84.6
23:00	7	1.5	393	86.2
23:58	1	0.2	394	86.4
24:00	60	13.2	454	99.6
24:30	2	0.4	456	100.0

Frequency Missing = 23

light hours/to: Oct Week

LF10T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	1	0.2	1	0.2
1:00	1	0.2	2	0.4
1:30	1	0.2	3	0.7
2:00	1	0.2	4	0.9
3:00	1	0.2	5	1.1
5:00	1	0.2	6	1.3
5:30	1	0.2	7	1.5
6:00	2	0.4	9	2.0
7:00	2	0.4	11	2.4
7:30	1	0.2	12	2.6
9:00	1	0.2	13	2.8
11:00	6	1.3	19	4.2
12:00	3	0.7	22	4.8
13:00	2	0.4	24	5.3
14:30	1	0.2	25	5.5
15:00	18	3.9	43	9.4
15:30	7	1.5	50	10.9
16:00	18	3.9	68	14.9
16:30	18	3.9	86	18.8
17:00	79	17.3	165	36.1
17:30	26	5.7	191	41.8
18:00	79	17.3	270	59.1
18:30	5	1.1	275	60.2
19:00	29	6.3	304	66.5
19:30	5	1.1	309	67.6
20:00	19	4.2	328	71.8
20:30	3	0.7	331	72.4
20:45	1	0.2	332	72.6
21:00	20	4.4	352	77.0
21:30	5	1.1	357	78.1
22:00	22	4.8	379	82.9
22:30	2	0.4	381	83.4
23:00	11	2.4	392	85.8
23:30	2	0.4	394	86.2
23:58	1	0.2	395	86.4
24:00	60	13.1	455	99.6
24:30	2	0.4	457	100.0

Frequency Missing = 22

light hours/to: Oct Sat

LF11T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	177	39.0	177	39.0
1:00	1	0.2	178	39.2
1:30	1	0.2	179	39.4
2:00	1	0.2	180	39.6
3:00	1	0.2	181	39.9
5:00	1	0.2	182	40.1
5:30	1	0.2	183	40.3
6:00	1	0.2	184	40.5
7:00	1	0.2	185	40.7
7:30	1	0.2	186	41.0
9:00	1	0.2	187	41.2
11:00	5	1.1	192	42.3
11:30	1	0.2	193	42.5
12:00	16	3.5	209	46.0
13:00	5	1.1	214	47.1
13:30	1	0.2	215	47.4
14:00	5	1.1	220	48.5
14:30	1	0.2	221	48.7
15:00	12	2.6	233	51.3
15:30	1	0.2	234	51.5
16:00	8	1.8	242	53.3
16:30	1	0.2	243	53.5
17:00	34	7.5	277	61.0
17:30	10	2.2	287	63.2
17:45	1	0.2	288	63.4
18:00	35	7.7	323	71.1
18:30	3	0.7	326	71.8
19:00	17	3.7	343	75.6
20:00	11	2.4	354	78.0
20:30	2	0.4	356	78.4
21:00	8	1.8	364	80.2
21:30	4	0.9	368	81.1
22:00	15	3.3	383	84.4
22:30	1	0.2	384	84.6
23:00	7	1.5	391	86.1
23:30	1	0.2	392	86.3
23:58	1	0.2	393	86.6
24:00	59	13.0	452	99.6
24:30	2	0.4	454	100.0

Frequency Missing = 25

light hours/to: Oct Sun

LF12T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	258	56.6	258	56.6
1:00	1	0.2	259	56.8
1:30	1	0.2	260	57.0
2:00	1	0.2	261	57.2
3:00	1	0.2	262	57.5
5:00	1	0.2	263	57.7
5:30	1	0.2	264	57.9
6:00	1	0.2	265	58.1
7:00	1	0.2	266	58.3
7:30	1	0.2	267	58.6
9:00	1	0.2	268	58.8
11:00	6	1.3	274	60.1
12:00	8	1.8	282	61.8
13:00	3	0.7	285	62.5
14:00	4	0.9	289	63.4
15:00	2	0.4	291	63.8
15:30	1	0.2	292	64.0
16:00	3	0.7	295	64.7
16:30	1	0.2	296	64.9
16:45	1	0.2	297	65.1
17:00	20	4.4	317	69.5
17:30	3	0.7	320	70.2
18:00	20	4.4	340	74.6
18:30	1	0.2	341	74.8
19:00	12	2.6	353	77.4
20:00	8	1.8	361	79.2
20:30	4	0.9	365	80.0
21:00	7	1.5	372	81.6
21:30	1	0.2	373	81.8
22:00	12	2.6	385	84.4
22:30	1	0.2	386	84.6
23:00	6	1.3	392	86.0
23:58	1	0.2	393	86.2
24:00	61	13.4	454	99.6
24:30	2	0.4	456	100.0

Frequency Missing = 23

light hours/to: Holiday

LF13T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	313	69.6	313	69.6
2:00	1	0.2	314	69.8
3:00	1	0.2	315	70.0
6:00	1	0.2	316	70.2
7:30	1	0.2	317	70.4
9:00	1	0.2	318	70.7
11:00	6	1.3	324	72.0
11:30	1	0.2	325	72.2
12:00	3	0.7	328	72.9
13:00	1	0.2	329	73.1
14:00	3	0.7	332	73.8
15:00	2	0.4	334	74.2
15:30	1	0.2	335	74.4
16:00	2	0.4	337	74.9
17:00	7	1.6	344	76.4
17:30	1	0.2	345	76.7
18:00	13	2.9	358	79.6
18:30	1	0.2	359	79.8
19:00	6	1.3	365	81.1
20:00	5	1.1	370	82.2
20:30	1	0.2	371	82.4
21:00	3	0.7	374	83.1
21:30	1	0.2	375	83.3
22:00	12	2.7	387	86.0
23:00	6	1.3	393	87.3
23:58	1	0.2	394	87.6
24:00	56	12.4	450	100.0

Frequency Missing = 29

light hours/am or pm: Dec Week

LF1N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	33	6.9	33	6.9
D	10	2.1	43	9.0
P	436	91.0	479	100.0

light hours/am or pm: Dec Sat

LF2N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	31	6.5	31	6.5
D	12	2.5	43	9.0
P	433	91.0	476	100.0

Frequency Missing = 3

light hours/am or pm: Dec Sun

LF3N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	30	6.3	30	6.3
D	11	2.3	41	8.6
P	435	91.4	476	100.0

Frequency Missing = 3

light hours/am or pm: Apr Week

LF4N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	35	7.4	35	7.4
D	10	2.1	45	9.6
P	425	90.4	470	100.0

Frequency Missing = 9

light hours/am or pm: Apr Sat

LF5N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	33	7.1	33	7.1
D	12	2.6	45	9.6
P	423	90.4	468	100.0

Frequency Missing = 11

light hours/am or pm: Apr Sun

LF6N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	32	6.9	32	6.9
D	11	2.4	43	9.2
P	423	90.8	466	100.0

Frequency Missing = 13

light hours/am or pm: Aug Week

LF7N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	36	7.7	36	7.7
D	10	2.1	46	9.9
P	421	90.1	467	100.0

Frequency Missing = 12

light hours/am or pm: Aug Sat

LF8N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	32	6.9	32	6.9
D	12	2.6	44	9.4
P	422	90.6	466	100.0

Frequency Missing = 13

light hours/am or pm: Aug Sun

LF9N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	32	6.9	32	6.9
D	11	2.4	43	9.2
P	424	90.8	467	100.0

Frequency Missing = 12

light hours/am or pm: Oct Week

LF10N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	34	7.3	34	7.3
D	10	2.1	44	9.4
P	423	90.6	467	100.0

Frequency Missing = 12

light hours/am or pm: Oct Sat

LF11N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	32	6.9	32	6.9
D	12	2.6	44	9.4
P	422	90.6	466	100.0

Frequency Missing = 13

light hours/am or pm: Oct Sun

LF12N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	31	6.6	31	6.6
D	11	2.4	42	9.0
P	425	91.0	467	100.0

Frequency Missing = 12

light hours/am or pm: Holiday

LF13N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	23	4.9	23	4.9
D	15	3.2	38	8.2
P	427	91.8	465	100.0

Frequency Missing = 14

light hours/percent on: Dec Week

LW1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
5	2	0.4	2	0.4
6	1	0.2	3	0.6
10	5	1.1	8	1.7
20	3	0.6	11	2.4
25	3	0.6	14	3.0
30	4	0.9	18	3.9
33	2	0.4	20	4.3
35	2	0.4	22	4.8
40	4	0.9	26	5.6
45	2	0.4	28	6.1
50	14	3.0	42	9.1
60	4	0.9	46	10.0
65	4	0.9	50	10.8
66	2	0.4	52	11.3
70	8	1.7	60	13.0
75	12	2.6	72	15.6
80	24	5.2	96	20.8
85	5	1.1	101	21.9
90	48	10.4	149	32.3
95	17	3.7	166	35.9
98	4	0.9	170	36.8
99	3	0.6	173	37.4
100	289	62.6	462	100.0

Frequency Missing = 17

light hours/percent on: Dec Sat

LW2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	70	15.5	70	15.5
0.5	1	0.2	71	15.7
1	9	2.0	80	17.7
2	28	6.2	108	23.9
3	18	4.0	126	27.9
5	29	6.4	155	34.4
6	1	0.2	156	34.6
8	1	0.2	157	34.8
10	11	2.4	168	37.3
13	1	0.2	169	37.5
15	5	1.1	174	38.6
20	12	2.7	186	41.2
25	3	0.7	189	41.9
30	10	2.2	199	44.1
33	1	0.2	200	44.3
35	1	0.2	201	44.6
40	6	1.3	207	45.9
45	2	0.4	209	46.3
50	16	3.5	225	49.9
60	3	0.7	228	50.6
65	2	0.4	230	51.0
66	2	0.4	232	51.4
70	2	0.4	234	51.9
75	8	1.8	242	53.7
80	17	3.8	259	57.4
85	3	0.7	262	58.1
90	14	3.1	276	61.2
95	5	1.1	281	62.3
98	4	0.9	285	63.2
99	1	0.2	286	63.4
100	165	36.6	451	100.0

Frequency Missing = 28

light hours/percent on: Dec Sun

LW3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	112	25.1	112	25.1
0.5	1	0.2	113	25.3
1	19	4.3	132	29.6
2	32	7.2	164	36.8
3	20	4.5	184	41.3
5	33	7.4	217	48.7
7	1	0.2	218	48.9
8	1	0.2	219	49.1
10	17	3.8	236	52.9
13	1	0.2	237	53.1
15	6	1.3	243	54.5
20	9	2.0	252	56.5
25	3	0.7	255	57.2
30	8	1.8	263	59.0
33	1	0.2	264	59.2
40	6	1.3	270	60.5
45	1	0.2	271	60.8
50	12	2.7	283	63.5
60	4	0.9	287	64.3
65	2	0.4	289	64.8
66	1	0.2	290	65.0
70	3	0.7	293	65.7
75	5	1.1	298	66.8
80	12	2.7	310	69.5
85	3	0.7	313	70.2
90	9	2.0	322	72.2
95	3	0.7	325	72.9
98	4	0.9	329	73.8
99	1	0.2	330	74.0
100	116	26.0	446	100.0

Frequency Missing = 33

light hours/percent on: Apr Week

LW4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
5	2	0.4	2	0.4
6	1	0.2	3	0.7
10	5	1.1	8	1.8
20	3	0.7	11	2.4
25	3	0.7	14	3.1
30	4	0.9	18	4.0
33	2	0.4	20	4.4
35	2	0.4	22	4.9
40	5	1.1	27	6.0
45	2	0.4	29	6.4
50	10	2.2	39	8.6
60	5	1.1	44	9.7
65	5	1.1	49	10.8
66	2	0.4	51	11.3
70	10	2.2	61	13.5
75	13	2.9	74	16.3
80	23	5.1	97	21.4
85	5	1.1	102	22.5
90	47	10.4	149	32.9
95	16	3.5	165	36.4
98	4	0.9	169	37.3
99	2	0.4	171	37.7
100	282	62.3	453	100.0

Frequency Missing = 26

light hours/percent on: Apr Sat

LW5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	68	15.3	68	15.3
0.5	1	0.2	69	15.5
1	9	2.0	78	17.6
2	27	6.1	105	23.6
3	17	3.8	122	27.5
5	27	6.1	149	33.6
6	1	0.2	150	33.8
8	1	0.2	151	34.0
10	10	2.3	161	36.3
13	1	0.2	162	36.5
15	5	1.1	167	37.6
20	12	2.7	179	40.3
25	3	0.7	182	41.0
30	11	2.5	193	43.5
33	1	0.2	194	43.7
35	1	0.2	195	43.9
40	5	1.1	200	45.0
45	2	0.5	202	45.5
50	14	3.2	216	48.6
60	2	0.5	218	49.1
65	3	0.7	221	49.8
66	2	0.5	223	50.2
70	3	0.7	226	50.9
75	7	1.6	233	52.5
80	14	3.2	247	55.6
85	3	0.7	250	56.3
90	15	3.4	265	59.7
92	1	0.2	266	59.9
95	5	1.1	271	61.0
98	4	0.9	275	61.9
99	1	0.2	276	62.2
100	168	37.8	444	100.0

Frequency Missing = 35

light hours/percent on: Apr Sun

LW6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	112	25.5	112	25.5
0.5	1	0.2	113	25.7
1	18	4.1	131	29.8
2	29	6.6	160	36.4
3	20	4.5	180	40.9
5	33	7.5	213	48.4
7	1	0.2	214	48.6
8	1	0.2	215	48.9
10	15	3.4	230	52.3
13	1	0.2	231	52.5
15	5	1.1	236	53.6
20	8	1.8	244	55.5
25	2	0.5	246	55.9
30	10	2.3	256	58.2
33	1	0.2	257	58.4
35	1	0.2	258	58.6
40	5	1.1	263	59.8
45	1	0.2	264	60.0
50	12	2.7	276	62.7
60	5	1.1	281	63.9
65	3	0.7	284	64.5
66	1	0.2	285	64.8
70	3	0.7	288	65.5
75	4	0.9	292	66.4
80	10	2.3	302	68.6
85	3	0.7	305	69.3
90	10	2.3	315	71.6
92	1	0.2	316	71.8
95	3	0.7	319	72.5
98	4	0.9	323	73.4
99	2	0.5	325	73.9
100	115	26.1	440	100.0

Frequency Missing = 39

light hours/percent on: Aug Week

LW7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.4	2	0.4
2	1	0.2	3	0.7
3	13	2.9	16	3.6
4	1	0.2	17	3.8
5	13	2.9	30	6.7
6	1	0.2	31	6.9
10	8	1.8	39	8.7
15	3	0.7	42	9.4
20	3	0.7	45	10.0
25	4	0.9	49	10.9
30	6	1.3	55	12.2
33	2	0.4	57	12.7
35	1	0.2	58	12.9
40	5	1.1	63	14.0
45	2	0.4	65	14.5
50	10	2.2	75	16.7
60	4	0.9	79	17.6
65	5	1.1	84	18.7
66	2	0.4	86	19.2
70	7	1.6	93	20.7
75	16	3.6	109	24.3
80	21	4.7	130	29.0
85	4	0.9	134	29.8
90	31	6.9	165	36.7
94	1	0.2	166	37.0
95	12	2.7	178	39.6
98	4	0.9	182	40.5
99	2	0.4	184	41.0
100	265	59.0	449	100.0

Frequency Missing = 30

light hours/percent on: Aug Sat

LW8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	69	15.7	69	15.7
0.5	1	0.2	70	15.9
1	9	2.0	79	18.0
2	29	6.6	108	24.5
3	17	3.9	125	28.4
5	26	5.9	151	34.3
6	1	0.2	152	34.5
8	1	0.2	153	34.8
10	11	2.5	164	37.3
13	1	0.2	165	37.5
15	6	1.4	171	38.9
20	12	2.7	183	41.6
25	3	0.7	186	42.3
30	12	2.7	198	45.0
33	1	0.2	199	45.2
40	5	1.1	204	46.4
45	2	0.5	206	46.8
50	12	2.7	218	49.5
60	3	0.7	221	50.2
65	3	0.7	224	50.9
66	2	0.5	226	51.4
70	2	0.5	228	51.8
75	7	1.6	235	53.4
80	15	3.4	250	56.8
85	3	0.7	253	57.5
90	14	3.2	267	60.7
94	1	0.2	268	60.9
95	5	1.1	273	62.0
98	4	0.9	277	63.0
99	1	0.2	278	63.2
100	162	36.8	440	100.0

Frequency Missing = 39

light hours/percent on: Aug Sun

LW9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	114	25.9	114	25.9
0.5	1	0.2	115	26.1
1	18	4.1	133	30.2
2	32	7.3	165	37.4
3	20	4.5	185	42.0
5	33	7.5	218	49.4
7	1	0.2	219	49.7
8	1	0.2	220	49.9
10	16	3.6	236	53.5
13	1	0.2	237	53.7
15	5	1.1	242	54.9
20	7	1.6	249	56.5
25	3	0.7	252	57.1
30	9	2.0	261	59.2
33	1	0.2	262	59.4
40	4	0.9	266	60.3
45	1	0.2	267	60.5
50	11	2.5	278	63.0
60	4	0.9	282	63.9
65	3	0.7	285	64.6
66	1	0.2	286	64.9
70	3	0.7	289	65.5
75	6	1.4	295	66.9
80	12	2.7	307	69.6
85	3	0.7	310	70.3
90	9	2.0	319	72.3
94	1	0.2	320	72.6
95	3	0.7	323	73.2
98	4	0.9	327	74.1
99	1	0.2	328	74.4
100	113	25.6	441	100.0

Frequency Missing = 38

light hours/percent on: Oct Week

LW10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.2	1	0.2
5	3	0.7	4	0.9
6	1	0.2	5	1.1
10	5	1.1	10	2.2
20	3	0.7	13	2.9
25	3	0.7	16	3.6
30	4	0.9	20	4.4
33	2	0.4	22	4.9
35	1	0.2	23	5.1
40	4	0.9	27	6.0
45	3	0.7	30	6.7
50	8	1.8	38	8.4
60	4	0.9	42	9.3
65	5	1.1	47	10.4
66	2	0.4	49	10.9
70	10	2.2	59	13.1
75	14	3.1	73	16.2
80	22	4.9	95	21.1
85	5	1.1	100	22.2
90	48	10.7	148	32.9
95	16	3.6	164	36.4
98	4	0.9	168	37.3
99	2	0.4	170	37.8
100	280	62.2	450	100.0

Frequency Missing = 29

light hours/percent on: Oct Sat

LW11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	70	15.8	70	15.8
0.5	1	0.2	71	16.1
1	9	2.0	80	18.1
2	28	6.3	108	24.4
3	17	3.8	125	28.3
5	28	6.3	153	34.6
6	1	0.2	154	34.8
8	1	0.2	155	35.1
10	10	2.3	165	37.3
13	1	0.2	166	37.6
15	6	1.4	172	38.9
20	12	2.7	184	41.6
25	3	0.7	187	42.3
30	11	2.5	198	44.8
33	1	0.2	199	45.0
40	5	1.1	204	46.2
45	2	0.5	206	46.6
50	13	2.9	219	49.5
60	2	0.5	221	50.0
65	4	0.9	225	50.9
66	2	0.5	227	51.4
70	2	0.5	229	51.8
75	7	1.6	236	53.4
80	15	3.4	251	56.8
85	3	0.7	254	57.5
90	14	3.2	268	60.6
95	5	1.1	273	61.8
98	4	0.9	277	62.7
99	1	0.2	278	62.9
100	164	37.1	442	100.0

Frequency Missing = 37

light hours/percent on: Oct Sun

LW12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	113	25.6	113	25.6
0.5	1	0.2	114	25.9
1	16	3.6	130	29.5
2	31	7.0	161	36.5
3	20	4.5	181	41.0
5	35	7.9	216	49.0
7	1	0.2	217	49.2
8	1	0.2	218	49.4
10	15	3.4	233	52.8
13	1	0.2	234	53.1
15	5	1.1	239	54.2
20	8	1.8	247	56.0
25	3	0.7	250	56.7
30	11	2.5	261	59.2
33	1	0.2	262	59.4
40	4	0.9	266	60.3
45	1	0.2	267	60.5
50	12	2.7	279	63.3
60	4	0.9	283	64.2
65	3	0.7	286	64.9
66	1	0.2	287	65.1
70	3	0.7	290	65.8
75	5	1.1	295	66.9
80	11	2.5	306	69.4
85	3	0.7	309	70.1
90	9	2.0	318	72.1
95	3	0.7	321	72.8
98	4	0.9	325	73.7
99	1	0.2	326	73.9
100	115	26.1	441	100.0

Frequency Missing = 38

light hours/percent on: Holiday

LW13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	155	34.4	155	34.4
0.5	2	0.4	157	34.9
1	20	4.4	177	39.3
2	36	8.0	213	47.3
3	22	4.9	235	52.2
5	33	7.3	268	59.6
6	1	0.2	269	59.8
7	1	0.2	270	60.0
8	1	0.2	271	60.2
10	26	5.8	297	66.0
13	1	0.2	298	66.2
15	7	1.6	305	67.8
20	8	1.8	313	69.6
25	2	0.4	315	70.0
30	7	1.6	322	71.6
33	1	0.2	323	71.8
40	3	0.7	326	72.4
45	2	0.4	328	72.9
50	11	2.4	339	75.3
60	2	0.4	341	75.8
65	3	0.7	344	76.4
66	1	0.2	345	76.7
70	3	0.7	348	77.3
75	3	0.7	351	78.0
80	10	2.2	361	80.2
85	2	0.4	363	80.7
90	5	1.1	368	81.8
95	1	0.2	369	82.0
98	3	0.7	372	82.7
99	1	0.2	373	82.9
100	77	17.1	450	100.0

Frequency Missing = 29

% are night lights on 24 hours?

LF014	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	241	53.8	241	53.8
0.5	2	0.4	243	54.2
0.7	1	0.2	244	54.5
1	38	8.5	282	62.9
2	25	5.6	307	68.5
3	16	3.6	323	72.1
4	1	0.2	324	72.3
5	49	10.9	373	83.3
6	1	0.2	374	83.5
7	1	0.2	375	83.7
8	2	0.4	377	84.2
10	30	6.7	407	90.8
12	2	0.4	409	91.3
13	1	0.2	410	91.5
15	6	1.3	416	92.9
18	1	0.2	417	93.1
20	2	0.4	419	93.5
25	4	0.9	423	94.4
30	6	1.3	429	95.8
40	1	0.2	430	96.0
50	5	1.1	435	97.1
65	1	0.2	436	97.3
80	1	0.2	437	97.5
90	1	0.2	438	97.8
95	1	0.2	439	98.0
100	9	2.0	448	100.0

Frequency Missing = 31

% of ind lights on during non-oper hours

LF025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	117	26.7	117	26.7
0.5	3	0.7	120	27.4
0.7	1	0.2	121	27.6
1	45	10.3	166	37.9
2	42	9.6	208	47.5
3	14	3.2	222	50.7
4	2	0.5	224	51.1
5	50	11.4	274	62.6
7	3	0.7	277	63.2
8	3	0.7	280	63.9
10	54	12.3	334	76.3
12	1	0.2	335	76.5
13	1	0.2	336	76.7
15	19	4.3	355	81.1
20	21	4.8	376	85.8
25	9	2.1	385	87.9
30	7	1.6	392	89.5
40	4	0.9	396	90.4
50	4	0.9	400	91.3
60	19	4.3	419	95.7
65	1	0.2	420	95.9
80	2	0.5	422	96.3
85	1	0.2	423	96.6
88	1	0.2	424	96.8
90	1	0.2	425	97.0
100	13	3.0	438	100.0

Frequency Missing = 41

% of retro lights on - SUM WKDAY - 1AM

LF017A	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	241	55.1	241	55.1
0.5	1	0.2	242	55.4
1	23	5.3	265	60.6
2	19	4.3	284	65.0
3	4	0.9	288	65.9
4	1	0.2	289	66.1
5	34	7.8	323	73.9
8	1	0.2	324	74.1
10	16	3.7	340	77.8
12	1	0.2	341	78.0
13	1	0.2	342	78.3
15	6	1.4	348	79.6
20	2	0.5	350	80.1
25	3	0.7	353	80.8
30	8	1.8	361	82.6
33	1	0.2	362	82.8
40	2	0.5	364	83.3
50	20	4.6	384	87.9
65	1	0.2	385	88.1
75	1	0.2	386	88.3
80	3	0.7	389	89.0
90	2	0.5	391	89.5
100	46	10.5	437	100.0

Frequency Missing = 42

% of retro lights on - SUM WKDAY - 2AM

LF017B	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	245	56.2	245	56.2
0.5	1	0.2	246	56.4
1	21	4.8	267	61.2
2	19	4.4	286	65.6
3	6	1.4	292	67.0
4	1	0.2	293	67.2
5	32	7.3	325	74.5
8	1	0.2	326	74.8
10	16	3.7	342	78.4
12	1	0.2	343	78.7
13	1	0.2	344	78.9
15	6	1.4	350	80.3
20	2	0.5	352	80.7
25	3	0.7	355	81.4
30	8	1.8	363	83.3
33	1	0.2	364	83.5
40	2	0.5	366	83.9
50	19	4.4	385	88.3
65	1	0.2	386	88.5
75	2	0.5	388	89.0
80	3	0.7	391	89.7
90	2	0.5	393	90.1
100	43	9.9	436	100.0

Frequency Missing = 43

% of retro lights on - SUM WKDAY - 3AM

LF017C	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	246	56.7	246	56.7
0.5	1	0.2	247	56.9
1	20	4.6	267	61.5
2	19	4.4	286	65.9
3	6	1.4	292	67.3
4	1	0.2	293	67.5
5	32	7.4	325	74.9
8	1	0.2	326	75.1
10	16	3.7	342	78.8
12	1	0.2	343	79.0
13	1	0.2	344	79.3
15	6	1.4	350	80.6
20	2	0.5	352	81.1
25	3	0.7	355	81.8
30	8	1.8	363	83.6
33	1	0.2	364	83.9
40	2	0.5	366	84.3
50	19	4.4	385	88.7
65	1	0.2	386	88.9
75	2	0.5	388	89.4
80	2	0.5	390	89.9
90	2	0.5	392	90.3
100	42	9.7	434	100.0

Frequency Missing = 45

% of retro lights on - SUM WKDAY - 4AM

LF017D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	243	56.4	243	56.4
0.5	1	0.2	244	56.6
1	20	4.6	264	61.3
2	18	4.2	282	65.4
3	6	1.4	288	66.8
4	1	0.2	289	67.1
5	32	7.4	321	74.5
8	1	0.2	322	74.7
10	16	3.7	338	78.4
12	1	0.2	339	78.7
13	1	0.2	340	78.9
15	6	1.4	346	80.3
20	2	0.5	348	80.7
25	3	0.7	351	81.4
30	8	1.9	359	83.3
33	1	0.2	360	83.5
40	2	0.5	362	84.0
50	19	4.4	381	88.4
60	2	0.5	383	88.9
65	1	0.2	384	89.1
75	2	0.5	386	89.6
80	1	0.2	387	89.8
90	2	0.5	389	90.3
100	42	9.7	431	100.0

Frequency Missing = 48

% of retro lights on - SUM WKDAY - 5AM

LF017E	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	231	53.5	231	53.5
0.5	1	0.2	232	53.7
1	20	4.6	252	58.3
2	18	4.2	270	62.5
3	6	1.4	276	63.9
4	1	0.2	277	64.1
5	32	7.4	309	71.5
8	1	0.2	310	71.8
10	16	3.7	326	75.5
12	1	0.2	327	75.7
13	1	0.2	328	75.9
15	6	1.4	334	77.3
20	2	0.5	336	77.8
25	5	1.2	341	78.9
30	8	1.9	349	80.8
33	1	0.2	350	81.0
40	2	0.5	352	81.5
50	20	4.6	372	86.1
60	3	0.7	375	86.8
65	1	0.2	376	87.0
75	2	0.5	378	87.5
80	2	0.5	380	88.0
90	2	0.5	382	88.4
100	50	11.6	432	100.0

Frequency Missing = 47

% of retro lights on - SUM WKDAY - 6AM

LF017F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	212	49.0	212	49.0
1	20	4.6	232	53.6
2	21	4.8	253	58.4
3	5	1.2	258	59.6
4	1	0.2	259	59.8
5	29	6.7	288	66.5
8	1	0.2	289	66.7
10	13	3.0	302	69.7
12	1	0.2	303	70.0
13	1	0.2	304	70.2
15	4	0.9	308	71.1
20	1	0.2	309	71.4
25	3	0.7	312	72.1
30	15	3.5	327	75.5
33	1	0.2	328	75.8
40	3	0.7	331	76.4
50	6	1.4	337	77.8
60	5	1.2	342	79.0
65	2	0.5	344	79.4
70	2	0.5	346	79.9
75	1	0.2	347	80.1
80	4	0.9	351	81.1
90	4	0.9	355	82.0
98	1	0.2	356	82.2
100	77	17.8	433	100.0

Frequency Missing = 46

% of retro lights on - SUM WKDAY - 7AM

LF017G	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	161	37.1	161	37.1
1	19	4.4	180	41.5
2	14	3.2	194	44.7
3	3	0.7	197	45.4
5	25	5.8	222	51.2
7	1	0.2	223	51.4
8	1	0.2	224	51.6
9	1	0.2	225	51.8
10	13	3.0	238	54.8
12	1	0.2	239	55.1
15	4	0.9	243	56.0
25	5	1.2	248	57.1
30	28	6.5	276	63.6
40	2	0.5	278	64.1
50	10	2.3	288	66.4
60	5	1.2	293	67.5
65	2	0.5	295	68.0
66	1	0.2	296	68.2
70	5	1.2	301	69.4
75	4	0.9	305	70.3
80	7	1.6	312	71.9
85	1	0.2	313	72.1
90	10	2.3	323	74.4
95	4	0.9	327	75.3
98	1	0.2	328	75.6
100	106	24.4	434	100.0

Frequency Missing = 45

% of retro lights on - SUM WKDAY - 8AM

LF017H	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	95	21.7	95	21.7
1	17	3.9	112	25.6
2	3	0.7	115	26.3
3	1	0.2	116	26.5
5	21	4.8	137	31.4
6	1	0.2	138	31.6
7	3	0.7	141	32.3
10	10	2.3	151	34.6
15	3	0.7	154	35.2
20	3	0.7	157	35.9
25	4	0.9	161	36.8
30	27	6.2	188	43.0
40	4	0.9	192	43.9
50	8	1.8	200	45.8
54	1	0.2	201	46.0
60	6	1.4	207	47.4
65	2	0.5	209	47.8
66	1	0.2	210	48.1
70	4	0.9	214	49.0
75	5	1.1	219	50.1
80	15	3.4	234	53.5
85	2	0.5	236	54.0
90	12	2.7	248	56.8
95	7	1.6	255	58.4
98	1	0.2	256	58.6
99	2	0.5	258	59.0
100	179	41.0	437	100.0

Frequency Missing = 42

% of retro lights on - SUM WKDAY - 9AM

LF017I	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	66	15.1	66	15.1
1	20	4.6	86	19.6
3	1	0.2	87	19.9
5	17	3.9	104	23.7
6	1	0.2	105	24.0
7	2	0.5	107	24.4
10	9	2.1	116	26.5
15	1	0.2	117	26.7
20	3	0.7	120	27.4
25	5	1.1	125	28.5
30	28	6.4	153	34.9
40	2	0.5	155	35.4
50	7	1.6	162	37.0
60	6	1.4	168	38.4
65	2	0.5	170	38.8
66	2	0.5	172	39.3
70	3	0.7	175	40.0
75	5	1.1	180	41.1
80	16	3.7	196	44.7
85	2	0.5	198	45.2
90	11	2.5	209	47.7
95	7	1.6	216	49.3
98	1	0.2	217	49.5
99	2	0.5	219	50.0
100	219	50.0	438	100.0

Frequency Missing = 41

% of retro lights on - SUM WKDAY - 10AM

LF017J	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	56	12.8	56	12.8
1	22	5.0	78	17.8
3	1	0.2	79	18.0
5	16	3.6	95	21.6
7	2	0.5	97	22.1
10	7	1.6	104	23.7
15	1	0.2	105	23.9
20	2	0.5	107	24.4
25	5	1.1	112	25.5
30	27	6.2	139	31.7
40	2	0.5	141	32.1
45	1	0.2	142	32.3
50	7	1.6	149	33.9
60	6	1.4	155	35.3
65	2	0.5	157	35.8
66	2	0.5	159	36.2
70	3	0.7	162	36.9
75	5	1.1	167	38.0
80	17	3.9	184	41.9
85	2	0.5	186	42.4
90	11	2.5	197	44.9
95	8	1.8	205	46.7
98	1	0.2	206	46.9
99	2	0.5	208	47.4
100	231	52.6	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 11AM

LF017K	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	55	12.5	55	12.5
1	22	5.0	77	17.5
3	1	0.2	78	17.8
5	15	3.4	93	21.2
7	2	0.5	95	21.6
10	8	1.8	103	23.5
15	1	0.2	104	23.7
20	1	0.2	105	23.9
25	5	1.1	110	25.1
30	26	5.9	136	31.0
40	2	0.5	138	31.4
45	1	0.2	139	31.7
50	7	1.6	146	33.3
60	6	1.4	152	34.6
65	2	0.5	154	35.1
66	2	0.5	156	35.5
70	3	0.7	159	36.2
75	6	1.4	165	37.6
80	17	3.9	182	41.5
85	2	0.5	184	41.9
90	11	2.5	195	44.4
95	8	1.8	203	46.2
98	1	0.2	204	46.5
99	2	0.5	206	46.9
100	233	53.1	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 12PM

LF017L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	53	12.1	53	12.1
1	21	4.8	74	16.9
2	13	3.0	87	19.8
3	1	0.2	88	20.0
5	16	3.6	104	23.7
7	2	0.5	106	24.1
10	8	1.8	114	26.0
15	1	0.2	115	26.2
20	1	0.2	116	26.4
25	4	0.9	120	27.3
30	13	3.0	133	30.3
40	2	0.5	135	30.8
45	1	0.2	136	31.0
50	12	2.7	148	33.7
60	6	1.4	154	35.1
65	2	0.5	156	35.5
66	2	0.5	158	36.0
70	3	0.7	161	36.7
75	6	1.4	167	38.0
80	18	4.1	185	42.1
85	2	0.5	187	42.6
90	12	2.7	199	45.3
95	8	1.8	207	47.2
98	1	0.2	208	47.4
99	2	0.5	210	47.8
100	229	52.2	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 1PM

LF017M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	52	11.8	52	11.8
1	21	4.8	73	16.6
2	13	3.0	86	19.6
3	1	0.2	87	19.8
5	17	3.9	104	23.7
7	2	0.5	106	24.1
10	9	2.1	115	26.2
15	1	0.2	116	26.4
20	1	0.2	117	26.7
25	4	0.9	121	27.6
30	13	3.0	134	30.5
40	2	0.5	136	31.0
45	1	0.2	137	31.2
50	7	1.6	144	32.8
60	6	1.4	150	34.2
64	1	0.2	151	34.4
65	1	0.2	152	34.6
66	2	0.5	154	35.1
70	3	0.7	157	35.8
75	6	1.4	163	37.1
80	18	4.1	181	41.2
85	2	0.5	183	41.7
90	12	2.7	195	44.4
95	8	1.8	203	46.2
98	1	0.2	204	46.5
99	2	0.5	206	46.9
100	233	53.1	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 2PM

LF017N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	56	12.8	56	12.8
1	21	4.8	77	17.5
2	13	3.0	90	20.5
3	1	0.2	91	20.7
5	19	4.3	110	25.1
7	2	0.5	112	25.5
10	7	1.6	119	27.1
15	1	0.2	120	27.3
20	1	0.2	121	27.6
25	3	0.7	124	28.2
30	13	3.0	137	31.2
40	2	0.5	139	31.7
50	7	1.6	146	33.3
60	6	1.4	152	34.6
65	2	0.5	154	35.1
66	2	0.5	156	35.5
70	3	0.7	159	36.2
75	6	1.4	165	37.6
80	18	4.1	183	41.7
85	2	0.5	185	42.1
90	12	2.7	197	44.9
95	8	1.8	205	46.7
98	1	0.2	206	46.9
99	2	0.5	208	47.4
100	231	52.6	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 3PM

LF017O	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	60	13.7	60	13.7
1	21	4.8	81	18.5
2	13	3.0	94	21.4
3	1	0.2	95	21.6
5	17	3.9	112	25.5
7	2	0.5	114	26.0
10	7	1.6	121	27.6
15	1	0.2	122	27.8
20	2	0.5	124	28.2
25	3	0.7	127	28.9
30	13	3.0	140	31.9
40	2	0.5	142	32.3
50	7	1.6	149	33.9
60	6	1.4	155	35.3
65	2	0.5	157	35.8
66	2	0.5	159	36.2
70	3	0.7	162	36.9
75	6	1.4	168	38.3
80	17	3.9	185	42.1
85	2	0.5	187	42.6
90	11	2.5	198	45.1
95	8	1.8	206	46.9
98	1	0.2	207	47.2
99	2	0.5	209	47.6
100	230	52.4	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 4PM

LF017P	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	83	18.9	83	18.9
1	20	4.6	103	23.5
2	15	3.4	118	26.9
5	9	2.1	127	28.9
7	2	0.5	129	29.4
10	5	1.1	134	30.5
15	1	0.2	135	30.8
20	1	0.2	136	31.0
25	2	0.5	138	31.4
30	3	0.7	141	32.1
40	2	0.5	143	32.6
50	6	1.4	149	33.9
54	1	0.2	150	34.2
60	6	1.4	156	35.5
65	2	0.5	158	36.0
66	2	0.5	160	36.4
70	3	0.7	163	37.1
75	6	1.4	169	38.5
80	17	3.9	186	42.4
85	2	0.5	188	42.8
90	9	2.1	197	44.9
95	9	2.1	206	46.9
98	1	0.2	207	47.2
99	2	0.5	209	47.6
100	230	52.4	439	100.0

Frequency Missing = 40

% of retro lights on - SUM WKDAY - 5PM

LF017Q	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	87	19.9	87	19.9
1	20	4.6	107	24.4
2	17	3.9	124	28.3
5	8	1.8	132	30.1
7	2	0.5	134	30.6
8	1	0.2	135	30.8
10	4	0.9	139	31.7
20	2	0.5	141	32.2
25	2	0.5	143	32.6
30	4	0.9	147	33.6
40	2	0.5	149	34.0
50	9	2.1	158	36.1
60	6	1.4	164	37.4
65	3	0.7	167	38.1
66	2	0.5	169	38.6
70	3	0.7	172	39.3
75	6	1.4	178	40.6
80	17	3.9	195	44.5
85	2	0.5	197	45.0
90	7	1.6	204	46.6
95	9	2.1	213	48.6
98	1	0.2	214	48.9
99	2	0.5	216	49.3
100	222	50.7	438	100.0

Frequency Missing = 41

% of retro lights on - SUM WKDAY - 6PM

LF017R	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	149	34.1	149	34.1
1	21	4.8	170	38.9
2	21	4.8	191	43.7
3	1	0.2	192	43.9
4	1	0.2	193	44.2
5	8	1.8	201	46.0
7	2	0.5	203	46.5
8	1	0.2	204	46.7
10	5	1.1	209	47.8
15	1	0.2	210	48.1
20	4	0.9	214	49.0
25	1	0.2	215	49.2
30	3	0.7	218	49.9
40	2	0.5	220	50.3
50	10	2.3	230	52.6
60	6	1.4	236	54.0
65	3	0.7	239	54.7
66	2	0.5	241	55.1
70	2	0.5	243	55.6
75	5	1.1	248	56.8
80	13	3.0	261	59.7
85	2	0.5	263	60.2
90	4	0.9	267	61.1
95	7	1.6	274	62.7
98	1	0.2	275	62.9
99	1	0.2	276	63.2
100	161	36.8	437	100.0

Frequency Missing = 42

% of retro lights on - SUM WKDAY - 7PM

LF017S	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	191	43.8	191	43.8
1	22	5.0	213	48.9
2	29	6.7	242	55.5
3	1	0.2	243	55.7
4	1	0.2	244	56.0
5	19	4.4	263	60.3
7	2	0.5	265	60.8
8	1	0.2	266	61.0
10	10	2.3	276	63.3
12	1	0.2	277	63.5
15	3	0.7	280	64.2
20	3	0.7	283	64.9
25	3	0.7	286	65.6
30	3	0.7	289	66.3
35	1	0.2	290	66.5
40	1	0.2	291	66.7
50	8	1.8	299	68.6
60	5	1.1	304	69.7
65	4	0.9	308	70.6
66	1	0.2	309	70.9
75	3	0.7	312	71.6
80	5	1.1	317	72.7
85	2	0.5	319	73.2
90	3	0.7	322	73.9
95	4	0.9	326	74.8
98	1	0.2	327	75.0
99	1	0.2	328	75.2
100	108	24.8	436	100.0

Frequency Missing = 43

% of retro lights on - SUM WKDAY - 8PM

LF017T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	178	40.9	178	40.9
0.5	1	0.2	179	41.1
1	25	5.7	204	46.9
2	31	7.1	235	54.0
3	2	0.5	237	54.5
4	1	0.2	238	54.7
5	24	5.5	262	60.2
7	2	0.5	264	60.7
8	1	0.2	265	60.9
10	10	2.3	275	63.2
12	1	0.2	276	63.4
13	1	0.2	277	63.7
15	3	0.7	280	64.4
20	5	1.1	285	65.5
25	1	0.2	286	65.7
30	3	0.7	289	66.4
35	1	0.2	290	66.7
40	1	0.2	291	66.9
50	8	1.8	299	68.7
60	6	1.4	305	70.1
65	3	0.7	308	70.8
66	1	0.2	309	71.0
75	4	0.9	313	72.0
80	5	1.1	318	73.1
85	1	0.2	319	73.3
90	3	0.7	322	74.0
95	2	0.5	324	74.5
98	1	0.2	325	74.7
100	110	25.3	435	100.0

Frequency Missing = 44

% of retro lights on - SUM WKDAY - 9PM

LF017U	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	182	41.7	182	41.7
0.5	1	0.2	183	42.0
1	25	5.7	208	47.7
2	34	7.8	242	55.5
3	3	0.7	245	56.2
4	1	0.2	246	56.4
5	27	6.2	273	62.6
8	1	0.2	274	62.8
10	11	2.5	285	65.4
12	1	0.2	286	65.6
13	1	0.2	287	65.8
15	5	1.1	292	67.0
20	4	0.9	296	67.9
25	1	0.2	297	68.1
30	5	1.1	302	69.3
35	1	0.2	303	69.5
40	1	0.2	304	69.7
50	8	1.8	312	71.6
60	4	0.9	316	72.5
65	2	0.5	318	72.9
66	1	0.2	319	73.2
70	1	0.2	320	73.4
75	4	0.9	324	74.3
80	6	1.4	330	75.7
90	3	0.7	333	76.4
95	2	0.5	335	76.8
98	1	0.2	336	77.1
100	100	22.9	436	100.0

Frequency Missing = 43

% of retro lights on - SUM WKDAY - 10PM

LF017V	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	200	46.0	200	46.0
0.5	1	0.2	201	46.2
1	23	5.3	224	51.5
2	34	7.8	258	59.3
3	3	0.7	261	60.0
4	1	0.2	262	60.2
5	27	6.2	289	66.4
8	1	0.2	290	66.7
10	13	3.0	303	69.7
12	1	0.2	304	69.9
13	1	0.2	305	70.1
15	5	1.1	310	71.3
20	4	0.9	314	72.2
25	1	0.2	315	72.4
30	8	1.8	323	74.3
35	1	0.2	324	74.5
40	2	0.5	326	74.9
50	7	1.6	333	76.6
60	4	0.9	337	77.5
65	2	0.5	339	77.9
70	3	0.7	342	78.6
75	4	0.9	346	79.5
80	1	0.2	347	79.8
90	2	0.5	349	80.2
95	2	0.5	351	80.7
98	1	0.2	352	80.9
100	83	19.1	435	100.0

Frequency Missing = 44

% of retro lights on - SUM WKDAY - 11PM

LF017W	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	211	48.4	211	48.4
0.5	1	0.2	212	48.6
1	23	5.3	235	53.9
2	34	7.8	269	61.7
3	4	0.9	273	62.6
4	1	0.2	274	62.8
5	31	7.1	305	70.0
8	1	0.2	306	70.2
10	16	3.7	322	73.9
12	1	0.2	323	74.1
13	1	0.2	324	74.3
15	6	1.4	330	75.7
20	2	0.5	332	76.1
25	2	0.5	334	76.6
30	9	2.1	343	78.7
33	1	0.2	344	78.9
35	1	0.2	345	79.1
40	2	0.5	347	79.6
50	8	1.8	355	81.4
60	1	0.2	356	81.7
65	1	0.2	357	81.9
75	3	0.7	360	82.6
80	1	0.2	361	82.8
90	1	0.2	362	83.0
95	1	0.2	363	83.3
98	1	0.2	364	83.5
100	72	16.5	436	100.0

Frequency Missing = 43

% of retro lights on - SUM WKDAY - 12AM

LF017X	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	236	53.8	236	53.8
0.5	1	0.2	237	54.0
1	26	5.9	263	59.9
2	19	4.3	282	64.2
3	4	0.9	286	65.1
4	1	0.2	287	65.4
5	30	6.8	317	72.2
8	1	0.2	318	72.4
10	17	3.9	335	76.3
12	1	0.2	336	76.5
13	1	0.2	337	76.8
15	6	1.4	343	78.1
20	2	0.5	345	78.6
25	3	0.7	348	79.3
30	8	1.8	356	81.1
33	1	0.2	357	81.3
40	2	0.5	359	81.8
50	19	4.3	378	86.1
65	1	0.2	379	86.3
75	1	0.2	380	86.6
80	3	0.7	383	87.2
90	2	0.5	385	87.7
98	1	0.2	386	87.9
100	53	12.1	439	100.0

Frequency Missing = 40

LF18	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	98	21.6	98	21.6
1	356	78.4	454	100.0

Frequency Missing = 25

% of retro lights on - WTR WKDAY - 1AM

LF020A	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	64	66.0	64	66.0
1	4	4.1	68	70.1
2	2	2.1	70	72.2
3	1	1.0	71	73.2
5	3	3.1	74	76.3
10	4	4.1	78	80.4
15	2	2.1	80	82.5
25	1	1.0	81	83.5
50	1	1.0	82	84.5
75	1	1.0	83	85.6
100	14	14.4	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 2AM

LF020B	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	67	69.1	67	69.1
1	3	3.1	70	72.2
2	2	2.1	72	74.2
3	1	1.0	73	75.3
5	3	3.1	76	78.4
10	4	4.1	80	82.5
15	2	2.1	82	84.5
25	1	1.0	83	85.6
50	1	1.0	84	86.6
75	1	1.0	85	87.6
100	12	12.4	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 3AM

LF020C	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	67	69.1	67	69.1
1	3	3.1	70	72.2
2	2	2.1	72	74.2
3	1	1.0	73	75.3
5	3	3.1	76	78.4
10	4	4.1	80	82.5
15	2	2.1	82	84.5
25	1	1.0	83	85.6
50	2	2.1	85	87.6
75	1	1.0	86	88.7
100	11	11.3	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 4AM

LF020D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	67	69.1	67	69.1
1	3	3.1	70	72.2
2	2	2.1	72	74.2
3	1	1.0	73	75.3
5	3	3.1	76	78.4
10	4	4.1	80	82.5
15	2	2.1	82	84.5
25	1	1.0	83	85.6
50	2	2.1	85	87.6
75	1	1.0	86	88.7
100	11	11.3	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 5AM

LF020E	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	66	68.0	66	68.0
1	4	4.1	70	72.2
2	2	2.1	72	74.2
3	1	1.0	73	75.3
5	3	3.1	76	78.4
10	4	4.1	80	82.5
15	2	2.1	82	84.5
20	1	1.0	83	85.6
25	1	1.0	84	86.6
50	2	2.1	86	88.7
75	1	1.0	87	89.7
100	10	10.3	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 6AM

LF020F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	39	39.8	39	39.8
1	2	2.0	41	41.8
2	15	15.3	56	57.1
3	1	1.0	57	58.2
5	5	5.1	62	63.3
10	4	4.1	66	67.3
15	2	2.0	68	69.4
20	1	1.0	69	70.4
25	2	2.0	71	72.4
50	2	2.0	73	74.5
60	1	1.0	74	75.5
70	9	9.2	83	84.7
75	2	2.0	85	86.7
80	1	1.0	86	87.8
100	12	12.2	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 7AM

LF020G	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	25	25.8	25	25.8
1	2	2.1	27	27.8
2	1	1.0	28	28.9
3	1	1.0	29	29.9
5	1	1.0	30	30.9
10	4	4.1	34	35.1
25	1	1.0	35	36.1
30	1	1.0	36	37.1
50	4	4.1	40	41.2
60	1	1.0	41	42.3
70	2	2.1	43	44.3
75	2	2.1	45	46.4
80	3	3.1	48	49.5
85	2	2.1	50	51.5
90	13	13.4	63	64.9
95	1	1.0	64	66.0
99	7	7.2	71	73.2
100	26	26.8	97	100.0

Frequency Missing = 382

% of retro lights on - WTR WKDAY - 8AM

LF020H	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
6	1	1.0	26	26.5
10	3	3.1	29	29.6
30	1	1.0	30	30.6
40	1	1.0	31	31.6
50	1	1.0	32	32.7
60	2	2.0	34	34.7
70	2	2.0	36	36.7
75	2	2.0	38	38.8
80	3	3.1	41	41.8
85	2	2.0	43	43.9
90	15	15.3	58	59.2
95	1	1.0	59	60.2
99	7	7.1	66	67.3
100	32	32.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 9AM

LF020I	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
6	1	1.0	26	26.5
10	1	1.0	27	27.6
30	2	2.0	29	29.6
40	1	1.0	30	30.6
50	1	1.0	31	31.6
60	2	2.0	33	33.7
70	2	2.0	35	35.7
75	2	2.0	37	37.8
80	4	4.1	41	41.8
85	2	2.0	43	43.9
90	15	15.3	58	59.2
95	1	1.0	59	60.2
99	7	7.1	66	67.3
100	32	32.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 10AM

LF020J	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
10	1	1.0	26	26.5
30	2	2.0	28	28.6
40	1	1.0	29	29.6
50	1	1.0	30	30.6
60	2	2.0	32	32.7
70	2	2.0	34	34.7
75	2	2.0	36	36.7
80	4	4.1	40	40.8
85	2	2.0	42	42.9
90	14	14.3	56	57.1
95	1	1.0	57	58.2
99	7	7.1	64	65.3
100	34	34.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 11AM

LF020K	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
10	1	1.0	26	26.5
30	1	1.0	27	27.6
40	1	1.0	28	28.6
50	1	1.0	29	29.6
60	2	2.0	31	31.6
70	2	2.0	33	33.7
75	2	2.0	35	35.7
80	4	4.1	39	39.8
85	2	2.0	41	41.8
90	14	14.3	55	56.1
95	1	1.0	56	57.1
99	7	7.1	63	64.3
100	35	35.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 12PM

LF020L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
10	1	1.0	26	26.5
30	1	1.0	27	27.6
40	1	1.0	28	28.6
50	1	1.0	29	29.6
60	2	2.0	31	31.6
70	2	2.0	33	33.7
75	2	2.0	35	35.7
80	4	4.1	39	39.8
85	2	2.0	41	41.8
90	14	14.3	55	56.1
95	1	1.0	56	57.1
99	7	7.1	63	64.3
100	35	35.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 1PM

LF020M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
10	1	1.0	26	26.5
30	1	1.0	27	27.6
40	1	1.0	28	28.6
50	1	1.0	29	29.6
60	2	2.0	31	31.6
70	2	2.0	33	33.7
75	2	2.0	35	35.7
80	4	4.1	39	39.8
85	2	2.0	41	41.8
90	14	14.3	55	56.1
95	1	1.0	56	57.1
99	7	7.1	63	64.3
100	35	35.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 2PM

LF020N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
5	1	1.0	26	26.5
30	1	1.0	27	27.6
40	1	1.0	28	28.6
50	1	1.0	29	29.6
60	2	2.0	31	31.6
70	2	2.0	33	33.7
75	2	2.0	35	35.7
80	4	4.1	39	39.8
85	2	2.0	41	41.8
90	14	14.3	55	56.1
95	1	1.0	56	57.1
99	7	7.1	63	64.3
100	35	35.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 3PM

LF020O	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
5	1	1.0	26	26.5
30	1	1.0	27	27.6
40	1	1.0	28	28.6
50	1	1.0	29	29.6
60	2	2.0	31	31.6
70	2	2.0	33	33.7
75	2	2.0	35	35.7
80	4	4.1	39	39.8
85	2	2.0	41	41.8
90	14	14.3	55	56.1
95	1	1.0	56	57.1
99	7	7.1	63	64.3
100	35	35.7	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 4PM

LF020P	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	24	24.5	24	24.5
1	1	1.0	25	25.5
3	13	13.3	38	38.8
5	4	4.1	42	42.9
10	3	3.1	45	45.9
30	1	1.0	46	46.9
35	1	1.0	47	48.0
40	1	1.0	48	49.0
50	6	6.1	54	55.1
60	2	2.0	56	57.1
70	1	1.0	57	58.2
75	2	2.0	59	60.2
80	4	4.1	63	64.3
99	7	7.1	70	71.4
100	28	28.6	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 5PM

LF020Q	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	10.1	10	10.1
1	4	4.0	14	14.1
3	13	13.1	27	27.3
5	5	5.1	32	32.3
10	5	5.1	37	37.4
25	10	10.1	47	47.5
30	2	2.0	49	49.5
35	1	1.0	50	50.5
40	1	1.0	51	51.5
50	15	15.2	66	66.7
60	2	2.0	68	68.7
70	1	1.0	69	69.7
75	3	3.0	72	72.7
80	2	2.0	74	74.7
100	25	25.3	99	100.0

Frequency Missing = 380

% of retro lights on - WTR WKDAY - 6PM

LF020R	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8	8.1	8	8.1
1	4	4.0	12	12.1
2	2	2.0	14	14.1
3	13	13.1	27	27.3
5	4	4.0	31	31.3
10	10	10.1	41	41.4
25	9	9.1	50	50.5
30	1	1.0	51	51.5
35	1	1.0	52	52.5
40	1	1.0	53	53.5
50	11	11.1	64	64.6
60	1	1.0	65	65.7
70	1	1.0	66	66.7
75	3	3.0	69	69.7
80	1	1.0	70	70.7
100	29	29.3	99	100.0

Frequency Missing = 380

% of retro lights on - WTR WKDAY - 7PM

LF020S	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	15.2	15	15.2
1	4	4.0	19	19.2
2	4	4.0	23	23.2
3	13	13.1	36	36.4
5	11	11.1	47	47.5
10	8	8.1	55	55.6
25	2	2.0	57	57.6
30	1	1.0	58	58.6
35	1	1.0	59	59.6
40	1	1.0	60	60.6
50	10	10.1	70	70.7
60	1	1.0	71	71.7
70	1	1.0	72	72.7
75	1	1.0	73	73.7
100	26	26.3	99	100.0

Frequency Missing = 380

% of retro lights on - WTR WKDAY - 8PM

LF020T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	16.3	16	16.3
1	4	4.1	20	20.4
2	4	4.1	24	24.5
3	14	14.3	38	38.8
5	11	11.2	49	50.0
10	7	7.1	56	57.1
25	11	11.2	67	68.4
30	1	1.0	68	69.4
35	1	1.0	69	70.4
40	1	1.0	70	71.4
50	1	1.0	71	72.4
60	1	1.0	72	73.5
70	1	1.0	73	74.5
75	1	1.0	74	75.5
80	1	1.0	75	76.5
100	23	23.5	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 9PM

LF020U	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	16	16.3	16	16.3
1	5	5.1	21	21.4
2	4	4.1	25	25.5
3	14	14.3	39	39.8
5	12	12.2	51	52.0
10	8	8.2	59	60.2
25	11	11.2	70	71.4
30	1	1.0	71	72.4
35	1	1.0	72	73.5
40	1	1.0	73	74.5
50	1	1.0	74	75.5
70	1	1.0	75	76.5
75	1	1.0	76	77.6
80	1	1.0	77	78.6
100	21	21.4	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 10PM

LF020V	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	27	27.6	27	27.6
1	5	5.1	32	32.7
2	4	4.1	36	36.7
3	14	14.3	50	51.0
5	4	4.1	54	55.1
10	8	8.2	62	63.3
25	11	11.2	73	74.5
30	1	1.0	74	75.5
35	1	1.0	75	76.5
40	1	1.0	76	77.6
50	1	1.0	77	78.6
70	1	1.0	78	79.6
75	1	1.0	79	80.6
100	19	19.4	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 11PM

LF020W	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	31	31.6	31	31.6
1	4	4.1	35	35.7
2	4	4.1	39	39.8
3	14	14.3	53	54.1
5	5	5.1	58	59.2
10	9	9.2	67	68.4
20	1	1.0	68	69.4
25	10	10.2	78	79.6
35	1	1.0	79	80.6
50	1	1.0	80	81.6
70	1	1.0	81	82.7
75	1	1.0	82	83.7
100	16	16.3	98	100.0

Frequency Missing = 381

% of retro lights on - WTR WKDAY - 12AM

LF020X	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	64	66.0	64	66.0
1	4	4.1	68	70.1
2	2	2.1	70	72.2
3	1	1.0	71	73.2
5	3	3.1	74	76.3
10	3	3.1	77	79.4
15	2	2.1	79	81.4
25	1	1.0	80	82.5
50	1	1.0	81	83.5
75	1	1.0	82	84.5
100	15	15.5	97	100.0

Frequency Missing = 382

% of light equip changed through prog

IL001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.6	2	0.6
1	3	0.8	5	1.4
2	2	0.6	7	1.9
3	1	0.3	8	2.2
4	1	0.3	9	2.5
5	11	3.0	20	5.5
8	1	0.3	21	5.8
10	8	2.2	29	8.0
11	1	0.3	30	8.3
15	4	1.1	34	9.4
17	4	1.1	38	10.5
20	10	2.8	48	13.3
25	5	1.4	53	14.6
30	10	2.8	63	17.4
33	4	1.1	67	18.5
35	2	0.6	69	19.1
40	12	3.3	81	22.4
45	2	0.6	83	22.9
50	20	5.5	103	28.5
60	10	2.8	113	31.2
65	2	0.6	115	31.8
66	2	0.6	117	32.3
70	7	1.9	124	34.3
75	15	4.1	139	38.4
80	17	4.7	156	43.1
85	7	1.9	163	45.0
90	56	15.5	219	60.5
95	19	5.2	238	65.7
98	4	1.1	242	66.9
99	3	0.8	245	67.7
100	117	32.3	362	100.0

Frequency Missing = 117

% of burn out equip changed through prog

IL005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	188	53.4	188	53.4
1	11	3.1	199	56.5
2	15	4.3	214	60.8
3	7	2.0	221	62.8
4	2	0.6	223	63.4
5	22	6.3	245	69.6
8	3	0.9	248	70.5
9	1	0.3	249	70.7
10	48	13.6	297	84.4
15	4	1.1	301	85.5
20	4	1.1	305	86.6
25	3	0.9	308	87.5
30	18	5.1	326	92.6
33	2	0.6	328	93.2
35	1	0.3	329	93.5
40	2	0.6	331	94.0
45	4	1.1	335	95.2
50	10	2.8	345	98.0
80	1	0.3	346	98.3
90	1	0.3	347	98.6
100	5	1.4	352	100.0

Frequency Missing = 127

Average age replaced fixtures

SR010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	3.9	12	3.9
0.39996338	1	0.3	13	4.2
1	6	2.0	19	6.2
2	8	2.6	27	8.8
3	8	2.6	35	11.4
3.5	1	0.3	36	11.8
4	7	2.3	43	14.1
5	18	5.9	61	19.9
6	3	1.0	64	20.9
7	7	2.3	71	23.2
7.5	1	0.3	72	23.5
8	36	11.8	108	35.3
9	8	2.6	116	37.9
10	40	13.1	156	51.0
11	2	0.7	158	51.6
12	6	2.0	164	53.6
12.5	1	0.3	165	53.9
13	2	0.7	167	54.6
14	2	0.7	169	55.2
15	16	5.2	185	60.5
16	4	1.3	189	61.8
17	2	0.7	191	62.4
18	4	1.3	195	63.7
19	3	1.0	198	64.7
20	56	18.3	254	83.0
22	1	0.3	255	83.3
23	2	0.7	257	84.0
24	2	0.7	259	84.6
25	16	5.2	275	89.9
26	1	0.3	276	90.2
27	1	0.3	277	90.5
28	1	0.3	278	90.8
29	1	0.3	279	91.2
30	14	4.6	293	95.8
32	2	0.7	295	96.4
35	1	0.3	296	96.7
38	1	0.3	297	97.1
40	2	0.7	299	97.7
45	2	0.7	301	98.4
50	2	0.7	303	99.0
55	1	0.3	304	99.3
60	1	0.3	305	99.7
75	1	0.3	306	100.0

Frequency Missing = 173

Changed any indoor lighting?

IL010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	409	93.0	409	93.0
Yes	31	7.0	440	100.0

Frequency Missing = 39

month/year indoor light change

IL020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
AUG1992	1	5.9	1	5.9
JUN1993	2	11.8	3	17.6
AUG1993	1	5.9	4	23.5
OCT1993	1	5.9	5	29.4
DEC1993	1	5.9	6	35.3
FEB1994	2	11.8	8	47.1
APR1994	3	17.6	11	64.7
JUL1994	1	5.9	12	70.6
SEP1994	1	5.9	13	76.5
NOV1994	2	11.8	15	88.2
JAN1995	1	5.9	16	94.1
MAR1995	1	5.9	17	100.0

Frequency Missing = 462

year indoor light change

IL021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	4	44.4	4	44.4
1993	2	22.2	6	66.7
1994	2	22.2	8	88.9
1995	1	11.1	9	100.0

Frequency Missing = 470

month/year indoor light change-2

IL025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1994	1	100.0	1	100.0

Frequency Missing = 478

year indoor light change-2

IL026	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1994	2	100.0	2	100.0

Frequency Missing = 477

Added or removed/4' T-8

IL040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	11	52.4	11	52.4
Added	9	42.9	20	95.2
Removed	1	4.8	21	100.0

Frequency Missing = 458

Added or removed/8' T-8

IL041	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	83.3	15	83.3
Added	2	11.1	17	94.4
Removed	1	5.6	18	100.0

Frequency Missing = 461

Added or removed/4' ES Fluor

IL042	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	16	94.1	16	94.1
Added	1	5.9	17	100.0

Frequency Missing = 462

Added or removed/8' ES Fluor

IL043	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	13	92.9	13	92.9
Added	1	7.1	14	100.0

Frequency Missing = 465

Added or removed/4' T-12

IL044	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	100.0	15	100.0

Frequency Missing = 464

Added or removed/8' T-12

IL045	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	14	93.3	14	93.3
Added	1	6.7	15	100.0

Frequency Missing = 464

Added or removed/Incandescent

IL046	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	11	73.3	11	73.3
Added	2	13.3	13	86.7
Removed	2	13.3	15	100.0

Frequency Missing = 464

Added or removed/Compact Fluor

IL047	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	10	62.5	10	62.5
Added	6	37.5	16	100.0

Frequency Missing = 463

Added or removed/High pres sodium

IL048	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	16	100.0	16	100.0

Frequency Missing = 463

Added or removed/Elec Ballasts

IL049	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	14	82.4	14	82.4
Added	3	17.6	17	100.0

Frequency Missing = 462

Number changed/4' T-8

IL040N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	11.1	1	11.1
4	1	11.1	2	22.2
6	1	11.1	3	33.3
7	1	11.1	4	44.4
8	1	11.1	5	55.6
9	1	11.1	6	66.7
20	1	11.1	7	77.8
21	1	11.1	8	88.9
40	1	11.1	9	100.0

Frequency Missing = 470

Number changed/8' T-8

IL041N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
4	1	100.0	1	100.0

Frequency Missing = 478

Number changed/4' ES Fluor

IL042N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Number changed/8' ES Fluor

IL043N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8	1	100.0	1	100.0

Frequency Missing = 478

Number changed/4' T-12

IL044N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Number changed/8' T-12

IL045N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
10	1	100.0	1	100.0

Frequency Missing = 478

Number changed/Incandescent

IL046N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
4	1	25.0	1	25.0
12	1	25.0	2	50.0
50	1	25.0	3	75.0
82	1	25.0	4	100.0

Frequency Missing = 475

Number changed/Compact Fluor

IL047N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	1	20.0	1	20.0
4	1	20.0	2	40.0
12	1	20.0	3	60.0
20	1	20.0	4	80.0
50	1	20.0	5	100.0

Frequency Missing = 474

Number changed/High pres sodium

IL048N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	50.0	1	50.0
15	1	50.0	2	100.0

Frequency Missing = 477

Number changed/Elec Ballasts

IL049N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
13	1	25.0	1	25.0
15	1	25.0	2	50.0
20	2	50.0	4	100.0

Frequency Missing = 475

Added or removed/Magnetic Ballasts

IL050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	93.8	15	93.8
Removed	1	6.3	16	100.0

Frequency Missing = 463

Added or removed/Metal Halide

IL051	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	13	86.7	13	86.7
Added	2	13.3	15	100.0

Frequency Missing = 464

Added or removed/Mercury Vapor

IL052	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	14	93.3	14	93.3
Added	1	6.7	15	100.0

Frequency Missing = 464

Added or removed/Quartz

IL053	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	13	86.7	13	86.7
Added	2	13.3	15	100.0

Frequency Missing = 464

Added or removed/Reflectors

IL054	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	100.0	15	100.0

Frequency Missing = 464

Added or removed/LED Exit Lights

IL055	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	93.8	15	93.8
Added	1	6.3	16	100.0

Frequency Missing = 463

Added or removed/Watt Saver-Power Choke

IL056	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	15	100.0	15	100.0

Frequency Missing = 464

Added or removed/Other

IL057	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	14	82.4	14	82.4
Added	3	17.6	17	100.0

Frequency Missing = 462

Number changed/Magnetic Ballasts

IL050N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
13	1	100.0	1	100.0

Frequency Missing = 478

Number changed/Metal Halide

IL051N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
16	1	50.0	1	50.0
100	1	50.0	2	100.0

Frequency Missing = 477

Number changed/Mercury Vapor

IL052N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Number changed/Quartz

IL053N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
40	1	100.0	1	100.0

Frequency Missing = 478

Number changed/Reflectors

IL054N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Number changed/LED Exit Lights

IL055N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
65	1	100.0	1	100.0

Frequency Missing = 478

Number changed/Watt Saver-Power Choke

IL056N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Number changed/Other

IL057N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	33.3	1	33.3
10	1	33.3	2	66.7
100	1	33.3	3	100.0

Frequency Missing = 476

OBS	IL058
1	REPLACED LT COVERS
2	SAFETY LIGHT
3	PL BULBS
4	20 WATT FLOR/T40

Problems with ballasts after retro?

DS030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	153	78.5	153	78.5
Yes	42	21.5	195	100.0

Frequency Missing = 284

DS045	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Any instld equip been removed

LP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	439	98.7	439	98.7
Yes	6	1.3	445	100.0

Frequency Missing = 34

month/year of new equip removed

LP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
APR1994	1	25.0	1	25.0
SEP1994	1	25.0	2	50.0
MAY1995	2	50.0	4	100.0

Frequency Missing = 475

year of new equip removed

LP021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1995	2	100.0	2	100.0

Frequency Missing = 477

month/year of new equip removed/2

LP025	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

year of new equip removed/2

LP026	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Removed/4' T-8

LP030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
4	2	100.0	2	100.0

Frequency Missing = 477

Removed/8' T-8

LP031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/4' ES Fluor

LP032	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/8' ES Fluor

LP033	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/4' T-12

LP034	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/8' T-12

LP035	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/Incandescent

LP036	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/Compact Fluor

LP037	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	33.3	1	33.3
14	2	66.7	3	100.0

Frequency Missing = 476

Removed/High pres sodium

LP038	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/Metal Halide

LP039	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	100.0	1	100.0

Frequency Missing = 478

Removed/Mercury Vpr

LP040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/Quartz

LP041	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/Reflctrs Delmp

LP042	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/Elec Ballasts

LP043	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Removed/Magnetic Ballasts

LP044	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/LED Exit Lights

LP045	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/Watt Saver-Power Choke

LP046	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Removed/Other

LP047	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	75.0	3	75.0
10	1	25.0	4	100.0

Frequency Missing = 475

OBS	LP048
1	SENSORS

Occ Sensors

LP049	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	100.0	1	100.0

Frequency Missing = 478

Why removed/poor light quality

LP050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Why removed/not enough light

LP051	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	75.0	3	75.0
1	1	25.0	4	100.0

Frequency Missing = 475

Why removed/equip not reliable

LP052	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Why removed/harmonics problems

LP053	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Why removed/ballasts failed

LP054	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	100.0	3	100.0

Frequency Missing = 476

Why removed/other

LP055	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.0	5	100.0

Frequency Missing = 474

OBS	LP056
1	MOVING WALLS DURING REMODE
2	PERSONNEL MOVED, LAYOUT DI
3	UPDATE EQUIPMENT
4	REMODEL
5	REMODEL

Why removed/refused

LP057	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	75.0	3	75.0
1	1	25.0	4	100.0

Frequency Missing = 475

Why removed/dont know

LP058	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	4	100.0	4	100.0

Frequency Missing = 475

Remodeled

LP059	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	4	100.0	4	100.0

Frequency Missing = 475

Replace removed retrofit?

LP060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	33.3	2	33.3
1	4	66.7	6	100.0

Frequency Missing = 473

Replcd w/4' T-8

LP070	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/8' T-8

LP071	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/4' ES Fluor

LP072	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/8' ES Fluor

LP073	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/4' T-12

LP074	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/8' T-12

LP075	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Incandescent

LP076	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Compact Fluor

LP077	Frequency	Percent	Cumulative Frequency	Cumulative Percent
14	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/High pres sodium

LP078	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Metal Halide

LP079	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Mercury Vpr

LP080	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Quartz

LP081	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Replcd w/Reflctrs Delmp

LP082	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/Elec Ballasts

LP083	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/Magnetic Ballasts

LP084	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/LED Exit Lights

LP085	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/Watt Saver-Power Choke

LP086	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	100.0	2	100.0

Frequency Missing = 477

Replcd w/Other

LP087	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	66.7	2	66.7
10	1	33.3	3	100.0

Frequency Missing = 476

OBS	LP088
1	TO STANDARD LIGHT SWITCHES

Glare: better, worse, same?

SR070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Better	145	74.4	145	74.4
Worse	8	4.1	153	78.5
Same	41	21.0	194	99.5
7	1	0.5	195	100.0

Frequency Missing = 284

SR075	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Less	121	68.8	121	68.8
More	5	2.8	126	71.6
Same	48	27.3	174	98.9
7	2	1.1	176	100.0

Frequency Missing = 303

Is outdoor lighting on bill?

OL010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	68	15.5	68	15.5
Yes	372	84.5	440	100.0

Frequency Missing = 39

Changed any outdoor lights

OL020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	285	77.0	285	77.0
Yes	85	23.0	370	100.0

Frequency Missing = 109

Month/year change outdoor lights

OL030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JUL1992	1	1.8	1	1.8
JAN1993	2	3.6	3	5.4
MAR1993	1	1.8	4	7.1
APR1993	1	1.8	5	8.9
AUG1993	3	5.4	8	14.3
SEP1993	1	1.8	9	16.1
NOV1993	1	1.8	10	17.9
DEC1993	2	3.6	12	21.4
JAN1994	1	1.8	13	23.2
FEB1994	4	7.1	17	30.4
MAR1994	3	5.4	20	35.7
APR1994	1	1.8	21	37.5
MAY1994	2	3.6	23	41.1
JUN1994	5	8.9	28	50.0
JUL1994	4	7.1	32	57.1
AUG1994	3	5.4	35	62.5
SEP1994	8	14.3	43	76.8
OCT1994	1	1.8	44	78.6
NOV1994	2	3.6	46	82.1
DEC1994	1	1.8	47	83.9
JAN1995	3	5.4	50	89.3
FEB1995	2	3.6	52	92.9
MAR1995	1	1.8	53	94.6
APR1995	1	1.8	54	96.4
MAY1995	2	3.6	56	100.0

Frequency Missing = 423

Year change outdoor lights

OL031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	6	23.1	6	23.1
1993	10	38.5	16	61.5
1994	9	34.6	25	96.2
1995	1	3.8	26	100.0

Frequency Missing = 453

Add/replace/remove outdoor lights

OL040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	21	24.7	21	24.7
Replaced	49	57.6	70	82.4
Add and Replace	13	15.3	83	97.6
Removed	2	2.4	85	100.0

Frequency Missing = 394

Cooling type

CE010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No AC	88	20.8	88	20.8
Centrl Plant	93	21.9	181	42.7
Sml Pack Sys	162	38.2	343	80.9
Wall/Wndo Unit	18	4.2	361	85.1
Heat Pump	40	9.4	401	94.6
Other	8	1.9	409	96.5
Evap Cooler	5	1.2	414	97.6
Swamp Cooler	10	2.4	424	100.0

Frequency Missing = 55

OBS	CE011
1	LATENT ICE
2	FANS
3	4 STAIR COOLING SYSTEM
4	SWAMP COOLERS
5	OLDER UNITS
6	ON EUNIT HAS EVAPORATIVE COOLE
7	ON EUNIT HAS EVAPORATIVE COOLE
8	SWAMP COOLERS
9	SWAMP COOLER
10	"TRAIN" ON TOP OF BUILDING
11	SWAMP COOLER
12	SWAMP COOLER
13	ELECTRIC ROOF AIR CONDITIONER
14	SWAMP COOLER
15	REFERGERATION
16	SWAMP COOLER
17	EVAPORATIVE COOLERS
18	SWAMP COOLERS
19	AIR HANLDERS & RECIPROCATING U
20	DUAL PACKS
21	SEVERAL MULTI TON UNITS
22	EVAPORATIVE
23	RELOCATABLES HAVE HEAT PUMPS
24	RELOCATABLES HAVE HEAT PUMPS
25	RELOCATABLES HAVE HEAT PUMPS
26	RELOCATABLES HAVE HEAT PUMPS
27	RELOCATABLES HAVE HEAT PUMPS
28	RELOCATABLES HAVE HEAT PUMPS
29	RELOCATABLES HAVE HEAT PUMPS
30	RELOCATABLES HAVE HEAT PUMPS
31	RELOCATABLES HAVE HEAT PUMPS
32	RELOCATABLES HAVE HEAT PUMPS
33	RELOCATABLES HAVE HEAT PUMPS
34	RELOCATABLES HAVE HEAT PUMPS
35	RELOCATABLES HAVE HEAT PUMPS
36	EVAPORATIVE COOLER
37	MULTY PACKAGE
38	5-TON UNITS
39	ROOF TOP CON.
40	PACKAGED SYSTEM
41	HIGH PRESSURE STEAM
42	15TON AC ON ROOF, MANY OF THEM
43	SWAMP COOLERS (OLD)
44	SWAMP COOLER
45	PACKAGE W\COMBO GAS & ELECTRIC

Cooling primary fuel

CE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	306	89.5	306	89.5
Natural Gas	27	7.9	333	97.4
Other	5	1.5	338	98.8
Gas and Electric	4	1.2	342	100.0

Frequency Missing = 137

OBS	CE016
1	PROPANE
2	GAS & ELECTRIC
3	MIXTURE OF GAS AND ELECTRICITY
4	FREON
5	CEILING FANS
6	BOTH GAS & ELECTRIC
7	FUEL OIL
8	WATER
9	COMBINATION GAS & ELECTRIC

System include economizer?

CE030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	150	53.6	150	53.6
Yes	130	46.4	280	100.0

Frequency Missing = 199

CE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	33	9.5	33	9.5
1-19	33	9.5	66	19.0
20-39	26	7.5	92	26.5
40-59	16	4.6	108	31.1
60-79	26	7.5	134	38.6
80-99	49	14.1	183	52.7
100	164	47.3	347	100.0

Frequency Missing = 132

Cooling operated/all year

CE059	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	211	66.8	211	66.8
Yes	105	33.2	316	100.0

Frequency Missing = 163

Cooling operated/Jan

CE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	244	99.2	244	99.2
Yes	2	0.8	246	100.0

Frequency Missing = 233

Cooling operated/Feb

CE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	244	99.2	244	99.2
Yes	2	0.8	246	100.0

Frequency Missing = 233

Cooling operated/Mar

CE062	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	233	94.7	233	94.7
Yes	13	5.3	246	100.0

Frequency Missing = 233

Cooling operated/Apr

CE063	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	170	71.7	170	71.7
Yes	67	28.3	237	100.0

Frequency Missing = 242

Cooling operated/May

CE064	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	104	43.2	104	43.2
Yes	137	56.8	241	100.0

Frequency Missing = 238

Cooling operated/Jun

CE065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	29	11.6	29	11.6
Yes	221	88.4	250	100.0

Frequency Missing = 229

Cooling operated/Jul

CE066	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	19	7.6	19	7.6
Yes	231	92.4	250	100.0

Frequency Missing = 229

Cooling operated/Aug

CE067	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	13	5.2	13	5.2
Yes	237	94.8	250	100.0

Frequency Missing = 229

Cooling operated/Sep

CE068	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	25	10.0	25	10.0
Yes	224	90.0	249	100.0

Frequency Missing = 230

Cooling operated/Oct

CE069	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	129	53.1	129	53.1
Yes	114	46.9	243	100.0

Frequency Missing = 236

Cooling operated/Nov

CE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	219	90.9	219	90.9
Yes	22	9.1	241	100.0

Frequency Missing = 238

Cooling operated/Dec

CE071	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	236	98.7	236	98.7
Yes	3	1.3	239	100.0

Frequency Missing = 240

Cooling operated/Ref

CE072	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	225	100.0	225	100.0

Frequency Missing = 254

Cooling operated/DK

CE073	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	215	95.1	215	95.1
Yes	11	4.9	226	100.0

Frequency Missing = 253

Added/replaced/removed cooling

CE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No chnge	368	84.2	368	84.2
Added	29	6.6	397	90.8
Replaced	36	8.2	433	99.1
Added/Replced	3	0.7	436	99.8
Removed	1	0.2	437	100.0

Frequency Missing = 42

Month/year cooling changes

CE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JUN1992	1	3.2	1	3.2
JUL1992	1	3.2	2	6.5
DEC1992	1	3.2	3	9.7
APR1993	1	3.2	4	12.9
JUN1993	1	3.2	5	16.1
JUL1993	1	3.2	6	19.4
AUG1993	1	3.2	7	22.6
NOV1993	1	3.2	8	25.8
FEB1994	1	3.2	9	29.0
MAY1994	1	3.2	10	32.3
JUN1994	4	12.9	14	45.2
JUL1994	8	25.8	22	71.0
AUG1994	2	6.5	24	77.4
JAN1995	1	3.2	25	80.6
MAR1995	2	6.5	27	87.1
APR1995	2	6.5	29	93.5
MAY1995	1	3.2	30	96.8
JUN1995	1	3.2	31	100.0

Frequency Missing = 448

Year cooling changes

CE091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	6	19.4	6	19.4
1993	7	22.6	13	41.9
1994	15	48.4	28	90.3
1995	3	9.7	31	100.0

Frequency Missing = 448

Old cooling fuel type

CE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	41	100.0	41	100.0

Frequency Missing = 438

OBS	CE111
1	WATER

Cooling addition fuel type

CE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	28	84.8	28	84.8
Natural Gas	5	15.2	33	100.0

Frequency Missing = 446

Type of main heating

HE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Cntrl elec fur	25	6.0	25	6.0
Cntrl HP	55	13.2	80	19.2
Cntrl Gas fur	178	42.8	258	62.0
Gas boiler	29	7.0	287	69.0
Oil boiler/fur	6	1.4	293	70.4
Elec strip heat	1	0.2	294	70.7
Basebrd elec hea	2	0.5	296	71.2
Rm/Wal AC w/stri	5	1.2	301	72.4
Perm non-elec ht	4	1.0	305	73.3
whlhs wl/flr ele	2	0.5	307	73.8
whlhs wl/flr gas	10	2.4	317	76.2
Port elec	2	0.5	319	76.7
Wood/Coal stove	2	0.5	321	77.2
Propane heat	7	1.7	328	78.8
Other	21	5.0	349	83.9
None	52	12.5	401	96.4
20	15	3.6	416	100.0

Frequency Missing = 63

OBS	HE016
1	DUAL PAK
2	DONT KNOW
3	PACKAGEDED SYUSTEM
4	HEAT PUMP
5	PACKAGED UNITS
6	EACH TENANT HAS THEIR OWN
7	ROOF UNITS
8	PACKAGED UNITS
9	FORCED AIR
10	DONT
11	PACKAGED SYSTEM
12	COMBINATION HEATING AND AIR
13	HEAT WITH COOLING PACKAGE
14	PACKAGED UNITS
15	PERMANENT CEILING HEATER
16	PORTABLE HEATERS
17	HEAT PUMP
18	5 GAS FURNACES
19	GAS FORCED AIR W/ ELEC. BLOWERS
20	RADIANT HEAT IN FLOORING
21	HEATER/AIR CONDITIONER ON THE ROOF
22	PACKAGED SYSTEMS
23	PACKAGED SYSTEMS
24	MOUNTED, DIRECT DISCHARGE
25	HEAT-PUMP
26	PART OF COOLING PACKAGE
27	DK
28	DUAL PACKS & EVAP COOLERS
29	PACKAGED SYSTEMS
30	PACKAGED UNITS
31	COMBINED
32	4 AND 3
33	GAS PACK.
34	IND. HEAT PUMPS
35	GAS PACK.
36	DUEL HEATING COOLING UNITS
37	50/50 GAS BOILER/GAS FURNACE
38	RECLAIMED HEAT
39	RECLAIMED HEAT
40	RECLAIMED HEAT
41	RECLAIMED HEAT
42	RECLAIMED HEAT
43	RECLAIMED HEAT
44	RECLAIMED HEAT
45	RECLAIMED HEAT
46	RECLAIMED HEAT
47	RECLAIMED HEAT
48	RECLAIMED HEAT
49	RECLAIMED HEAT
50	RECLAIMED HEAT
51	RECLAIMED HEAT
52	RECLAIMED HEAT
53	RECLAIMED HEAT

OBS	HE016
54	RECLAIMED HEAT
55	RECLAIMED HEAT
56	HVC UNITS
57	PORTABLE UNITS
58	CENTRAL GAS SYSTEM
59	SMALL SYSTEM
60	STEAM BOILER IN THE FLOOR
61	INDIVD HEATER, NOT CENTRALIZED HEAT SYS
62	HIGH PRESSURE STEAM
63	MANY 15 TON HEATERS ON ROOF
64	ZZZ
65	INDIVIDUAL ROOM UNITS
66	HOT AIR GAS INDEPENDENT UNITS
67	FORCED AIR
68	ELECTRIC AREA HEATERS
69	COMBO UNIT GAS & ELECTRIC
70	BUILT INTO THE SAME PACKAGED UNIT (GAS)
71	COMBINATION OF GAS HEAT PUMP
72	DON'T KNOW

Primary fuel to heat facility

HE020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	286	68.4	286	68.4
Propane/Bottld g	17	4.1	303	72.5
Oil	4	1.0	307	73.4
Elec	75	17.9	382	91.4
Other	6	1.4	388	92.8
Reclaimed Heat	18	4.3	406	97.1
None	11	2.6	417	99.8
Combination	1	0.2	418	100.0

Frequency Missing = 61

OBS	HE021
1	GAS/ELECRTIC
2	NONE
3	NONE
4	WOOD
5	NONE
6	NONE
7	HEAT COMES FROM DRY CLEANING
8	NONE
9	NONE
10	NONE
11	NONE
12	NONE
13	NONE
14	NONE; NO HEATING.
15	DIESEL
16	PORTABLE ELECTRIC HEATER
17	NONE
18	RECLAIMED HEAT BLOWN BY FANS
19	RECLAIMED HEAT BLOWN BY FANS
20	RECLAIMED HEAT BLOWN BY FANS
21	RECLAIMED HEAT BLOWN BY FANS
22	RECLAIMED HEAT BLOWN BY FANS
23	RECLAIMED HEAT BLOWN BY FANS
24	RECLAIMED HEAT BLOWN BY FANS
25	RECLAIMED HEAT BLOWN BY FANS
26	RECLAIMED HEAT BLOWN BY FANS
27	RECLAIMED HEAT BLOWN BY FANS
28	RECLAIMED HEAT BLOWN BY FANS
29	RECLAIMED HEAT BLOWN BY FANS
30	RECLAIMED HEAT BLOWN BY FANS
31	RECLAIMED HEAT BLOWN BY FANS
32	RECLAIMED HEAT BLOWN BY FANS
33	RECLAIMED HEAT BLOWN BY FANS
34	RECLAIMED HEAT BLOWN BY FANS
35	RECLAIMED HEAT BLOWN BY FANS
36	PELLET
37	NONE
38	DO NOT HAVE

% of facility heated - WTR WKDAY - 8AM

HE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	64	14.8	64	14.8
1-19	15	3.5	79	18.3
20-39	26	6.0	105	24.3
40-59	19	4.4	124	28.7
60-79	39	9.0	163	37.7
80-99	84	19.4	247	57.2
100	185	42.8	432	100.0

Frequency Missing = 47

Heating operated/all year

HE059	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	288	76.4	288	76.4
Yes	89	23.6	377	100.0

Frequency Missing = 102

Heating operated/Jan

HE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	38	10.9	38	10.9
Yes	310	89.1	348	100.0

Frequency Missing = 131

Heating operated/Feb

HE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	43	12.4	43	12.4
Yes	304	87.6	347	100.0

Frequency Missing = 132

Heating operated/Mar

HE062	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	72	21.0	72	21.0
Yes	271	79.0	343	100.0

Frequency Missing = 136

Heating operated/Apr

HE063	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	157	46.2	157	46.2
Yes	183	53.8	340	100.0

Frequency Missing = 139

Heating operated/May

HE064	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	246	72.8	246	72.8
Yes	92	27.2	338	100.0

Frequency Missing = 141

Heating operated/Jun

HE065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	321	95.5	321	95.5
Yes	15	4.5	336	100.0

Frequency Missing = 143

Heating operated/Jul

HE066	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	328	97.9	328	97.9
Yes	7	2.1	335	100.0

Frequency Missing = 144

Heating operated/Aug

HE067	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	326	97.3	326	97.3
Yes	9	2.7	335	100.0

Frequency Missing = 144

Heating operated/Sep

HE068	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	309	92.0	309	92.0
Yes	27	8.0	336	100.0

Frequency Missing = 143

Heating operated/Oct

HE069	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	199	58.2	199	58.2
Yes	143	41.8	342	100.0

Frequency Missing = 137

Heating operated/Nov

HE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	63	18.3	63	18.3
Yes	282	81.7	345	100.0

Frequency Missing = 134

Heating operated/Dec

HE071	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	43	12.4	43	12.4
Yes	303	87.6	346	100.0

Frequency Missing = 133

Heating operated/Ref

HE072	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	284	94.7	284	94.7
Yes	16	5.3	300	100.0

Frequency Missing = 179

Heating operated/DK

HE073	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	280	90.9	280	90.9
Yes	28	9.1	308	100.0

Frequency Missing = 171

Added/replaced/removed heating sys

HE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No chnge	377	86.5	377	86.5
Added	14	3.2	391	89.7
Replaced	42	9.6	433	99.3
Added/Replaced	3	0.7	436	100.0

Frequency Missing = 43

Month/Year changed heating

HE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1992	1	4.0	1	4.0
JUN1992	1	4.0	2	8.0
JUL1992	1	4.0	3	12.0
DEC1992	1	4.0	4	16.0
MAY1993	1	4.0	5	20.0
JUN1993	1	4.0	6	24.0
NOV1993	1	4.0	7	28.0
DEC1993	1	4.0	8	32.0
APR1994	1	4.0	9	36.0
JUN1994	2	8.0	11	44.0
JUL1994	8	32.0	19	76.0
AUG1994	1	4.0	20	80.0
OCT1994	1	4.0	21	84.0
JAN1995	1	4.0	22	88.0
MAR1995	1	4.0	23	92.0
APR1995	2	8.0	25	100.0

Frequency Missing = 454

Year changed heating

HE091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	5	13.5	5	13.5
1993	17	45.9	22	59.5
1994	12	32.4	34	91.9
1995	3	8.1	37	100.0

Frequency Missing = 442

Old heat fuel type

HE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	36	73.5	36	73.5
Propane/Bottld g	2	4.1	38	77.6
Steam	1	2.0	39	79.6
Elec	10	20.4	49	100.0

Frequency Missing = 430

heat addition fuel type

HE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	9	50.0	9	50.0
Propane/Bottld g	3	16.7	12	66.7
Oil	1	5.6	13	72.2
Elec	3	16.7	16	88.9
Other	2	11.1	18	100.0

Frequency Missing = 461

OBS	HE121
1	PORTABLES, SOME GAS, SOME ELEC.
2	WOOD AND GAS

Changed top 10% equip?

OE010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	401	90.9	401	90.9
Yes	40	9.1	441	100.0

Frequency Missing = 38

Changed H2O heat

OE012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	28	90.3	28	90.3
Yes	3	9.7	31	100.0

Frequency Missing = 448

Changed cooking equip

OE013	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	29	93.5	29	93.5
Yes	2	6.5	31	100.0

Frequency Missing = 448

Changed refrigeration

OE014	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	23	69.7	23	69.7
Yes	10	30.3	33	100.0

Frequency Missing = 446

Changed HVAC

OE014B	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.0	5	100.0

Frequency Missing = 474

Changed mfg equip

OE014C	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	100.0	1	100.0

Frequency Missing = 478

Changed computers

OE014D	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Changed other1

OE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	11	26.8	11	26.8
Yes	30	73.2	41	100.0

Frequency Missing = 438

OBS	OE016
1	TEMPORARY BUILDINGS W/HVAC
2	EXHAUST FANS
3	POOL HEATER
4	LIGHTING RETROFITS
5	LIGHTS
6	CLOSED SHOP
7	40 NEW WASHERS
8	PHOTO PROCESSING EQUIP
9	NEW A\C IN NEW OFFICE
10	AIR COMPRESSORS
11	CHANGED WELL PUMP
12	SEE ADITION OF RELOCATABLES
13	SEE ADITION OF RELOCATABLES
14	SEE ADITION OF RELOCATABLES
15	SEE ADITION OF RELOCATABLES
16	SEE ADITION OF RELOCATABLES
17	ADDED 2 PORT. CLASSROOMS
18	SEE ADITION OF RELOCATABLES
19	SEE ADITION OF RELOCATABLES
20	SEE ADITION OF RELOCATABLES
21	SEE ADITION OF RELOCATABLES
22	SEE ADITION OF RELOCATABLES
23	SEE ADITION OF RELOCATABLES
24	SEE ADITION OF RELOCATABLES
25	SEE ADITION OF RELOCATABLES
26	COOLERS
27	AC LOWER CEILING TO MAKE
28	EXCELLARATOR
29	SPACE HEATING
30	PROPANE HEAT

Changed other2

OE017	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	34	89.5	34	89.5
Yes	4	10.5	38	100.0

Frequency Missing = 441

OBS	OE018
1	COMPUTERS.
2	CONVEYER SYSTEM
3	COMPRESSORS
4	IT MORE SUFFIECIENT.

Changed refused

OE019	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	36	100.0	36	100.0

Frequency Missing = 443

Changed dont know

OE011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	39	100.0	39	100.0

Frequency Missing = 440

Month/Year changed H2O heat

OE020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
OCT1993	1	50.0	1	50.0
APR1995	1	50.0	2	100.0

Frequency Missing = 477

Year changed H2O heat

OE021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1994	1	100.0	1	100.0

Frequency Missing = 478

Added/replaced/removed H2O heat

OE030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	2	66.7	2	66.7
Added/Replaced	1	33.3	3	100.0

Frequency Missing = 476

Old H2O heat fuel type

OE040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	1	100.0	1	100.0

Frequency Missing = 478

H2O heat addition fuel type

OE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	1	33.3	1	33.3
Elec	2	66.7	3	100.0

Frequency Missing = 476

Month/Year changed cooking equip

OE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Year changed cooking equip

OE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	2	100.0	2	100.0

Frequency Missing = 477

Added/replaced/removed cooking equip

OE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	2	100.0	2	100.0

Frequency Missing = 477

Old cooking equip fuel type

OE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

cooking equip addition fuel type

OE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	2	100.0	2	100.0

Frequency Missing = 477

Month/Year changed refrigeration equip

OE100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
NOV1992	1	16.7	1	16.7
JAN1993	1	16.7	2	33.3
OCT1993	1	16.7	3	50.0
JUN1994	1	16.7	4	66.7
SEP1994	1	16.7	5	83.3
APR1995	1	16.7	6	100.0

Frequency Missing = 473

Year changed refrigeration equip

OE101	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	4	100.0	4	100.0

Frequency Missing = 475

Added/replaced/removed refrig equip

OE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	5	50.0	5	50.0
Replaced	1	10.0	6	60.0
Added/Replaced	3	30.0	9	90.0
Removed	1	10.0	10	100.0

Frequency Missing = 469

Old refrigeration equip fuel type

OE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	5	100.0	5	100.0

Frequency Missing = 474

refrigeration equip addition fuel type

OE130	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	8	100.0	8	100.0

Frequency Missing = 471

Month/Year changed Other1 equip

OE140	Frequency	Percent	Cumulative Frequency	Cumulative Percent
SEP1992	1	12.5	1	12.5
NOV1992	1	12.5	2	25.0
AUG1993	1	12.5	3	37.5
DEC1993	2	25.0	5	62.5
FEB1994	1	12.5	6	75.0
MAY1994	1	12.5	7	87.5
NOV1994	1	12.5	8	100.0

Frequency Missing = 471

Year changed Other1 equip

OE141	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	17	85.0	17	85.0
1994	1	5.0	18	90.0
1995	2	10.0	20	100.0

Frequency Missing = 459

Added/replaced/removed Other1 equip

OE150	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	3	75.0	3	75.0
Replaced	1	25.0	4	100.0

Frequency Missing = 475

Old Other1 equip fuel type

OE160	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	1	100.0	1	100.0

Frequency Missing = 478

Other1 equip addition fuel type

OE170	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	2	100.0	2	100.0

Frequency Missing = 477

Month/Year changed Other2 equip

OE180	Frequency	Percent	Cumulative Frequency	Cumulative Percent
AUG1994	1	100.0	1	100.0

Frequency Missing = 478

Year changed Other2 equip

OE181	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	1	100.0	1	100.0

Frequency Missing = 478

Added/replaced/removed Other2 equip

OE190	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Old Other2 equip fuel type

OE200	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Other2 equip addition fuel type

OE202	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 479

Made any other energy using changes?

OC010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	385	87.7	385	87.7
Yes	54	12.3	439	100.0

Frequency Missing = 40

OBS	OC020
1	DECREASE USAGE AT PEAK HRS W/PG&E PROGRA,
2	INSTALLED TERMAL PYNE WINDOWS
3	NEW WATER HEATER
4	ADDED COMPUTERS
5	TENANT LEFT WHICH REDUCED POWER USAGE
6	ADDED COMPUTERS
7	INSTALLED 4 INDIVIDUAL AIR CONDITIONER WALL UNITS
8	MORE ENERGY EFFICIENT LIGHT BULBS
9	ADDITION OF AIR COMPRESSOR
10	ADDED COMPUTERS
11	HIGHER WATTAGE PARKING LOT LIGHTS.
12	CHANGED EXIT LIGHTS TO LED LIGHTS
13	REMOVED PUMP,
14	MORE OF THE BUILDING IS OCCUPIED
15	ADDED A GENERATOR
16	ADDED MORE GAS STOVES
17	ADDED RADIANT BARRIER INSULATION
18	A COMPUTER SYSTEM WAS ADDED.
19	NEW WINDOWS AND MORE WINDOWS
20	ADDED CEILING FAN IN OFFICE
21	REPLACED 2 SINGLE DOOR DRYERS, WITH 2 DOUBLE STACK DRYERS.
22	PUT WATER COOLER ON DRY CLEANING MACHINE
23	INSTALLE AN ENERGY MANAGEMENT SYSTEM
24	ADDED SOME NEON SIGNS
25	RE-ENFORCED ENERGY STANDARDS & GUIDELINES
26	ADDITIONAL OFFICE SPACE
27	ADDITIONAL PLUG-IN EQUIPMENT
28	ADDED COMPUTERS
29	CHANGED 4 ROOFTOP HEATING/COOLING UNITS
30	NEW WALK IN FRIDGES
31	CHANGED ENERGY MANAGEMENT SYSTEM
32	CHANGED TO HIGH EFF. BOILER AT SWIMMING POOL
33	ENERGY MANAGEMENT SYSTEM INSTALLED
34	ADDED PCS
35	MORE EQUIPMENT
36	ADDED SMALL COOLER
37	ADDED GAS EQUIP.
38	NEW FRIDGE
39	NEW FRIDGE
40	ELIMINTED SOME EQUIPMENTS
41	ADDED GAS EQUIP.
42	NEW ROOF
43	ADDED A WALK IN BOX
44	REPLACED WALK-IN FREEZER COMPRESSOR WITH LARGER, MORE EFFICIENT UNIT
45	CHANGED LIGHTING OUTSIDE OF PROGRAM, MOTION SENSORS
46	ADDED TIME CLOCKS FOR GARAGE LIGHTING
47	CHANGED BASEBOARD HEATERS
48	NEW WATER HEATERS
49	MORE PEOPLE/ LIGHTS ARE ON MORE OFTEN.
50	PUT SUN SHADES UP AND VERTICLE BLINDS
51	ADDITION OF FAX MACHINE, COMPUTER AND PRINTER, AND VIDEO CAMERA AND
52	RETROFIT
53	ADDED A STERALIZER THAT USES A LOT OF ENERGY, HAS 390 AMP, PRETTY INT

OBS	OC020
54	ADDED A HOT WATER HEATER
55	ADDED NEW COMPUTERS
56	REMOVED PUMP,

OBS	OC021
1	AND IS ADDING TWO MORE DRYERS, TODAY (8/9/95). {TOTAL CHANGE = +4 }
2	TV MONTIOR
3	ENSE ON HEAT USAGES

Month/Year of other change

OC030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1992	1	3.6	1	3.6
JUL1992	2	7.1	3	10.7
JUN1993	3	10.7	6	21.4
JUL1993	1	3.6	7	25.0
NOV1993	1	3.6	8	28.6
JAN1994	1	3.6	9	32.1
APR1994	1	3.6	10	35.7
JUN1994	2	7.1	12	42.9
AUG1994	2	7.1	14	50.0
SEP1994	2	7.1	16	57.1
OCT1994	2	7.1	18	64.3
NOV1994	1	3.6	19	67.9
DEC1994	3	10.7	22	78.6
JAN1995	2	7.1	24	85.7
MAR1995	1	3.6	25	89.3
APR1995	2	7.1	27	96.4
JUN1995	1	3.6	28	100.0

Frequency Missing = 451

Year of other change

OC031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	2	9.1	2	9.1
1993	6	27.3	8	36.4
1994	10	45.5	18	81.8
1995	4	18.2	22	100.0

Frequency Missing = 457

Is there an EMS system?

EM010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	365	83.9	365	83.9
Yes	70	16.1	435	100.0

Frequency Missing = 44

Month/Year EMS installed

EM020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1970	1	6.3	1	6.3
APR1982	1	6.3	2	12.5
MAR1986	1	6.3	3	18.8
APR1992	1	6.3	4	25.0
JUL1992	1	6.3	5	31.3
JAN1994	1	6.3	6	37.5
FEB1994	1	6.3	7	43.8
APR1994	1	6.3	8	50.0
JUN1994	2	12.5	10	62.5
JUL1994	1	6.3	11	68.8
AUG1994	1	6.3	12	75.0
SEP1994	1	6.3	13	81.3
OCT1994	1	6.3	14	87.5
APR1995	1	6.3	15	93.8
MAY1995	1	6.3	16	100.0

Frequency Missing = 463

Year EMS installed

EM021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1970	1	1.7	1	1.7
1980	1	1.7	2	3.4
1984	1	1.7	3	5.2
1985	1	1.7	4	6.9
1986	2	3.4	6	10.3
1987	2	3.4	8	13.8
1988	1	1.7	9	15.5
1989	2	3.4	11	19.0
1991	3	5.2	14	24.1
1992	5	8.6	19	32.8
1993	22	37.9	41	70.7
1994	15	25.9	56	96.6
1995	2	3.4	58	100.0

Frequency Missing = 421

Is there a cogeneration plant?

CP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	416	99.0	416	99.0
Yes	4	1.0	420	100.0

Frequency Missing = 59

Month/Year cogeneration installed

CP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
DEC1991	1	100.0	1	100.0

Frequency Missing = 478

Year cogeneration installed

CP021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1983	1	33.3	1	33.3
1993	2	66.7	3	100.0

Frequency Missing = 476

Appendix I

NONPARTICIPANTS TELEPHONE SURVEY RESPONSE FREQUENCIES

audit OK?

MN001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	2	0.4	2	0.4
Yes	448	99.6	450	100.0

Frequency Missing = 8

Own building?/Decis

SC001D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	205	46.1	205	46.1
Yes	240	53.9	445	100.0

Frequency Missing = 13

Firm occupies space/Decis

FI001D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	18	4.0	18	4.0
Yes	432	96.0	450	100.0

Frequency Missing = 8

Firm manages prop/Decis

FI002D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	111	24.9	111	24.9
Yes	335	75.1	446	100.0

Frequency Missing = 12

Own building?/Tech

SC001T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	71.4	5	71.4
Yes	2	28.6	7	100.0

Frequency Missing = 451

Firm occupies space/Tech

FI001T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	2	28.6	2	28.6
Yes	5	71.4	7	100.0

Frequency Missing = 451

Firm manages prop/Tech

FI002T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	3	33.3	3	33.3
Yes	6	66.7	9	100.0

Frequency Missing = 449

Own building?/Light

SC001L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	1	50.0	1	50.0
Yes	1	50.0	2	100.0

Frequency Missing = 456

Firm occupies space/Light

FI001L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	1	50.0	1	50.0
Yes	1	50.0	2	100.0

Frequency Missing = 456

Firm manages prop/Light

FI002L	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	1	50.0	1	50.0
Yes	1	50.0	2	100.0

Frequency Missing = 456

Is there a PM firm?

SC016	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	76	69.1	76	69.1
Yes	34	30.9	110	100.0

Frequency Missing = 348

Are you the sole occupant?

FI003	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	147	33.9	147	33.9
Yes	286	66.1	433	100.0

Frequency Missing = 25

Is any part of building leased?

FI004	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	169	68.7	169	68.7
Yes	77	31.3	246	100.0

Frequency Missing = 212

Is person decision maker

SC003	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	450	100.0	450	100.0

Frequency Missing = 8

Is person Tech person

SC005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	1.1	5	1.1
Yes	444	98.9	449	100.0

Frequency Missing = 9

Is person Light person

SC006	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	4	0.9	4	0.9
Yes	446	99.1	450	100.0

Frequency Missing = 8

Recall participation?

SC020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	408	90.7	408	90.7
Yes	42	9.3	450	100.0

Frequency Missing = 8

LIghts instald pre/post Jan1992

SC021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
After Jan 1992	2	4.2	2	4.2
Before Jan 1992	46	95.8	48	100.0

Frequency Missing = 410

Changed any indoor lighting?

IL010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	303	68.6	303	68.6
Yes	139	31.4	442	100.0

Frequency Missing = 16

month/year indoor light change

IL020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1992	1	1.6	1	1.6
JUN1992	1	1.6	2	3.3
SEP1992	1	1.6	3	4.9
OCT1992	1	1.6	4	6.6
JAN1993	1	1.6	5	8.2
MAR1993	1	1.6	6	9.8
APR1993	2	3.3	8	13.1
JUN1993	2	3.3	10	16.4
AUG1993	1	1.6	11	18.0
SEP1993	1	1.6	12	19.7
FEB1994	2	3.3	14	23.0
MAR1994	1	1.6	15	24.6
MAY1994	1	1.6	16	26.2
JUL1994	3	4.9	19	31.1
AUG1994	2	3.3	21	34.4
SEP1994	2	3.3	23	37.7
NOV1994	3	4.9	26	42.6
DEC1994	2	3.3	28	45.9
JAN1995	5	8.2	33	54.1
FEB1995	3	4.9	36	59.0
MAR1995	4	6.6	40	65.6
APR1995	8	13.1	48	78.7
MAY1995	5	8.2	53	86.9
JUN1995	2	3.3	55	90.2
JUL1995	6	9.8	61	100.0

Frequency Missing = 397

year indoor light change

IL021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	12	17.4	12	17.4
1993	31	44.9	43	62.3
1994	17	24.6	60	87.0
1995	9	13.0	69	100.0

Frequency Missing = 389

month/year indoor light change-2

IL025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
MAY1994	1	33.3	1	33.3
NOV1994	1	33.3	2	66.7
APR1995	1	33.3	3	100.0

Frequency Missing = 455

year indoor light change-2

IL026	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	1	8.3	1	8.3
1993	2	16.7	3	25.0
1994	9	75.0	12	100.0

Frequency Missing = 446

Added or removed/4' T-8

IL040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	79	76.0	79	76.0
Added	23	22.1	102	98.1
Removed	2	1.9	104	100.0

Frequency Missing = 354

Added or removed/8' T-8

IL041	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	92	88.5	92	88.5
Added	9	8.7	101	97.1
Removed	3	2.9	104	100.0

Frequency Missing = 354

Added or removed/4' ES Fluor

IL042	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	103	97.2	103	97.2
Added	3	2.8	106	100.0

Frequency Missing = 352

Added or removed/8' ES Fluor

IL043	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	106	99.1	106	99.1
Added	1	0.9	107	100.0

Frequency Missing = 351

Added or removed/4' T-12

IL044	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	96	92.3	96	92.3
Added	7	6.7	103	99.0
Removed	1	1.0	104	100.0

Frequency Missing = 354

Added or removed/8' T-12

IL045	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	96	92.3	96	92.3
Added	5	4.8	101	97.1
Removed	3	2.9	104	100.0

Frequency Missing = 354

Added or removed/Incandescent

IL046	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	82	78.1	82	78.1
Added	15	14.3	97	92.4
Removed	8	7.6	105	100.0

Frequency Missing = 353

Added or removed/Compact Fluor

IL047	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	92	88.5	92	88.5
Added	11	10.6	103	99.0
Removed	1	1.0	104	100.0

Frequency Missing = 354

Added or removed/High pres sodium

IL048	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	93	89.4	93	89.4
Added	11	10.6	104	100.0

Frequency Missing = 354

Added or removed/Elec Ballasts

IL049	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	95	91.3	95	91.3
Added	9	8.7	104	100.0

Frequency Missing = 354

Number changed/4' T-8

IL040N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	10.0	2	10.0
4	2	10.0	4	20.0
6	4	20.0	8	40.0
10	2	10.0	10	50.0
14	1	5.0	11	55.0
15	1	5.0	12	60.0
20	1	5.0	13	65.0
24	1	5.0	14	70.0
32	1	5.0	15	75.0
40	1	5.0	16	80.0
100	2	10.0	18	90.0
200	1	5.0	19	95.0
500	1	5.0	20	100.0

Frequency Missing = 438

Number changed/8' T-8

IL041N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	14.3	1	14.3
4	1	14.3	2	28.6
8	1	14.3	3	42.9
14	1	14.3	4	57.1
20	2	28.6	6	85.7
25	1	14.3	7	100.0

Frequency Missing = 451

Number changed/4' ES Fluor

IL042N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	33.3	1	33.3
2	1	33.3	2	66.7
40	1	33.3	3	100.0

Frequency Missing = 455

Number changed/8' ES Fluor

IL043N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Number changed/4' T-12

IL044N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	1	16.7	1	16.7
6	2	33.3	3	50.0
8	1	16.7	4	66.7
12	1	16.7	5	83.3
3000	1	16.7	6	100.0

Frequency Missing = 452

Number changed/8' T-12

IL045N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
6	1	16.7	1	16.7
10	3	50.0	4	66.7
50	1	16.7	5	83.3
72	1	16.7	6	100.0

Frequency Missing = 452

Number changed/Incandescent

IL046N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	4.5	1	4.5
2	2	9.1	3	13.6
3	3	13.6	6	27.3
4	1	4.5	7	31.8
6	1	4.5	8	36.4
7	1	4.5	9	40.9
10	4	18.2	13	59.1
12	1	4.5	14	63.6
15	1	4.5	15	68.2
20	1	4.5	16	72.7
24	1	4.5	17	77.3
30	1	4.5	18	81.8
50	1	4.5	19	86.4
100	1	4.5	20	90.9
215	1	4.5	21	95.5
500	1	4.5	22	100.0

Frequency Missing = 436

Number changed/Compact Fluor

IL047N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	8.3	1	8.3
4	3	25.0	4	33.3
6	1	8.3	5	41.7
8	1	8.3	6	50.0
14	2	16.7	8	66.7
24	1	8.3	9	75.0
50	1	8.3	10	83.3
215	1	8.3	11	91.7
2000	1	8.3	12	100.0

Frequency Missing = 446

Number changed/High pres sodium

IL048N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
2	1	10.0	1	10.0
3	1	10.0	2	20.0
4	3	30.0	5	50.0
6	1	10.0	6	60.0
10	1	10.0	7	70.0
20	1	10.0	8	80.0
40	1	10.0	9	90.0
50	1	10.0	10	100.0

Frequency Missing = 448

Number changed/Elec Ballasts

IL049N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	11.1	1	11.1
1	1	11.1	2	22.2
2	2	22.2	4	44.4
4	3	33.3	7	77.8
6	1	11.1	8	88.9
10	1	11.1	9	100.0

Frequency Missing = 449

Added or removed/Magnetic Ballasts

IL050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	92	94.8	92	94.8
Added	4	4.1	96	99.0
Removed	1	1.0	97	100.0

Frequency Missing = 361

Added or removed/Metal Halide

IL051	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	95	95.0	95	95.0
Added	4	4.0	99	99.0
Removed	1	1.0	100	100.0

Frequency Missing = 358

Added or removed/Mercury Vapor

IL052	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	97	98.0	97	98.0
Added	2	2.0	99	100.0

Frequency Missing = 359

Added or removed/Quartz

IL053	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	93	94.9	93	94.9
Added	5	5.1	98	100.0

Frequency Missing = 360

Added or removed/Reflectors

IL054	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	97	98.0	97	98.0
Added	2	2.0	99	100.0

Frequency Missing = 359

Added or removed/LED Exit Lights

IL055	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	97	97.0	97	97.0
Added	3	3.0	100	100.0

Frequency Missing = 358

Added or removed/Watt Saver-Power Choke

IL056	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	98	100.0	98	100.0

Frequency Missing = 360

Added or removed/Other

IL057	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No change	86	78.9	86	78.9
Added	23	21.1	109	100.0

Frequency Missing = 349

Number changed/Magnetic Ballasts

IL050N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	20.0	1	20.0
3	1	20.0	2	40.0
4	3	60.0	5	100.0

Frequency Missing = 453

Number changed/Metal Halide

IL051N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	20.0	1	20.0
4	2	40.0	3	60.0
6	1	20.0	4	80.0
12	1	20.0	5	100.0

Frequency Missing = 453

Number changed/Mercury Vapor

IL052N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	100.0	1	100.0

Frequency Missing = 457

Number changed/Quartz

IL053N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	25.0	1	25.0
8	1	25.0	2	50.0
72	1	25.0	3	75.0
100	1	25.0	4	100.0

Frequency Missing = 454

Number changed/Reflectors

IL054N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
700	1	100.0	1	100.0

Frequency Missing = 457

Number changed/LED Exit Lights

IL055N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
9	2	50.0	2	50.0
14	1	25.0	3	75.0
40	1	25.0	4	100.0

Frequency Missing = 454

Number changed/Watt Saver-Power Choke

IL056N	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Number changed/Other

IL057N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	6	37.5	6	37.5
1	3	18.8	9	56.3
3	3	18.8	12	75.0
10	3	18.8	15	93.8
12	1	6.3	16	100.0

Frequency Missing = 442

OBS	IL058
1	CENTURY 21 SIGN
2	BALLASTS
3	GROUND LIGHTS
4	1
5	DID NOT KNOW...
6	OIUTSIDE SECURITY LITE
7	0
8	NEW REFLECTORS
9	PHOTOCELL SENSORS
10	LOW PRESSURE SODIUM
11	HALOGEN
12	FLOURESCENT FIXTURE
13	1
14	1
15	1
16	.
17	1
18	.
19	HI PRESSURE SODIUM
20	HALLOGENS
21	HALOGEN LOW DRAW
22	FLORESCENT TYPE UNKWN
23	HALOGEN
24	METAL ARC LAMPS
25	1
26	NEON SIGNS
27	0
28	999
29	HEAT SENSITIVE
30	PHOTO CELL CONTROLS
31	NEON LTG.
32	NEON
33	TIMER
34	NEON LIGHTS
35	NEON SIGN
36	999
37	OUTSIDE
38	0
39	"BI-AX FLOURESCENT"
40	PHOTO SENSORS
41	1
42	1
43	1
44	1

Single/Multiple/Portion of Build

FI005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
One building	356	81.8	356	81.8
Multiple buildin	65	14.9	421	96.8
Portion of a bui	14	3.2	435	100.0

Frequency Missing = 23

Multiple accnts for addr?

FI007	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	33	41.8	33	41.8
Yes	46	58.2	79	100.0

Frequency Missing = 379

Num buildings covered by address

FI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	17	21.3	17	21.3
2	29	36.3	46	57.5
3	9	11.3	55	68.8
4	8	10.0	63	78.8
5	4	5.0	67	83.8
6	3	3.8	70	87.5
8	3	3.8	73	91.3
9	1	1.3	74	92.5
10	2	2.5	76	95.0
11	1	1.3	77	96.3
13	1	1.3	78	97.5
16	1	1.3	79	98.8
40	1	1.3	80	100.0

Frequency Missing = 378

Separate bills for buildings?

FI015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	40	66.7	40	66.7
Yes	20	33.3	60	100.0

Frequency Missing = 398

Other firms in building?

FI020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	321	72.6	321	72.6
Yes	121	27.4	442	100.0

Frequency Missing = 16

Number other firms in building

FI025	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	157	57.5	157	57.5
1	37	13.6	194	71.1
2	21	7.7	215	78.8
3	9	3.3	224	82.1
4	4	1.5	228	83.5
5	9	3.3	237	86.8
6	7	2.6	244	89.4
7	5	1.8	249	91.2
8	3	1.1	252	92.3
9	3	1.1	255	93.4
10	2	0.7	257	94.1
11	1	0.4	258	94.5
12	2	0.7	260	95.2
14	1	0.4	261	95.6
15	1	0.4	262	96.0
16	2	0.7	264	96.7
18	2	0.7	266	97.4
20	1	0.4	267	97.8
27	1	0.4	268	98.2
30	1	0.4	269	98.5
50	2	0.7	271	99.3
120	1	0.4	272	99.6
125	1	0.4	273	100.0

Frequency Missing = 185

Organizational Structure

FI040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Chain/Multifacil	59	13.2	59	13.2
Franchise	29	6.5	88	19.7
Independant	358	80.3	446	100.0

Frequency Missing = 12

OBS	FI045
1	OIL, CHEM & ATOMIC INTERNATIONAL
2	ELECTRO SKILLS
3	AMERICAN BAPTIST HOMES OF THE WEST
4	BIBETT CORP.
5	LA PETITE ACADEMY INC
6	PATRICK JAMES CLOTHES
7	WORLDCOMM
8	TITAN CORP
9	CITY AND COUNTY GOVERNMENT
10	CHARLES SCHWAB
11	BAYCOM
12	PRIORITY HEALTH SERVICES
13	AUTOMOBILE CLUB OF SO. CAL
14	DESTEC ENERGY INC.
15	BRYANS TRUCK AND AUTO
16	BS&E INC
17	J E HIGGINS LUMBER
18	CLASSIC PARKING
19	CHARMING SHOPS
20	EDISON BROS.
21	TILT
22	BAKERSFIELD CENTER'S, INC.
23	NW TRANSPORTS
24	BLUMENFELD SAN FRANCISCO THEATRES
25	COMPAS
26	GOODYEAR TIRE AND RUBBER CO.
27	GREAT WORKS INC
28	CINEMERICA
29	DAIICHI & LA SLLE
30	GOODYEAR TIRE
31	BT OFFICE PRODUCTS INTL.
32	LOEHMANNS
33	CHALLENGER SCHOOLS
34	CHILDREN'S DISCOVERY CENTERS OF AMERICA, INC.
35	COMMUMITY SCHOOLS OF KERN CO.
36	FAIRFAX SCHOOL DISTRICT
37	A.R.C., FRESNO
38	DIANDAS ITAL. AMER. PASTRY INC.
39	BOUMIS ASSOCIATES
40	DEJAVU INC.
41	GORDON BIERSCH BREWING CO. INC.
42	SISTERS OF ST. JOSEPH OF ORANGE COUNTY
43	PHYSICIANS RESOURCE GROUP
44	UNILAB
45	CRESTWOOD HOSPITALS INC
46	SURGICAL CARE AFFILIATESL
47	TEACHERS MANAGEMENT ?-----TMI
48	COMFORT CALIFORNIA, INC. OF MANOR CARE, INC.
49	ALLEN & O'HARA INC.
50	APPLE CO.
51	HOTEL GROUP OF AMERICA
52	SECURITY PACIFIC / INSIGNIA
53	KIMTON HOTEL MNGT CO.

OBS	FI045
54	HILLENBRAND INDUSTRIES
55	REED EQUIPMENT
56	LEO'S PROFESSIONAL AUDIO INC
57	W W GRAINGER, INC
58	ARROW ELECTRONICS

Legal Tax Status

FI050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
For-Profit	349	80.6	349	80.6
Public	14	3.2	363	83.8
501(c3)Non-proft	70	16.2	433	100.0

Frequency Missing = 25

Tax status of parent company

FI055	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Where are energy decisions made

FI060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Locally on site	369	82.4	369	82.4
Regional head of	29	6.5	398	88.8
National head of	23	5.1	421	94.0
Internat headoff	1	0.2	422	94.2
PM firm/build ow	19	4.2	441	98.4
Other	2	0.4	443	98.9
both local and n	4	0.9	447	99.8
13	1	0.2	448	100.0

Frequency Missing = 10

OBS	FI062
1	SCHOOL BOARD MEETING
2	CORPORATE HEAD CORTERES
3	MADE AT AN OWNERS' MEETING
4	LOCAL AND CORPORATE
5	MUTUAL AGREEMENT
6	MADE COMBO LOCAL AND NATIONAL
7	COMBO LOC AND REG
8	O-SIT + PRES & VP

Number people currently employed

EI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	0.7	3	0.7
1	23	5.3	26	6.0
2	25	5.8	51	11.8
3	29	6.7	80	18.5
4	31	7.2	111	25.6
5	24	5.5	135	31.2
6	16	3.7	151	34.9
7	8	1.8	159	36.7
8	18	4.2	177	40.9
9	4	0.9	181	41.8
10	15	3.5	196	45.3
11	4	0.9	200	46.2
12	10	2.3	210	48.5
13	3	0.7	213	49.2
14	8	1.8	221	51.0
15	17	3.9	238	55.0
16	3	0.7	241	55.7
17	5	1.2	246	56.8
18	6	1.4	252	58.2
19	2	0.5	254	58.7
20	18	4.2	272	62.8
21	1	0.2	273	63.0
22	5	1.2	278	64.2
23	3	0.7	281	64.9
25	16	3.7	297	68.6
26	2	0.5	299	69.1
27	1	0.2	300	69.3
28	2	0.5	302	69.7
30	11	2.5	313	72.3
31	1	0.2	314	72.5
34	2	0.5	316	73.0
35	11	2.5	327	75.5
36	2	0.5	329	76.0
37	2	0.5	331	76.4
38	3	0.7	334	77.1
39	2	0.5	336	77.6
40	8	1.8	344	79.4
42	1	0.2	345	79.7
45	4	0.9	349	80.6
46	1	0.2	350	80.8
50	25	5.8	375	86.6
54	1	0.2	376	86.8
55	2	0.5	378	87.3
56	1	0.2	379	87.5
60	10	2.3	389	89.8
65	5	1.2	394	91.0
67	1	0.2	395	91.2
70	3	0.7	398	91.9
75	2	0.5	400	92.4
77	1	0.2	401	92.6

Number people currently employed

EI010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
80	4	0.9	405	93.5
85	1	0.2	406	93.8
90	2	0.5	408	94.2
100	8	1.8	416	96.1
120	2	0.5	418	96.5
125	2	0.5	420	97.0
134	1	0.2	421	97.2
150	3	0.7	424	97.9
160	1	0.2	425	98.2
170	1	0.2	426	98.4
190	1	0.2	427	98.6
200	1	0.2	428	98.8
250	1	0.2	429	99.1
350	1	0.2	430	99.3
400	1	0.2	431	99.5
500	1	0.2	432	99.8
1000	1	0.2	433	100.0

Frequency Missing = 25

Any change in number of employees?

EI020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	314	71.9	314	71.9
Yes	123	28.1	437	100.0

Frequency Missing = 21

Mon/Year of change in employees

EI030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1992	2	4.8	2	4.8
MAR1992	1	2.4	3	7.1
JUN1992	1	2.4	4	9.5
AUG1992	2	4.8	6	14.3
OCT1992	1	2.4	7	16.7
JAN1993	2	4.8	9	21.4
FEB1993	1	2.4	10	23.8
APR1993	1	2.4	11	26.2
JUN1993	1	2.4	12	28.6
NOV1993	2	4.8	14	33.3
DEC1993	1	2.4	15	35.7
FEB1994	1	2.4	16	38.1
APR1994	3	7.1	19	45.2
JUN1994	1	2.4	20	47.6
AUG1994	1	2.4	21	50.0
SEP1994	1	2.4	22	52.4
NOV1994	2	4.8	24	57.1
JAN1995	5	11.9	29	69.0
FEB1995	1	2.4	30	71.4
MAR1995	1	2.4	31	73.8
APR1995	2	4.8	33	78.6
MAY1995	2	4.8	35	83.3
JUN1995	5	11.9	40	95.2
JUL1995	2	4.8	42	100.0

Frequency Missing = 416

Year of change in employees

EI031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	12	30.0	12	30.0
1993	13	32.5	25	62.5
1994	11	27.5	36	90.0
1995	4	10.0	40	100.0

Frequency Missing = 418

Number people employed B4 chng

EI040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	1	0.9	1	0.9
2	6	5.6	7	6.5
3	3	2.8	10	9.3
4	2	1.9	12	11.1
5	4	3.7	16	14.8
6	3	2.8	19	17.6
7	3	2.8	22	20.4
8	4	3.7	26	24.1
9	2	1.9	28	25.9
10	2	1.9	30	27.8
11	2	1.9	32	29.6
12	3	2.8	35	32.4
13	3	2.8	38	35.2
15	3	2.8	41	38.0
17	2	1.9	43	39.8
18	1	0.9	44	40.7
19	1	0.9	45	41.7
20	3	2.8	48	44.4
21	3	2.8	51	47.2
22	2	1.9	53	49.1
23	1	0.9	54	50.0
24	1	0.9	55	50.9
25	5	4.6	60	55.6
30	2	1.9	62	57.4
35	5	4.6	67	62.0
40	6	5.6	73	67.6
50	3	2.8	76	70.4
55	1	0.9	77	71.3
60	1	0.9	78	72.2
67	1	0.9	79	73.1
70	1	0.9	80	74.1
74	1	0.9	81	75.0
80	1	0.9	82	75.9
90	1	0.9	83	76.9
100	1	0.9	84	77.8
120	1	0.9	85	78.7
137	1	0.9	86	79.6
175	1	0.9	87	80.6
Season Workforce	21	19.4	108	100.0

Frequency Missing = 350

OBS	EI041
1	SUMMER CLERKSHIPS
2	INCREASE IN SUMMER; MANY PART TIME
3	THERE IS NO SINGLE TIME WHEN THE NUMBER OF EMPLOYEES CHANGED
4	SHE SAID THE NUMBER OF EMPLOYEES HAS CHANGED SEVERAL TIMES, BUT
5	NUMBER LOW FROM OCT TO MAY WHEN WEATHER IS LESS GOOD (= 20
6	DUE TO SUMMER SCHOOL SESSIONS, THE NUMBER OF EMPLOYEES FLUCTUAT
7	THERE USED TO BE 2 PEOPLE, ONE WAS LAID OFF.
8	THE NUMBER OF EMPLOYEES HAS GONE UP AND DOWN BY ONE OR TWO
9	# OF EMPLOYEES FLUCTUATES
10	BETWEEN 1 AND 500
11	THE NUMBER OF EMPLOYEES HAS GRADUALLY DECLINED FROM 50, STARTIN
12	SHE SAID THE NUMBER OF EMPLOYEES FLUCTUATES BUT ONLY BY A COUPL
13	WINTER IS SKIING RETAIL
14	THE NUMBER HAS GONE DOWN AND UP, ABOUT 30 AT ITS LOWEST
15	THE NUMBER OF EMPLOYEES FLUCTUATES, IT HAS GONE UP AND DOWN
16	THE NUMBER OF EMPLOYEES FLUCTUATES FROM 50, IN THE SLOW
17	IT FLUCTUATES BETWEEN 40 AND 50 PEOPLE
18	NUMBER OF EMPLOYEES FLUCTUATES
19	RETAIL BUSINESS...
20	MORE IN THE SUMMER AND LESS IN THE WINTER
21	THE NUMBER HAS CHANGED BY MAYBE 1 OR 2 BUT THERE WAS NO
22	FLUCTUATES BETWEEN 7 AND 10 PEOPLE
23	"WE'RE SEASONAL,SO IT FLUCTUATES, WE MAKE DELI SALADS, WE'RE
24	SEASONAL ADDITION OF CLEANING PERSONEL

OBS	EI042
1	THE MAXIMUM NUMBER WAS 60, BUT IT IS CHANGING CONSTANTLY
2	NEVER BY VERY MUCH. SHE SAID BEFORE 1992, THERE WERE PROBABLY
3	EMPLOYEES). THEN GOES TO 35 FOR THE OTHER MONTHS.
4	E
5	SINCE JAN 1992
6	G IN 1992, THE COMPANY USED TO OIL RELATED WORK,
7	OF PEOPLE
8	SEASONS, TO 95 IN SUMMERTIME.
9	DATE OF CHANGE, FLUCTUATES
10	BUSIER IN SUMMER THAN IN WINTER".

OBS	EI043
1	22 PEOPLE EMPLOYED THERE

Are utilities payed thru lease?

FI080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
All included	39	14.2	39	14.2
Some included	13	4.7	52	19.0
All paid direct	222	81.0	274	100.0

Frequency Missing = 184

Indoor Light paid thru lease

FI090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	3	27.3	3	27.3
Yes	8	72.7	11	100.0

Frequency Missing = 447

Heat paid thru lease

FI091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	41.7	5	41.7
Yes	7	58.3	12	100.0

Frequency Missing = 446

Ventilation paid thru lease

FI092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 446

Elec to outlets paid thru lease

FI093	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	41.7	5	41.7
Yes	7	58.3	12	100.0

Frequency Missing = 446

Cooking paid thru lease

FI094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	9	75.0	9	75.0
Yes	3	25.0	12	100.0

Frequency Missing = 446

Outdoor Light paid thru lease

FI095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	5	41.7	5	41.7
Yes	7	58.3	12	100.0

Frequency Missing = 446

Cooling paid thru lease

FI096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 446

H2O heat paid thru lease

FI097	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	4	33.3	4	33.3
Yes	8	66.7	12	100.0

Frequency Missing = 446

Refridgeration paid thru lease

FI098	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	6	50.0	6	50.0
Yes	6	50.0	12	100.0

Frequency Missing = 446

Other paid thru lease

FI099	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	9	81.8	9	81.8
Yes	2	18.2	11	100.0

Frequency Missing = 447

OBS	FI100
1	PORTION OF ALL
2	999

Length of current lease

FI110	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Years left on lease

FI115	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Is it first lease?

FI120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	121	49.2	121	49.2
Yes	125	50.8	246	100.0

Frequency Missing = 212

Have a regular light contr?

IS001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	344	77.3	344	77.3
Yes	101	22.7	445	100.0

Frequency Missing = 13

Reg Light Contr inform bout prog?

IS002	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	68	77.3	68	77.3
Yes	20	22.7	88	100.0

Frequency Missing = 370

Heard of program?

AW005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	265	62.2	265	62.2
Yes	161	37.8	426	100.0

Frequency Missing = 32

Mon/Year first aware of prog

AW010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
APR1990	1	3.8	1	3.8
JUN1990	1	3.8	2	7.7
AUG1991	1	3.8	3	11.5
SEP1992	1	3.8	4	15.4
JAN1993	2	7.7	6	23.1
JUN1993	1	3.8	7	26.9
JUL1993	3	11.5	10	38.5
NOV1993	1	3.8	11	42.3
JAN1994	1	3.8	12	46.2
MAR1994	1	3.8	13	50.0
JUL1994	2	7.7	15	57.7
SEP1994	1	3.8	16	61.5
NOV1994	2	7.7	18	69.2
DEC1994	1	3.8	19	73.1
JAN1995	1	3.8	20	76.9
FEB1995	1	3.8	21	80.8
MAY1995	1	3.8	22	84.6
JUL1995	4	15.4	26	100.0

Frequency Missing = 432

Year frist aware of prog

AW011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1990	26	30.6	26	30.6
1991	9	10.6	35	41.2
1992	15	17.6	50	58.8
1993	20	23.5	70	82.4
1994	11	12.9	81	95.3
1995	4	4.7	85	100.0

Frequency Missing = 373

Hear about prog before or after purch

AW015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
After	10	22.7	10	22.7
Before	34	77.3	44	100.0

Frequency Missing = 414

How first learned of Prog

IS010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Resp aproch vend	1	0.9	1	0.9
Resp aproch PG_E	4	3.5	5	4.4
Contd by acct re	30	26.3	35	30.7
Contd by lit con	10	8.8	45	39.5
Contd by elec co	1	0.9	46	40.4
Brochure n mail	33	28.9	79	69.3
Bill insert	25	21.9	104	91.2
TV/Radio/News	5	4.4	109	95.6
Other	5	4.4	114	100.0

Frequency Missing = 344

OBS	IS020
1	NEWSLETTER
2	AT THE SCHOOL HIS CHILDREN ATTEND
3	SOMEONE DID A STUDY
4	WENT TO PG&E SEMINAR
5	SPOUSE WORKS FOR PG&E

Firm Part in any PG&E prog?

PP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	348	82.1	348	82.1
Yes	70	16.5	418	98.6
Not awar othrs	6	1.4	424	100.0

Frequency Missing = 34

Year firm part in PG_E prog

PP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1985	4	7.4	4	7.4
1987	2	3.7	6	11.1
1988	1	1.9	7	13.0
1989	2	3.7	9	16.7
1990	10	18.5	19	35.2
1991	4	7.4	23	42.6
1992	8	14.8	31	57.4
1993	11	20.4	42	77.8
1994	6	11.1	48	88.9
1995	6	11.1	54	100.0

Frequency Missing = 404

Most important changeout factor

PD010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Get latest tech	7	5.4	7	5.4
Save $ on bills	43	33.3	50	38.8
Replc old/brokn	13	10.1	63	48.8
Imprv qual lite	44	34.1	107	82.9
Obtn advce in fr	2	1.6	109	84.5
Other	14	10.9	123	95.3
Security	6	4.7	129	100.0

Frequency Missing = 329

OBS	PD011
1	EYE STAIN.
2	USAGE
3	SECURITY (OUTDOOR LIGHTS)
4	SECURITY REASONS
5	NEW MGMT/ NEW STRUCTURE OF RADIO
6	MORE LIGHT!
7	AVAILABILITY OF EQUIPMENT
8	MATCH FIXTURES W/ EXISTING
9	SPACE ADDITION
10	PLEASING CORP OFFICE
11	SAVING ENERGY
12	#'S 2 AND 6
13	ALSO #2
14	DID NOT PURCHASE NEW LIGHTING!!!
15	COST EFFICIENCY
16	FEDERAL STANDARDS
17	ADDED STORAGE, OFFICES W/ LIGHTS
18	SECURITY & IMPROVE LIGHTING
19	SECURITY
20	THERE WAS A NEED FOR MORE LIGHTS
21	WHAT I WANTED
22	SAFETY AND POWER USE ISSUES
23	DECORATIVE
24	BETTER EXPOSURE TO PUBLIC
25	GAVE CONTRACTOR DISCRETION
26	SECURITY
27	OBTAINING THE REBATE
28	ESTHETICS
29	COST OF FIXTURE

Didn't do prior/Lack $

FR100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	39	95.1	39	95.1
Yes	2	4.9	41	100.0

Frequency Missing = 417

Didn't do prior/payback not enuf

FR101	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	50	89.3	50	89.3
Yes	6	10.7	56	100.0

Frequency Missing = 402

Didn't do prior/not save as much

FR102	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	56	100.0	56	100.0

Frequency Missing = 402

Didn't do prior/unaware about EE light

FR103	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	53	94.6	53	94.6
Yes	3	5.4	56	100.0

Frequency Missing = 402

Didn't do prior/didn't know where/how

FR104	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	54	96.4	54	96.4
Yes	2	3.6	56	100.0

Frequency Missing = 402

Didn't do prior/hadn't had time

FR105	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	50	89.3	50	89.3
Yes	6	10.7	56	100.0

Frequency Missing = 402

Didn't do prior/concern w/ bright

FR106	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	55	98.2	55	98.2
Yes	1	1.8	56	100.0

Frequency Missing = 402

Didn't do prior/tenants didn't want

FR107	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	55	100.0	55	100.0

Frequency Missing = 403

Didn't do prior/decision made elsewhere

FR108	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	56	100.0	56	100.0

Frequency Missing = 402

Didn't do prior/was planning to do

FR109	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	55	98.2	55	98.2
Yes	1	1.8	56	100.0

Frequency Missing = 402

Didn't do prior/2 part 2 big a hassle

FR110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	47	83.9	47	83.9
Yes	9	16.1	56	100.0

Frequency Missing = 402

Didn't do prior/just remodeled

FR111	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Didn't do prior/moving soon

FR112	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Didn't do prior/did it <5 years ago

FR113	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Didn't do prior/Other specified

FR114	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	27	52.9	27	52.9
Yes	24	47.1	51	100.0

Frequency Missing = 407

OBS	FR115
1	DIDN'T KNOW ENOUGH ABOUT IT!
2	DID NOT KNOW IT PERTAINED TO
3	HANDLED THROUGH CORPORATE
4	THEY DIDN'T KEEP APPT
5	HADN'T DECIDED TO PARTICIPAT
6	DIDN'T KNOW IT QUALIFIED
7	CHOSE ACCORDNG TO CRITERIA
8	HAD A NEED AND FILLED IT.
9	IT WAS WHAT WE WANTED
10	NOT ENOUTH REPLACEMENT NEEDE
11	OFFER NOT TEMPTING
12	DID NOT BUY NEW LIGHTING!!!
13	DIDN'T QUALIFY FOR PROGRAM
14	NO PROBLEM W/ CONTRACTOR.
15	VOLUNTEERS PROVIDED SERVICE.
16	RECIEVED DONATIONS
17	I DON'T QUALIFY
18	DIND'T KNOW ENOUGH OF PROGRA
19	VICTIM OF SCAM
20	EQUIPMENT NOT APPROPRIATE
21	WAS INSIDE PROGRAM
22	NO ONE THOUGHT ABOUT IT
23	FORGOT ABOUT PROGRAM
24	WENT THROUGH CONTRACTOR

Didn't do prior/Refused

FR116	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	52	100.0	52	100.0

Frequency Missing = 406

Didn't do prior/Don't Know

FR117	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	45	80.4	45	80.4
Yes	11	19.6	56	100.0

Frequency Missing = 402

How many estimates or quotes B4 purchase

FR011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	28.8	15	28.8
1	13	25.0	28	53.8
2	8	15.4	36	69.2
3	11	21.2	47	90.4
4	3	5.8	50	96.2
5	1	1.9	51	98.1
9	1	1.9	52	100.0

Frequency Missing = 406

Get est 4 bth high and stand eff lights?

FR012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Yes	17	53.1	17	53.1
2	4	12.5	21	65.6
3	11	34.4	32	100.0

Frequency Missing = 426

number people involved in decision

FR014	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	19	32.8	19	32.8
2	14	24.1	33	56.9
3	16	27.6	49	84.5
4	3	5.2	52	89.7
5	1	1.7	53	91.4
6	2	3.4	55	94.8
7	1	1.7	56	96.6
8	2	3.4	58	100.0

Frequency Missing = 400

Is this person final decision maker

FR015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	23	37.7	23	37.7
Yes	38	62.3	61	100.0

Frequency Missing = 397

job title of final decision maker

FR016	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

How active a role do tenants have in dec

FI065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Very active	109	56.8	109	56.8
Somewhat active	25	13.0	134	69.8
Slight role	20	10.4	154	80.2
None	38	19.8	192	100.0

Frequency Missing = 266

Retorft if 0 rebate/1%<prime financing

TR030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	178	50.7	178	50.7
Yes	173	49.3	351	100.0

Frequency Missing = 107

Retorft if 0 rebate/1.5%<prime financing

TR040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	157	90.2	157	90.2
Yes	17	9.8	174	100.0

Frequency Missing = 284

Retorft if 50% rebate/1%<prime financing

TR050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	130	76.0	130	76.0
Yes	41	24.0	171	100.0

Frequency Missing = 287

Retorft if 50% rebate/on-site audit

TR070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	125	35.5	125	35.5
Yes	227	64.5	352	100.0

Frequency Missing = 106

Intrstd in operate/maintain lights

PR020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	282	68.4	282	68.4
Yes	75	18.2	357	86.7
Depends on price	55	13.3	412	100.0

Frequency Missing = 46

Intrstd in building recommissioning

PR040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	115	28.8	115	28.8
Yes	285	71.3	400	100.0

Frequency Missing = 58

Intrstd in future equip selection hlp

PR060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	135	32.7	135	32.7
Yes	278	67.3	413	100.0

Frequency Missing = 45

Times have contact w/ account rep

PR001	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	329	76.2	329	76.2
0.1	2	0.5	331	76.6
0.5	3	0.7	334	77.3
1	60	13.9	394	91.2
2	21	4.9	415	96.1
3	8	1.9	423	97.9
4	6	1.4	429	99.3
5	1	0.2	430	99.5
6	2	0.5	432	100.0

Frequency Missing = 26

time period have contact w/ account rep

PR002	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Never	335	76.1	335	76.1
Week	2	0.5	337	76.6
Month	21	4.8	358	81.4
Year	82	18.6	440	100.0

Frequency Missing = 18

Someone else have contact w/ acct rep

PR005	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	303	94.1	303	94.1
Yes	19	5.9	322	100.0

Frequency Missing = 136

Times other has contact w/ account rep

PR010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	25.0	3	25.0
1	7	58.3	10	83.3
2	2	16.7	12	100.0

Frequency Missing = 446

time period othr has contct w/ acct rep

PR011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Month	1	11.1	1	11.1
Year	8	88.9	9	100.0

Frequency Missing = 449

Any other services would like

PR090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	299	80.6	299	80.6
Yes	72	19.4	371	100.0

Frequency Missing = 87

Any other services would like

PR092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	317	92.2	317	92.2
Yes	27	7.8	344	100.0

Frequency Missing = 114

Any other services would like

PR094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	322	94.7	322	94.7
Yes	18	5.3	340	100.0

Frequency Missing = 118

OBS	PR091
1	GOOD IDEA TO TAKE SURVEYS LIKE THESE!
2	EASIER TO REGULATE CENTRAL GAS
3	BROWN OUT--SURGE PROTECTION
4	KISSES
5	WANTS CHANGE IN USAGE STATUS
6	WOULD LIKE HELP FROM PG&E TO INSTALL
7	AIR CONDITION INFORMATION
8	CHEAPER RATES
9	EASE UP A LITTLE UP
10	REBATE AND FINANCING FOR HVAC!
11	PROGRAM W/VERY LOW INTEREST RATES
12	RESPOND TO CUSTOMER REQUESTS TO LOOK
13	HELP SAVE ENERGY/COST
14	MORE KNOWLEGE OF PROGRAMS
15	FREE POWER
16	RATE SUMMARY FOR GAS USAGE
17	EVALUATE AC ZONING (FOR FREE)
18	FIBEROPTIC COMMUNICATION CHANNELS
19	LOWER RATES
20	FREE LIGHTBULB REPLACEMENT
21	SPECIAL RATES FOR NON PROFITS
22	FASTER PAYMENT PROCESSING
23	REBATE IS THE BEST
24	MORE ACCURATE
25	COST FOR 3 PHASE FOR STAND BY
26	EASIER TO GET A HOLD OF
27	LOWER RATES
28	ONE DAY FREE SERVICE
29	ANALYSIS OF WHEN PEAK USE PERIODS ARE.
30	CHEAPER RATES
31	HELP SMALL BUSINESSES SAVE ENERGY BY
32	BETTER EXPLANATION OF BILLS
33	OUR COMPANY SOMETIMES HAS PROBLEMS W/
34	LIST OF SERVICES WILLING PROVIDE
35	ON SITE VISIT TO EXPLAIN EXTERNAL
36	COMPLETE SITE SURVEY TO SUGGEST
37	BILL BASED ON HOURS OF OPERATION
38	QUICKER RESPONSE TO EMERGENCIES
39	ID
40	LOWER RATES
41	CHEEPER GAS & ELECTRIC BILLS
42	BETTER CONACT WITH REPRESENTATIVES
43	PG&E SHOULD PROVIDE CUSTOMERS WITH
44	LOWER PRICES
45	INFORMATION ABOUT ENERGY SAVINGS
46	NEED CLEARER INFO ABOUT BILLING PROCED
47	TO STOP USING NUCLEAR ENERGY IN CAL.
48	FREE POWER !!!
49	FREQUENT ENERGY EFFICIENCY ADVICE
50	ALTERNATIVES TO AIR CONDITIONING AT A
51	FREE ELECTRICITY!
52	WARNINGS BEFORE POWER SHUTOFF
53	GIVE INFO ON BILL AMT CHANGES -- WHY

OBS	PR091
54	INFO ON HVAC
55	CUT DOWN OUT POWER USAGE
56	PHONE WITH HUMAN RESPONDEE
57	TAKE CARE OF TREE GROWTH THAT
58	WARNINGS ABOUT POWER FAILIURES
59	WOULD LIKE ASSISTANCE IN DTERMINING
60	CHEAPER RATES
61	PHAMPLETS
62	ENERGY AUDIT DONE THERE
63	NEED BETTER INFO ON ESTHETIC CONCERNS.
64	JBETTER PUBLICIZE REBATE PROGRAMS
65	WOULD LIKE TO BE ABLE TO SELF VERIFY
66	BETTER STREET LIGHTING
67	REPLACEMENT OF REFLECTIVE WINDOWS
68	HE GETS 5 BILLS NOW AND WONDERS IF
69	WOULD LIKE TO SEE SOMETHING LIKE TIME
70	IMPROVE QUALITY OF POWER IN NEIGHBORHO
71	LARGER TRANSFORMER

OBS	PR093
1	ON-SITE INSPECTIONS AND AUDITS TO
2	WE NEED KISSING TO GO ALONG WITH THE S
3	WANTS HELP WITH HIGH VOLTAGE WIRES
4	A LINE TO SOME OUTDOOR LIGHTING THEY
5	AT METERS (POWER SURGES)
6	EVAL EFFICIENCY OF WINDOWS (FOR FREE)
7	MAKE SURE STREET LIGHTING WORKS
8	ALL BILLING SHOULD BE DONE AT THE SAME
9	MORE KNOWLEDGE ABOUT PROGRAMS
10	GOING DIRECTLY TO THEM, HELP THEM
11	COMPUTRS BECAUSE OF POWER FLUCTUATIONS
12	LIGHTING AND TIMING SYSTEM
13	MORE ENERGY EFFICIENCY
14	PROGRAM Z???
15	BILLING CLARIFICATION SERVICE
16	INFORMATION ON SOLAR CELLS, SECONDARY
17	URES
18	NEW TECHNOLOGY UPDATES
19	REDUCED RATE.
20	LOW RATES!
21	THEY ARE CHANGING
22	INTERFERES WITH POWER LINES.
23	WHETHER RTROFITTING IS COST EFFECTIVE
24	USE OF MORE EE BULBS, FOR EXAMPLE
25	METER READING AND POWER USAGE
26	LOW E-VALUE WINDOW REPLACEMENTS
27	THERE IS SOME WAY TO COMPACT THAT INTO
28	OF USE PROGRAM ..TO SEE INCENTIVE TO
29	OOD..
30	DOUBLING OF EXISTING SERVICES

OBS	PR095
1	SURVEY ELECTRICITY USAGE.
2	ANY SAVINGS-AIDS, EE OR OTHERWISE...
3	SCREWING
4	WOULD LIKE TO INSTALL.
5	MORE CONTACT W/REP
6	NEED AUDIT FROM PGE INSTEAD OF BROKER
7	TIME
8	MORE RESPONSIVE, LET THEM KNOW
9	CHOOSE AND INSTALL EQUIPMENT
10	PG&E COULD HELP OFFER SOLUTIONS
11	FREE ELECTRICITY
12	MORE FAIR BILLING RATINGS
13	LIGHTING AND OTHER ENERGY OPTIONS!
14	DISCOUNTS FOR EE EFFORTS BY CUSTOMERS
15	MORE EE/REBATE INFO...
16	LOWER RATES
17	BEFORE SIGNING NEW LEASES
18	ONE BILLING STATEMENT
19	SAVE ENGERY FOR BUS. DURING PEAK HRS.

More EE info and energy audits

PR096	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Financial Criteria/Payback

DC010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	147	43.4	147	43.4
Yes	192	56.6	339	100.0

Frequency Missing = 119

Financial Criteria/Internal ROR

DC011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	250	72.9	250	72.9
Yes	93	27.1	343	100.0

Frequency Missing = 115

Financial Criteria/Net Pres Value

DC012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	262	75.9	262	75.9
Yes	83	24.1	345	100.0

Frequency Missing = 113

Financial Criteria/Other

DC013	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	336	90.8	336	90.8
Yes	34	9.2	370	100.0

Frequency Missing = 88

OBS	DC014
1	?
2	ESTHETICS DESIGN ISSUES
3	INITIAL OUTLAY
4	SAVING MONEY
5	CASH FLOW
6	WHAT EVER KEEPS LIGHTS ON
7	QUALITY OF LIGHTING
8	DEPENDS ON HOW IT LOOKS!
9	AVAILABILITY OF EQUIPMENT
10	SAVINGS
11	OPERATING COSTS
12	EFFICIENCY, LONG-TERM COST
13	COST EFFECTIVENESS
14	9
15	IMPROVING LIGHTING
16	TIME OF PAYBACK,RETURNON INVE
17	FUNCTIONALITY
18	PLEASE VISUAL MERCHANDISERS
19	MADE BY CORPORATE OFFICE
20	OPERATING COSTS
21	COST SAVINGS
22	VERY COST EFFICIENT
23	REDUCES LTG. BILL
24	QUALITY OF LIGHT
25	BUDGET
26	AESTHETICS
27	INITIAL COST OF PROGRAM
28	INITIAL OUTLAY OF CAS
29	BASED ON NEED ONLY
30	EFFICIENCY AND COST
31	LOOKING AT GENERAL SAVINGS
32	EQUIPMENT LIFESPAN
33	COST
34	IS IT A WISE INVESTMENT

Savings

DC015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.0	5	100.0

Frequency Missing = 453

Initial cost

DC016	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	3	100.0	3	100.0

Frequency Missing = 455

Operating cost

DC017	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	2	100.0	2	100.0

Frequency Missing = 456

What is payback period

DC020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1 yr or <	37	24.7	37	24.7
2 yr or <	56	37.3	93	62.0
3 yr or <	21	14.0	114	76.0
4 yr or <	5	3.3	119	79.3
5 yr or <	18	12.0	137	91.3
6 yr or <	1	0.7	138	92.0
7 yr or <	3	2.0	141	94.0
10 yr or <	1	0.7	142	94.7
Other	8	5.3	150	100.0

Frequency Missing = 308

OBS	DC021
1	DONT REQUIRE
2	DEPENDS ON PURCHASE
3	MONTH
4	DEPENDS ON COST AND TYPE
5	DEPENDS ON EQUIPMENT
6	DEPENDS ON PROJECT & COST
7	MUST CONSIDER EACH SEPARATELY.
8	DEPENDS ON PURCHASE SIZE

What is IROR

DC030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
3	1	7.1	1	7.1
8	1	7.1	2	14.3
10	1	7.1	3	21.4
12	1	7.1	4	28.6
12.5	1	7.1	5	35.7
15	3	21.4	8	57.1
25	2	14.3	10	71.4
50	1	7.1	11	78.6
99	1	7.1	12	85.7
100	2	14.3	14	100.0

Frequency Missing = 444

What is discount rate

DC040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
8	1	11.1	1	11.1
9	1	11.1	2	22.2
11	1	11.1	3	33.3
14.28	1	11.1	4	44.4
15	1	11.1	5	55.6
20	2	22.2	7	77.8
30	1	11.1	8	88.9
99	1	11.1	9	100.0

Frequency Missing = 449

Use diff financl critera for EE vs other

DC050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	233	75.2	233	75.2
Yes	77	24.8	310	100.0

Frequency Missing = 148

EE critera high/short or lower/long

DC051	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Higher/Shorter	41	74.5	41	74.5
Lower/Longer	14	25.5	55	100.0

Frequency Missing = 403

Any locats of bisns part n RE/CI

BC021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	385	93.7	385	93.7
1	26	6.3	411	100.0

Frequency Missing = 47

Number othr locats part in RE/CI

BC022	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	3.8	1	3.8
1	10	38.5	11	42.3
2	7	26.9	18	69.2
3	4	15.4	22	84.6
5	2	7.7	24	92.3
10	1	3.8	25	96.2
13	1	3.8	26	100.0

Frequency Missing = 432

Planning any future retrofits

FR070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	337	82.4	337	82.4
Yes	72	17.6	409	100.0

Frequency Missing = 49

Future lights/high or standard EE

FR075	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Standard EE	4	6.8	4	6.8
High EE	55	93.2	59	100.0

Frequency Missing = 399

Future retofit though program?

FR077	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	13	27.7	13	27.7
Yes	34	72.3	47	100.0

Frequency Missing = 411

Future Lights/4' T-8

FR080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	28	70.0	28	70.0
1	1	2.5	29	72.5
9	1	2.5	30	75.0
46	1	2.5	31	77.5
50	2	5.0	33	82.5
84	1	2.5	34	85.0
100	1	2.5	35	87.5
200	1	2.5	36	90.0
300	1	2.5	37	92.5
1050	1	2.5	38	95.0
3500	1	2.5	39	97.5
10000	1	2.5	40	100.0

Frequency Missing = 418

Future Lights/8' T-8

FR081	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	33	84.6	33	84.6
4	1	2.6	34	87.2
9	1	2.6	35	89.7
50	1	2.6	36	92.3
75	1	2.6	37	94.9
100	1	2.6	38	97.4
770	1	2.6	39	100.0

Frequency Missing = 419

Future Lights/4' ES Fluor

FR082	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	33	91.7	33	91.7
9	1	2.8	34	94.4
40	1	2.8	35	97.2
200	1	2.8	36	100.0

Frequency Missing = 422

Future Lights/8' ES Fluor

FR083	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	35	97.2	35	97.2
9	1	2.8	36	100.0

Frequency Missing = 422

Future Lights/4' T-12

FR084	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	35	97.2	35	97.2
9	1	2.8	36	100.0

Frequency Missing = 422

Future Lights/8' T-12

FR085	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	34	94.4	34	94.4
6	1	2.8	35	97.2
9	1	2.8	36	100.0

Frequency Missing = 422

Future Lights/Incandescent

FR086	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	36	97.3	36	97.3
9	1	2.7	37	100.0

Frequency Missing = 421

Future Lights/Compact Fluor

FR087	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	34	82.9	34	82.9
3	1	2.4	35	85.4
9	1	2.4	36	87.8
50	1	2.4	37	90.2
180	1	2.4	38	92.7
200	2	4.9	40	97.6
400	1	2.4	41	100.0

Frequency Missing = 417

Future Lights/High pres sodium

FR088	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	30	76.9	30	76.9
1	1	2.6	31	79.5
8	1	2.6	32	82.1
9	1	2.6	33	84.6
14	1	2.6	34	87.2
17	1	2.6	35	89.7
30	2	5.1	37	94.9
40	1	2.6	38	97.4
159	1	2.6	39	100.0

Frequency Missing = 419

Future Lights/Elec Ballasts

FR089	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	32	84.2	32	84.2
9	1	2.6	33	86.8
120	1	2.6	34	89.5
345	1	2.6	35	92.1
778	1	2.6	36	94.7
3500	1	2.6	37	97.4
10000	1	2.6	38	100.0

Frequency Missing = 420

Future Lights/Magnetic Ballasts

FR090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	35	94.6	35	94.6
4	1	2.7	36	97.3
9	1	2.7	37	100.0

Frequency Missing = 421

Future Lights/Metal Halide

FR091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	34	94.4	34	94.4
9	1	2.8	35	97.2
12	1	2.8	36	100.0

Frequency Missing = 422

Future Lights/Mercury Vapor

FR092	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	34	89.5	34	89.5
9	1	2.6	35	92.1
12	1	2.6	36	94.7
30	1	2.6	37	97.4
100	1	2.6	38	100.0

Frequency Missing = 420

Future Lights/Quartz

FR093	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	36	90.0	36	90.0
1	1	2.5	37	92.5
9	1	2.5	38	95.0
12	1	2.5	39	97.5
20	1	2.5	40	100.0

Frequency Missing = 418

Future Lights/Reflectors

FR094	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	39	92.9	39	92.9
9	1	2.4	40	95.2
2000	1	2.4	41	97.6
3500	1	2.4	42	100.0

Frequency Missing = 416

Future Lights/LED Exit Lights

FR095	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	38	92.7	38	92.7
1	1	2.4	39	95.1
9	1	2.4	40	97.6
12	1	2.4	41	100.0

Frequency Missing = 417

Future Lights/Watt Saver-Power Choke

FR096	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	40	100.0	40	100.0

Frequency Missing = 418

Future Lights/Other

FR097	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	31	72.1	31	72.1
1	7	16.3	38	88.4
9	1	2.3	39	90.7
10	1	2.3	40	93.0
28	1	2.3	41	95.3
36	1	2.3	42	97.7
300	1	2.3	43	100.0

Frequency Missing = 415

OBS	FR098
1	EARLY PLANNING STAGE
2	EARLY PLANNING STAGE
3	HAVEN'T DECIDED
4	CENSORED CONTROLLEC
5	CHANGE TO NEW LIGHT SOCKET
6	WOULD HAVE TO TALK TO PG&E
7	HALOGEN??
8	METAL ARC LAMPS
9	COST EFFECTIVE $$$
10	LOW VOLTAGE BULBS
11	9
12	UNSPECIFIED FLOUR

Future Lights/Refused

FR099R	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	45	100.0	45	100.0

Frequency Missing = 413

Future Lights/Don't Know

FR099D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	25	100.0	25	100.0

Frequency Missing = 433

Main business activity

BC011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Office	91	20.8	91	20.8
Retail (no-food)	53	12.1	144	33.0
Manuf/Assmbly	7	1.6	151	34.6
Warehouse	10	2.3	161	36.8
Restaurant	21	4.8	182	41.6
Grocery Store	13	3.0	195	44.6
School	33	7.6	228	52.2
Hotel/Motel	31	7.1	259	59.3
Hospital	1	0.2	260	59.5
Collg/Univ	4	0.9	264	60.4
Health Care	10	2.3	274	62.7
Municipalty	2	0.5	276	63.2
Indust procss	3	0.7	279	63.8
Other	158	36.2	437	100.0

Frequency Missing = 21

OBS	BC012
1	AIRCRAFT MAINTENANCE
2	SOCIAL CLUB
3	ALL LEASED SPACE
4	RENTAL
5	MEETING OF GIRL SCOUTS
6	APARTMENT RENTALS
7	APARTMENT
8	CHURCH LIBRARY
9	CHURCH HALL
10	LEGAL SERVICES
11	CONSTRUCTION, GEOTECHNICAL
12	THEATRE
13	TESTING & INSPECTIONS
14	RADIO STATION
15	RADIO STATION
16	UNION OFFICE
17	MEETINGS
18	MEETING & BANDQUET & SPA FACIL.
19	BANKING
20	HELICOPTER OPERATIONS
21	RADIO STATIONS
22	RADIO BROADCASTING
23	APARTMENT BUILDING
24	LABOR UNION
25	AGRICULTURAL CONSULTING&TESTING
26	ENGINEERING AND TESTING
27	CHILD CARE
28	ALCOHOL AND DRUG DETOX
29	RV PARK
30	DAY CARE CENTER
31	TRANSPORTATION
32	SR. CITIZEN RESIDENCE
33	SPACE RENTAL 4 SPECIAL OCCASION
34	RESEARCH & DEVELOPMENT
35	R&
36	CREDIT UNION
37	MARINA BOAT STORAGE FACILITY
38	OFFICE AND MEALS FOR HOMEMLESS
39	TV BROADCASTING
40	TRANSMITTER SITE
41	MISSION
42	BUSINESS SERVICES
43	SHIP PILOTING STATION
44	TRAINING, WAREHOUSE, ADMIN.
45	LIBRARY
46	CHAPEL
47	RE[PAIR ELECTRIC MOTORS
48	DISTRIBUTION
49	HARDWARE/CLEANING GEAR
50	BEAUTY SALON
51	SERVICE COMPANY
52	BARBER SHOP
53	MASSAGE

OBS	BC012
54	HAIR SALON
55	EDUCATION
56	VIDIO PRODUCTION
57	SHIRT LAUNDRY, DRY CLEANING
58	ALSO BEAUTY SERVICES
59	TRAVEL AGENCY
60	SELLING ANTIQUES
61	PHOTOGRAPHY
62	LAUNDRY MAT
63	LEASE AND SELL DUMPSTERS
64	BICYCLE SHOP
65	AUTO BODY/PAINTING
66	DISPATCH CENTER/TOW TRUCK SVCS
67	AUTO REPAIR
68	ATTORNEY SUPPORT GROUP
69	RENT EQUIPMENT
70	SALEA AND SERVICE
71	TRANSPORTATION BROKER
72	FRUIT PROCESSING
73	LUMBER YARD
74	PHOTO FINISHING
75	LUMBER DISTRIBUTION
76	PHARMACY
77	SERVICE STATION
78	SERVICE STATION
79	PARKING GARAGE
80	PARTS SALES
81	TRUCKING AND CRANE SERVIC
82	TRUCKING COMPANY
83	AUTO SVCS AND GASOLINE
84	SERVICE STATION
85	SERVICE STATION
86	CLEANERS
87	MANUFACTURING
88	COLLISION REPAIR
89	HARDWARE
90	FAMILY ENTERTAINMENT
91	BAR, COFFEE SHOP, & BOWLING CTR
92	TRUCKING
93	TRUCK STOP /RETAIL
94	CAR DEALER
95	AUTO DEALERSHIP
96	ENTERTAINMENT-MOVIE THEATRE
97	UNOCAL GAS/CARWASH
98	EMPLOYING PEOPLE
99	BOWLING CENTER
100	TRUCK STOP
101	FOOD AND VENDING COMPANY
102	SELL LUMBER BUILDING
103	RETREADING TRUCK TIRES
104	PHARMACY
105	AUTO ELECTRICAL REBUILDER
106	CAR WASH/GAS STATION

OBS	BC012
107	AUTO BODY
108	MOVIE THEATRE
109	PARKING FACILITY
110	MALL
111	TIRE SALES/RETREAD
112	BOWLING ALLEY
113	OFFICE PRODUCTS DISTRIBUTION
114	PARKING SERVICE
115	GOLF COURSE
116	LAUNDRY STORE
117	CAR WASH
118	GOLF COURSE
119	SCHOOL
120	SCHOOL
121	CHURC
122	SCHOOL
123	LIQUOR AND CONVENIENCE STORE
124	BAKERY
125	BAKERY
126	MEAT SALES
127	DELI BAKERY
128	PIZZA PRODUCTION
129	MEAT PROCESSING PLANT
130	LIQUOR STORE
131	RETAIL FISH AND POULTRY
132	BAKERY
133	WHOLESALE BAKERY
134	COCKTAIL LOUNGE
135	BAR
136	NIGHTCLUB
137	BLUES CLUB
138	BAR
139	CONCERT HALL
140	EVENT PRODUCTION
141	SPORTS BAR
142	NIGHTCLUB
143	NIGHTCLUB
144	BOWLING!
145	DENTAL
146	REST HOME
147	PLASTIC SURGERY
148	COUNTRY CLUB
149	LABORATORY & OFFICE
150	HEALTH CLUB & CHIROPRACTIC
151	WOMAN'S GYM
152	CONVALESENT HOME\HOSP
153	YACHT CLUB
154	MEDICAL LAB
155	OUTPATIENT SURGERY
156	FITNESS CLUB
157	RV PARK
158	RENT RV SITES OVERNIGHT.
159	EXPORT COMPANY FOR BLDG MATERIA

OBS	BC012
160	WRECKING YARD
161	WHOLESALE PRODUCE
162	RECYCLE OPERATION
163	INDUS. EQUIP RENTAL
164	WHOLESALE MEAT
165	DISTRIBUTION FACILITY
166	WHOLESALE MEAT
167	WHOLESALE PRODUCE
168	SALE CASH REGISTER
169	WHOLESALE PRODUCE
170	SHIP * RECEIV AUTO WAREHOUSE
171	RESTAURANT SUPPLY SALES
172	BUS REPAIR
173	DISTRIBUTION
174	TRANSMISSION TOWER
175	INDUS/COMMER SUPPLY COMPANY
176	GROWERS, PACKER, & SHIPPERS

Since Jan1992, size changed

FC110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Increasd space	29	6.5	29	6.5
Decreasd space	2	0.4	31	6.9
Stayed same	416	93.1	447	100.0

Frequency Missing = 11

Area of size change

FC120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
32	1	3.8	1	3.8
200	1	3.8	2	7.7
400	1	3.8	3	11.5
450	1	3.8	4	15.4
500	1	3.8	5	19.2
800	1	3.8	6	23.1
1000	1	3.8	7	26.9
1200	1	3.8	8	30.8
1500	1	3.8	9	34.6
1600	1	3.8	10	38.5
1800	2	7.7	12	46.2
2000	1	3.8	13	50.0
2400	1	3.8	14	53.8
2500	2	7.7	16	61.5
2700	1	3.8	17	65.4
3000	2	7.7	19	73.1
5000	1	3.8	20	76.9
6000	1	3.8	21	80.8
8000	2	7.7	23	88.5
9000	1	3.8	24	92.3
15000	1	3.8	25	96.2
500000	1	3.8	26	100.0

Frequency Missing = 432

Month/Year of area change

FC130	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1992	1	10.0	1	10.0
AUG1992	1	10.0	2	20.0
OCT1992	1	10.0	3	30.0
JAN1993	1	10.0	4	40.0
APR1993	1	10.0	5	50.0
AUG1993	1	10.0	6	60.0
NOV1994	1	10.0	7	70.0
JAN1995	1	10.0	8	80.0
MAY1995	1	10.0	9	90.0
JUL1995	1	10.0	10	100.0

Frequency Missing = 448

Year of area change

FC131	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	3	21.4	3	21.4
1993	5	35.7	8	57.1
1994	4	28.6	12	85.7
1995	2	14.3	14	100.0

Frequency Missing = 444

Month/Year of area increase occupied

FC140	Frequency	Percent	Cumulative Frequency	Cumulative Percent
NOV1992	1	10.0	1	10.0
JAN1993	1	10.0	2	20.0
MAR1993	1	10.0	3	30.0
APR1993	1	10.0	4	40.0
AUG1994	1	10.0	5	50.0
NOV1994	1	10.0	6	60.0
APR1995	1	10.0	7	70.0
MAY1995	1	10.0	8	80.0
AUG1995	1	10.0	9	90.0
SEP1995	1	10.0	10	100.0

Frequency Missing = 448

Year of area increase occupied

FC141	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	3	27.3	3	27.3
1993	5	45.5	8	72.7
1994	2	18.2	10	90.9
1995	1	9.1	11	100.0

Frequency Missing = 447

Month/Year of last major space remodel

FR033	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1970	1	2.0	1	2.0
AUG1980	1	2.0	2	4.1
JUL1981	1	2.0	3	6.1
MAR1988	1	2.0	4	8.2
FEB1989	1	2.0	5	10.2
MAR1989	1	2.0	6	12.2
OCT1989	1	2.0	7	14.3
DEC1989	1	2.0	8	16.3
APR1990	1	2.0	9	18.4
JUN1990	1	2.0	10	20.4
SEP1990	1	2.0	11	22.4
JUL1991	1	2.0	12	24.5
OCT1991	1	2.0	13	26.5
JAN1992	1	2.0	14	28.6
FEB1992	1	2.0	15	30.6
JUN1992	1	2.0	16	32.7
AUG1992	2	4.1	18	36.7
JAN1993	1	2.0	19	38.8
MAY1993	1	2.0	20	40.8
AUG1993	3	6.1	23	46.9
FEB1994	1	2.0	24	49.0
MAR1994	2	4.1	26	53.1
MAY1994	1	2.0	27	55.1
JUN1994	1	2.0	28	57.1
JUL1994	3	6.1	31	63.3
AUG1994	1	2.0	32	65.3
OCT1994	2	4.1	34	69.4
DEC1994	1	2.0	35	71.4
JAN1995	2	4.1	37	75.5
FEB1995	3	6.1	40	81.6
APR1995	1	2.0	41	83.7
MAY1995	1	2.0	42	85.7
JUN1995	3	6.1	45	91.8
JUL1995	4	8.2	49	100.0

Frequency Missing = 409

Year of last major space remodel

FR034	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	1	0.3	1	0.3
Never remodled	197	57.9	198	58.2
10	1	0.3	199	58.5
85	1	0.3	200	58.8
1954	1	0.3	201	59.1
1956	2	0.6	203	59.7
1965	1	0.3	204	60.0
1970	3	0.9	207	60.9
1971	1	0.3	208	61.2
1973	2	0.6	210	61.8
1975	1	0.3	211	62.1
1978	1	0.3	212	62.4
1979	3	0.9	215	63.2
1980	5	1.5	220	64.7
1982	1	0.3	221	65.0
1983	1	0.3	222	65.3
1984	2	0.6	224	65.9
1985	14	4.1	238	70.0
1986	5	1.5	243	71.5
1987	4	1.2	247	72.6
1988	7	2.1	254	74.7
1989	14	4.1	268	78.8
1990	7	2.1	275	80.9
1991	8	2.4	283	83.2
1992	20	5.9	303	89.1
1993	16	4.7	319	93.8
1994	12	3.5	331	97.4
1995	9	2.6	340	100.0

Frequency Missing = 118

Did remodel cover space retrofitted

FR035	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	38	58.5	38	58.5
Yes	27	41.5	65	100.0

Frequency Missing = 393

light hours/from: Dec Week

LF1F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	65	14.9	65	14.9
1:00	4	0.9	69	15.9
2:00	3	0.7	72	16.6
3:00	1	0.2	73	16.8
4:00	2	0.5	75	17.2
4:30	1	0.2	76	17.5
5:00	11	2.5	87	20.0
5:15	1	0.2	88	20.2
5:30	3	0.7	91	20.9
6:00	37	8.5	128	29.4
6:30	13	3.0	141	32.4
6:45	2	0.5	143	32.9
7:00	58	13.3	201	46.2
7:30	26	6.0	227	52.2
7:45	1	0.2	228	52.4
8:00	83	19.1	311	71.5
8:15	2	0.5	313	72.0
8:30	25	5.7	338	77.7
9:00	43	9.9	381	87.6
9:14	1	0.2	382	87.8
9:30	5	1.1	387	89.0
10:00	26	6.0	413	94.9
11:00	9	2.1	422	97.0
11:30	1	0.2	423	97.2
12:00	2	0.5	425	97.7
13:30	1	0.2	426	97.9
14:00	1	0.2	427	98.2
15:00	2	0.5	429	98.6
16:00	1	0.2	430	98.9
16:30	1	0.2	431	99.1
18:00	1	0.2	432	99.3
19:30	1	0.2	433	99.5
24:00	2	0.5	435	100.0

Frequency Missing = 23

light hours/from: Dec Sat

LF2F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	230	54.8	230	54.8
1:00	3	0.7	233	55.5
2:00	1	0.2	234	55.7
4:00	1	0.2	235	56.0
4:30	1	0.2	236	56.2
5:00	4	1.0	240	57.1
5:30	1	0.2	241	57.4
6:00	18	4.3	259	61.7
6:30	3	0.7	262	62.4
7:00	22	5.2	284	67.6
7:30	2	0.5	286	68.1
8:00	38	9.0	324	77.1
8:30	6	1.4	330	78.6
9:00	33	7.9	363	86.4
9:14	1	0.2	364	86.7
9:30	7	1.7	371	88.3
10:00	25	6.0	396	94.3
11:00	10	2.4	406	96.7
12:00	4	1.0	410	97.6
13:00	1	0.2	411	97.9
14:00	1	0.2	412	98.1
16:00	2	0.5	414	98.6
16:30	1	0.2	415	98.8
19:30	1	0.2	416	99.0
24:00	4	1.0	420	100.0

Frequency Missing = 38

light hours/from: Dec Sun

LF3F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	287	68.8	287	68.8
1:00	3	0.7	290	69.5
2:00	1	0.2	291	69.8
4:00	1	0.2	292	70.0
5:00	3	0.7	295	70.7
5:30	1	0.2	296	71.0
6:00	16	3.8	312	74.8
6:30	2	0.5	314	75.3
7:00	15	3.6	329	78.9
8:00	13	3.1	342	82.0
8:30	4	1.0	346	83.0
9:00	16	3.8	362	86.8
10:00	23	5.5	385	92.3
11:00	14	3.4	399	95.7
11:30	2	0.5	401	96.2
12:00	5	1.2	406	97.4
13:00	1	0.2	407	97.6
14:00	1	0.2	408	97.8
16:00	1	0.2	409	98.1
16:30	1	0.2	410	98.3
17:00	1	0.2	411	98.6
19:30	1	0.2	412	98.8
23:00	1	0.2	413	99.0
24:00	4	1.0	417	100.0

Frequency Missing = 41

light hours/from: Apr Week

LF4F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	54	13.3	54	13.3
1:00	4	1.0	58	14.3
2:00	3	0.7	61	15.0
3:00	1	0.2	62	15.3
4:00	2	0.5	64	15.8
4:30	1	0.2	65	16.0
5:00	11	2.7	76	18.7
5:15	1	0.2	77	19.0
5:30	2	0.5	79	19.5
6:00	33	8.1	112	27.6
6:30	13	3.2	125	30.8
6:45	1	0.2	126	31.0
7:00	58	14.3	184	45.3
7:30	26	6.4	210	51.7
7:45	1	0.2	211	52.0
8:00	79	19.5	290	71.4
8:15	2	0.5	292	71.9
8:30	23	5.7	315	77.6
9:00	40	9.9	355	87.4
9:14	1	0.2	356	87.7
9:30	4	1.0	360	88.7
10:00	26	6.4	386	95.1
11:00	8	2.0	394	97.0
11:30	1	0.2	395	97.3
12:00	2	0.5	397	97.8
14:00	1	0.2	398	98.0
15:00	2	0.5	400	98.5
18:00	2	0.5	402	99.0
18:30	1	0.2	403	99.3
19:30	1	0.2	404	99.5
24:00	2	0.5	406	100.0

Frequency Missing = 52

light hours/from: Apr Sat

LF5F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	223	55.5	223	55.5
1:00	3	0.7	226	56.2
2:00	1	0.2	227	56.5
4:00	1	0.2	228	56.7
4:30	1	0.2	229	57.0
5:00	4	1.0	233	58.0
5:30	1	0.2	234	58.2
6:00	15	3.7	249	61.9
6:30	3	0.7	252	62.7
7:00	23	5.7	275	68.4
7:30	2	0.5	277	68.9
8:00	36	9.0	313	77.9
8:30	6	1.5	319	79.4
9:00	31	7.7	350	87.1
9:14	1	0.2	351	87.3
9:30	5	1.2	356	88.6
10:00	24	6.0	380	94.5
11:00	9	2.2	389	96.8
12:00	3	0.7	392	97.5
13:00	1	0.2	393	97.8
14:00	1	0.2	394	98.0
16:00	1	0.2	395	98.3
18:00	1	0.2	396	98.5
18:30	1	0.2	397	98.8
19:30	1	0.2	398	99.0
24:00	4	1.0	402	100.0

Frequency Missing = 56

light hours/from: Apr Sun

LF6F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	279	69.9	279	69.9
1:00	3	0.8	282	70.7
2:00	1	0.3	283	70.9
4:00	1	0.3	284	71.2
5:00	3	0.8	287	71.9
5:30	1	0.3	288	72.2
6:00	11	2.8	299	74.9
6:30	2	0.5	301	75.4
7:00	15	3.8	316	79.2
8:00	13	3.3	329	82.5
8:30	4	1.0	333	83.5
9:00	16	4.0	349	87.5
10:00	21	5.3	370	92.7
11:00	15	3.8	385	96.5
11:30	1	0.3	386	96.7
12:00	4	1.0	390	97.7
13:00	1	0.3	391	98.0
14:00	1	0.3	392	98.2
17:00	1	0.3	393	98.5
18:00	1	0.3	394	98.7
18:30	1	0.3	395	99.0
19:30	1	0.3	396	99.2
24:00	3	0.8	399	100.0

Frequency Missing = 59

light hours/from: Aug Week

LF7F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	56	14.0	56	14.0
1:00	4	1.0	60	15.0
2:00	3	0.7	63	15.7
3:00	1	0.2	64	16.0
4:00	2	0.5	66	16.5
4:30	1	0.2	67	16.7
5:00	11	2.7	78	19.5
5:15	1	0.2	79	19.7
5:30	2	0.5	81	20.2
6:00	33	8.2	114	28.4
6:30	13	3.2	127	31.7
6:45	1	0.2	128	31.9
7:00	57	14.2	185	46.1
7:30	27	6.7	212	52.9
7:45	1	0.2	213	53.1
8:00	75	18.7	288	71.8
8:15	1	0.2	289	72.1
8:30	24	6.0	313	78.1
9:00	39	9.7	352	87.8
9:14	1	0.2	353	88.0
9:30	3	0.7	356	88.8
10:00	25	6.2	381	95.0
11:00	8	2.0	389	97.0
11:30	1	0.2	390	97.3
12:00	2	0.5	392	97.8
14:00	1	0.2	393	98.0
15:00	2	0.5	395	98.5
18:00	1	0.2	396	98.8
19:30	1	0.2	397	99.0
20:00	1	0.2	398	99.3
20:15	1	0.2	399	99.5
24:00	2	0.5	401	100.0

Frequency Missing = 57

light hours/from: Aug Sat

LF8F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	223	55.8	223	55.8
1:00	3	0.8	226	56.5
2:00	1	0.3	227	56.8
4:00	1	0.3	228	57.0
4:30	1	0.3	229	57.3
5:00	4	1.0	233	58.3
5:30	1	0.3	234	58.5
6:00	14	3.5	248	62.0
6:30	3	0.8	251	62.8
7:00	22	5.5	273	68.3
7:30	3	0.8	276	69.0
8:00	36	9.0	312	78.0
8:30	6	1.5	318	79.5
9:00	30	7.5	348	87.0
9:14	1	0.3	349	87.3
9:30	5	1.3	354	88.5
10:00	24	6.0	378	94.5
11:00	9	2.3	387	96.8
12:00	3	0.8	390	97.5
13:00	1	0.3	391	97.8
14:00	1	0.3	392	98.0
16:00	1	0.3	393	98.3
19:30	1	0.3	394	98.5
20:00	1	0.3	395	98.8
20:15	1	0.3	396	99.0
24:00	4	1.0	400	100.0

Frequency Missing = 58

light hours/from: Aug Sun

LF9F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	279	69.9	279	69.9
1:00	3	0.8	282	70.7
2:00	1	0.3	283	70.9
4:00	1	0.3	284	71.2
5:00	3	0.8	287	71.9
5:30	1	0.3	288	72.2
6:00	11	2.8	299	74.9
6:30	2	0.5	301	75.4
7:00	15	3.8	316	79.2
7:30	1	0.3	317	79.4
8:00	12	3.0	329	82.5
8:30	4	1.0	333	83.5
9:00	16	4.0	349	87.5
10:00	21	5.3	370	92.7
11:00	15	3.8	385	96.5
11:30	1	0.3	386	96.7
12:00	4	1.0	390	97.7
13:00	1	0.3	391	98.0
14:00	1	0.3	392	98.2
17:00	1	0.3	393	98.5
19:30	1	0.3	394	98.7
20:00	1	0.3	395	99.0
20:15	1	0.3	396	99.2
24:00	3	0.8	399	100.0

Frequency Missing = 59

light hours/from: Oct Week

LF10F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	53	13.3	53	13.3
1:00	4	1.0	57	14.3
2:00	3	0.8	60	15.0
3:00	1	0.3	61	15.3
4:00	2	0.5	63	15.8
4:30	1	0.3	64	16.0
5:00	11	2.8	75	18.8
5:15	1	0.3	76	19.0
5:30	2	0.5	78	19.5
6:00	32	8.0	110	27.5
6:30	13	3.3	123	30.8
6:45	1	0.3	124	31.0
7:00	58	14.5	182	45.5
7:30	25	6.3	207	51.8
7:45	1	0.3	208	52.0
8:00	80	20.0	288	72.0
8:15	2	0.5	290	72.5
8:30	22	5.5	312	78.0
9:00	39	9.8	351	87.8
9:14	1	0.3	352	88.0
9:30	3	0.8	355	88.8
10:00	25	6.3	380	95.0
11:00	8	2.0	388	97.0
11:30	1	0.3	389	97.3
12:00	2	0.5	391	97.8
14:00	1	0.3	392	98.0
15:00	2	0.5	394	98.5
18:00	2	0.5	396	99.0
18:30	1	0.3	397	99.3
19:30	1	0.3	398	99.5
24:00	2	0.5	400	100.0

Frequency Missing = 58

light hours/from: Oct Sat

LF11F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	222	55.8	222	55.8
1:00	3	0.8	225	56.5
2:00	1	0.3	226	56.8
4:00	1	0.3	227	57.0
4:30	1	0.3	228	57.3
5:00	3	0.8	231	58.0
5:30	1	0.3	232	58.3
6:00	15	3.8	247	62.1
6:30	3	0.8	250	62.8
7:00	22	5.5	272	68.3
7:30	2	0.5	274	68.8
8:00	37	9.3	311	78.1
8:30	6	1.5	317	79.6
9:00	29	7.3	346	86.9
9:14	1	0.3	347	87.2
9:30	5	1.3	352	88.4
10:00	24	6.0	376	94.5
11:00	9	2.3	385	96.7
12:00	3	0.8	388	97.5
13:00	1	0.3	389	97.7
14:00	1	0.3	390	98.0
16:00	1	0.3	391	98.2
18:00	1	0.3	392	98.5
18:30	1	0.3	393	98.7
19:30	1	0.3	394	99.0
24:00	4	1.0	398	100.0

Frequency Missing = 60

light hours/from: Oct Sun

LF12F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	277	69.8	277	69.8
1:00	3	0.8	280	70.5
2:00	1	0.3	281	70.8
4:00	1	0.3	282	71.0
5:00	2	0.5	284	71.5
5:30	1	0.3	285	71.8
6:00	11	2.8	296	74.6
6:30	2	0.5	298	75.1
7:00	15	3.8	313	78.8
8:00	13	3.3	326	82.1
8:30	4	1.0	330	83.1
9:00	17	4.3	347	87.4
10:00	21	5.3	368	92.7
11:00	15	3.8	383	96.5
11:30	1	0.3	384	96.7
12:00	4	1.0	388	97.7
13:00	1	0.3	389	98.0
14:00	1	0.3	390	98.2
17:00	1	0.3	391	98.5
18:00	1	0.3	392	98.7
18:30	1	0.3	393	99.0
19:30	1	0.3	394	99.2
24:00	3	0.8	397	100.0

Frequency Missing = 61

light hours/from: Holiday

LF13F	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	321	77.9	321	77.9
1:00	3	0.7	324	78.6
3:00	1	0.2	325	78.9
4:00	1	0.2	326	79.1
5:00	2	0.5	328	79.6
5:30	1	0.2	329	79.9
6:00	11	2.7	340	82.5
6:30	3	0.7	343	83.3
7:00	11	2.7	354	85.9
7:30	2	0.5	356	86.4
8:00	9	2.2	365	88.6
8:30	4	1.0	369	89.6
9:00	13	3.2	382	92.7
10:00	11	2.7	393	95.4
11:00	8	1.9	401	97.3
12:00	1	0.2	402	97.6
13:00	1	0.2	403	97.8
14:00	1	0.2	404	98.1
15:00	1	0.2	405	98.3
16:00	1	0.2	406	98.5
18:00	1	0.2	407	98.8
18:30	1	0.2	408	99.0
19:30	1	0.2	409	99.3
24:00	3	0.7	412	100.0

Frequency Missing = 46

light hours/am or pm: Dec Week

LF1M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	425	97.0	425	97.0
D	3	0.7	428	97.7
P	10	2.3	438	100.0

Frequency Missing = 20

light hours/am or pm: Dec Sat

LF2M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	410	96.9	410	96.9
D	3	0.7	413	97.6
P	10	2.4	423	100.0

Frequency Missing = 35

light hours/am or pm: Dec Sun

LF3M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	405	96.4	405	96.4
D	3	0.7	408	97.1
P	12	2.9	420	100.0

Frequency Missing = 38

light hours/am or pm: Apr Week

LF4M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	396	97.1	396	97.1
D	3	0.7	399	97.8
P	9	2.2	408	100.0

Frequency Missing = 50

light hours/am or pm: Apr Sat

LF5M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	393	97.0	393	97.0
D	3	0.7	396	97.8
P	9	2.2	405	100.0

Frequency Missing = 53

light hours/am or pm: Apr Sun

LF6M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	389	96.5	389	96.5
D	4	1.0	393	97.5
P	10	2.5	403	100.0

Frequency Missing = 55

light hours/am or pm: Aug Week

LF7M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	392	97.3	392	97.3
D	2	0.5	394	97.8
P	9	2.2	403	100.0

Frequency Missing = 55

light hours/am or pm: Aug Sat

LF8M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	391	97.3	391	97.3
D	2	0.5	393	97.8
P	9	2.2	402	100.0

Frequency Missing = 56

light hours/am or pm: Aug Sun

LF9M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	389	96.8	389	96.8
D	3	0.7	392	97.5
P	10	2.5	402	100.0

Frequency Missing = 56

light hours/am or pm: Oct Week

LF10M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	391	97.3	391	97.3
D	2	0.5	393	97.8
P	9	2.2	402	100.0

Frequency Missing = 56

light hours/am or pm: Oct Sat

LF11M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	389	97.3	389	97.3
D	2	0.5	391	97.8
P	9	2.3	400	100.0

Frequency Missing = 58

light hours/am or pm: Oct Sun

LF12M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	387	96.8	387	96.8
D	3	0.8	390	97.5
P	10	2.5	400	100.0

Frequency Missing = 58

light hours/am or pm: Holiday

LF13M	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	404	96.2	404	96.2
D	8	1.9	412	98.1
P	8	1.9	420	100.0

Frequency Missing = 38

light hours/to: Dec Week

LF1T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	2	0.5	2	0.5
1:00	5	1.1	7	1.6
2:00	16	3.7	23	5.3
3:00	1	0.2	24	5.5
6:00	1	0.2	25	5.7
6:30	1	0.2	26	6.0
7:00	2	0.5	28	6.4
7:30	1	0.2	29	6.7
12:00	3	0.7	32	7.4
12:30	1	0.2	33	7.6
13:00	1	0.2	34	7.8
13:30	2	0.5	36	8.3
14:00	4	0.9	40	9.2
14:30	1	0.2	41	9.4
15:00	4	0.9	45	10.3
15:30	5	1.1	50	11.5
16:00	13	3.0	63	14.5
16:30	18	4.1	81	18.6
16:45	1	0.2	82	18.9
17:00	87	20.0	169	38.9
17:30	23	5.3	192	44.1
17:45	1	0.2	193	44.4
18:00	58	13.3	251	57.7
18:30	9	2.1	260	59.8
19:00	29	6.7	289	66.4
19:30	1	0.2	290	66.7
20:00	13	3.0	303	69.7
20:30	2	0.5	305	70.1
21:00	20	4.6	325	74.7
21:30	1	0.2	326	74.9
22:00	18	4.1	344	79.1
22:30	1	0.2	345	79.3
23:00	12	2.8	357	82.1
23:30	2	0.5	359	82.5
24:00	76	17.5	435	100.0

Frequency Missing = 23

light hours/to: Dec Sat

LF2T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	177	42.1	177	42.1
1:00	7	1.7	184	43.8
2:00	17	4.0	201	47.9
3:00	2	0.5	203	48.3
6:00	1	0.2	204	48.6
7:00	2	0.5	206	49.0
7:30	1	0.2	207	49.3
9:00	1	0.2	208	49.5
11:00	1	0.2	209	49.8
12:00	14	3.3	223	53.1
12:30	1	0.2	224	53.3
13:00	6	1.4	230	54.8
13:30	1	0.2	231	55.0
14:00	10	2.4	241	57.4
15:00	4	1.0	245	58.3
15:30	2	0.5	247	58.8
16:00	2	0.5	249	59.3
16:30	1	0.2	250	59.5
17:00	18	4.3	268	63.8
17:30	3	0.7	271	64.5
17:45	1	0.2	272	64.8
18:00	26	6.2	298	71.0
18:30	7	1.7	305	72.6
19:00	15	3.6	320	76.2
19:30	1	0.2	321	76.4
20:00	9	2.1	330	78.6
20:30	1	0.2	331	78.8
21:00	12	2.9	343	81.7
22:00	6	1.4	349	83.1
22:30	1	0.2	350	83.3
23:00	7	1.7	357	85.0
23:30	2	0.5	359	85.5
24:00	61	14.5	420	100.0

Frequency Missing = 38

light hours/to: Dec Sun

LF3T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	234	56.3	234	56.3
1:00	4	1.0	238	57.2
2:00	16	3.8	254	61.1
3:00	1	0.2	255	61.3
6:00	1	0.2	256	61.5
7:00	2	0.5	258	62.0
7:30	1	0.2	259	62.3
12:00	9	2.2	268	64.4
13:00	4	1.0	272	65.4
13:30	1	0.2	273	65.6
14:00	5	1.2	278	66.8
15:00	3	0.7	281	67.5
16:00	2	0.5	283	68.0
17:00	16	3.8	299	71.9
17:30	1	0.2	300	72.1
18:00	17	4.1	317	76.2
18:30	2	0.5	319	76.7
19:00	12	2.9	331	79.6
19:30	1	0.2	332	79.8
20:00	4	1.0	336	80.8
20:30	1	0.2	337	81.0
21:00	7	1.7	344	82.7
22:00	6	1.4	350	84.1
22:30	1	0.2	351	84.4
23:00	8	1.9	359	86.3
23:30	2	0.5	361	86.8
24:00	55	13.2	416	100.0

Frequency Missing = 42

light hours/to: Apr Week

LF4T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	1	0.2	1	0.2
1:00	4	1.0	5	1.2
2:00	15	3.7	20	4.9
3:00	1	0.2	21	5.2
6:00	2	0.5	23	5.7
6:30	1	0.2	24	5.9
7:00	1	0.2	25	6.2
7:30	1	0.2	26	6.4
12:00	6	1.5	32	7.9
12:30	1	0.2	33	8.1
13:00	1	0.2	34	8.4
13:30	2	0.5	36	8.9
14:00	4	1.0	40	9.9
14:30	1	0.2	41	10.1
15:00	3	0.7	44	10.9
15:30	5	1.2	49	12.1
16:00	13	3.2	62	15.3
16:30	17	4.2	79	19.5
16:45	1	0.2	80	19.8
17:00	81	20.0	161	39.8
17:30	21	5.2	182	44.9
17:45	1	0.2	183	45.2
18:00	57	14.1	240	59.3
18:30	8	2.0	248	61.2
19:00	28	6.9	276	68.1
19:30	1	0.2	277	68.4
20:00	12	3.0	289	71.4
20:30	2	0.5	291	71.9
21:00	19	4.7	310	76.5
21:30	2	0.5	312	77.0
22:00	18	4.4	330	81.5
22:30	1	0.2	331	81.7
23:00	12	3.0	343	84.7
23:30	1	0.2	344	84.9
24:00	61	15.1	405	100.0

Frequency Missing = 53

light hours/to: Apr Sat

LF5T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	168	41.8	168	41.8
1:00	7	1.7	175	43.5
2:00	16	4.0	191	47.5
3:00	2	0.5	193	48.0
6:00	2	0.5	195	48.5
7:00	1	0.2	196	48.8
7:30	1	0.2	197	49.0
9:00	1	0.2	198	49.3
11:00	1	0.2	199	49.5
12:00	14	3.5	213	53.0
12:30	1	0.2	214	53.2
13:00	5	1.2	219	54.5
13:30	1	0.2	220	54.7
14:00	9	2.2	229	57.0
15:00	5	1.2	234	58.2
15:30	2	0.5	236	58.7
16:00	2	0.5	238	59.2
16:30	1	0.2	239	59.5
17:00	15	3.7	254	63.2
17:30	3	0.7	257	63.9
17:45	1	0.2	258	64.2
18:00	26	6.5	284	70.6
18:30	6	1.5	290	72.1
19:00	13	3.2	303	75.4
19:30	1	0.2	304	75.6
20:00	8	2.0	312	77.6
20:30	1	0.2	313	77.9
21:00	13	3.2	326	81.1
22:00	7	1.7	333	82.8
22:30	1	0.2	334	83.1
23:00	6	1.5	340	84.6
23:30	1	0.2	341	84.8
24:00	61	15.2	402	100.0

Frequency Missing = 56

light hours/to: Apr Sun

LF6T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	225	56.4	225	56.4
1:00	4	1.0	229	57.4
2:00	15	3.8	244	61.2
3:00	1	0.3	245	61.4
6:00	2	0.5	247	61.9
7:00	1	0.3	248	62.2
7:30	1	0.3	249	62.4
12:00	8	2.0	257	64.4
13:00	4	1.0	261	65.4
13:30	1	0.3	262	65.7
14:00	5	1.3	267	66.9
15:00	3	0.8	270	67.7
16:00	2	0.5	272	68.2
17:00	11	2.8	283	70.9
17:30	1	0.3	284	71.2
18:00	17	4.3	301	75.4
18:30	2	0.5	303	75.9
19:00	10	2.5	313	78.4
19:30	1	0.3	314	78.7
20:00	4	1.0	318	79.7
20:30	1	0.3	319	79.9
21:00	7	1.8	326	81.7
22:00	8	2.0	334	83.7
22:30	1	0.3	335	84.0
23:00	7	1.8	342	85.7
23:30	2	0.5	344	86.2
24:00	55	13.8	399	100.0

Frequency Missing = 59

light hours/to: Aug Week

LF7T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	4	1.0	4	1.0
1:00	4	1.0	8	2.0
2:00	16	4.0	24	6.0
3:00	1	0.2	25	6.2
6:00	1	0.2	26	6.5
6:15	1	0.2	27	6.7
6:30	1	0.2	28	7.0
7:00	1	0.2	29	7.2
7:30	1	0.2	30	7.5
12:00	6	1.5	36	9.0
12:30	2	0.5	38	9.5
13:00	1	0.2	39	9.7
13:30	3	0.7	42	10.5
14:00	4	1.0	46	11.5
15:00	4	1.0	50	12.5
15:30	5	1.2	55	13.7
16:00	13	3.2	68	17.0
16:30	14	3.5	82	20.4
16:45	1	0.2	83	20.7
17:00	77	19.2	160	39.9
17:30	22	5.5	182	45.4
17:45	1	0.2	183	45.6
18:00	56	14.0	239	59.6
18:30	8	2.0	247	61.6
19:00	28	7.0	275	68.6
19:30	2	0.5	277	69.1
20:00	12	3.0	289	72.1
20:30	2	0.5	291	72.6
21:00	16	4.0	307	76.6
21:30	2	0.5	309	77.1
22:00	18	4.5	327	81.5
22:30	1	0.2	328	81.8
23:00	12	3.0	340	84.8
23:30	1	0.2	341	85.0
24:00	60	15.0	401	100.0

Frequency Missing = 57

light hours/to: Aug Sat

LF8T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	167	41.8	167	41.8
1:00	7	1.8	174	43.5
2:00	17	4.3	191	47.8
3:00	2	0.5	193	48.3
6:00	1	0.3	194	48.5
6:15	1	0.3	195	48.8
7:00	1	0.3	196	49.0
7:30	1	0.3	197	49.3
9:00	1	0.3	198	49.5
11:00	1	0.3	199	49.8
12:00	14	3.5	213	53.3
12:30	1	0.3	214	53.5
13:00	5	1.3	219	54.8
13:30	1	0.3	220	55.0
14:00	9	2.3	229	57.3
15:00	4	1.0	233	58.3
15:30	2	0.5	235	58.8
16:00	2	0.5	237	59.3
16:30	1	0.3	238	59.5
17:00	14	3.5	252	63.0
17:30	3	0.8	255	63.8
17:45	1	0.3	256	64.0
18:00	25	6.3	281	70.3
18:30	6	1.5	287	71.8
19:00	13	3.3	300	75.0
19:30	2	0.5	302	75.5
20:00	8	2.0	310	77.5
20:30	1	0.3	311	77.8
21:00	11	2.8	322	80.5
22:00	7	1.8	329	82.3
22:30	1	0.3	330	82.5
23:00	7	1.8	337	84.3
23:30	1	0.3	338	84.5
24:00	62	15.5	400	100.0

Frequency Missing = 58

light hours/to: Aug Sun

LF9T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	224	56.1	224	56.1
1:00	4	1.0	228	57.1
2:00	16	4.0	244	61.2
3:00	1	0.3	245	61.4
6:00	1	0.3	246	61.7
6:15	1	0.3	247	61.9
7:00	1	0.3	248	62.2
7:30	1	0.3	249	62.4
12:00	8	2.0	257	64.4
13:00	4	1.0	261	65.4
13:30	1	0.3	262	65.7
14:00	5	1.3	267	66.9
15:00	3	0.8	270	67.7
16:00	2	0.5	272	68.2
17:00	11	2.8	283	70.9
17:30	1	0.3	284	71.2
18:00	16	4.0	300	75.2
18:30	2	0.5	302	75.7
19:00	10	2.5	312	78.2
19:30	2	0.5	314	78.7
20:00	4	1.0	318	79.7
20:30	1	0.3	319	79.9
21:00	6	1.5	325	81.5
22:00	7	1.8	332	83.2
22:30	1	0.3	333	83.5
23:00	8	2.0	341	85.5
23:30	2	0.5	343	86.0
24:00	56	14.0	399	100.0

Frequency Missing = 59

light hours/to: Oct Week

LF10T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	1	0.3	1	0.3
1:00	4	1.0	5	1.3
2:00	15	3.8	20	5.0
3:00	1	0.3	21	5.3
6:00	2	0.5	23	5.8
6:30	1	0.3	24	6.0
7:00	1	0.3	25	6.3
7:30	1	0.3	26	6.5
12:00	6	1.5	32	8.0
12:30	1	0.3	33	8.3
13:00	1	0.3	34	8.5
13:30	2	0.5	36	9.0
14:00	4	1.0	40	10.0
14:30	1	0.3	41	10.3
15:00	3	0.8	44	11.0
15:30	5	1.3	49	12.3
16:00	13	3.3	62	15.5
16:30	17	4.3	79	19.8
16:45	1	0.3	80	20.0
17:00	82	20.5	162	40.5
17:30	20	5.0	182	45.5
17:45	1	0.3	183	45.8
18:00	54	13.5	237	59.3
18:30	8	2.0	245	61.3
19:00	28	7.0	273	68.3
19:30	1	0.3	274	68.5
20:00	12	3.0	286	71.5
20:30	2	0.5	288	72.0
21:00	17	4.3	305	76.3
21:30	2	0.5	307	76.8
22:00	19	4.8	326	81.5
22:30	1	0.3	327	81.8
23:00	12	3.0	339	84.8
23:30	1	0.3	340	85.0
24:00	60	15.0	400	100.0

Frequency Missing = 58

light hours/to: Oct Sat

LF11T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	167	42.0	167	42.0
1:00	7	1.8	174	43.7
2:00	16	4.0	190	47.7
3:00	2	0.5	192	48.2
6:00	2	0.5	194	48.7
7:00	1	0.3	195	49.0
7:30	1	0.3	196	49.2
9:00	1	0.3	197	49.5
11:00	1	0.3	198	49.7
12:00	13	3.3	211	53.0
12:30	1	0.3	212	53.3
13:00	5	1.3	217	54.5
13:30	1	0.3	218	54.8
14:00	9	2.3	227	57.0
15:00	4	1.0	231	58.0
15:30	2	0.5	233	58.5
16:00	2	0.5	235	59.0
16:30	1	0.3	236	59.3
17:00	14	3.5	250	62.8
17:30	3	0.8	253	63.6
17:45	1	0.3	254	63.8
18:00	26	6.5	280	70.4
18:30	6	1.5	286	71.9
19:00	15	3.8	301	75.6
19:30	1	0.3	302	75.9
20:00	8	2.0	310	77.9
20:30	1	0.3	311	78.1
21:00	10	2.5	321	80.7
22:00	7	1.8	328	82.4
22:30	1	0.3	329	82.7
23:00	7	1.8	336	84.4
23:30	1	0.3	337	84.7
24:00	61	15.3	398	100.0

Frequency Missing = 60

light hours/to: Oct Sun

LF12T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	222	55.9	222	55.9
1:00	4	1.0	226	56.9
2:00	15	3.8	241	60.7
3:00	1	0.3	242	61.0
6:00	2	0.5	244	61.5
7:00	1	0.3	245	61.7
7:30	1	0.3	246	62.0
12:00	8	2.0	254	64.0
13:00	4	1.0	258	65.0
13:30	1	0.3	259	65.2
14:00	5	1.3	264	66.5
15:00	3	0.8	267	67.3
16:00	2	0.5	269	67.8
17:00	12	3.0	281	70.8
17:30	1	0.3	282	71.0
18:00	17	4.3	299	75.3
18:30	2	0.5	301	75.8
19:00	11	2.8	312	78.6
19:30	1	0.3	313	78.8
20:00	4	1.0	317	79.8
20:30	1	0.3	318	80.1
21:00	5	1.3	323	81.4
22:00	7	1.8	330	83.1
22:30	1	0.3	331	83.4
23:00	8	2.0	339	85.4
23:30	2	0.5	341	85.9
24:00	56	14.1	397	100.0

Frequency Missing = 61

light hours/to: Holiday

LF13T	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0:00	258	62.6	258	62.6
1:00	5	1.2	263	63.8
2:00	11	2.7	274	66.5
3:00	1	0.2	275	66.7
6:00	2	0.5	277	67.2
7:00	1	0.2	278	67.5
7:30	1	0.2	279	67.7
12:00	5	1.2	284	68.9
13:00	2	0.5	286	69.4
13:30	2	0.5	288	69.9
14:00	3	0.7	291	70.6
15:30	2	0.5	293	71.1
16:00	1	0.2	294	71.4
17:00	8	1.9	302	73.3
17:30	1	0.2	303	73.5
18:00	9	2.2	312	75.7
19:00	10	2.4	322	78.2
20:00	3	0.7	325	78.9
20:30	1	0.2	326	79.1
21:00	5	1.2	331	80.3
22:00	4	1.0	335	81.3
22:30	1	0.2	336	81.6
23:00	9	2.2	345	83.7
23:30	1	0.2	346	84.0
24:00	66	16.0	412	100.0

Frequency Missing = 46

light hours/am or pm: Dec Week

LF1N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	40	9.1	40	9.1
D	3	0.7	43	9.8
P	395	90.2	438	100.0

Frequency Missing = 20

light hours/am or pm: Dec Sat

LF2N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	46	10.9	46	10.9
D	3	0.7	49	11.6
P	374	88.4	423	100.0

Frequency Missing = 35

light hours/am or pm: Dec Sun

LF3N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	35	8.4	35	8.4
D	3	0.7	38	9.1
P	381	90.9	419	100.0

Frequency Missing = 39

light hours/am or pm: Apr Week

LF4N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	39	9.6	39	9.6
D	3	0.7	42	10.3
P	366	89.7	408	100.0

Frequency Missing = 50

light hours/am or pm: Apr Sat

LF5N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	45	11.1	45	11.1
D	3	0.7	48	11.9
P	357	88.1	405	100.0

Frequency Missing = 53

light hours/am or pm: Apr Sun

LF6N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	33	8.2	33	8.2
D	4	1.0	37	9.2
P	366	90.8	403	100.0

Frequency Missing = 55

light hours/am or pm: Aug Week

LF7N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	40	9.9	40	9.9
D	2	0.5	42	10.4
P	361	89.6	403	100.0

Frequency Missing = 55

light hours/am or pm: Aug Sat

LF8N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	46	11.4	46	11.4
D	2	0.5	48	11.9
P	354	88.1	402	100.0

Frequency Missing = 56

light hours/am or pm: Aug Sun

LF9N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	34	8.5	34	8.5
D	3	0.7	37	9.2
P	365	90.8	402	100.0

Frequency Missing = 56

light hours/am or pm: Oct Week

LF10N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	39	9.7	39	9.7
D	2	0.5	41	10.2
P	361	89.8	402	100.0

Frequency Missing = 56

light hours/am or pm: Oct Sat

LF11N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	45	11.3	45	11.3
D	2	0.5	47	11.8
P	353	88.3	400	100.0

Frequency Missing = 58

light hours/am or pm: Oct Sun

LF12N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	33	8.3	33	8.3
D	3	0.8	36	9.0
P	364	91.0	400	100.0

Frequency Missing = 58

light hours/am or pm: Holiday

LF13N	Frequency	Percent	Cumulative Frequency	Cumulative Percent
A	32	7.6	32	7.6
D	8	1.9	40	9.5
P	380	90.5	420	100.0

Frequency Missing = 38

light hours/percent on: Dec Week

LW1	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.5	2	0.5
1	2	0.5	4	1.0
2	2	0.5	6	1.5
5	2	0.5	8	2.0
8	1	0.2	9	2.2
10	1	0.2	10	2.5
20	4	1.0	14	3.4
25	3	0.7	17	4.2
30	4	1.0	21	5.1
33	3	0.7	24	5.9
35	1	0.2	25	6.1
40	5	1.2	30	7.4
45	1	0.2	31	7.6
50	20	4.9	51	12.5
60	9	2.2	60	14.7
65	3	0.7	63	15.4
66	3	0.7	66	16.2
67	1	0.2	67	16.4
70	5	1.2	72	17.6
75	26	6.4	98	24.0
80	21	5.1	119	29.2
82.390625	1	0.2	120	29.4
85	6	1.5	126	30.9
87	1	0.2	127	31.1
90	27	6.6	154	37.7
95	18	4.4	172	42.2
98	4	1.0	176	43.1
99	1	0.2	177	43.4
100	231	56.6	408	100.0

Frequency Missing = 50

light hours/percent on: Dec Sat

LW2	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	67	17.4	67	17.4
1	17	4.4	84	21.8
2	12	3.1	96	24.9
3	4	1.0	100	25.9
5	21	5.4	121	31.3
8	2	0.5	123	31.9
10	33	8.5	156	40.4
15	3	0.8	159	41.2
20	8	2.1	167	43.3
25	7	1.8	174	45.1
30	7	1.8	181	46.9
33	4	1.0	185	47.9
35	1	0.3	186	48.2
40	4	1.0	190	49.2
50	20	5.2	210	54.4
60	9	2.3	219	56.7
65	1	0.3	220	57.0
66	1	0.3	221	57.3
70	3	0.8	224	58.0
75	10	2.6	234	60.6
77	1	0.3	235	60.9
80	11	2.8	246	63.7
85	5	1.3	251	65.0
90	12	3.1	263	68.1
95	5	1.3	268	69.4
98	1	0.3	269	69.7
99	2	0.5	271	70.2
100	115	29.8	386	100.0

Frequency Missing = 72

light hours/percent on: Dec Sun

LW3	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	98	26.2	98	26.2
1	21	5.6	119	31.8
2	15	4.0	134	35.8
3	4	1.1	138	36.9
5	28	7.5	166	44.4
8	2	0.5	168	44.9
10	34	9.1	202	54.0
15	2	0.5	204	54.5
20	7	1.9	211	56.4
25	5	1.3	216	57.8
30	7	1.9	223	59.6
33	3	0.8	226	60.4
35	2	0.5	228	61.0
40	4	1.1	232	62.0
50	13	3.5	245	65.5
60	9	2.4	254	67.9
65	1	0.3	255	68.2
66	1	0.3	256	68.4
70	4	1.1	260	69.5
75	10	2.7	270	72.2
80	8	2.1	278	74.3
85	3	0.8	281	75.1
90	11	2.9	292	78.1
95	3	0.8	295	78.9
98	1	0.3	296	79.1
100	78	20.9	374	100.0

Frequency Missing = 84

light hours/percent on: Apr Week

LW4	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.5	2	0.5
1	2	0.5	4	1.0
2	1	0.3	5	1.3
5	1	0.3	6	1.6
8	1	0.3	7	1.8
10	1	0.3	8	2.1
20	4	1.0	12	3.1
25	4	1.0	16	4.2
30	3	0.8	19	4.9
33	3	0.8	22	5.7
35	2	0.5	24	6.3
40	3	0.8	27	7.0
45	1	0.3	28	7.3
50	21	5.5	49	12.8
60	9	2.3	58	15.1
65	2	0.5	60	15.6
66	3	0.8	63	16.4
67	1	0.3	64	16.7
70	5	1.3	69	18.0
75	25	6.5	94	24.5
80	21	5.5	115	29.9
82.390625	1	0.3	116	30.2
85	4	1.0	120	31.3
90	27	7.0	147	38.3
95	15	3.9	162	42.2
98	4	1.0	166	43.2
100	218	56.8	384	100.0

Frequency Missing = 74

light hours/percent on: Apr Sat

LW5	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	63	17.2	63	17.2
1	16	4.4	79	21.6
2	13	3.6	92	25.1
3	3	0.8	95	26.0
5	21	5.7	116	31.7
8	2	0.5	118	32.2
10	30	8.2	148	40.4
15	4	1.1	152	41.5
20	8	2.2	160	43.7
25	7	1.9	167	45.6
30	8	2.2	175	47.8
33	4	1.1	179	48.9
35	1	0.3	180	49.2
40	5	1.4	185	50.5
50	21	5.7	206	56.3
60	8	2.2	214	58.5
66	1	0.3	215	58.7
70	3	0.8	218	59.6
75	10	2.7	228	62.3
80	11	3.0	239	65.3
85	3	0.8	242	66.1
90	11	3.0	253	69.1
95	4	1.1	257	70.2
98	1	0.3	258	70.5
100	108	29.5	366	100.0

Frequency Missing = 92

light hours/percent on: Apr Sun

LW6	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	93	26.0	93	26.0
1	21	5.9	114	31.8
2	15	4.2	129	36.0
3	3	0.8	132	36.9
5	27	7.5	159	44.4
8	2	0.6	161	45.0
10	34	9.5	195	54.5
15	3	0.8	198	55.3
20	7	2.0	205	57.3
25	6	1.7	211	58.9
30	7	2.0	218	60.9
33	3	0.8	221	61.7
35	2	0.6	223	62.3
40	4	1.1	227	63.4
50	13	3.6	240	67.0
60	8	2.2	248	69.3
66	1	0.3	249	69.6
70	4	1.1	253	70.7
75	9	2.5	262	73.2
80	8	2.2	270	75.4
85	2	0.6	272	76.0
90	10	2.8	282	78.8
95	2	0.6	284	79.3
98	1	0.3	285	79.6
100	73	20.4	358	100.0

Frequency Missing = 100

light hours/percent on: Aug Week

LW7	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	3	0.8	3	0.8
1	1	0.3	4	1.1
2	2	0.5	6	1.6
5	3	0.8	9	2.4
8	1	0.3	10	2.6
10	3	0.8	13	3.4
20	5	1.3	18	4.7
25	5	1.3	23	6.1
30	5	1.3	28	7.4
33	3	0.8	31	8.2
35	3	0.8	34	8.9
40	3	0.8	37	9.7
50	20	5.3	57	15.0
60	8	2.1	65	17.1
65	1	0.3	66	17.4
66	3	0.8	69	18.2
67	1	0.3	70	18.4
70	5	1.3	75	19.7
75	25	6.6	100	26.3
80	19	5.0	119	31.3
82.390625	1	0.3	120	31.6
85	5	1.3	125	32.9
90	25	6.6	150	39.5
95	16	4.2	166	43.7
98	4	1.1	170	44.7
100	210	55.3	380	100.0

Frequency Missing = 78

light hours/percent on: Aug Sat

LW8	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	65	17.9	65	17.9
1	13	3.6	78	21.5
2	13	3.6	91	25.1
3	3	0.8	94	25.9
5	21	5.8	115	31.7
8	2	0.6	117	32.2
10	28	7.7	145	39.9
15	5	1.4	150	41.3
20	8	2.2	158	43.5
25	7	1.9	165	45.5
30	7	1.9	172	47.4
33	4	1.1	176	48.5
35	1	0.3	177	48.8
40	5	1.4	182	50.1
50	21	5.8	203	55.9
60	8	2.2	211	58.1
66	1	0.3	212	58.4
70	2	0.6	214	59.0
75	10	2.8	224	61.7
80	12	3.3	236	65.0
85	4	1.1	240	66.1
90	11	3.0	251	69.1
95	4	1.1	255	70.2
98	1	0.3	256	70.5
100	107	29.5	363	100.0

Frequency Missing = 95

light hours/percent on: Aug Sun

LW9	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	90	25.2	90	25.2
1	20	5.6	110	30.8
2	16	4.5	126	35.3
3	3	0.8	129	36.1
5	28	7.8	157	44.0
8	2	0.6	159	44.5
10	34	9.5	193	54.1
15	4	1.1	197	55.2
20	7	2.0	204	57.1
25	6	1.7	210	58.8
30	7	2.0	217	60.8
33	3	0.8	220	61.6
35	2	0.6	222	62.2
40	4	1.1	226	63.3
50	13	3.6	239	66.9
60	8	2.2	247	69.2
66	1	0.3	248	69.5
70	3	0.8	251	70.3
75	9	2.5	260	72.8
80	8	2.2	268	75.1
85	3	0.8	271	75.9
90	10	2.8	281	78.7
95	2	0.6	283	79.3
98	1	0.3	284	79.6
100	73	20.4	357	100.0

Frequency Missing = 101

light hours/percent on: Oct Week

LW10	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.5	2	0.5
1	1	0.3	3	0.8
2	2	0.5	5	1.3
5	1	0.3	6	1.6
8	1	0.3	7	1.8
10	1	0.3	8	2.1
20	4	1.1	12	3.2
25	3	0.8	15	4.0
30	4	1.1	19	5.0
33	3	0.8	22	5.8
35	1	0.3	23	6.1
40	2	0.5	25	6.6
45	1	0.3	26	6.9
50	20	5.3	46	12.1
60	7	1.8	53	14.0
65	2	0.5	55	14.5
66	3	0.8	58	15.3
67	1	0.3	59	15.6
70	5	1.3	64	16.9
75	27	7.1	91	24.0
80	21	5.5	112	29.6
82.390625	1	0.3	113	29.8
85	5	1.3	118	31.1
90	28	7.4	146	38.5
95	16	4.2	162	42.7
98	4	1.1	166	43.8
100	213	56.2	379	100.0

Frequency Missing = 79

light hours/percent on: Oct Sat

LW11	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	64	17.7	64	17.7
1	14	3.9	78	21.6
2	13	3.6	91	25.2
3	3	0.8	94	26.0
5	21	5.8	115	31.9
8	2	0.6	117	32.4
10	30	8.3	147	40.7
15	5	1.4	152	42.1
20	8	2.2	160	44.3
25	6	1.7	166	46.0
30	7	1.9	173	47.9
33	4	1.1	177	49.0
35	1	0.3	178	49.3
40	4	1.1	182	50.4
50	21	5.8	203	56.2
60	7	1.9	210	58.2
65	1	0.3	211	58.4
66	1	0.3	212	58.7
70	2	0.6	214	59.3
75	11	3.0	225	62.3
80	11	3.0	236	65.4
85	4	1.1	240	66.5
90	11	3.0	251	69.5
95	4	1.1	255	70.6
98	1	0.3	256	70.9
100	105	29.1	361	100.0

Frequency Missing = 97

light hours/percent on: Oct Sun

LW12	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	90	25.2	90	25.2
1	20	5.6	110	30.8
2	16	4.5	126	35.3
3	3	0.8	129	36.1
5	28	7.8	157	44.0
8	2	0.6	159	44.5
10	33	9.2	192	53.8
15	4	1.1	196	54.9
20	8	2.2	204	57.1
25	5	1.4	209	58.5
30	7	2.0	216	60.5
33	3	0.8	219	61.3
35	2	0.6	221	61.9
40	3	0.8	224	62.7
50	13	3.6	237	66.4
60	8	2.2	245	68.6
65	1	0.3	246	68.9
66	1	0.3	247	69.2
70	3	0.8	250	70.0
75	11	3.1	261	73.1
80	8	2.2	269	75.4
85	2	0.6	271	75.9
90	10	2.8	281	78.7
95	2	0.6	283	79.3
98	1	0.3	284	79.6
100	73	20.4	357	100.0

Frequency Missing = 101

light hours/percent on: Holiday

LW13	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	139	34.3	139	34.3
1	30	7.4	169	41.7
2	16	4.0	185	45.7
3	4	1.0	189	46.7
5	32	7.9	221	54.6
8	1	0.2	222	54.8
10	37	9.1	259	64.0
15	5	1.2	264	65.2
20	9	2.2	273	67.4
25	4	1.0	277	68.4
30	5	1.2	282	69.6
33	3	0.7	285	70.4
40	2	0.5	287	70.9
50	11	2.7	298	73.6
60	7	1.7	305	75.3
66	1	0.2	306	75.6
70	2	0.5	308	76.0
75	10	2.5	318	78.5
80	4	1.0	322	79.5
85	1	0.2	323	79.8
87	1	0.2	324	80.0
90	6	1.5	330	81.5
95	2	0.5	332	82.0
98	1	0.2	333	82.2
100	72	17.8	405	100.0

Frequency Missing = 53

percnt cond space lit durn busines hrs

LF015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	27	6.0	27	6.0
0.5	1	0.2	28	6.2
1	2	0.4	30	6.7
3	1	0.2	31	6.9
5	2	0.4	33	7.3
10	7	1.6	40	8.9
12	1	0.2	41	9.1
15	3	0.7	44	9.8
20	7	1.6	51	11.4
25	4	0.9	55	12.2
30	4	0.9	59	13.1
33	3	0.7	62	13.8
35	3	0.7	65	14.5
40	10	2.2	75	16.7
50	17	3.8	92	20.5
60	7	1.6	99	22.0
66	1	0.2	100	22.3
70	7	1.6	107	23.8
75	16	3.6	123	27.4
80	23	5.1	146	32.5
85	3	0.7	149	33.2
90	32	7.1	181	40.3
95	19	4.2	200	44.5
98	3	0.7	203	45.2
99	5	1.1	208	46.3
100	219	48.8	427	95.1
888	1	0.2	428	95.3
999	21	4.7	449	100.0

Frequency Missing = 9

Average age replaced fixtures

SR010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	15	15.3	15	15.3
0.29999995	1	1.0	16	16.3
1	2	2.0	18	18.4
2	1	1.0	19	19.4
3	4	4.1	23	23.5
5	3	3.1	26	26.5
6	3	3.1	29	29.6
7	2	2.0	31	31.6
8	2	2.0	33	33.7
9	2	2.0	35	35.7
10	9	9.2	44	44.9
12	1	1.0	45	45.9
15	7	7.1	52	53.1
17	2	2.0	54	55.1
18	2	2.0	56	57.1
19	1	1.0	57	58.2
20	13	13.3	70	71.4
21	1	1.0	71	72.4
24	1	1.0	72	73.5
25	8	8.2	80	81.6
27	1	1.0	81	82.7
30	5	5.1	86	87.8
35	1	1.0	87	88.8
40	1	1.0	88	89.8
44	1	1.0	89	90.8
50	2	2.0	91	92.9
999	7	7.1	98	100.0

Frequency Missing = 360

Average age existing fixtures

SR100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	2	0.5	2	0.5
0.17999995	1	0.3	3	0.8
0.19999993	1	0.3	4	1.1
0.29999995	1	0.3	5	1.3
1	15	4.0	20	5.4
1.5	1	0.3	21	5.6
2	16	4.3	37	9.9
2.5	1	0.3	38	10.2
3	21	5.6	59	15.9
4	16	4.3	75	20.2
5	19	5.1	94	25.3
6	20	5.4	114	30.6
6.5	1	0.3	115	30.9
7	9	2.4	124	33.3
7.5	1	0.3	125	33.6
8	14	3.8	139	37.4
9	9	2.4	148	39.8
10	48	12.9	196	52.7
11	4	1.1	200	53.8
12	10	2.7	210	56.5
13	4	1.1	214	57.5
14	2	0.5	216	58.1
15	36	9.7	252	67.7
16	4	1.1	256	68.8
17	5	1.3	261	70.2
18	4	1.1	265	71.2
19	2	0.5	267	71.8
20	39	10.5	306	82.3
22	2	0.5	308	82.8
23	3	0.8	311	83.6
25	18	4.8	329	88.4
26	1	0.3	330	88.7
27	1	0.3	331	89.0
28	2	0.5	333	89.5
30	20	5.4	353	94.9
31	1	0.3	354	95.2
35	2	0.5	356	95.7
38	1	0.3	357	96.0
40	4	1.1	361	97.0
45	1	0.3	362	97.3
47	1	0.3	363	97.6
50	4	1.1	367	98.7
57	1	0.3	368	98.9
60	2	0.5	370	99.5
100	2	0.5	372	100.0

Frequency Missing = 86

Any instld equip been removed

LP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	123	89.8	123	89.8
Yes	14	10.2	137	100.0

Frequency Missing = 321

month/year of new equip removed

LP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
DEC1994	1	20.0	1	20.0
APR1995	1	20.0	2	40.0
JUN1995	1	20.0	3	60.0
JUL1995	2	40.0	5	100.0

Frequency Missing = 453

year of new equip removed

LP021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	2	40.0	2	40.0
1994	1	20.0	3	60.0
1995	2	40.0	5	100.0

Frequency Missing = 453

month/year of new equip removed/2

LP025	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

year of new equip removed/2

LP026	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Removed/4' T-8

LP030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	7	87.5	7	87.5
1	1	12.5	8	100.0

Frequency Missing = 450

Removed/8' T-8

LP031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/4' ES Fluor

LP032	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/8' ES Fluor

LP033	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/4' T-12

LP034	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/8' T-12

LP035	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/Incandescent

LP036	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8	80.0	8	80.0
1	1	10.0	9	90.0
35	1	10.0	10	100.0

Frequency Missing = 448

Removed/Compact Fluor

LP037	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/High pres sodium

LP038	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	8	88.9	8	88.9
4	1	11.1	9	100.0

Frequency Missing = 449

Removed/Metal Halide

LP039	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	100.0	9	100.0

Frequency Missing = 449

Removed/Mercury Vpr

LP040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/Quartz

LP041	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	90.0	9	90.0
20	1	10.0	10	100.0

Frequency Missing = 448

Removed/Reflctrs Delmp

LP042	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/Elec Ballasts

LP043	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/Magnetic Ballasts

LP044	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/LED Exit Lights

LP045	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/Watt Saver-Power Choke

LP046	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	100.0	10	100.0

Frequency Missing = 448

Removed/Other

LP047	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	9	81.8	9	81.8
1	1	9.1	10	90.9
20	1	9.1	11	100.0

Frequency Missing = 447

OBS	LP048
1	GAS BULB SHOWROOM
2	"BI-AX FLOURESCENT"

Replcd w/4' T-8

LP070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	90.9	10	90.9
1	1	9.1	11	100.0

Frequency Missing = 447

Replcd w/8' T-8

LP071	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/4' ES Fluor

LP072	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/8' ES Fluor

LP073	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/4' T-12

LP074	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/8' T-12

LP075	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Incandescent

LP076	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	10	83.3	10	83.3
1	1	8.3	11	91.7
20	1	8.3	12	100.0

Frequency Missing = 446

Replcd w/Compact Fluor

LP077	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/High pres sodium

LP078	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	91.7	11	91.7
4	1	8.3	12	100.0

Frequency Missing = 446

Replcd w/Metal Halide

LP079	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Mercury Vpr

LP080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Quartz

LP081	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Reflctrs Delmp

LP082	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Elec Ballasts

LP083	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	91.7	11	91.7
20	1	8.3	12	100.0

Frequency Missing = 446

Replcd w/Magnetic Ballasts

LP084	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/LED Exit Lights

LP085	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Watt Saver-Power Choke

LP086	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	12	100.0	12	100.0

Frequency Missing = 446

Replcd w/Other

LP087	Frequency	Percent	Cumulative Frequency	Cumulative Percent
0	11	91.7	11	91.7
1	1	8.3	12	100.0

Frequency Missing = 446

OBS	LP088
1	NOT EXACTLY SURE

Is outdoor lighting on bill?

OL010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	108	24.5	108	24.5
Yes	332	75.5	440	100.0

Frequency Missing = 18

Changed any outdoor lights

OL020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	256	81.3	256	81.3
Yes	59	18.7	315	100.0

Frequency Missing = 143

Month/year change outdoor lights

OL030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JUN1992	1	5.0	1	5.0
APR1993	1	5.0	2	10.0
SEP1993	1	5.0	3	15.0
DEC1993	1	5.0	4	20.0
JAN1994	1	5.0	5	25.0
MAR1994	1	5.0	6	30.0
MAY1994	1	5.0	7	35.0
JUN1994	1	5.0	8	40.0
JUL1994	1	5.0	9	45.0
SEP1994	1	5.0	10	50.0
NOV1994	1	5.0	11	55.0
DEC1994	1	5.0	12	60.0
JAN1995	2	10.0	14	70.0
APR1995	1	5.0	15	75.0
MAY1995	3	15.0	18	90.0
JUN1995	1	5.0	19	95.0
JUL1995	1	5.0	20	100.0

Frequency Missing = 438

Year change outdoor lights

OL031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	7	23.3	7	23.3
1993	13	43.3	20	66.7
1994	9	30.0	29	96.7
1995	1	3.3	30	100.0

Frequency Missing = 428

Add/replace/remove outdoor lights

OL040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	40	67.8	40	67.8
Replaced	13	22.0	53	89.8
Add and Replace	6	10.2	59	100.0

Frequency Missing = 399

Cooling type

CE010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No AC	130	29.7	130	29.7
Centrl Plant	107	24.5	237	54.2
Sml Pack Sys	130	29.7	367	84.0
Wall/Wndo Unit	26	5.9	393	89.9
Heat Pump	12	2.7	405	92.7
Other	25	5.7	430	98.4
Evap Cooler	1	0.2	431	98.6
Swamp Cooler	6	1.4	437	100.0

Frequency Missing = 21

OBS	CE011
1	AIR CONDITIONER/HEATERS
2	FORCED AIR
3	0
4	REFRIGERATION UNIT
5	ANTIQUE
6	SWAMP COOLER
7	COOLERS
8	SWAMP COOLER
9	REFRIGIRATION UNIT
10	WATER COOLER
11	SWAMP COOLERS
12	FORCED AIR
13	FORCED AIR COMPRESSOR
14	CENTRAL AIR COOLING
15	MULTIPLE/FAN/AC/WINDOW COMBO
16	20 TON FORCED AIR
17	REFRIGERATION
18	SWAMP COOLER
19	SWAMP COOLER 421
20	40= HVAC
21	FORCED AIR
22	FAN
23	HEATER COOLERS
24	CHILLER
25	COMBO OF ALL OF THE ABOVE
26	SWAMP COOLER
27	CEILING FANS
28	EVAPORATIVE COOLER
29	WATER COOLER
30	ROOF UNITS
31	HVAC
32	COMMERCIAL UNITS
33	WEATHER CARRIERS
34	CHILLING TOWER
35	CONGLOMERATION
36	2 PIPE SYSTEM
37	4 PIPE SYSTEM
38	COMPRESSOR UNIT
39	6 ROOF UNITS

Cooling primary fuel

CE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	285	92.5	285	92.5
Natural Gas	15	4.9	300	97.4
Other	4	1.3	304	98.7
Gas and Electric	4	1.3	308	100.0

Frequency Missing = 150

OBS	CE016
1	BOTH 1 AND 2
2	WATER
3	WATER
4	WATER
5	BOTH 1 AND 2
6	GAS 4 TON FORCED/ELECTRIC
7	BOTH ELECTRICITY & GAS
8	ELECTRIC W\FREON
9	ELECTRICITY & GAS

System include economizer?

CE030	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

CE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Cooling operated/all year

CE059	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	125	48.8	125	48.8
Yes	131	51.2	256	100.0

Frequency Missing = 202

Cooling operated/Jan

CE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	147	97.4	147	97.4
Yes	4	2.6	151	100.0

Frequency Missing = 307

Cooling operated/Feb

CE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	147	98.7	147	98.7
Yes	2	1.3	149	100.0

Frequency Missing = 309

Cooling operated/Mar

CE062	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	138	92.0	138	92.0
Yes	12	8.0	150	100.0

Frequency Missing = 308

Cooling operated/Apr

CE063	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	116	74.8	116	74.8
Yes	39	25.2	155	100.0

Frequency Missing = 303

Cooling operated/May

CE064	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	57	32.8	57	32.8
Yes	117	67.2	174	100.0

Frequency Missing = 284

Cooling operated/Jun

CE065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	24	13.0	24	13.0
Yes	160	87.0	184	100.0

Frequency Missing = 274

Cooling operated/Jul

CE066	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	12	6.5	12	6.5
Yes	172	93.5	184	100.0

Frequency Missing = 274

Cooling operated/Aug

CE067	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	9	4.8	9	4.8
Yes	177	95.2	186	100.0

Frequency Missing = 272

Cooling operated/Sep

CE068	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	22	12.1	22	12.1
Yes	160	87.9	182	100.0

Frequency Missing = 276

Cooling operated/Oct

CE069	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	89	51.7	89	51.7
Yes	83	48.3	172	100.0

Frequency Missing = 286

Cooling operated/Nov

CE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	154	91.7	154	91.7
Yes	14	8.3	168	100.0

Frequency Missing = 290

Cooling operated/Dec

CE071	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	162	96.4	162	96.4
Yes	6	3.6	168	100.0

Frequency Missing = 290

Cooling operated/Ref

CE072	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	139	100.0	139	100.0

Frequency Missing = 319

Cooling operated/DK

CE073	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	140	94.0	140	94.0
Yes	9	6.0	149	100.0

Frequency Missing = 309

Added/replaced/removed cooling

CE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No chnge	378	85.3	378	85.3
Added	25	5.6	403	91.0
Replaced	32	7.2	435	98.2
Added/Replced	7	1.6	442	99.8
Removed	1	0.2	443	100.0

Frequency Missing = 15

Month/year cooling changes

CE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1992	1	3.7	1	3.7
MAR1992	1	3.7	2	7.4
MAY1992	2	7.4	4	14.8
OCT1992	1	3.7	5	18.5
APR1993	1	3.7	6	22.2
JUN1993	2	7.4	8	29.6
JUL1993	1	3.7	9	33.3
DEC1993	1	3.7	10	37.0
FEB1994	1	3.7	11	40.7
JUL1994	1	3.7	12	44.4
OCT1994	2	7.4	14	51.9
NOV1994	2	7.4	16	59.3
DEC1994	1	3.7	17	63.0
FEB1995	1	3.7	18	66.7
APR1995	1	3.7	19	70.4
MAY1995	2	7.4	21	77.8
JUN1995	2	7.4	23	85.2
JUL1995	4	14.8	27	100.0

Frequency Missing = 431

Year cooling changes

CE091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	10	28.6	10	28.6
1993	8	22.9	18	51.4
1994	11	31.4	29	82.9
1995	6	17.1	35	100.0

Frequency Missing = 423

Old cooling fuel type

CE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	36	94.7	36	94.7
Natural Gas	2	5.3	38	100.0

Frequency Missing = 420

Cooling addition fuel type

CE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	59	93.7	59	93.7
Natural Gas	1	1.6	60	95.2
Other	3	4.8	63	100.0

Frequency Missing = 395

OBS	CE121
1	BOTH
2	ELECTRICITY AND GA
3	ELEC & GAS

Type of main heating

HE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Cntrl elec fur	39	9.4	39	9.4
Cntrl HP	35	8.4	74	17.8
Cntrl Gas fur	156	37.6	230	55.4
Gas boiler	34	8.2	264	63.6
Elec boiler	1	0.2	265	63.9
Oil boiler/fur	2	0.5	267	64.3
Elec strip heat	2	0.5	269	64.8
Basebrd elec hea	5	1.2	274	66.0
Rm/Wal AC w/stri	11	2.7	285	68.7
Perm non-elec ht	4	1.0	289	69.6
whlhs wl/flr ele	8	1.9	297	71.6
whlhs wl/flr gas	12	2.9	309	74.5
Port elec	11	2.7	320	77.1
Wood/Coal stove	2	0.5	322	77.6
Propane heat	4	1.0	326	78.6
Other	35	8.4	361	87.0
None	44	10.6	405	97.6
Packaged Systems	10	2.4	415	100.0

Frequency Missing = 43

OBS	HE016
1	STEAM HEAT
2	INDUSTRIAL BLOWERS
3	FORCED AIR THRU ROOFTOP UNITS
4	PACKAGED HEATING SYSTEMS ELECTRIC
5	PACKAGED SYSTEMS
6	PACKAGED UNITS
7	BOILER
8	SAME AS AC
9	FORST AIR
10	GAS WALL UNIT
11	RADIANT HEATERS
12	ROOF MOUNTED UNIT
13	GAS RANGE
14	GAS BLOW HEATER
15	GAS FORCED AIR
16	FORCED AIR-GAS
17	SAME SYSTEM AS COOLING
18	PACKAGED SYSTEM
19	SAME SYSTEM AS COOLING
20	SAME AS COOLING
21	ATLAS TAKES CARE OF IT
22	FORCED AIR SAME AS AC
23	NOT SURE BUT ELECTRIC
24	SAME AS ABOVE
25	FORCED AIR HEAT; GAS BLOWER
26	GAS - INFRARED, CATALYTIC, CERAMIC
27	4 FORCED AIR 20 TN
28	GAS FURNACE WITH SPACE HEATERS
29	ELECTRIC SPACE HEATER
30	COMBINATION AIR COND./HEATING UNITS!
31	FORSTARE
32	VARIOUS; EACH CLASSROOM HAS SOMETHING.
33	AIR BLOWERS
34	SAME AS AIR
35	DON'T KNOW, BUT IT'S GAS SOMETHING
36	DUAL PACK / GAS HEATERS
37	SPACE HEATER
38	FORCED AIR GAS
39	GAS POWERED
40	DUAL ROOFTOP UNITS
41	HVAC
42	CENTRAL FURNACE
43	PACKAGED UNITS
44	PACKAGED SYSTEMS
45	PACKAGED SYSTEMS
46	PACKAGED SYSTEMS
47	INDIVIDUAL ELECTRIC ROOM HEATERS
48	INDIVIDUAL ROOM HEATING
49	4 PIPE SYSTEM
50	ELECTRIC HEATER
51	PORTABLE GAS HEATERS.

Primary fuel to heat facility

HE020	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

% of facility heated - WTR WKDAY - 8AM

HE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Heating operated/all year

HE059	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	164	56.2	164	56.2
Yes	128	43.8	292	100.0

Frequency Missing = 166

Heating operated/Jan

HE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	19	6.9	19	6.9
Yes	256	93.1	275	100.0

Frequency Missing = 183

Heating operated/Feb

HE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	34	12.7	34	12.7
Yes	233	87.3	267	100.0

Frequency Missing = 191

Heating operated/Mar

HE062	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	90	34.2	90	34.2
Yes	173	65.8	263	100.0

Frequency Missing = 195

Heating operated/Apr

HE063	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	173	67.8	173	67.8
Yes	82	32.2	255	100.0

Frequency Missing = 203

Heating operated/May

HE064	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	230	92.0	230	92.0
Yes	20	8.0	250	100.0

Frequency Missing = 208

Heating operated/Jun

HE065	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	242	97.6	242	97.6
Yes	6	2.4	248	100.0

Frequency Missing = 210

Heating operated/Jul

HE066	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	246	99.6	246	99.6
Yes	1	0.4	247	100.0

Frequency Missing = 211

Heating operated/Aug

HE067	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	246	99.2	246	99.2
Yes	2	0.8	248	100.0

Frequency Missing = 210

Heating operated/Sep

HE068	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	237	94.4	237	94.4
Yes	14	5.6	251	100.0

Frequency Missing = 207

Heating operated/Oct

HE069	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	166	65.1	166	65.1
Yes	89	34.9	255	100.0

Frequency Missing = 203

Heating operated/Nov

HE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	51	19.0	51	19.0
Yes	217	81.0	268	100.0

Frequency Missing = 190

Heating operated/Dec

HE071	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	18	6.6	18	6.6
Yes	255	93.4	273	100.0

Frequency Missing = 185

Heating operated/Ref

HE072	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	189	96.9	189	96.9
Yes	6	3.1	195	100.0

Frequency Missing = 263

Heating operated/DK

HE073	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	195	94.2	195	94.2
Yes	12	5.8	207	100.0

Frequency Missing = 251

Added/replaced/removed heating sys

HE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No chnge	345	85.6	345	85.6
Added	22	5.5	367	91.1
Replaced	30	7.4	397	98.5
Added/Replaced	3	0.7	400	99.3
Removed	3	0.7	403	100.0

Frequency Missing = 55

Month/Year changed heating

HE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
FEB1992	1	3.8	1	3.8
AUG1992	1	3.8	2	7.7
OCT1992	2	7.7	4	15.4
APR1993	1	3.8	5	19.2
JUN1993	1	3.8	6	23.1
JUL1993	1	3.8	7	26.9
MAR1994	1	3.8	8	30.8
MAY1994	1	3.8	9	34.6
JUN1994	1	3.8	10	38.5
JUL1994	2	7.7	12	46.2
SEP1994	1	3.8	13	50.0
NOV1994	1	3.8	14	53.8
DEC1994	2	7.7	16	61.5
JAN1995	3	11.5	19	73.1
FEB1995	2	7.7	21	80.8
MAR1995	1	3.8	22	84.6
APR1995	1	3.8	23	88.5
JUN1995	2	7.7	25	96.2
JUL1995	1	3.8	26	100.0

Frequency Missing = 432

Year changed heating

HE091	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	7	24.1	7	24.1
1993	7	24.1	14	48.3
1994	12	41.4	26	89.7
1995	3	10.3	29	100.0

Frequency Missing = 429

Old heat fuel type

HE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	19	55.9	19	55.9
Propane/Bottld g	1	2.9	20	58.8
Steam	1	2.9	21	61.8
Elec	13	38.2	34	100.0

Frequency Missing = 424

heat addition fuel type

HE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	32	60.4	32	60.4
Oil	1	1.9	33	62.3
Elec	18	34.0	51	96.2
Other	2	3.8	53	100.0

Frequency Missing = 405

OBS	HE121
1	ELECRICITY & NATURAL GAS
2	GAS & ELECTRIC

Changed top 10% equip?

OE010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	410	92.6	410	92.6
Yes	33	7.4	443	100.0

Frequency Missing = 15

Changed H2O heat

OE012	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	15	78.9	15	78.9
Yes	4	21.1	19	100.0

Frequency Missing = 439

Changed cooking equip

OE013	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	17	94.4	17	94.4
Yes	1	5.6	18	100.0

Frequency Missing = 440

Changed refrigeration

OE014	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	13	65.0	13	65.0
Yes	7	35.0	20	100.0

Frequency Missing = 438

Changed HVAC

OE014B	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Changed mfg equip

OE014C	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Changed computers

OE014D	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1	5	100.0	5	100.0

Frequency Missing = 453

Changed other1

OE015	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	10	33.3	10	33.3
Yes	20	66.7	30	100.0

Frequency Missing = 428

OBS	OE016
1	TESTING EQUIP (COMPRESSOR)
2	REPLACED COMPUTERS
3	COMPUTER
4	GOT SMALLER POWER TOOLS
5	ADDED COMPUTERS
6	ADDING COMPUTERS
7	COMMUNICATIONS EQUIPMENT
8	ADDED MAINFRAMES
9	NEW UPS SYSTEM FOR COMPS
10	2 GAS DRYERS
11	GAS DISPENSERS
12	SOFT START ON 60 HP MOTOR
13	BLOWTHERM, HEATING MECH.
14	ELECTRIC MOTOR
15	4 VEHICLE LIFTS DETAIL SHOP
16	ALL KINDS OF MACHINERY
17	NEW ELECTRICAL SYSTEM
18	ADDED COMPRESSORS
19	DISHWASHER
20	ADDED CLINICAL LAB
21	REPLACED POOL AREA COOLERS

Changed other2

OE017	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	24	92.3	24	92.3
Yes	2	7.7	26	100.0

Frequency Missing = 432

OBS	OE018
1	COMPUTERS
2	ICE MACHINE

Changed refused

OE019	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	26	100.0	26	100.0

Frequency Missing = 432

Changed dont know

OE011	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	32	97.0	32	97.0
Yes	1	3.0	33	100.0

Frequency Missing = 425

Month/Year changed H2O heat

OE020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
DEC1994	1	100.0	1	100.0

Frequency Missing = 457

Year changed H2O heat

OE021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	1	33.3	1	33.3
1994	2	66.7	3	100.0

Frequency Missing = 455

Added/replaced/removed H2O heat

OE030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Replaced	4	100.0	4	100.0

Frequency Missing = 454

Old H2O heat fuel type

OE040	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	3	100.0	3	100.0

Frequency Missing = 455

H2O heat addition fuel type

OE050	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	3	100.0	3	100.0

Frequency Missing = 455

Month/Year changed cooking equip

OE060	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Year changed cooking equip

OE061	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1994	1	100.0	1	100.0

Frequency Missing = 457

Added/replaced/removed cooking equip

OE070	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	1	100.0	1	100.0

Frequency Missing = 457

Old cooking equip fuel type

OE080	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

cooking equip addition fuel type

OE090	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	1	100.0	1	100.0

Frequency Missing = 457

Month/Year changed refrigeration equip

OE100	Frequency	Percent	Cumulative Frequency	Cumulative Percent
MAR1994	1	33.3	1	33.3
DEC1994	1	33.3	2	66.7
JUN1995	1	33.3	3	100.0

Frequency Missing = 455

Year changed refrigeration equip

OE101	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1994	3	100.0	3	100.0

Frequency Missing = 455

Added/replaced/removed refrig equip

OE110	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	3	42.9	3	42.9
Replaced	4	57.1	7	100.0

Frequency Missing = 451

Old refrigeration equip fuel type

OE120	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	4	100.0	4	100.0

Frequency Missing = 454

refrigeration equip addition fuel type

OE130	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	7	100.0	7	100.0

Frequency Missing = 451

Month/Year changed Other1 equip

OE140	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1992	1	12.5	1	12.5
JUN1992	1	12.5	2	25.0
JUL1992	1	12.5	3	37.5
MAY1993	1	12.5	4	50.0
JUN1994	2	25.0	6	75.0
JAN1995	1	12.5	7	87.5
APR1995	1	12.5	8	100.0

Frequency Missing = 450

Year changed Other1 equip

OE141	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1993	3	33.3	3	33.3
1994	4	44.4	7	77.8
1995	2	22.2	9	100.0

Frequency Missing = 449

Added/replaced/removed Other1 equip

OE150	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	6	30.0	6	30.0
Replaced	10	50.0	16	80.0
Added/Replaced	4	20.0	20	100.0

Frequency Missing = 438

Old Other1 equip fuel type

OE160	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	1	7.1	1	7.1
Elec	13	92.9	14	100.0

Frequency Missing = 444

Other1 equip addition fuel type

OE170	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Natural Gas	3	15.0	3	15.0
Elec	17	85.0	20	100.0

Frequency Missing = 438

Month/Year changed Other2 equip

OE180	Frequency	Percent	Cumulative Frequency	Cumulative Percent
MAR1994	1	50.0	1	50.0
FEB1995	1	50.0	2	100.0

Frequency Missing = 456

Year changed Other2 equip

OE181	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Added/replaced/removed Other2 equip

OE190	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Added	2	100.0	2	100.0

Frequency Missing = 456

Old Other2 equip fuel type

OE200	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Other2 equip addition fuel type

OE202	Frequency	Percent	Cumulative Frequency	Cumulative Percent
Elec	2	100.0	2	100.0

Frequency Missing = 456

Made any other energy using changes?

OC010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	385	86.5	385	86.5
Yes	60	13.5	445	100.0

Frequency Missing = 13

OBS	OC020
1	ADDED COMPUTER
2	NEW COMPUTER SYSTEM
3	NEW COMPUTERS AND COPY MACHINES
4	ADDED COMPUERS & PRINTERS
5	ADDED SOME COMPUTERS, ETC.
6	REPLACED COMPUTERS
7	LEAVING LIGHTS FOR RESTAURANT ON ALL NIGHT LONG FOR ADVERTISEMENT
8	ADDED 64 NEW "APARTMENTS" IN 1993
9	REPLACE WATER HEATER
10	NEW TENANTS ON FIRST FLOOR REQUIRE MORE HEAT AND LIGHT
11	CHANGES FROM ATOMIC ABSORPTION TO ICP UNIT
12	COMPUTERS
13	COPY MACHINE
14	NEW TESTING EQUIPMENT
15	COPY MACHINE WAS ADDED
16	RENTED OUT MORE OF THE SPACE
17	ADDITIONAL SPACE OCCUPIED
18	PEOPLE MOVING INTO PREVIOUSLY UNOCCUPIED SPACES
19	COMPUTER SYSTEM & MANUFACTURING EQUIP
20	VACATED BUILDING
21	ADDED MORE MACHINERY
22	CHANGED THERMOSTATS
23	ADDED COMPUTERS
24	MECHANICAL MANAGEMENT
25	ADDED AN AIR VENT FAN
26	TOOK OUT TRACK LIGHTS AND PUT IN FLOURESCENTS
27	SUMMER SCHOOL MEANS INCREASED ENERGY CONSUMPTION
28	PURCHASE OF ENERGY-EFFICIENT WELDING EQUIPMENT
29	NEW LIGHTS ???
30	5 HUGE BULBS IN SHOWROOM; UNCERTAIN OF TYPE, BUT NOT FLORESCENT
31	INSTALLED A COMPUTER NETWORK..W/ 10 WORK STATIONS
32	INSTALLED IN-HOUSE ENERGY MANAGEMENT SYSTEM
33	ELECTRIC CARTS ARE ON A SPECIAL TIME METER
34	ADDED COMPUTERS
35	NEW BOILER IS MORE EFFICIENT.
36	ADDED PORTABLE CLASSROOMS (3) BUILDINGS.
37	HE TOLD ME HERE THAT HE ADDED A SWAMP COOLER
38	REFRIGERATION
39	A SECOND COOLER UNIT WAS ADDED
40	REPLACED ICE MACHINE
41	INSULATED BOILERS FOR HOT WATER
42	ADDED EQUIPMENT FOR MORE POWER
43	REPLACE ICE MACHINE
44	ADDED FREEZER
45	INSTALLED NEW SERVICE PANELS
46	NEW KITCHEN AND STOVES
47	MORE HOURS OF OPERATION
48	BETTER WATER HEATER
49	ADDED SWAMP COOLERS (2 6500 UNITS)
50	CLOSED KITCHEN AREA. NO LONGER USING GAS THERE.
51	INSTALLED A MORE EFFICIENT THERMASTAT & CONSERVATION MEASURES
52	MORE EMPLOYEES USING MORE ENERGY
53	ADDED 4 COMPUTER TERMINALS,ADDED 2 FAX MACHINES, ADDED 2 COPIERS

OBS	OC020
54	ADDED X-RAY MACHINE
55	ADDED COMPUTERS
56	ADDED A SOLAR HEATER FOR SWIMMING POOL
57	POOL PUMPS, SAUNA HEATING REPLACED.
58	INSTALLED SENSORS TO TURN ON AND OFF LIGHTS
59	BOUGHT A SMOKE HOUSE
60	PUT IN NEW 75 HORSE COMPRESSORS

OBS	OC021
1	TO LET PEOPLE KNOW THAT THEY ARE THERE.

Month/Year of other change

OC030	Frequency	Percent	Cumulative Frequency	Cumulative Percent
JAN1992	1	4.5	1	4.5
JUN1992	1	4.5	2	9.1
AUG1992	1	4.5	3	13.6
JAN1993	1	4.5	4	18.2
MAR1993	2	9.1	6	27.3
MAY1993	2	9.1	8	36.4
OCT1993	1	4.5	9	40.9
JAN1994	1	4.5	10	45.5
JUL1994	1	4.5	11	50.0
SEP1994	1	4.5	12	54.5
NOV1994	2	9.1	14	63.6
DEC1994	2	9.1	16	72.7
JAN1995	1	4.5	17	77.3
APR1995	1	4.5	18	81.8
MAY1995	2	9.1	20	90.9
JUN1995	1	4.5	21	95.5
JUL1995	1	4.5	22	100.0

Frequency Missing = 436

Year of other change

OC031	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1992	4	12.5	4	12.5
1993	13	40.6	17	53.1
1994	13	40.6	30	93.8
1995	2	6.3	32	100.0

Frequency Missing = 426

Is there an EMS system?

EM010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	410	92.8	410	92.8
Yes	32	7.2	442	100.0

Frequency Missing = 16

Month/Year EMS installed

EM020	Frequency	Percent	Cumulative Frequency	Cumulative Percent
AUG1984	1	14.3	1	14.3
NOV1985	1	14.3	2	28.6
JUN1987	1	14.3	3	42.9
SEP1990	1	14.3	4	57.1
AUG1992	1	14.3	5	71.4
FEB1995	1	14.3	6	85.7
JUN1995	1	14.3	7	100.0

Frequency Missing = 451

Year EMS installed

EM021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
1977	2	11.1	2	11.1
1982	1	5.6	3	16.7
1983	1	5.6	4	22.2
1986	1	5.6	5	27.8
1988	2	11.1	7	38.9
1989	2	11.1	9	50.0
1990	2	11.1	11	61.1
1991	2	11.1	13	72.2
1992	2	11.1	15	83.3
1994	2	11.1	17	94.4
1995	1	5.6	18	100.0

Frequency Missing = 440

Is there a cogeneration plant?

CP010	Frequency	Percent	Cumulative Frequency	Cumulative Percent
No	443	98.9	443	98.9
Yes	5	1.1	448	100.0

Frequency Missing = 10

Month/Year cogeneration installed

CP020	Frequency	Percent	Cumulative Frequency	Cumulative Percent

Frequency Missing = 458

Year cogeneration installed

CP021	Frequency	Percent	Cumulative Frequency	Cumulative Percent
9	1	20.0	1	20.0
1978	1	20.0	2	40.0
1988	1	20.0	3	60.0
1991	2	40.0	5	100.0

Frequency Missing = 453

Appendix J

PURCHASE DECISION LOGISTIC REGRESSION MODEL

Appendix J

PURCHASE DECISION LOGISTIC REGRESSION MODEL

A logistic regression model predicting free ridership was developed using self-report data in a pooled model incorporating data from all surveyed Lighting Program participants in the commercial sector. *Section 3 (Methodology)* contains a description of the superset of variables included in the model and rationale for their inclusion. This appendix describes the analytical steps undertaken in the model selection, building, and refinement process and presents the final model results.

Exhibit J-1 presents the variables used in the decision logistic regression model.

Exhibit J-1
Self-Reported Free Ridership: Superset of Model Variables

Model Variable	Wording of Question	Predicted Direction: Net Participant	Predicted Direction: Free Rider	In Final Model
	TIMING OF PLANS			
PERIOD_ BEFORE_ AWARE	How long were you considering <the measure> before you heard about the program?	short-moderate period	longer period	
NO_PLANS	Wasn't planning on purchase until approached	yes	no	x
PERIOD_ AFTER_ AWARE	How long did you take to decide to participate after becoming aware of the program?	longer period	shorter period	x
WAIT_NO_ PGM	How long would you have waited to <take the measure> without the program?	longer period	shorter period	x
WAIT_FOR_ PGM	Did you delay a retrofit in order to participate?	no	yes	
	OPTIONS			
QUOTES	How many estimates or quotes did you obtain before purchasing your new equipment?	few	many	
STD_EQUIP	Did you consider purchasing standard-efficiency equipment?	yes	no	x
BROKEN	(Did the customer mention broken equipment?)	yes	no	
	PROGRAM INFORMATION AND BENEFITS			
PGE_CONTA	How many times a year do you have contact with your PG&E rep?	few	many	
REBATE	(Did the customer mention the rebate?)	yes	no	
BILL_ SAVINGS	(Did the customer mention bill savings?)	yes	no	
FREE_RIDE	Before you knew about the program, which of the following statements best describes your company's plans to <take the measure>?	had considered, but no plans	planning to do it within the next 12 months	

J.1 Variables Excluded from Model

With the exclusion of PERIOD_BEFORE_AWARE, bivariate relationships between independent variables and FREE_RIDE (examined through cross-tabs and bivariate logistic regressions) showed them to be sufficiently associated. (i.e., they were at least marginally statistically significant.) These variables were therefore included in initial model runs. Variable PERIOD_BEFORE_AWARE was dichotomized, classifying customers into two groups: those who were and those who were not in the market for energy efficient lighting equipment before they heard about the program.

J.2 Functional Form of Variables Included in Free Ridership Model

"Yes" or "No" questions were entered into the initial model as dummy variables coded either "1" or "0." Continuous variables WAIT_NO_PGM, QUOTES, PERIOD_AFTER_AWARE, and PGE_CONTACT were initially entered as continuous covariates with Box-Tidwell transformation terms. The Box-Tidwell terms allow one to test for nonlinearity in the logit; they are formed by creating an additional variable, "xlnx," for each continuous variable. A logisitic regression is then run with just two covariates: x and xlnx. When the xlnx term is statistically significant, there is evidence of nonlinearity. This data screening process was carried out for each of the continuous variables in the model. Results of these tests showed that WAIT_NO_PGM could be entered as a continuous variable, but QUOTES, PERIOD_AFTER_AWARE, and PGE_CONTACT demonstrated nonlinear components and needed recoding. Techniques following Hosmer and Lemeshow[1] were used to identify the correct functional forms of QUOTES, PERIOD_AFTER_AWARE, and PGE_CONTACT. A variable was created for PERIOD_AFTER_AWARE, which was set equal to the natural logarithm of PERIOD_AFTER_AWARE[2]. Further follow-up tests showed that QUOTES and PGE_CONTACT should be provisionally retained in the model as a continuous, untransformed variables.

[1] Hosmer, D., and Lemeshow, S. (1989). *Applied Logistic Regression*. Wiley, New York.

[2] In order to account for the many "0" responses, values of "0" were set to $1x10^{-6}$ before taking their natural logarithm. This resulted in minimum values equal to -14 for this variable.

J.3 Variables Dropped from Model During Model Building

The initial, full model contained all variables mentioned previously. The model-building process involved testing subsets of variables until stable results were obtained. Criteria used to drop variables from the model included nonsignificant regression coefficients (e.g., the Wald Chi-Square test was not significant in a multivariate model) and nonsignificant change in model log-likelihood ratios with the inclusion or omission of the variable.[3]

The QUOTES, WAIT_FOR_PGM, PGE_CONTACT, REBATE, BILL_SAVINGS, and BROKEN variables proved consistently nonsignificant and were dropped.

J.4 Goodness-of-Fit Tests: Outliers, High Leverage Values, and Influential Observations

Pearson residuals, deviance residuals, and hat values resulting from the later model specifications were examined. In the final model, Pearson residuals had an average value of 0.025, and a variance of 0.938. This quantity is thought to be N(0,1)[4] when the model is correctly specified. Deviance residuals followed the same pattern as the Pearson residuals, with the same observations showing extreme values. Overall, fourteen cases had Pearson or deviance residuals greater than 2 or less than -2. This represents just over 5% of the sample used in the final model. Hat values showed that high-leverage values were not also influential outliers. Large hat values indicate points with undue weight on regression results and/or parameter estimates. Using a criterion of hat values exceeding 2k/n [where k is the number of independent variables and n is the number of observations in the model], only 10% of the cases demonstrated high leverage. Six of the fourteen outliers (or 2% of the sample) had leverage values greater than the criterion.

An examination of outliers revealed that the model tended to underpredict free ridership by anywhere from 2% to 20%. For this reason, an adjustment was made to the predicted free ridership values using the following adjustments: If 2% of the H.I.D. cases were underpredicted, the “adjusted” free ridership value for the H.I.D technology group was increased by 2%.

[3] Hosmer, D., and Lemeshow, S. (1989). *Applied Logistic Regression*. Wiley, New York.

[4] Normally distributed with a mean=0 and a variance=1.

J.5 Collinearity

Correlations between the continuous independent variables were checked, as well as the correlation matrix of regression coefficients.

J.6 Missing Data

Because many of the survey questions used in the model required the customer to recall various decision-making stages, there was a fair amount of missing data. Rather than including missing data with mean or median values, the model was run with fewer observations. If the sample size had permitted, cross-validation of model results on a hold-out dataset would have been performed, but these data were not available. The final model was run with sample weights. The weighted model was statistically significant, but individual variables differed in their statistical significance from the unweighted model. The final free ridership estimates were made using the coefficients obtained from the weighted commercial model.

J.7 Precision of Results

Results presented in *Section 4* are shown with 90% confidence intervals. Error levels used correspond to predicted average values for the technology group.

Exhibit J-2
Descriptive Statistics for Variables Included in Final Model

Variable	N	Mean	Std	Min	Max
NO_PLANS (0,1)	407	0.763	0.416	0	1
WAIT_NO_PGM (years)	304	7.505	5.083	0	20
STD_EQUIP (0,1)	422	0.246	0.421	0	1
PERIOD_AFTER_AWARE [ln(weeks)]	409	-3.437	7.120	-14	4
FREE_RIDE (0,1)	431	0.116	0.314	0	1

Source: Telephone Survey Data

J.8 Descriptive Statistics

All but one of the independent variables in the model are continuous. Mean values for dummy variables are the percentage of customers reporting, "yes," or otherwise responding affirmatively.

As shown in Exhibit J-2, many customers mentioned that they were not even in the market for lighting products when they were approached about the program (NO_PLANS = 76%). Further evidence that the program is contractor driven is provided by the retrofit plans of program participants: customers on average would have waited over 7 years to replace their lighting equipment. Consistent with these results is a low univariate self-reported free ridership rate: according to question FREE_RIDE, fewer than 12% of the sample members were classified as free riders.

Exhibit J-3
Final Model Results

Unweighted

Variable	B	SE	Wald Chi-Square	P
NO_PLANS	-0.9210	0.5003	3.3888	0.0656
WAIT_NO_PGM	-0.1982	0.0534	13.7665	0.0002
STD_EQUIP	-0.7028	0.5713	1.5133	0.2186
PERIOD_AFTER_AWARE	-0.0555	0.0316	3.0713	0.0797
INTERCEPT	-0.5377	0.4515	1.4185	0.2336
N	257			
-2LLR	26.018			
P	0.0001			

Weighted

Variable	B	SE	Wald Chi-Square	P
NO_PLANS	-0.5787	0.5256	1.2123	0.2709
WAIT_NO_PGM	-0.2247	0.0625	12.9201	0.0003
STD_EQUIP	-0.4777	0.5758	0.6884	0.4067
PERIOD_AFTER_AWARE	-0.0431	0.0340	1.6044	0.2053
INTERCEPT	-0.8329	0.4647	3.213	0.0731
N	257			
-2LLR	23.598			
P	0.0001			

Source: Telephone Survey Data

J.9 Model Results

Results shown in Exhibit J-3 show the logisitic regression coefficients (B), their standard errors (SE), Wald Chi-Square values[5], and the probability associated with the parameter estimate for each variable included in the model. All variables retained in the final unweighted model were significant at the p<.10 level, except STD_EQUIP which was marginally significant. The overall weighted model-2 log-likelihood ratio, a measure of goodness-of-fit, was 23.60, with four degrees of freedom (p<.0001). This indicates a statistically significant model. Data contributed to the final model came from 257 customers, from a possible 440 customers. As stated above, we elected to run the model with fewer data points rather than drop interesting variables with higher percentages of missing data. As with all behavioral models, results should be considered provisional and viewed in context. Cross-validation of the model on a separate dataset would test the reliability of the model in predicting free ridership and help strengthen conclusions.

All variables showed effects in the direction predicted (see *Section 3,* pages 3-38 and 3-39 of the report). The natural logarithm of PERIOD_AFTER_AWARE (PERIOD_AFTER_AWARE_LN) term showed a monotonic effect, with the probability of being a free rider decreasing as the amount of time to reach a decision to participate increased.

J.10 Predicted Free Ridership

Model results were used to obtain probabilities of free ridership for each lighting technology group. These probabilities were calculated in SAS using Proc Logistic. The probability of being a free rider, for any given technology group is

$$\hat{p} = \frac{e^{bX}}{1 + e^{bX}}$$

where *b* is a vector of regression coefficients and *X* is a vector of mean values for the different explanatory variables. A probability for free ridership was assigned to each technology group by calculating the mean values for all the independent variables included in the model, for that technology group. These were then multiplied by their respective regression coefficients to yield the term “bX”. This term was exponentiated and the ratio of $e^{bX}/(1+e^{bX})$ formed the predicted probability of free ridership for each technology group. These were then combined with spillover estimates (as described in *Section 3*) to yield NTG ratios.

[5] analogous to a t statistic

Appendix K

GROSS ENERGY AND DEMAND IMPACTS BY COSTING PERIOD

Appendix K

SUMMARY OF GROSS PROGRAM IMPACTS BY COSTING PERIOD

Unadjusted program gross demand and energy impacts are summarized by time-of-use (TOU) costing periods in Exhibit K-1, yielding important H-factor information in support of Pacific Gas and Electric Company's (PG&E's) cost-effectiveness calculations. The following hours were selected from the PG&E costing periods when generating demand figures:

- Summer on-peak is defined as the weekday hour 3:00 PM to 4:00 PM.
- Summer partial-peak is defined for two distinct weekday hours: 11:00 AM to noon, and 6:00 PM to 7:00 PM.
- Summer off-peak is defined as the weekday hour 8:30 AM to 9:30 AM. To estimate this impact for this hour, a mean impact was generated using the hours 7:00 AM to 8:00 AM, and 8:00 AM to 9:00 AM.
- Winter partial-peak is defined as the weekday hour 5:00 PM to 6:00 PM.
- Winter off-peak is defined as the weekday hour 8:30 AM to 9:30 AM. To estimate this impact for this hour, a mean impact was generated using the hours 7:00 AM to 8:00 AM, and 8:00 AM to 9:00 AM.

The results presented in Exhibit K-1 were generated using evaluation program impact estimates for every hour in a year (8,760 hours). In general, the estimates provided are based upon only those specific hours that comprise a particular row (or costing period) in the exhibit. Whether demand or energy, the impacts presented reflect all contributing hours during that period, a mean or total, respectively. The following describes in greater detail how each column in the exhibit was calculated using evaluation impact results:

- Program gross unadjusted kW impacts are presented in the first column for a single specified hour of the day. In all cases, the hour specified occurs on a weekday. Each impact is the mean impact for a particular hour of the day, across all contributing days and customers. To achieve this, customer- or measure-specific mean estimates were taken across all contributing days; these intermediate mean estimates were then summed across all contributing customers and / or measures.

- The second column, the kW adjustment factor, is the ratio of each program demand impact (column 1 kW savings) to the summer on-peak demand estimate.
- The third column, kWh savings, is the sum of all hourly impacts during each costing period for all applicable daytypes. Note that some costing periods only contain weekdays, while others include both weekdays and weekends. The sum of all contributing rows is equal to the annual program impact.
- The fourth column, kWh adjustment factor, is the ratio of each program energy impact (column 3 kWh savings) to annual total energy savings.

Exhibit K-1
Gross Demand and Energy Savings by Costing Period
For COMMERCIAL Indoor and Outdoor Lighting Measures

PG&E Cost Period	INDOOR Lighting				OUTDOOR Lighting			
	Program kW Savings Coin. with System Max in Period	kW Adjustment Factor	kWh Savings	kWh Adjustment Factor	Program kW Savings Coin. with System Max in Period	kW Adjustment Factor	kWh Savings	kWh Adjustment Factor
Summer On-Peak: May 1 to Oct. 31 12:00 - 6:00 PM Weekdays	62,389	1.00	48,148,944	0.16	782	1.00	782,958	0.04
Summer Partial Peak: May 1 to Oct. 31 8:30 AM - 12:00 PM Weekdays	63,075	1.01	27,823,952	0.09	1,884	2.41	857,913	0.05
Summer Partial Peak: May 1 to Oct. 31 6:00 PM - 9:30 PM Weekdays	41,847	0.67	15,178,433	0.05	502	0.64	832,926	0.05
Summer Off-Peak: May to Oct. 31 Other	46,227	0.74	72,952,950	0.24	2,030	2.59	6,628,869	0.37
Winter Partial Peak: Nov. 1 to April 31 8:30 AM - 9:30 PM Weekdays	47,804	0.77	79,112,554	0.26	933	1.19	2,436,030	0.13
Winter Off-Peak: Nov. 1 to April 31 9:30 PM - 8:30 AM Other	41,394	0.66	61,163,621	0.20	2,030	2.59	6,519,670	0.36

Appendix L

EX ANTE NET-TO-GROSS RATIOS

Appendix L

EX ANTE NET-TO-GROSS RATIOS

The attached print-outs list the net-to-gross ratios that are being applied in the MDSS as a function of the business type, the application (indoor vs. outdoor), and the technology. Also listed is the frequency of occurrence.

These are enclosed to document discussions of varying MDSS net-to-gross ratios in *Sections 4* and *5* of the main body of the report.

Appendix M

COMMERCIAL REFUSAL COMMENTS

Appendix M

RE/CUSTOMIZED PROGRAM PARTICIPANTS: REASONS FOR REFUSING THE SURVEY

The following pages present comments made by participants at the time they refused to participate. The comments begin on the top half of the page and, if necessary, continue on the bottom half of the page under the same observation (OBS) number.

OBS	COMMENT1
1	PREFERS NOT TO SPEND A LOT OF TIME ANSWERING QUESTIONS, PREFERS TO*
2	THE OTHER DATA SETS WERE ON CATI 12 AND IT WAS CODED AS A PARTIAL
3	They liked the program very much except for the long survey at**MYT
4	SEE QC 50 FOR THE COMMENTS
5	Bruce was getting irate about the questions asked because**DET
6	Susan says that survey is too long and really can't take the time t
7	VIRGINIA NEVER ASKED HOW LONG IT WOULD TAKE WHEN I CALLED BACK SHE*
8	Trish at Marin Office for DCOMP and Tom Tantriella for TCOMP**JRJ**
9	did not really want to answer any more questions, but did; had a**C
10	THAT ASKING ABOUT ST #A WAS POINTLESS, IT'S SMALL PART OF FACIL.**J
11	Mr. R was irritated w/ c/b, thinking he'd completed it already**JRJ
12	PHS is happy with PG&E's services but does not have time to**MYT
13	Trudy did part, got started, then was interupted, said to c\b**SGW
14	(6-21)Mr. Singh wants hardcopy to complete survey, stopped @**REJ
15	Mr. Singh had difficulty understanding the questions;had customers*
16	Need to completed TCOMP section.-gv--**REJ
17	Matthew Duran got to sc. 88 before he refused to continue.
18	Mr. Clark didn't know exactly when the work was done,**REJ
19	Mr. Respini stated that the questons were to personal did not care*
20	Ted said that "you're just gonna have to live with that" he has no*
21	Mr. Yablon said he was very happy w/ his metal halide lights and th
22	he does not want to continue.**CG
23	completed decision maker questions w\Tom Ritter. He didn't know**RE
24	Tim did LCOMP referred us to Comptroller Jan Petersen for rest**JRJ
25	**CG

OBS	COMMENT2
1	DO WORK. STOPPED AT SCREEN 47.**CJG
2	REFUSED ON THAT CATI.
3	the end...suggest to cut down on length of survey*
4	
5	he insisted that they do not qualify b/c are multi tenant.**DET
6	o finish it. She apologizes but suggests a 10 min. survey.**HEM
7	SAID IT HAD BEEN L0NG ENOUGH ALREADY.**CG
8	**JRJ
9	skip problem. ***KAY Survey seems to have stopped at screen 80.**SG
10	MAILED SURVEY. DO *NOT* CALL THIS GENTLEMAN BACK.**JTM
11	Requests we not call again, he "has no time"**JRJ
12	complete survey***MYT
13	CALLED BACK, SHE REFUSED TO CONTINUE BECAUSE "TOO MANY QUESTIONS".*
14	sc 47. ***REJ
15	wanted a print out of the rest of the questions**REJ
16	lcomp not complete, but John was very irritated 2 being called(SC2)
17	
18	and didn't have time to complete the survey**REJ
19	to continue.**JS
20	more time to spend on this***MYT
21	e good PR but has no time for a phone survey.SC34***JRJ
22	**CG
23	who good tech contact would be.
24	Jan said they are moving so a survey is not helpful at this time**J
25	**CG

OBS	COMMENT1
26	see qc 358 for the comments
27	The survey skipped to the on-site scheduling, when only the "DCOMP"
28	Left off on screen 87. Gary will NOT call 800 # to continue survey.
29	Mr. Holtzinger became very agitated at the financial questions**REJ
30	he said that he is a very BUSY man.***MYT
31	refused to continue fr sc35
32	MR. MOHAMED STARTED SURVEY STOPPED ON SCR. 28 HE COULDN'T UNDERSTAN
33	Started w\Mr. Anast. He had some difficulty understanding the**REJ
34	DID NOT WANT OT FINISH SURVEY FELT ? WERE IRRELEVANT. BECAUSE HE ON
35	mr. stanhor got to scr. 91 and decided to stop the survey said that
36	Johanna completed decision making and lighting ques..for technical*
37	the Office Manager completed 1&2; said Dr. Williams didn't take
38	Dr. Liebowitz does not wish to give more time to the survey. Got to
39	doctor does not want to continue the survey**CG
40	see msfd293 for the comments.
41	completed first 2 sections w\Mr. Tom; there is no contact for
42	DID NOT HAVE TIME TO COMPLETE SURVEY.**ALS
43	Terry Turner sounds irritated and didn't want to go on b/c he did**
44	GREG COMPLETED PART OF THE SURVEY,WAS INTERESTED IN FINISHING THE**
45	He's too busy today to do survey so he suggested that we call until
46	Mr. Baker says they just redid the lighting again through PG&E &**J
47	REFUSED TO COMPLETE SURVEY**LMC
48	he said that he could answer the questions for the descision makein
49	HE DOES NOT WANT TO DO THE SURVEY AT ALL..**CJG
50	mr olson stated that he didn't have time for a survey and will

OBS	COMMENT2
26	
27	section was competed.**KAY On-Site Refused, so its a PARTIAL...**KA
28	No time; refused to continue: PARTIAL.
29	Had to T&T stopped @ sc 32**REJ
30	**MYT
31	
32	D ENGLISH TOO WELL.**RRF
33	questions, had to leave. did not want c\b**REJ
34	LY PURCHASED A FEW LIGHT BULBS.**ALS
35	it was entirley too long and how did we expect someone(see scr. 2)*
36	call Rona Griego @ (714)721-8000***MYT left 800# on machine***MYT
37	ph calls. therefore don't c\b.**REJ
38	screen 88.**BB
39	**CGthe secretary scolded me**CG
40	do not call.**DSH
41	tech questions.***REJ
42	
43	not know the answers to some questions***MYT
44	OTHER HALF BUT JUST HAS NO TIME SO SEND HIM A HARD COPY.**DET
45	we catch him w/some time to spare.**HEM Refused on 6/13***HEM
46	says this survey is just "flogging a dead horse"**JRJ
47	
48	g part but there is no one else for the other sections of the surve
49	
50	never have time for one.

OBS	COMMENT1
51	MRS. CALVERT SAID THAT SHE DON'T THINK THEY WOULD HAVE MUCH INFO. T
52	Wasn't interested in doing a survey that takes so long b/c he is a*
53	adele refused to do survey b/c she said that she doesn't have time*
54	spoke w\Chuck Carpenter, who was dissatisfied with PG&E and**REJ
55	see qc 114 for comments**
56	Dave said that he's sure that he had already completed this**MYT
57	see qc 114 for comments**
58	Martha said she does not have the time, she has three children and
59	see qc 114 for comments**
60	MR. KIMBALL KEPT SAYING HE REMEMBER GETTING A REBATE AND DOING**CJG
61	see qc 114 for comments**
62	Mr. Calatto (owner of building) was not interested in doing the**HE
63	Refused b/c she can't take that much time out of her day to answer*
64	Charlaotte says her boss does not want her to complete the survey**
65	Mr. Bal said that he is too busy and refuses to take survey**MYT
66	MR. SEILER SAID THAT HE DOSEN'T LIKE TO DO THINGS OVER THE PHONE
67	see qc 114 for comments**
68	Liked the program and would do the survey if we can consolidate it*
69	Lou said that they have already done the survey***MYT
70	Said he's busy and does not want to participate in a survey**MJP
71	1st # is wrong. Sec said Doug is volunteer, send something in the**
72	ty shettron is no longer with the company and mary hunter took his*
73	BUNNIE JUST DOESN'T HAVE THE TIME TO DO ANY SURVEYS.**JGP
74	Office mgr said she would never have the time to do a survey**MJP
75	see qc 42 for the comments.**DSH

OBS	COMMENT2
51	O HELP US OUT BECAUSE THEY ARE A SMALL FIRM**RRF
52	one man show at this address.**HEM
53	
54	refused survey**REJ
55	
56	survey.**MYT
57	
58	is just too busy.
59	
60	THE PAPER WORK, BUT HE CLAIMS THERE IS NO ONE TO DO SURVEY.**CJG
61	
62	survey. Ezekiel Contreras referred us to Mr. Calatto for info.**HE
63	questions.**HEM
64	please send hard copy**JRJ
65	
66	AND JUST ended the call
67	
68	to a 1 minute survey.**HEM
69	**MYT
70	
71	mail & he'll get it.**REJ
72	place and stated that she had no time and didn't know (see scr 2)**
73	**JGP
74	
75	

OBS	COMMENT1
76	refused b/c he was too busy to participate***MYT
77	LOGGED ON TWICE BY MISTAKE CHUCK DECLINED TO DO THE SURVEY IT WOULD
78	John said "I don't have 15 min for a survey."
79	see qc 114 for comments**
80	see qc 114 for comments**
81	see qc 114 for comments**
82	Kathy said she didn't have time, they have just two lines, and**REJ
83	CHARLES YOZSA HAD A STROKE AND CANNOT SUCCESSFULLY COMPLETE THE SUR
84	DO NOT CALL BACK. STATED HE DID SURVEY WITH ANOTHER COMPANY.**SMB
85	Mr.Lucke said he had no time for survey He had already completed**R
86	DO NOT CALL HIM BACK; HE SAID HE WAS ALREADY CONTACTED BY ANOTHER**
87	DON NOT CALL BACK. STATED HE ALREADY DID A SURVEY WITH ANOTHER**SM
88	DO NOT CALL BACK. STATED HE DID THE SURVEY WITH ANOTHER**SMB
89	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
90	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
91	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
92	GARY SAID "I DONT DO SURVEYS THAT LONG OVER THE PHONE" THAK YOU**CG
93	ms. kimber didn't want to participate in the survey, she was too**D
94	DO NOT CALL. HE STATED THAT HE DONE A SURVEY WITH ANOTHER COMPANY.*
95	He isn't interested and claims that he has already participated in*
96	Asked who is paying for survey, when told it was for PG&E he refuse
97	This is a pager #, not an answering machine.**DT**DT
98	busy no time to do survey**LMC
99	larry does not have time to answer questions at all**KYS
100	DO NOT CALL. HE HAD STATED THAT HE HAD DONE A SURVEY WITH ANOTHER**

OBS	COMMENT2
76	**MYT
77	TAKE TO LONG.**CG
78	
79	
80	
81	
82	she'd preffer that we send the survey through the mail**REJ
83	VEY**JGP
84	
85	one survey, didn't want to be involved in another**REJ
86	COMPANY WHO DID A SURVEY WITH HIM THIS MORNING.
87	COMPANY
88	COMPANY.**SMB
89	
90	
91	
92	
93	busy.**DSH
94	
95	this survey.**HEM
96	d to take survey or offer explanation for his refusal**MJP**MJP
97	Mr. Mannina, Sr declined to answer most questions, then terminated.
98	
99	**KYS
100	COMPANY.**AD

OBS	COMMENT1
101	see qc 376 for comments**
102	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
103	mr. WATSON SAID that THEY HAVE LIGHTING CONTRACTORS THAT DO SURVEYS
104	Mickie says they've just started their harvest season and will have
105	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
106	DO NOT CALL. HE STATED THAT HE HAD DONE A SURVEY WITH ANOTHER COMP.
107	SAID THAT HE'S NOT INTERESTED IN DOING SURVEY, HE SAID THAT HE'S**R
108	DO NOT CALL. HE STATED THAT HE HAD DONE ANOTHER SURVEY WITH ANOTHER
109	see qc 81 for the comments**
110	DO NOT CALL. HE STATED THAT HE HAD DONE ANOTHER SURVEY WITH**AD
111	DO NOT CALL. HE STATED THAT THEY HAD DONE A SURVEY WITH ANOTHER**AD
112	too busy, pg&e has surveyed him very recently, not us., he thinks
113	Pete was in a serious hurry. refused oral survey, wanted written**R
114	see qc 114 for comments**
115	see qc 114 for comments *****
116	MR. ZIEGLAR PREFERS NOT TO ANSWER ANY QUESTIONS.**CJG
117	see qc 114 for comments**
118	see qc 114 for comments**
119	John said he did not have time after I told him it would take 20-25
120	DO NOT CALL BACK. HE STATED THAT HE DID SURVEY WITH ANOTHER COMP.*
121	Said she had taken survey and didn't feel it applied to her, so ref
122	Chuck refused after I told him it would take 20-25 min.
123	Jim Hamlin is no longer there, manager that was there knew nothing
124	bob does not do surveys**JGP
125	SHE FEELS THAT IT IS JUST TO MUCH TIME (ABOUT 20 MIN. OR SO) TO

OBS	COMMENT2
101	
102	
103	FOR THEM AND THAT HE REALLY DIDN'T THINK THAT THEY(SEE SCR. 2)**DSH
104	no time for a survey until late NOV or DEC**JRJ
105	
106	
107	VERRY HAPPY WITH PROGRAM.**RRF
108	COMPANY.**AD
109	
110	ANOTHER COMPANY.**AD
111	COMPANY.**AD
112	
113	one***REJ
114	
115	
116	
117	
118	
119	min.
120	
121	used.**MJP
122	
123	about program.**DET
124	**JGP
125	TAKE UP ANSWERING QUESTIONS.**CJG

OBS	COMMENT1
126	DO NOT CALLBACK. STATED THAT HE DID SURVEY WITH ANOTHER COMPANY.**
127	DO NOT CALL BACK. STATED HE DID SURVEY WITH ANOTHER COMPANY**SMB
128	He's hard to get a hold of so I left the 800#. Piero is the buildi
129	LARRY SAID THAT HE HAS ALREADY DONE A SURVEY REGARDING THE LIGHTING
130	Bob Lycette recomended Jenny Scarlet who refused the survey because
131	Spoke to Brett who said he couldn't spend 20 minutes on a survey.**
132	mr. webb stated that he was just too busy at the time so he chose t
133	MS. UNDERWOOD PUT ME THROUGH TO A WOMAN NAMED IRENE. doesn't have t
134	Carl says he already did a survey on this and hasn't had any new li
135	Irene said she wants a survey in the mail, but is not willing to
136	JAN SAID THAT THE SURVEY IS ENTIRELY TOO LONG BUT SHE DID HAVE A
137	PAM ABRUPTLY ended the call AND STATED THAT SHE WAS NOT INTERESTED IN**KAY
138	Refused to take a survey for 20 min even if done in parts**MJP
139	Kim said it would be impossible to do survey on ph, but if we**REJ
140	MAUREEN SAID SHE DOES NOT HAVE 15 MIN.SHE SAID THERE WAS NO GOOD TI
141	JOHN WAS BUSY. HE SAID IT TAKES TOO MUCH TIME & TIME IS**JLG
142	MAGNUS SAID HIS CO. WAS TO SMALL. REFUSED TO DO SURVEY.**KAY
143	CONNIE SAYS SHE HAS CUSTOMERS ALL DAY AND DOES NOT HAVE THE TIME TO
144	Mrs. Theile stated that its a small business and they do not have t
145	BEFORE I COULD EXPLAIN WHO I WAS CALLING FOR HE SAID HE WAS ALL**KY
146	I ONLY HAVE ONE SET OF LIGHTS AND DONT CARE TO PARTICIPATE.**CG
147	Mr. Olivera had already done this survey with another interviewer**
148	Mr. West refused to do the evaluation on the phone b/c he can not**
149	Mary Lou not in, new secretary doesn't know her schedule**JRJ
150	joe's out of town today will be back in tomorrow morning.**DSH

OBS	COMMENT2
126	
127	
128	ng manager.**HEM SECT'Y SAID HE GOT THE MESSAGE. WAIT A WHILE,C/B.*
129	RETROFIT WITH SOMEONE ELSE..AND DOENS'T WISH TO DO THIS ONE.**MYT
130	she did not have 20-25 min.
131	
132	o decline the survey.**DSH
133	time until Sept--refused***lmc**LMC
134	ghting done since that survey**JRJ Mistaken entry**156
135	complete the survey over the phone.
136	GOOD DISPOSITION.
137	DOING THIS SURVEY***KAY
138	
139	send her something, she'd gladly fill it out**REJ**REJ
140	ME TO CALL HER BACK**CG tried to find someone else no luck**CG
141	MONEY. DID NOT WANT TO CONTINUE.
142	
143	DO THE SURVEY**JGP
144	he 20-30 min. They are assisting customers.**JMS
145	TAKEN CARE OF AND ended the call**KYS
146	**AD
147	so he refused to do this one because it would be a repeat***MYT
148	stay on the phone that long,he said to send him hard copy, (sc2)**M
149	Mary did not know date of installation & refused to continue****KAY
150	husan said whats the big deal we changed the lights goodbye**CGH

OBS	COMMENT1
151	Mike doesn't "that kind of time" and refused to do survey***MYT
152	mr. seiler refused to do the survey. his reasoning was that he
153	Mr.Simmons said,'that he does not have the time now or in the futur
154	sec. stated he didn't have any time to answer questions.**DSH
155	Subash Rane (mngr) claims he completed the survey yesterday.**JRJ
156	SAID THAT 20 MIN. ON THE PHONE IS TOO EXCESSIVE AND HE WOULD HELP**
157	SEE QC 379 FOR THE COMMENTS**DSH
158	Mr.Carpenter did not want to be bothered.**JMS
159	SAYS THAT HE HAS NO TIME TO PARTICIPATE IN THE SURVEY.****KAY
160	HE COULDN'T DEVOTE THE TIME TO THE SURVEY. IF WE SEND HIM SOMETHING
161	Lee Lohff said he could't think of a more conveinent time, sounded
162	HE SAID THAT HE REALLY WANTS TO HELP BUT HE RUNS HIS OWN BUSINESS**
163	SCOTT SAID HE DOESN'T HAVE TIME TO ANSWER QUESTIONS HE SAID WE CAN*
164	MR. RALPH SAID HE WASN'T INTERESTED**RRF
165	MR. WALKER STATED THAT 15 MINUTES OR SO IS ENTIRELY TOO LONG AND
166	MR. MELVIN WAS VERY BRASH AND STATED THAT HE DOSEN'T HAVE TIME AND
167	SEE QC 160 FOR THE COMMENTS
168	SEE QC 48 FOR THE COMMENTS**
169	SEE QC 406 FOR THE COMMENTS**DSH
170	Call correct number first if no answer call this number**JMS
171	dan seemed upset b/c the retrofit program went bad...had to replace
172	"We're too busy to do a telephone survey," said Fran.
173	THEY DO NOT HAVE TIME TO DO SURVEY**JGP
174	GREG asked if HE HAD TO PATICIPATE I SAID NO SO HE DECLINED**CG
175	NEW MANAGEMENT KNOWS NOTHING ABOUT THE PROGRAM**JGP

OBS	COMMENT2
151	
152	dosen't "do survey's over the phone" and ended the call**DSH
153	e to take time for the survey.**JMS
154	
155	**JRJ
156	US IF WE MAILED HIM SOMETHING**LDB
157	
158	
159	
160	IN WRITING HE WILL DO IT.**LDB
161	testy. this is a refusal, per Dante.
162	AND HAS A NEWBORN BABY HE JUST DOES NOT HAVE ANY TIME**JMT**JMT
163	SEND HIM SOMETHING IN THE MAIL**KYS
164	
165	THAT HE WILL NEVER HAVE THAT MUCH TIME, SO HE DECLINED THE SURVEY
166	WILL NEVER HAVE TIME AND ended the call.
167	
168	
169	
170	(510) 475 0481**JMS Not interested she refused.**JMS
171	20% of ballasts w/in 1st yr of retrofit...refused to do survey.**MY
172	
173	**JGP
174	
175	**JGP

OBS	COMMENT1
176	secretary said, "to be honest, Randy just won't do it."**MYT
177	Mr. Harless says he is happy with the program and his PG&E rep, but
178	ms. forbes said that someone else already contacted her with a
179	Mr. Walker said he wasn't interested**REJ
180	was not interested in taking survey.**ALS
181	Not eligible for survey. See sc 2 for comment**REJ
182	Mr. Pierre didn't "want to spend any mor time on this".
183	SEE QC 96 FOR THE COMMENTS
184	mr. becker said that he already did a survey for one of his sights
185	SEE QC 406 FOR THE COMMENTS
186	see qc 78 for the comments
187	spoke w\Mrs Muenter, who said "this is a retail business, we're
188	see qc 78 for the comments
189	SEE QC 476 FOR THE COMMENTS**
190	ans machine**LMC moving location & will be unable to do survey, sai
191	ROY BEGAN THE SURVEY KNOWING HE COULD JUST SPARE AROUND 10 MIN. ROY
192	SEE QC 160 FOR THE COMMENTS
193	SEE QC 406 FOR THE COMMENTS
194	MR. BAKER DIDN'T WANT TO DO A SURVEY BECAUSE HE WOULD HAVE TO DIG
195	Ernie felt the survey was a waste of time. He refused interview.
196	FEELS HE HAS DONE TO MANY SURVEYS ALREADY DOES NOT CARE TO PARTICIP
197	MR. BURGESS said that pg&e already sent him out a lenghty questiona
198	Laura says no one there would have the time or inclination to do
199	DIDN'T KNOW WHEN LIGHTING WAS INSTALLED - SUGGESTED WE "PASS" ON
200	he said that he has a million people from electrical companies call

OBS	COMMENT2
176	**MYT
177	has no time for a survey**JRJ
178	survey regarding her lights. so i coded it as a refusal**DSH
179	
180	**ALS
181	**REJ
182	
183	
184	so he didn't want to participate.
185	**DSH
186	
187	very busy, send a questionaire and I'll try to fill it out."
188	
189	**DSH
190	d it was ok to call in July when relocated**KAY**KAY
191	DID NOT KNOW WHEN THE LIGHTING WAS INSTALLED. THANKED AND TERM.**AD
192	
193	
194	UP ALL THE INFO ON THOSE LOCATIONS AND HE DIDN'T HAVE TIME.
195	see sc 2 for comment*
196	ATE.**CG
197	ire and he feels as though he's done enough as far as this program.
198	the survey, so just " take us off your list."
199	DOING SURVEY WITH THEM.
200	ing him about surveys and he just does not have the time**JMT

OBS	COMMENT1
201	do not call.**CG
202	I spoke to Callie and she just didn't have enough time at the**CJG
203	**CG
204	Sam is extremely happy with the program but refuses to do the surve
205	Mr. Coyle says he has no time for survey**JRJ
206	**DSH
207	SEE QC 476 FOR THE COMMENTS**
208	this was a multi site but you should see qc 65 it is a refusal; .
209	I WAS TOLD THAT NO MS.WINTERS WORKS THERE. THE LADY THAT I WAS SPEA
210	SEE QC 160 FOR THE COMMENTS
211	MS. CLARK SAID SHE DOESN'T HAVE TIME FOR THIS AND ended the call**RRF
212	SEE QC 160 FOR THE COMMENTS**DSH
213	MS.SPENCER SAID THAT THE PERSON WHO HAD THE PROG. INSTALLED NO LONG
214	SEE QC. 407**CG
215	GAVE SECRETARY 800 NUMBER FOR THE NEW CONTACT MAGGIE TONINI.
216	JERRY SAID THAT "I DO NOT DO PHONE SURVEYS" THEN ended the call***CG
217	**HEM
218	Mr. Morgan is brand new in job, doesn't know anything about program
219	hard man to reach b/c he is in between 6:45 and 7:15 only then he**
220	HUGE CUTBACKS IN PERSONEL JUST NO TIME**CG
221	CHARLES MEADORS DIRECTOR HAS 800 NUM**CG
222	Spoke to her. She said she has other surveys from salespeople, so I
223	SEE QC.200**CG
224	SEE QC. 200
225	SEC. SAID THAT HE TOLD HER TO TELL US THAT HE IS JUST TOO BUSY TO**

OBS	COMMENT2
201	
202	moment to complete survey.**CJG
203	mr.jenson was short with me and did not have 20 mins..**CG
204	y over the phone.Wants me t send hard copy.
205	**JRJ
206	**DSH
207	
208	Do Not Call Ross Stores. ***DSH
209	KING TO SAID THAT SHE WAS NOT INTERESTED AND ended the call.**CJG
210	
211	
212	
213	ER WORKS HERE AND GO TO SCR. 2 FOR MOR INFO.**RRF
214	
215	MAGGIE CALLED BACK AND SAID I HAVE NO TIME**CG
216	
217	**HEM
218	refused**LMC
219	roams around the different job sites..left 800# with sec***MYT
220	
221	OUR SURVEY IS WRITTEN IN SUCH A WAY THESE PEOPLE WANT A CONFERENCE
222	told her we weren't selling anything, but she still refused.
223	
224	
225	COMPLETE A PHONE SURVEY AT THIS TIME**JMT

OBS	COMMENT1
226	**
227	CLAIMED TO HAVE COMPLETED THE SURVEY ALREADY.***MYT
228	ext 219**CGH left our 800number on the voice mail**CGH
229	LEFT 800 NUM. WITH HIS SEC.**CG
230	SEE QC 440 FOR THE COMMENTS**
231	AMRIK SAID HE DID NOT HAVE TIME FOR SURVEY.**ALS
232	SEE QC. 442**CG
233	AFTER TELLING PERSON WHO I WAS AND WHAT CALL WAS REGARDING HE SAID
234	SEE QC 442**CG
235	MS. SHANAHAN SAID That she's not interested in doing a survey
236	SEE QC 442**CG
237	SAL SAID THAT HE WAS NOT INTERESTED IN TAKING ANY SURVEY.**ALS**ALS
238	SEE QC 422**CG
239	SEE QC 440 FOR THE COMMENTS**
240	SEE QC 440 FOR THE COMMENTS**
241	SEE QC 440 FOR THE COMMENTS**
242	See QC 14.**
243	CALL BACK LATE NEXT WEEK 7/6 HE ASKED FOR ELSIA'S NUMBER.**CG
244	See QC 14.**
245	SPOKE WITH RUSS HE IS SATISFIED WITH RETROFIT PROGRAM.**ALS
246	SEE QC.402
247	See QC 14.**
248	MR WOOD WOULD NOT EVEN LET ME SPEAK HE WAS HOSTILE AND NOT INTERESTED.**CG
249	See QC 14.**
250	See QC 14.**

OBS	COMMENT2
226	Mr. Omran said he didn't have time for survey.
227	
228	WE DONT DO PHONE SURVEYS IT IS AGAINST OUR POLICY**CG
229	
230	
231	
232	
233	HE HAD NO TIME**ALS
234	
235	**JGP
236	
237	
238	
239	
240	
241	
242	
243	
244	
245	BUT DOES NOT HAVE TIME TO DO SURVEY.**ALS
246	
247	
248	
249	
250	

OBS	COMMENT1
251	See QC 14.**
252	SEE QC. 294**CG
253	See QC 14.**
254	See QC 14.**
255	See QC 14.**
256	See QC 14.**
257	See QC 14.**
258	See QC 14.**
259	See QC 14.**
260	See QC 14.**
261	See QC 14.**
262	See QC 14.**
263	See QC 14.**
264	See QC 14.**
265	call jim wood on friday**CG
266	See QC 14.**
267	THIS PLACE IS A DAIRY QUEEN AND MR. DAYA SAID THAT HE HAS NO TIME
268	MR. ANOMA IS NEVER THERE BETWEEN BUSINESS HOURS (8AM-5PM)***MYT
269	henry said that he didn't understand and was eager to hang up befor
270	**CG
271	Naomi said that she was the only one at the store and doesn't have*
272	HE PREFERS NOT TO DO SURVEY B/C HE IS VERY BUSY***MYT
273	HE SAID THAT HE WAS NOT INTERESTED AT THIS TIME IN DOING A SURVEY.
274	DID NOT HAVE TIME TO DO SURVEY.**ALS
275	HELEN SAID SHE CHECKED INTO THE PROGRAM AND WAS NOT INTERESTED**ALS

OBS	COMMENT2
251	
252	
253	
254	
255	
256	
257	
258	
259	
260	
261	
262	
263	
264	
265	see qc#14**CG
266	
267	TO DO A SURVEY BECAUSE HE HAS TOO MANY CUSTOMERS TO TEND TO.
268	**MYT
269	e i got a chance to explain, he doesn't remember the program**KAY
270	**CG
271	any time to talk on the phone and ended the call b4 I could proceed**MYT
272	
273	**CJG
274	
275	

OBS	COMMENT1
276	CLIFFORD CHOW. COMPANY OWNED STORE**CG
277	they just do not have time to do phone survey**LMC
278	was SATISFIED WITH PROGRAM DID NOT WANT TO DO SURVEY.**ALS
279	Lori said she did not have the time,no time was good.**CG
280	no time, happy with lights**LMC
281	DR. NUCKTON WAS AN EXTREMELY NOT INTERESTED INDIVIDUAL WHO REFUSED IN A LESS
282	SPOKE WITH MR. COSART DID NOT WANT ONSITE VISIT.**ALS
283	sent hard copy and Denise(sec) knows that we need phone survey**ALS
284	DR. FUNK SAID THAT HE REALLY DOESN'T HAVE THE LENGTH OF TIME THIS**
285	**REJ
286	Dr Joseph has asked for hard copy, he has 800 number. do not call**
287	Barbara Barstow, ofc mgr for 191 W. Shaw, call her at corr phone**L
288	cindy office mngr felt like question. were not neccesary for light*
289	C/B SPOKE WITH MR. ROSS SAID HE WAS HAPPY WITH LIGHTS BUT DOES NOT*
290	DOES NOT HAVE TIME TO LOOK IT UP WE SHOULD KNOWTHE DATE SINCE IT IS
291	Calvin refused to do the survey after Itold him it would take 20-25
292	REFUSED--HAD JSUT COMPLETED ANOTHER SURCEY FOR ANOTHER ACCOUNT***LM
293	does not want to be bothered****KAY
294	Mr. patel was confused by the relationship between Quantum & PG&E**
295	Chris said he does not answer questions over the phone,but ended the call
296	Her partner says PG&E refuses to pay for equipment damaged there by
297	MR. PATEL SAID THEY DID NOT PATICIPATE.**CG
298	only vaguely remembers participating, but claims that he wouldn't k
299	Mr. Onaga wants PG&E call him direct, & ask him the questions.
300	John Randall has replaced Marv Samuelson.**BB john knows nothing ab

OBS	COMMENT2
276	**CG
277	**LMC
278	
279	**CG
280	**LMC
281	THAN POLITE FASHION
282	
283	SEC SAID THAT DR. LEY THREW OUT THE HARDCOPY & DID NOT HAVE TIME**K
284	REQUIRES HE HAS ALOT OF PATIENTS HE'S A VERY BUSY DOCTOR**RRF
285	Dr. Don said he had no time for survey**REJ
286	him back--no time to do phone survey.**LMC
287	BARBARA SAID THAT THEY DO NOT DO ANY TELEPHONE SURVEYS*************
288	program and refused to answer anymore.**ALS
289	HAVE TIME FOR SURVEY.**ALS
290	ON THE APPLICATION FOR THE REBATE**CG
291	min.But He wants a hard copy.
292	
293	
294	he declined survey**REJ
295	before I could offer to send a hard copy.
296	bad voltage. Says until PG&E makes good, don't wish to do survey.**
297	
298	now adequate info to answer survey questions, so don't cb****KAY
299	
300	out stockton location, he couldn't refer me to another contact t&t*

OBS	COMMENT1
301	RON SAID HE DID NOT HAVE TIME IT. AND ended the call.**ALS
302	HE SAID THAT HE JUST WILL NEVER HAVE 20 MINUTES TO CHAT ON THE PHON
303	sharon said that she didn't have time to answer a 20minute survey
304	MR. JOHN HANSEN DID NOT WANT TO DO THE SURVEY***ALS
305	BEFORE I SAID WHAT I WAS CALLING ABOUT SHE SAID THAT SHE WASN'T
306	BEFORE I HAD A REAL CHANCE TO EXPLAIN HE SAID THAT HE HAD NO INTERE
307	SENT A HARD COPY**CG
308	ANNA SAID SHE WAS NOT INTERESTED IN ANY MANAGEMENT, WHEN I TOLD HER
309	MR. BORODKIN SAID HE WAS NOT INTERESTED.**ALS
310	BOB SAID HE IS SHORT STAFFED.I GAVE HIM OUR 800# FOR HIM TO CALL US
311	MR. HARPERS SEC. STATED THAT HE SAID HE WAS NOT INTERESTED IN DOING
312	WAS NOT INTERESTED IN DOING SURVEY. REFUSED............
313	JOEL SAID THAT HE DID ONE ALREADY AND ended the call.**DET
314	said that that would be too much time on the phone to do a
315	DID NOT HAVE TIME TO DO SURVEY.**ALS**ALS
316	HE SAID THAT HE WILL NEVER HAVE TIME TO DO A TELEPHONE INTERVIEW
317	**ALS
318	Les said he does not have 20-25 minutes to give me, and that he nev
319	WAS SATISFIED WITH RETRO LIGHTS BUT DID NOT HAVE TIME FOR SURVEY.**
320	Jean said that she'd contacted PG&E & she was sent the form
321	no time ever**LMC
322	MUST CALL ON THE 11TH AT 1PM**CG
323	JOE SAID HE IS NOT INTERESTED IN ANSWERING ANY QUESTIONS. HE ALSO**
324	MR. DOUGLAS SAID THAT A GUY FROM PG&E IS COMING OUT TODAY THEIR PLA
325	Mr. Hughes wants his PG&E acct. rep to verbally give him**REJ

OBS	COMMENT2
301	
302	E NOT EVEN IN SEGMENTS**JMT
303	**KAY
304	
305	INTERESTED AND ended the call.
306	ST **JMT**JMT
307	
308	IT WAS JUST A SURVEY SAID SHE HAD NO TIME.**D
309	REFUSAL.**ALS
310	BACK WHEN HE HAS TIME. CHECK ABOVE INFORMATION.**DET
311	A SURVEY AT THIS TIME.
312	
313	**DET
314	survey so he would rather not participate.
315	
316	BUT HE REALLY APPRECIATES THE PROGRAM**JMT
317	WAS NOT INTERESTED IN TAKING SURVEY.**ALS
318	er will.**DET
319	**ALS
320	to fill out; she has no time for phone survey.**REJ
321	**LMC
322	. . .
323	SAID HE DOESN'T KNOW WHAT I'M GOING TO ASK BUT HE'S NOT INTERESTED*
324	NNING ON DOING SOME MORE RETROFITS--DON'T HAVE TIME TO DO SURVEY
325	survey, he says he has no time for ph survey***REJ

OBS	COMMENT1
326	ART SAID THAT HE DOESN'T HAVE TIME FOR THE SURVEY***ALS

OBS	COMMENT2
326	

Appendix N

NONPARTICIPANT REFUSAL COMMENTS

Appendix N

NONPARTICIPANTS: REASONS FOR REFUSING THE SURVEY

The following pages present comments made by nonparticipants at the time they refused to participate. The comments begin on the top half of the page and, if necessary, continue on the bottom half of the page under the same observation (OBS) number.

OBS	COMMENT1
1	Ms. Woo said she didn't have time to do a survey over the phone. S
2	talked with Annete from NMPC, michael and gary own the building**RS
3	now is not a good time for L. to take the survey and there is no**
4	TECH CALL NEEDS TO BE MADE IN THE AFTERNOON. SCREEN 4**JQS
5	MS. ACUNA SAID SHE REALLY DOESN'T HAVE TIME TO COMPLETE SHE'S REALL
6	MR WANG ANSWERED 3 QUESTIONS, THEN HE SAID THAT HE DIDN'T WANT**MJP
7	CEO Deborah Tarbat refused DCOMP**JRJ
8	THE SEC. TREASURER WAS NO HELP AT ALL HE EVENTUALLY REFUSED TO ANSW
9	REFUSED BY MR HARM**JQS
10	Walt Hoefler went through all of decis. questions, and then**BAC
11	SEE SC2**CLK
12	This may be a 40, but we should talk to Bill Diman to be sure.**JRJ
13	refused**MJP
14	REBECCA THE RECEPTIONIST WAS KIND ENOUGH TO TRY TO ANSWER OUR QUEST
15	modified field more than twice therefore didn't skip appropriately.
16	started w\Vijay, got to sc 66. got cut off there
17	Dave said lighting ques.needs to be directed to the landlord....**M
18	went through some of the survey then refused to finish**LMT
19	Mark (see screen 2) did not want us to continue survey.**BAC
20	Got to sc. 87 with Mike before he said the survey was a waste of**J
21	Jerry Swenson said, "It's terrible that you don't do this by mail.*
22	Evelyn at corp. office said they were not interested.**JCM
23	Did not complete lighting and technical. Was pretty impatient.**CL
24	STARTED DOING SURVEY AND THEN SIS. KATHLEEN EXPLAINED THAT THEY DO*
25	Very nice man who wanted to help, but he is under a lot of pressure

OBS	COMMENT2
1	She requested a hard copy but did not want anyone to call back.**RS
2	
3	better time.**
4	DECISION MAKER ETHAN ALLEN REFUSED TO PARTICIPATE.**JQS
5	Y BUSY STOPPED ON SCR#53**RRF
6	TO PARTICIPATE.---REFUSAL---**MJP
7	at (209) 472-3465 for D/M. Left 800# for them to call.**JCM
8	ER B/C HE THOUGHT WE WERE TRYING TO SELL HIM A SERVICE.
9	**JQS
10	decided he had enough information.**BAC
11	LADY REFUSED, BUT IT WOULD'VE BEEN A #40 ANYWAY.**CLK
12	Maries' answers prompted a 40, but when Mr. Diman confirmed them**J
13	
14	IONS, BUT SHE WAS NOT THE DECISION MAKER AND THE OWNER WAS NOT (SC2
15	.did not c/b for a third time to prevent upsetting Richard***MYT
16	*
17	Landlord is "an unusual fella" and so dave said they have to pass**
18	
19	
20	time.**JCM
21	I'm not interested." Partial, because Betty Souza did Ltg.**JCM
22	
23	**CLK
24	NOT HAVE ANYTHING TO DO W/SCHOOL THE SIS. LIVE AT THIS ADDRESS SCR2
25	and could not find the time. We got to screen 17 and had to stop.

OBS	COMMENT1
26	Was referred to Vuth at the corr. phone # by Barbara at original**R
27	Pam did LCOMP but referred us to the building owner who is the
28	Jim terminated call @ SC69 saying survey was too long**JRJ
29	Mr Sambuceti was somewhat cooperative, but refused to answer ques-*
30	Got through SC40, but Mr. Burns said he'd given us all the time he*
31	Barbara wanted to know why we didn't have "info in our files"**REJ
32	stopped at sc59**JRJ
33	I contacted Mrs. Brooks, she was able to answer some questions but*
34	Called 7/18; afternoon.Did a partial/refused, but lost data due to*
35	Rich is the Manager.
36	D.F. said that since we were calling lots of people he would prefer
37	Tim informed that he was swamped and didn't have the time.
38	Business is being sold.**SGW
39	She didn't have the time to participate and the company is moving.
40	We are very busy and wouldn't have the time to take part in the sur
41	Not interested in doing survey. Refusal.
42	WANTED TO HELP BUT IS TOO BUSY**JQS
43	Secretary said Mr. Roberts is in process of selling business and**B
44	FINALLY REACHED MR COLLINS, FOUND OUT THEY HAVE CHANGED THEIR LIGHT
45	NOT INTERESTED SECRETARY SAID HE WAS NOT AVAILABLE, TRY BACK AT ANOTHER TIME*
46	Woman who answered did not really understand me, and did not**BAC
47	REFUSED**CLK
48	Janet said the company was too small to benefit from PG&E programs*
49	H.P. said he was entirely too busy to participate in any surveys.**
50	Claims that he told previous interviewer he was not interested,**RE

OBS	COMMENT2
26	number. Neither one seemed to know anything, and Vuth wanted F10**
27	PREVIOUS owner of the business (as of april), but he won't talk**JR
28	
29	tions about Decisions or technical questions.
30	was willing to**JRJ
31	She didn't want to continue Stopped @ sc 33**REJ
32	
33	not all, the person to contact is Mr. Harper.**KAR
34	CATI crash**JRJ
35	
36	if we got the information from someone else.**RSD
37	
38	
39	
40	vey.
41	**REZ
42	**JQS
43	building. There is no good time where I could talk to him.**BAC
44	S SINCE 92 BUT HE DID NOT WANT TO MAKE THE TIME FOR THE SURVEY**JQS
45	Brian will have no time, nobody else can answer Q's.**BAC
46	know who I should talk to.**BAC
47	
48	so she did not want to participate in the survey.**RSD
49	
50	but I doubt that... Sounds like he just didn't want to do it.**REZ

OBS	COMMENT1
51	Recept says her company already did this survey a few weeks ago,**B
52	Gale did not give a reason for refusal; she just said she wasn't**R
53	LANGUAGE BARRIER, CLIENT DOES NOT SPEAK ENGLISH**JGP
54	TOO BUSY, NOT INTERESTED**JQS
55	WILL IS DEAD, AND MANAGER SAID "NO" TO SURVEY.**JRC
56	Steve Remmington told me that he did not have time to answer**BAC
57	OLINDA WAS NOT IN; ROBERTO SAID HE DID NOT HAVE THE TIME TO TAKE**J
58	THE WOMAN WHO ANSWERED THE PHONE WAS TOTALLY CLUELESS. SHE DIDN'T**
59	SPOKE WITH THE OFFICE MANAGER. HE WAS NOT INTERESTED IN TAKING PAR
60	"Yes, I'm the person but I don't have time to answer the questions"
61	no reason for refusal given.**RSD
62	refused**JGP
63	Mr. Martin's time is worth 250-300$ per hour and it is ridiculous**
64	NOT INTERESTED SINCE IT DOES NOT DIRECTLY SAVE THEM MONEY**JQS
65	Olivia could not answer the questions and could not give the names*
66	mr. marks CHOSE TO DECLINE THE SURVEY.**DSH
67	she stated that she runs a daycare and will never have time for
68	RESPONDENT DIDN'T HAVE TIME**JQS
69	Ms. Lau was on her way out the door. She didn't think it would be*
70	DIANA IS OUT OF THE OFFICE ALL WEEK AND THE OFFICE IS TOO BUSY TO**
71	call back later; Sharon is on another line**LMC She did another sur
72	jon stated that he really didn't have any time for this. but he sai
73	AFTER 6 RINGS A SULLEN WOMAN ANSWERED AND WHEN TOLD IT WAS A PG&E**
74	office manager**
75	**DSH

OBS	COMMENT2
51	At any rate, refused to answer questions.**BAC
52	interested.**RSD
53	
54	
55	
56	any questions, but "thank you"**BAC
57	PART IN A SURVEY OVER THE PHONE**JQS
58	OF ANYBODY WHO COULD HELP US.**MJP
59	T IN THE SURVEY NOR REFERRING IT TO ANYONE ELSE THERE.**JQS
60	
61	
62	
63	to expect him to do a survey over the phone.**RSD
64	
65	of any contacts.**RSD
66	
67	this, and ended the call
68	
69	worth it for her to participate in survey. Politely refused.**REZ
70	HAVE TIME FOR THE SURVEY**JQS
71	vey a while back and is not going to waste a further 20 minutes now
72	d it in a polite way.
73	SURVEY, SAID "OH FORGET IT"**JQS
74	OVER THE WEEKEND, SHE WAS FIRED. RESPONDENT REFUSED TO TAKE PART**
75	He said that he DIDN'T WANT TO PARTICIPATE. ***DSH

OBS	COMMENT1
76	Spoke to a woman who was VERY defensive toward PG&E. Had all kinds
77	Spoke to a man who said he did not want to spend the time on the**R
78	MR. BORTON stated that he didn't have time and just ended the call.*DSH**D
79	Didn't want to take part in survey because office is very small and
80	1ST # DOES NOT COVER LOCATION IN SAN JOSE. AT 2ND #, THEY WERE BUS
81	Debra said "we don't participate in telephone surveys. Thank you**
82	REFUSED**CLK
83	REFUSED.**CLK
84	NOT INTERESTED AT THIS TIME IN PARTICIPATING**RRF
85	Recept says call Irene, office coordinator.**BB She said she was no
86	TOO BUSY. TAMMY SAID THEY WOULDN'T HAVE ANY TIME FOR AT LEAST A**J
87	secretary said mr. Redy wouldn't have time.
88	this is mr. yu home #; does not wish to participate**CLK**CLK
89	Amy said she didn't have the time**REJ
90	SPOKE WITH A NOT INTERESTED LADY WHO WOULDN'T HARDLY LET ME EXPLAIN BE-F
91	"DON'T HAVE TIME FOR THIS, THANK YOU"**JQS
92	Ended the call before I could explain.**RSD
93	Mr. Vu'duc just said he would pass on this survey.**RSD
94	suman & starr**CLK
95	Refused.**MJP
96	MS. LEVINSON WAS BUSY W/ A CLIENT SPOKE TO WALTER WHO SAID THAT THE
97	A "one-girl office", and she is 'way too busy to help...**SGW
98	LADY SAID SHE DOESN'T HAVE TIME TO SPEND 15MIN. DOING A TEL. INTER-
99	Rosalee does not wish to participate in a survey.**RSD
100	REFUSED.**CLK

OBS	COMMENT2
76	of questions about the survey before deciding for herself (F10)**RE
77	survey right now. He ended the call before I could arrange a C/B.**REZ
78	
79	would be of no use.
80	Y AND I WAS TOLD TO TRY IN THE AFTERNOON**JQS
81	very much." Then she ended the call***MYT
82	
83	
84	
85	t decision contact and did not want to indicate who might be the co
86	COUPLE OF WEEKS**JQS
87	
88	
89	**REJ
90	ORE SHE SAID SHE WASN'T INTERESTED AND ended the call**RRF
91	
92	
93	**RSD
94	REFUSED.**CLK
95	
96	Y ARE A SMALL CO. AND THEY DON'T THINK THEY ARE INTERSTED**RRF
97	
98	VIEW**RRF
99	
100	

OBS	COMMENT1
101	receptionist was polite but did not want to give out contact info-*
102	HE'S VERY BUSY. HE SUGGESTED AFTERNOON BUT IS MOST LIKELY TO DO IT
103	Phil said that "we are three or four levels down in the chain of**R
104	She says they are very busy and would not have time for the survey.
105	He said he'd rather not participate in the survey. Small company.**
106	"It wouldn't be pertinent because I split the bill or something**BA
107	DO NOT CALL THIS COMPANY**BAC
108	use correct ph #. this is prestige properties**REJ The recep said**
109	spoke w\ Cami, who asked for a c\b for the end of the day.
110	spoke w\Rachel Rodriguez, who wants a hard copy**REJ
111	spoke w\Michael, and he said they are moving w\in two weeks,**REJ
112	"Billy" said that building engineer was always very busy and she**
113	The bevanda company**MYT
114	MR WILSON IS TOO BUSY TO ANSWER QUESTIONS AND NO ONE ELSE HAS THE**
115	spoke w\Jocelyne Chute who said she was TOO BUSY to help out.
116	MARY SAID THAT WE WOULD HAVE TO SPEAK TO PROP. MANAGEMENT CO. TRIED
117	REFUSED.**KAR
118	dir asst 415 code gave me 415-957-1622; refused***CLK
119	Emily Palmer apologizes not having the time to answer survey questi
120	REFUSAL.**KAR
121	REFUSED -- THEY MANAGE MANY LARGE OFC BUILDINGS & HAVE REG REP TO**
122	Radio Station KGST.Mr Crotty refeused the survey because they**JRJ
123	Finally talked to Barbara, but she claims they have hundreds of
124	THEIR OLD BUILDING BURNT DOWN. SO SHE DIDN'T FEEL IT WAS NECESARY**
125	refused.**KAR

OBS	COMMENT2
101	**RSD
102	BIT BY BIT.**JQS DECIDED HE DID NOT HAVE TIME TO COMMIT**JQS
103	command on this property, we won't be able to answer questions."**R
104	
105	
106	like that" In other words, Don't call back**BAC
107	
108	"we have had this interview atleast a couple of times"**MYT
109	"I don't have the time."
110	
111	wouldn't be time effective to do survey**REJ
112	knows he doesn't want to do a survey.**
113	they are not interested***MYT
114	KNOWLEDGE**JQS
115	***REJ
116	TO GET NAME AND # OF PERSON AND SHE SAID SHE COULDN'T GIVE THAT OUT
117	
118	
119	ons and would prefer if no one calls back.**KAR
120	
121	HANDLE ALL PGE COMMUNICATIONS**LMC
122	lease and have no control of the lighting equipment. GOTO SC2**JRJ
123	heating/cooling units and it would take thousands of hours of (F10)
124	TO ANSWER OUR QUESTIONS.**MJP
125	

OBS	COMMENT1
126	1st # is for the Ventura Co. Sherrif's dept.**REJ
127	Person on ph wanted a hard copy, then he changed his mind when
128	refused nicely
129	THIS MAN WAS SOOO BUSY THAT HE COULD HARDLY TAKE THE TIME TO TELL**
130	REFUSAL.**CLK
131	REFUSED.**KAR
132	CURRENTLY UNDERGOING A PG&E AUDIT SO FELT NO NEED TO PARTICIPATE IN
133	Jerry Burgess refused politely**LMC
134	David Shallenberger is their chief engineer, says he's done such a
135	REFUSED**KAR
136	REFUSED.**KAR
137	A series of run-arounds culminating in refusal by property mngr**JR
138	OOPS. Failed to not the 6. Fortunately I did not reach anyone thi
139	REFUSED.**KAR
140	NORMA IS ON VACATION AND THEY DON'T KNOW WHEN SHE'S GETTING BACK.**
141	REFUSED
142	REFUSAL.**KAR
143	REFUSED**MJP
144	sec said that mgr was not interested in taking a survey**KAY
145	REFUSED.**MYT
146	person on ph said that they "have everything, retrofitted lights,
147	REFUSED.**KAR
148	arthur said that he wasn't interested in answering any questions**K
149	not interested to do the survey***MYT
150	REFUSED.**KAR

OBS	COMMENT2
126	Receptionist said "We don't answer any questions over ph."**REJ
127	he realized it wouldn't come direct from PG&E***REJ
128	
129	ME NO.**MJP
130	**CLK
131	
132	THIS STUDY**JQS
133	**LMC
134	survey, just in the last month or so...
135	
136	
137	Ed Lau, saying, "we don' 'ave nothing to ask"**JRJ
138	s call.**JRJ
139	
140	SOUNDS LIKE A MAJOR BLOW-OFF TO ME, BUT TRY BACK LATER IN THE WEEK.
141	
142	
143	**MJP
144	
145	**MYT
146	energy saving stuff, everything"
147	
148	
149	
150	

OBS	COMMENT1
151	see sc2***CLK
152	KEN WILSON'S SECRETARY FREAKED ON ME. SHE ASKED WHO I WAS WITH,THEN
153	Thought that it would be a waste of our time and of their time**REZ
154	REFUSAL**KAR
155	sec said that no one in that office wants to take the time to**KAY
156	THE WOMAN WAS NICE, BUT SHE HAD TO REFUSE. WHEN SHE ANSWERED THE**M
157	refused politely -- no time -- not sure if they retrofitted since
158	RECEPTIONIST WAS VERY UNCOOPERATIVE, AND RELUCTANT TO GIVE ANY**REJ
159	REFUSED, THEY ARE TOO BUSY TO ANSWER OUR QUESTIONS.**MJP
160	REFUSED.**KAR
161	Mike says they wouldn't be interested in doing any surveys.Nobody h
162	WHEN I TOLD THE SECRETARY WHAT I WAS DOING, SHE SAID THAT THERE WAS
163	Mr. Haymond said that he just does not have the time to do this**MY
164	receptioninst said contact wouldn't want to participate in survey**
165	"I don't have the time"**JRJ
166	Company just been purchased. Knowledgeable people there too busy.**
167	THE ONLY PERSON WHO CAN ANSWER THESE QUESTIONS IS THE OWNER.**MJP
168	WHEN I EXPLAINED WHAT WE WERE ABOUT, HE SAID "NO NOT REALLY."**MJP
169	REFUSED.**RSD
170	THEY WERE INTERESTED IN A WRITTEN SURVEY, BUT THEY WEREN'T**MJP
171	REFUSED. SHE WAS NICE ABOUT IT, BUT SHE DOESN'T HAVE THE TIME.**MJP
172	I EXPLAINED OUR SURVEY, AND THE RECEPTIONIST SAID WE WOULD HAVE TO
173	REFUSAL.**KAR
174	spoke w\Bert, who said "I really hate questions, you know that?
175	REFUSED**MJP

OBS	COMMENT2
151	A BLATENT REFUSAL.**CLK
152	SHE WOULDN'T TELL ME WHEN HE WAS GOING TO BE BACK IN HIS OFFICE.**M
153	to talk to them. Politely refused.**REZ
154	
155	answer questions, then she ended the call**KAY
156	PHONE SHE SAID "DENTIST'S OFFICE" SO MAYBE IT WASN'T WHO WE WANTED*
157	1992
158	TYPE OF INFORMATION**REJ
159	**MJP
160	
161	as time for that.**JRJ
162	NOBODY WHO COULD ANSWER OUR QUESTIONS.**MJP
163	now..and he has done surveys for PG&E before...no thanks***MYT
164	
165	
166	**BB
167	THE RECEPTIONIST SAID THAT IT WON'T HAPPEN.**MJP
168	THEN HE ended the call.**MJP
169	
170	INTERESTED IN THE FOLLOW-UP VISIT.**MJP
171	
172	SPEAK WITH THEIR ARCHITECT. NOBODY KNEW WHO THAT WOULD BE.
173	
174	I really hate when people call me & ask oddball questions."
175	

OBS	COMMENT1
176	WHEN I TOLD THE RECEPTIONIST WHO I WAS AND WHAT THE CALL WAS**MJP
177	REFUSED.**KAR
178	THE WOMAN I SPOKE WITH WAS QUITE NOT INTERESTED.**MJP
179	REFUSED.**MJP
180	Mr. Ragsdale was not able to complete the survey, however he was ve
181	Nancy Nelson said,"this is the 3rd time someone has called...not**M
182	THE WOMAN I SPOKE WITH SAID THAT SHE HAD JUST HAD AN ONSITE FROM**M
183	The American Cancer Society will be moving their office in one week
184	Richard Smith said "I do not want to give out our priavte records"*
185	Lisa said she was not interested in participating in this survey***
186	BARBARA SAID THAT ALL THE INFO WAS AVAILABLE FROM THE BLDG. OWNER.*
187	REFUSED.**MJP
188	THEY WEREN'T INTERESTED**MJP
189	Roxanne said "we are going through a merger, I am not one to talk**
190	I WAS TRANSFERRED TO 3 DIFFERENT PEOPLE, NOT ONE OF THEM UNDERSTOOD
191	REFUSED.**RSD
192	DONNA WAS VERY BUSY AND WOULDN'T HAVE TIME TO ANSWER ANY QUESTIONS.
193	Les said "I'm not interested" before I could say anything beyond my
194	THE RECEPTIONIST SAID THAT THE BUILDING MNGT. CO. COULD ANSWER OUR*
195	DON IS VERY BUY AND WILL PROBABLY NOT HAVE TIME TO DO OUR SURVEY.**
196	Was hung-up on even before I could fully explain that it was a
197	THE SECRETARY WAS AN UNCOOPERATIVE PERSON. REFUSED.**MJP
198	Shirley said that they are busy right now and won't be able to help
199	THE MAN WHO ANSWERED SAID THAT WE WOULD HAVE TO SPEAK W/ THE MNGT.*
200	said that they were not interested in doing a survey & ended the call**KAY

OBS	COMMENT2
176	REGARDING SHE SENT ME TO LYNN'S VOICE MAIL. I THINK IT'S A BLOW OFF
177	
178	
179	
180	ry nice in assuring me he was not able to.**KAR
181	sure if it's ur company...but enough already***MYT
182	PG&E. SHE SAID THEY LOOKED AT LIGHT FIXTURES ETC.**MJP
183	, so at the present time their is no one available to answer questi
184	**MYT**MYT
185	***MYT
186	BARBARA WOULDN'T GIVE US THE OWNER'S #. SHE WAS NOT INTERESTED.**MJP
187	
188	
189	to..don't know who to talk to"***MYT
190	WHAT INFO. I NEEDED. LADY #3 SAID THEY WEREN'T INTERESTED.**MJP
191	
192	SHE WAS VERY ABRUPT, BUT I FOUND OUT THAT THEY ARE A 40 ANYWAY.**MJ
193	name..he said thanks then ended the call.***MYT
194	QUESTIONS. HE WAS BUSY AND DIDN'T GIVE ME THE MNGT CO'S #.**MJP
195	**MJP
196	survey...
197	
198	in this survey...***MYT
199	CO. ONE PROBLEM-HE DOSEN'T KNOW WHO THEY ARE.**MJP
200	

OBS	COMMENT1
201	REFUSED.**RSD
202	HE SAID THAT HE WAS THE ONLY PERSON AT THE BUILDING AND THAT HE**MJ
203	Donna said "I don't have time right now but we do appreciate your**
204	He is the knowledgeable contact but is too busy to do the survey.**
205	Ms. Roper did not seem thrilled about spending time answering
206	REFUSED.**CLK
207	Ken told me he already talked to somebody about this. DON't**BAC
208	" Y'KNOW WE REALLY CAN'T DO ANY TYPE OF SURVEY" AKA REFUSED.**MJP
209	John Doesn't feel that this is straight forward enough..doesn't**MY
210	REFUSED.**LMC
211	MS.CASELLI SAID SHE WOULDN'T BE INTERESTED IN PARTICIPATING IN SURV
212	Will not have the time to take place in the survey.
213	SAID HE'S NOT INTERESTED IN PARTICIPATING BECAUSE HE'S ALWAYS BUSY.
214	Refused saying they have very strict rules about giving out any**JR
215	MS. GEE SAID SHE REALLY DOESN'T HAVE TIME TO DO THIS SHE'S PRETTY B
216	Was hung-up on as soon as I could say I was calling on behalf of**R
217	NOT IMTERESTED. ended the call**LIT
218	don't do surveys over the phone**LMC
219	After several attempts to contact, finally reached Marty (female)
220	CATHY SAID SHE GENERALLY DON'T PARTICIPATE IN SURVEYS TAKES TOO MUC
221	she was very busy and reluctant, she didn't actually refuse...**LMC
222	Person said that she would not have time for a telephone survey.
223	refused**LMC
224	don't do surveys**LMC
225	Receptionist asked me to call back and speak to Lolita Pyonne.**LIT

OBS	COMMENT2
201	
202	WOULDN'T HAVE THE TIME OR THE NECESARY INFORMATION.**MJP
203	calling" then ended the call.***MYT
204	
205	a survey that would take 15 minutes of her time.
206	
207	CALL BACK
208	
209	want to give any info w/o a call from PG&E first. refused***MYT
210	
211	EY AT THIS TIME
212	
213	
214	information over the phone**JRJ
215	USY.**RRF
216	PG&E. Wasted time with previous callbacks. Definite refusal.**REZ
217	
218	
219	and she told me they are not comfortable talking about the (F10)
220	H TIME**RRF
221	Dante says DO NOT CALL BACK.**REZ
222	Refusal.
223	
224	**LMC
225	call around 3:00pm. out to lunch**LIT Lolita not interested.**LIT

OBS	COMMENT1
226	Call any day except monday.**LIT
227	Was told that they would pass on this at this time.
228	Owner claimed he could only give me 2 minutes of time because he**R
229	did not want to participate.
230	Joe said " we are so small and so it doesn't matter anyways. I thi
231	"We're just a small Travel agency, try someone else..."
232	John Traverso died eight years ago.**JCM
233	I RECEIVED THEIR ANSWERING SERVICE SHE SAID WE HAVE TO C/B WITHIN**
234	Has zero time to do a "stupid survey that deals with something I do
235	said that someone already called them**LMT**LMT
236	Bob said, " I don't know what this is about...you are wasting my
237	SHE SAID THAT SHE DOES NOT HAVE ANYTIME THEY ARE CLOSING THE BUSINE
238	Ida wanted to know how this survey will benefit her...she seemed**M
239	did not want to take part during business hours**LMT
240	Mr. Song was very impatient and extremely not interested. He ended the call on me
241	SAID THAT SOMEONE ALREADY CALLED HER**LMT
242	Mr.Wong was not in but will be in tomorrow.**FH3
243	Guy said he didn't have time.**LIT
244	The number given to me by 411 was some lady who I did not understnd
245	BEFORE I HAD A CHANCE TO EXPLAIN TH LADY SAID THAT IF IT IS A SURVE
246	BEFORE I HAD A CHANCE TO EXPLAIN LADY SAID THAT THEY WERE NOT INTER
247	John said that the owner of the building is kind of wierd and does*
248	Refusal
249	said that he just will NEVER have the time to do the survey.**LMT
250	The guy could not speak english at all and when I asked for someone

OBS	COMMENT2
226	He did not want to do the survey.
227	
228	is on the sales force... Was sorry he could not help. Refusal.**R
229	
230	nk I'll just pass on this one"***MYT
231	
232	
233	THE OFFICE HOURS WHICH ARE FROM 7:30A-4PM**RRF info on next screen
234	nt give a hoot about".Nice guy eh?**LMT
235	
236	time"****MYT
237	SS IN A WEEK**JMT
238	eager to hang up.. said thank you and *click* ***MYT
239	
240	**JCM
241	
242	I don't have any need to take part.
243	
244	and then she ended the call on me.**BAC
245	Y THEY WERE NOT INTERESTED**JMT
246	ESTED AND ended the call
247	not wish to get involved w/ this..anyways...a refusal.***MYT
248	
249	
250	who spoke english he ended the call and said,"You no call here."**LMT

OBS	COMMENT1
251	person on phone wouldn't give his name, and was hesitant to agree**
252	Rosa's Beauty Salon is name of business and Elba said they are in
253	Person ended the call after I read Intro.**LIT
254	GLENN SAID, "WE ARE NOT INTERESTED IN A SURVEY."**JRC
255	PERSON WHO ANSWERED THE PHONE WAS VERY
256	ED IS DEAD.ASK FOR WAYNE HE'S NOT DEAD**LMT
257	Grigor is NOT interested.
258	DIDN'T WANT TO DO IT, SAID, "GOODBYE."**JRC
259	Was Not interested onthe phone**LMT
260	Did not want to participate**LMT
261	DBA: Universal Electrics (?) Mr. Chu said that he won't be able to*
262	Nina said, " that's ok, NO" then ended the call***MYT
263	Did not want to participate.**LMT
264	Mr. Leybin said "it's not my building so I don't know" therefore a*
265	Reached a Barber shop. Person not interested.**LIT
266	Person said no thank-you and ended the call. I don't think he understood a
267	DO NOT CALL. PER SUPERVISORS.**LMT
268	the woman who answered the phone said" we rather not participate"**
269	SECRETARY TOOK 800# AND SAID HE WOULD MOST LIKELY NOT TAKE PART IN*
270	was very anxious to get off the phone**LMT
271	I reached Rudy's answering machine.**LIT
272	could not speak english**LMT
273	Dana Freeze said she had to go and ended the call abruptly.**LIT
274	DBA: Vision Gallery..the receptionist said that they don't have the
275	ask for Silva ***MYT Silva said she does not have time for this***

OBS	COMMENT2
251	to anwering other questions**REJ
252	the middle of selling the place and doesn't wish to do survey now.
253	
254	
255	
256	guy was not too happy on this survey stuff**LMT
257	
258	
259	
260	
261	participate in this survey at this time..therefore refusal***MYT
262	**MYT
263	
264	refusal***MYT
265	
266	nything I said.**LIT
267	
268	then hung up***MYT
269	THE SURVEY SO DON'T CALL BACK**JQS
270	
271	SPOKE TO RALPH GLINSEK, HE WAS NOT INTERESTED IN TAKING PART**JQS
272	
273	
274	time to do this now...don't c/b***MYT
275	***MYT and she couldn't answer the qualifier question***MYT

OBS	COMMENT1
276	JIM SAID HE'S NOT INTERESTED AND ended the call**RRF
277	She just gave me some response and ended the call on me.**BAC
278	Manager said that he won't have 15 min. to spare and doesn't want
279	I had trouble understanding Henry, but he told me to talk to**BAC
280	LES claimed that someone else had already called and asked him a**M
281	Man who answered said he had no idea who could answer questions**BA
282	MS. STEVENS STATED THAT IT WOULD BE NO PURPOSE TO THIS SEEING AS
283	This man only wanted to answer questions if it were to his benefit,
284	"We're not interested in this kind of stuff"**BAC
285	"No we're a business, that's OK", than he ended the call...**BAC
286	Monica said she was very busy and did not have time to answer**BAC
287	SPOKE W\MIKE,WHO SAID "I'M JUST REAL BUSY, & IT'S HARD FOR**REJ
288	RECEPTIONIST VERY UNCOOPERATIVE.
289	Jim said I was probably the 5th or 6th person calling representing*
290	Muriel was manager at the store, she did not want to answer**BAC
291	HE STATED THAT HE' JUST TOO BUSY FOR THIS AND ended the call.**DSH
292	THERESA SAID THAT THE PERSON WE NEED TO SPEAK TO IS MR.LAKIN IS THE
293	see sc2***CLK
294	Martha answered a couple of questions, then decided she was too**BA
295	They are swamped w/ weddings so they can not do it at this time***M
296	June said owner could answer questions, but she would not give**BAC
297	WHEN I TOLD HIM THAT IT WOULD TAKE ABOUT 10 MINUTES, HE SAID THAT
298	"I don't think anyone wants to bother with it." .**BAC
299	I SPOKE W/MR.DUNKINS WHO IS MR. SCHOLES PARTNER AND HE SAID THAT HE
300	I was told there was nobody that I could talk to

OBS	COMMENT2
276	
277	
278	a call back.**FH3
279	Mr. Zieo, landlord at (310) 928-0100, he didn't want to talkto me**
280	bunch of questions***MYT
281	
282	THOUGH THEY ARE MOVING SHORTLY.
283	if PG&E were going to cut his power in half**BAC
284	
285	
286	questions.**BAC
287	ME TO TAKE THE TIME TO DO THIS"**REJ
288	
289	PG&E but not actually PG&E, "I'm not interested"....**BAC
290	questions**BAC
291	
292	ONE TO TALK TO HE'S THE CONTROLLER, GO TO SCR. 2 FOR MORE INFO.**RR
293	
294	busy to talk to me**BAC
295	***MYT
296	me his number**BAC
297	MAYBE WE SHOULD PASS HIM BY
298	
299	APOLIGIZES BUT THEY JUST DON'T HAVE THE TIME TO PARTICIPATE**RRF
300	

OBS	COMMENT1
301	THEY SAID THEY WERE NOT INTERESTED IN PARTICIPATING**RRF
302	VALLEY WEST REALTY SEE SC2 4 CB***CLK**CLK
303	master craft dry cleaning*clk**CLK
304	Mr. Seiler was tired of taking pg&E surveys. He retrofitted**BAC
305	Just did a survey, last month...
306	Ron says, "This is a business, we have customers. We don't have**B
307	JANIE SAID "I KNOW NOTHING ABOUT IT."**REJ
308	C\B AND ASK FOR CORREIN, WHO SAID SHE'D TRY TO HELP**REJ
309	STEVE FELT THAT QUESTIONS, LIKE SC001d shoud be submitted in**REJ**
310	Mike does not have the time if I am not directly from PG&E**BAC
311	"Don't have time for this"**BAC
312	amber said "we are a retail store, very busy, thank you, bye"***MYT
313	NYT=MYT..typo...the woman who answered the phone said "not interest
314	THE PERSON WHO ANSWERED THE PHONE WAS NOT INTERESTED AND STATED THAT**DS
315	SAID THAT SHE'S GOING THROUGH A CONSTRUCTION AT THE TIME AND THERE
316	Kevin, upon reflection and a return call decided two minutes**BAC
317	They were not interested to do this survey***MYT
318	Tammy said "I don't have the physical time for this, I'm sorry."
319	Mr. Lang told me to call Michael's Art supplies at 421-1576, he**BA
320	"We're already on that special program." However it sounded**BAC
321	see sc2**CLK
322	joe wagner, the corporate head, said that he is way too busy to do*
323	PG&E is on their premises now doing the EMS and Mr. Wardlow doesn't
324	said that he was too busy to do phone survey but will be willing to
325	Mr. Zart said that they are extremely busy now, they are a mail**MY

OBS	COMMENT2
301	
302	CALLED MICKEY; ALREADY EVALUATED VISITED***CLK
303	not interested***MYT
304	the lights at his location, but would not take survey**BAC
305	
306	an time"**BAC
307	**REJ
308	
309	writing.***REJ**REJ
310	**BAC
311	
312	
313	ed.." then ended the call***NYT
314	THERE WAS NO ONE WHO COULD ANSWER ANY QUESTIONS AND ended the call.**DSH
315	WILL BE NO TIME SOON THAT SHE CAN TAKE AND ANSWER QUESTIONS
316	was all he could spare, w/ no better time to c/b. Polite, though**B
317	
318	
319	said he was not best person, but he did not want to talk to me*****
320	more like an excuse to get me off the phone**BAC
321	
322	the survey**KAY
323	feel like doing this evaluation ***MYT
324	do a survey on paper**KAY
325	order business and won't be able to help out***MYT

OBS	COMMENT1
326	Was informed that they are in very close contact with their PG&E
327	Secretary did not seem too keen on us contacting Ben.**RSD
328	Norman does not participate in surveys in general. Told me not to*
329	Was referred from one person to another throughout company, before
330	Jeff referred me back to San Jose store, which referred me back to*
331	did not have the time to help; refused politely
332	JACK BEGAN TO DO SURVEY, THEN HE SAID, "THAT'S ENOUGH, I DON'T**JRC
333	Jon said, "I'm not interested, thanks," and ended the call.**JCM
334	Sayeth Jeff, "Anybody who would sit on the phone for 10 or 15 minut
335	Mark Tavarez said PG&E did the same sort of thing a year ago, and**
336	I spoke to a woman who said, "This is a pay phone. We're not inter-
337	see sc 2**CCL
338	Greg said that someone already called him, so either it is a**BAC
339	EXT. 10**RSD
340	Refused saying"we've already replaced our lights and done a survey
341	I really don't have time for that. I'm in the middle of selling**J
342	see sc 2***CLK
343	Recept. quickly refused to participate**BAC
344	Mgr didn't want to give out much info, we started the survey & afte
345	PAT JUST DOESN'T HAVE TIME TO DO THE SURVEY**JRC
346	The man I spoke to said, "We'll do it through the mail, but not**JC
347	the receptionist said " I answer 6 lines here and I can't help you,
348	Mgr said she doesn't have that much time to use the phone for a***
349	The woman who answered the phone had no idea who I can talk to and
350	Genie does not have time to do a survey over the phone for 15 min.

OBS	COMMENT2
326	account rep. and that they do not have time for a survey.
327	
328	take it personally.**RSD
329	finally coming full circle. They claim they really don't have >F10
330	Cathy Roland at corporate office, who finally refused.**RSD
331	
332	WANT TO DO ANYMORE.**JRC
333	
334	es for a survey I wouldn't want working for me. Goodbye"**JRJ
335	he wasn't interested.**JCM
336	ested."**JCM
337	
338	refusal or something else.**BAC
339	
340	on that"
341	the dealership and I have about 30 people to deal with right away**
342	**CLK
343	
344	r a few questions, he didn't want to continue**KAY**KAY
345	**JRC
346	over the phone."**JCM
347	I am sorry" then ended the call***MYT
348	survey**KAY
349	wasn't willing to give me a name nor number that I can call*
350	She is the assistant manager.

OBS	COMMENT1
351	didn't see the first result before dialing this number***MYT
352	Greg said that it would be a waste of time to do survey w/him**KAY*
353	REFUSED.**CLK
354	"I don' tink we need to do that; we,uh,jus change everyting"**JRJ
355	Agatha, the mgr, said that she didn't have the time, she cut me off
356	Doesn't want to disclose any information regarding the company**KAY
357	Sandy is the contact, but she is very busy, but keep trying**BAC
358	politely declined**JRJ
359	Bob Holman said he has no time and he would regrettably have to**JC
360	Fran, the office mgr, said that they don't answer any questions on*
361	L.A. said that 15 minutes was too long for a phone survey.**RSD
362	Spoke w/mgr & she said that they really don't participate in any**K
363	Roger "wouldn't be interested" .**BAC
364	Mgr said that she was not interested in answering any questions**KA
365	B. participated a few months ago and doesn't feel like participatin
366	Jeff is the controller,but he said that he never participates in*KA
367	She said, "I'm not interested" and ended the call**JRJ
368	SPOLKE WITH MR. SCOTT HE SAID THAT AT THIS POINT IN TIME THEY ARE
369	Jim said he is much too busy to do a 15 minute survey.**RSD
370	i started my greeting but before i could say what i was calling
371	mr. johnson said that they're moving in may so there really was no
372	ANTOINE WANTED A HARD COPY OF SURVEY. I SAID OK BUT THAT WE WOULD
373	REFUSED NICELY -- BUSY**LMC
374	Jeff Downs called our 800#. Said he couldn't do the survey bec.**D
375	The man I talked to said that the office at the school was closed**

OBS	COMMENT2
351	
352	
353	
354	
355	before I had a chance to explain**KAY
356	
357	WON'T HAVE TIME UNTIL AFTER 8/15**JQS
358	
359	pass on this survey.**JCM
360	the phone at all**KAY
361	
362	kind of survey**KAY**KAY
363	
364	
365	again.**RSD
366	telephone surveys**KAY
367	
368	COMPLETELY SWAMED THEY HAVE NO TIME TO SPEND ON THE PHONE**JMT
369	
370	about she stated that she dosen't want to deal with(see scr.2)
371	point in this survey
372	HAVE TO CALL HIM BACK TO DO ORAL SURVEY AND HE SAID HE HAD NO TIME
373	
374	he only has a pager, no regular phone. Coded refused.DRN--SUPVSR**D
375	and that there was no one there to answer our questions.**MJP

OBS	COMMENT1
376	SAID THAT HE HAD BETTER THINGS TO DO THAN SIT AND ANSWER QUESTIONS*
377	Fae said that she has customers to tend to and that it's probably**
378	Dan said "I don't have time for this. Thank you." and then he**REZ
379	Too busy. If we wanted to stop by and talk to him, it would be
380	the woman who answered the phone said that she doesn't know who we*
381	Mrs. Thomas said " we have been here for forty years and we don't**
382	"No thank you... I pass." Refusal.***REZ
383	Yong Lee said he couldn't understand why we didn't do this on paper
384	The recept pretended like Katie was busy, after answering a**BAC
385	paul mazzella is always really busy**JGP
386	Respondent did not want to have a supervisor listening in... He
387	SMALL BUSINESS, NOT INTERESTED IN DEALING WITH THIS.**JGP
388	WORKS ALONE, DOES NOT HAVE THE TIME**JGP
389	Carolin says she's trying to do taxes right now and won't have the*
390	Ms. Frye said that there is really no good time to do a survey**MYT
391	SPOKE TO BOB HE STATED THAT HE'S IN RETAIL AND WILL NEVER HAVE ANY
392	Kathy says talk to Jerry**JRJ Jerry says he can't spare 10 minutes*
393	Advised not to call back. These people do not like PG&E to put it*
394	**JGP
395	Mr. Flood is in the process of settling a monetary dispute with
396	Claudio Lane Sr. said that he'll have to pass ..refused***MYT
397	Robert said, "I think I'm not inclined to take this survey."
398	accidental login**JRJ
399	not interested**JGP
400	polite (but firm) declination**JRJ

OBS	COMMENT2
376	OVER THE PHONE.**DSH
377	better to forget her survey***MYT
378	promptly ended the call. I'd guess this is a refusal.**REZ
379	better... Refusal.***REZ
380	are and have done other PG&E evaluations before; "not interested"**
381	need any of that, thanks" then ended the call*
382	
383	and he said he didn't want to continue.**JCM
384	couple of questions, told me we could not finish**BAC
385	
386	hung on the phone before I could continue.
387	
388	
389	time. I guess it's a refusal, since she ended the call while I was F10**R
390	b/c she was in the store alone***MYT
391	TIME. BUT HE SAID IT IN A POLITE WAY
392	for a survey**JRJ
393	mildly. Refusal.**REZ
394	
395	PG&E so he isn't really willing to do this for them at this time*
396	
397	
398	Just got to SC21 before she refused to go on.Very busy**JRJ
399	
400	

OBS	COMMENT1
401	Bub said that they are pretty happy with everything but like to**MY
402	does not have time**JGP
403	SAID HE'S TOO BUSY, AND HE ended the call.**JRC
404	The woman who answered the phone said that she doesn't know anythin
405	no time -- nicely refused
406	this is a bar, he's got to take care of business, thus, he cannot**
407	no time for phone survey; refused nicely**LMC
408	Doris said, "we're not interested" and ended the call.***MYT
409	extremely busy; very small restaurant; very nicely refused survey**
410	Person on phone said "No thankyou during opening paragraph and hung
411	no, thank you**JGP
412	Carl Mohrmann is passed away. Agnes does not wish to be called**JCM
413	Leticia said she'll never have fifteen or twenty minutes for a**JCM
414	RICHARD HAD NO TIME, DID PART OF SURVEY AND HAD TO STOP**JRC
415	Leticia said she just didn't have the 10-15 min. necessary**REJ**RE
416	THEY ARE GOING OUT OF BUSINESS**JGP
417	Christine had left the building. She may be availiable again**REJ
418	SEC WOULD NOT PUT ME THROUGH TO HIM SHE SAID THAT HE IS ABOUT TO RE
419	BEFORE I HAD A CHANCE TO EXPLAIN MUCH HE SAID THAT HE WAS NOT INTER
420	SPOKE TO VICTOR COLER AND HE SAID THAT HE IS NOT INTERESTED AND NEV
421	MICHELLE SPOKE WITH THE DOCTOR AND HE SAID THAT THIS DOES NOT SOUND
422	DR. SCOTTON SAID THAT THIS LINE IS OPEN FOR ONLY HIS PATIENTS AND H
423	THE LADY DIDN'T EVEN LET ME EXPLAIN SHE JUST SAID THAT SHE WAS NOT
424	BEFORE I HAD A CHANCE TO REALLY SAY MUCH HE SAID THAT HE WAS NOT IN
425	HE SAID THAT HE JUST DOES NOT WANT TO SPEND ANY TIME ON TELEPHONE

OBS	COMMENT2
401	pass on this survey..John Sr. is only there weekend mornings***MYT
402	
403	
404	g, she said thank you and then ended the call**
405	
406	speak to me**JGP
407	
408	
409	
410	up**JRJ
411	
412	back.**JCM
413	survey.**JCM
414	WHEN ASKED FOR A BETTER TIME, SAID HE DIDN'T HAVE ONE.**JRC
415	for the survey**REJ
416	
417	@ the above date.**REJ Christine did not want to take survey**BAC
418	TIRE AND WOULD NOT BE INTERESTED.**JMT
419	ESTED AND HUNG THE PHONE UP**JMT
420	ER HAS ANY TIME TO SPEND ON THE PHONE**JMT
421	LIKE SOMETHING HE WOULD BE INTERESTED IN**JMT
422	E DOES NOT HAVE ANOTHER LINE SO DO NOT CALL ANY MORE**JMT
423	INTERESTED**JMT
424	TERESTED AND HUNG THE PHONE UP**JMT
425	SURVEY**JMT

OBS	COMMENT1
426	BEFORE I HAD A CHANCE TO SAY WHAT I WAS CALLING FOR SHE SAID THAT S
427	THE PERSON I SPOKE WITH SAID THAT HE CHOOSES NOT TO DO PHONE SURVEY
428	BEFORE I HAD A CHANCE TO EXPLAIN VERY MUCH SECRETARY SAID THAT THEY
429	SPOKE WITH RICHARD HE DID NOT REALLY UNDERSTAND WHAT I WAS SAYING I
430	CINDY SAID THAT THEY DON'T HAVE ANY TIME FOR THIS**DSH
431	HE SAID THAT HE DOES NOT HAVE ANYTIME RIGHT NOW AND HE DOES NOT WAN
432	BEFORE I COULD FINISH SHE SAID THAT SHE DOES NOT HAVE ANY TIME TO
433	TRIED TO EXPLAIN PROGRAM BUT SHE ACTED AS THOUGH SHE DIDN'T UNDER-
434	person on ph wasn't intersted in survey**REJ
435	spoke w\Jill Jacobs, who didn't have time for survey**REJ
436	spoke w\Nancy Finch, who said they pay for power through rent, &
437	c\b & ask for Linda Taylor or Mr. Ohaver**REJ
438	person on ph didn't know about power usage, & didn't know**REJ
439	VERY HOSTILE, ASKED FOR HARD COPY, BUT REFUSED TO CONFIRM**REJ
440	sec said that they don't have anyone who can answer questions. she
441	did not want to disclose information w/organization that they are**
442	ignore sc 156, the person on the ph "Ben" refused to share his last
443	Sharon said "I'm swamped, I just don't have the time for a survey,
444	said that they just don't have time to do any survey**KAY
445	"WE DON'T HAVE TIME FOR THIS...."
446	spoke w\Dorothy, who said "I don't know why all this is necessary**
447	refused nicely**LMC
448	Polite refusal
449	"We wouldn't have time to take a survey"**JRJ
450	does not want to participate in a survey.**LMT

OBS	COMMENT2
426	HE DOES NOT HAVE ANY TIME AND SHE IS NOT INTERESTED.**JMT
427	S**JMT
428	WERE NOT INTERESTED AND HUNG THE PHONE UP**JMT
429	EXPLAINED EVERYTHING THOROWLY BUT HE IS NOT INTERESTED**JMT
430	**DSH
431	T US TO CALL HIM BACK**JMT
432	TALK AND HUNG THE PHONE UP**JMT
433	STAND
434	
435	
436	landlord is impossible to reach***REJ
437	linda siad that she didn't have time for this & then ended the call**KAY
438	# of property management firm**REJ
439	ADDRESS. IGNORE SC 156 SAID GLORIA**REJ
440	was not very helpful when i asked her to find another contact**KAY
441	not aware of, so they refused**KAY
442	name, and was very sarcastic
443	I'm sorry."
444	
445	SAID THE RECEPTIONIST**REJ
446	for PG&E, all they want to to is charge us for kw\h."**REJ
447	no time**LMC
448	
449	
450	

OBS	COMMENT1
451	The Embassy; Might try to talk to Gaston, but George, there refused
452	Was very irate on the telephone.**LMT
453	Fred is NOT INTERESTED. Its a "waste of time".
454	"No time."
455	refused politely; too busy
456	The man who answered the call said "I'm on another line now, we app
457	Stan said that they are in the process of moving to a different**MY
458	Refused
459	Shelly (manager) said " I don't have time for this now" then HUNG**
460	Mr. Agnetti said, "no, I don't think so" and then ended the call***MYT
461	the receptionist said that they do not give out names..and in this*
462	The man who answered the phone said that the lighting is taken care
463	DID NOT PARTICIPATE IN PROGRAM, AND WOULD LIKE TO KEEP IT THAT WAY*
464	NOT INTERESTED**JGP
465	DOES NOT HAVE THE TIME**JGP
466	Recpt. said "She's already worked with PG&E to save money on her
467	Dave (district mgr) said that they just did a PG&E survey last**MYT
468	The receptionist said that the only person who can answer the ques*
469	every decision is made out of their Houston Office and the woman**M
470	Right now they are not interested in anything we have to say***MYT
471	Sharon said "We really don't have time to do this survey...our time
472	There is no one there knowledgeable about their energy usage there*
473	the recep said," this is a office and no one here would be interest
474	the woman who ans the phone said,"this is the busiest season of the
475	They are really busy in the summer so won't be able to answer any**

OBS	COMMENT2
451	
452	
453	
454	
455	
456	reciate your call but we don't need anything now" and ended the call.***MY
457	location, he said thanks and then ended the call***MYT
458	
459	UP.***MYT
460	**MYT
461	case they probably just can not participate in the survey***MYT
462	by the owner and he couldn't give me the name nor the phone#***MYT
463	
464	
465	**JGP
466	bill, so thanks, but no thanks . { Refusal }
467	month and at this time he would rather not do this one***MYT
468	is really busy and wouldn't do a survey...but we can try to fax***M
469	who answered the phone would rather not give out that number***MYT
470	
471	is valuable"***MYT
472	and there was no one that the recep. could refer me to***MYT
473	ed in doing any survey at this time"***MYT
474	yr and unless this is required by law, there's no one to answer***M
475	questions***MYT