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2013 Nonresidential Downstream Deemed Lighting Impact Evaluation Report

Prepared for
California Public Utilities Commission

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Introduction and Overview of Study

This report documents the activities undertaken by the Nonresidential Downstream Lighting Impact Evaluation of the 2013-2014 investor-owned utilities' (IOU) energy efficiency programs[1]. The overall goal of this study is to perform an impact evaluation on specific nonresidential deemed lighting measures and/or measure-parameters that were identified in the Efficiency Savings and Performance Incentive (ESPI) decision[2].

This report is informed by Attachment 2 and 3 of the ESPI decision for program year (PY) 2013 and details the goals and objectives of the impact evaluation to meet those requirements. Likewise, the report will discuss the researchable issues, information on the measure groups evaluated as well as the data sources used, the approach for sampling, the verification analysis and the methods used to determine ex-post energy and demand impacts. Finally, the report will present the results and findings from the analysis that can then be used to update the impact parameters, unit energy savings (UES), net-to-gross (NTG) ratios and gross/net first year and lifecycle savings for the measures detailed in the ESPI decision.

1.1 Evaluation Research Objectives

The objective of this study is to perform a measure and/or measure-parameter impact evaluation, utilizing existing evaluation data and new primary evaluation data, in order to update existing gross and/or net savings estimates and inform future savings values for specific lighting measures identified in the ESPI decision. Attachment 2 of the ESPI decision provides an overview of the portfolio parameters that have been identified as potentially requiring ex-post verification. The parameters associated with deemed measure verification include measure installation/verification, unit energy savings, net-to-gross ratios (NTGR), gross and net energy savings values, effective useful life (EUL) and impact load shapes. The ESPI decision lists, in Attachment 3, a number of deemed nonresidential measures that are subject to some level of ex-post evaluation for the 2013 program year. Below is a list of the lighting measures that were identified in that decision. It is important to note that the parameters associated with these measures represent potential areas of focus and that the ex-post evaluation is not limited in scope

[1] This report focuses on the ESPI measures that were identified for the 2013 program cycle.

[2] D.13.09.023, Decision Adopting Efficiency Savings and Performance Incentive Mechanism. http://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M076/K775/76775903.PDF

to any specific parameters. The evaluation team has determined, with guidance from the CPUC, what measure and measure-parameters are subject to ex-post evaluation. This determination is based on a number of factors, which will be presented in more detail throughout this report.

- Screw-in CFLs
- T5 fluorescent lamps and fixtures replacing metal halides
- LED lighting (surface, pendant, track, accent and recess down lighting)
- Occupancy sensor lighting controls (integrated and wall/ceiling mount)
- Delamping of T12 lamps in existing fixtures

Rather than develop a full, comprehensive analysis for all measures, this evaluation focuses on evaluating specific parameters within the savings algorithms for some measures while implementing a more comprehensive analysis of others.

In order to implement this approach in meeting the overall study goal, a number of research objectives have been targeted. The following tasks have been performed, either by leveraging existing data from past evaluation efforts or collecting new primary data from participant phone surveys and/or on-site verification analyses. A more thorough discussion of how these research objectives are applied to each of the studied measures and the algorithm by which they have been evaluated are discussed in Section 4, but to summarize:

- Confirm installations (verification). This includes on-site verification of measure installations that represent a significant percentage of ex-ante claimed savings or measures that have not previously been evaluated. For lighting measures that represent less than significant levels of claimed ex-ante savings and have been evaluated throughout previous program cycles, existing data on installation rates are applied to these measures.

- Estimate baseline (both pre-retrofit and code based) and replacement (post-retrofit) equipment wattages, operating hours, and use shapes to support the estimate of unit energy savings values and 8760 impact load shapes. For lighting measures that represent less than significant levels of claimed ex-ante savings and have been evaluated throughout previous program cycles, existing data on these impact parameters will be leveraged.

- Estimate participant free-ridership to support the development of net-to-gross ratios and net savings values. For lighting measures that represent less than significant levels of claimed ex-ante savings and have been evaluated throughout previous program cycles, existing data on ex-post NTGRs are leveraged.

- Estimate remaining useful life values for selected measures, and update effective useful life estimates based on ex-post operating hours.

- Based on the above, estimate first year and lifetime gross and net ex post impacts (kWh, kW) for select measures.

1.2 Studied Measure Groups

The five lighting measures listed in Attachment 3 of the ESPI decision are aggregate measures that comprise seventeen unique measure groups. The ex-post analysis has been conducted at the measure group level, but not all 17 measure groups have been targeted for evaluation. Table 1-1 presents each measure group's contribution to each PA's 2013 portfolio energy savings[3] (as well as the statewide contribution). Table 1-2 provides a comparison of each measure's contribution to portfolio energy savings for 2013 and 2014 (Q2).

[3] These savings don't include those associated with Codes and Standards

Table 1-1: Summary of Nonresidential Downstream Deemed Lighting ESPI Measure Groups – Expressed as a Percentage of the PA's 2013 Portfolio Gross Ex-Ante Savings

	2013 kWh Savings				2013 kW Savings			
Measure Group	**SW**	**PGE**	**SCE**	**SDGE**	**SW**	**PGE**	**SCE**	**SDGE**
Lighting Indoor CFL > 30 Watts	0.0%	0.0%	0.0%		0.0%	0.0%	0.0%	
Lighting Indoor CFL Basic	0.2%	0.3%	0.1%	0.7%	0.2%	0.3%	0.1%	0.8%
Lighting Indoor CFL Fixture	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Lighting Indoor CFL Other	0.0%			0.0%	0.0%			0.0%
Lighting Indoor CFL Reflector	0.1%	0.1%	0.1%	0.5%	0.1%	0.1%	0.1%	0.7%
Lighting Indoor Controls Wall Or Ceiling Mounted Occupancy Sensor	0.6%	0.6%	0.6%	0.4%	0.9%	0.5%	1.4%	0.6%
Lighting Indoor Fixture Integrated Occupancy Sensor	0.4%	0.3%	0.5%		0.4%	0.2%	0.7%	
Lighting Indoor High Bay Fixture Integrated Occupancy Sensor	0.0%			0.1%	0.0%			0.2%
Lighting Indoor High Bay Fluorescent*	3.2%	4.0%	2.9%	0.5%	4.1%	4.8%	4.2%	0.8%
Lighting Indoor LED Fixture	0.0%	0.0%		0.3%	0.0%	0.0%		0.4%
Lighting Indoor LED Lamp	0.8%		1.5%	0.7%	0.8%		1.7%	0.7%
Lighting Indoor LED Reflector Lamp	1.1%	0.1%	1.9%	1.9%	1.2%	0.1%	2.4%	2.1%
Lighting Indoor Linear Fluorescent Delamping	0.0%		0.0%		0.0%		0.0%	
Lighting Outdoor CFL > 30 Watts	0.0%	0.0%			0.0%	0.0%		
Lighting Outdoor CFL Basic								
Lighting Outdoor CFL Fixture	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lighting Outdoor LED Fixture	0.1%			0.8%	0.0%			0.0%

* The High Bay Fluorescent measure group contains the T5 replacing metal halides ESPI measure.

Note: Values with 0.0% have a positive claim, but that claim is less than one tenth of one percent.

Table 1-2: Comparison of Nonresidential Downstream Deemed Lighting ESPI Measure Groups – Expressed as a Percentage of the PA's 2013 and 2014 (Q2) Portfolio Gross Ex-Ante kWh Savings

	2013 kWh Savings				2014 (Q2) kWh Savings			
Measure Group	**SW**	**PGE**	**SCE**	**SDGE**	**SW**	**PGE**	**SCE**	**SDGE**
Lighting Indoor CFL > 30 Watts	0.0%	0.0%	0.0%		0.0%	0.0%		
Lighting Indoor CFL Basic	0.2%	0.3%	0.1%	0.7%	0.2%	0.3%	0.0%	0.8%
Lighting Indoor CFL Fixture	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
Lighting Indoor CFL Other	0.0%			0.0%	0.0%			0.0%
Lighting Indoor CFL Reflector	0.1%	0.1%	0.1%	0.5%	0.1%	0.0%	0.0%	0.4%
Lighting Indoor Controls Wall Or Ceiling Mounted Occupancy Sensor	0.6%	0.6%	0.6%	0.4%	0.6%	0.9%	0.3%	2.1%
Lighting Indoor Fixture Integrated Occupancy Sensor	0.4%	0.3%	0.5%		0.3%	0.4%	0.4%	
Lighting Indoor High Bay Fixture Integrated Occupancy Sensor	0.0%			0.1%	0.0%			0.1%
Lighting Indoor High Bay Fluorescent*	3.2%	4.0%	2.9%	0.5%	3.3%	6.2%	2.6%	0.1%
Lighting Indoor LED Fixture	0.0%	0.0%		0.3%	0.1%	0.2%	0.0%	0.8%
Lighting Indoor LED Lamp	0.8%		1.5%	0.7%	2.7%	1.5%	2.7%	6.6%
Lighting Indoor LED Reflector Lamp	1.1%	0.1%	1.9%	1.9%	1.4%	0.1%	1.6%	3.9%
Lighting Indoor Linear Fluorescent Delamping	0.0%		0.0%		0.3%	1.2%		
Lighting Outdoor CFL > 30 Watts	0.0%	0.0%			0.0%	0.0%		
Lighting Outdoor CFL Basic					0.0%	0.0%		
Lighting Outdoor CFL Fixture	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Lighting Outdoor LED Fixture	0.1%			0.8%	0.2%	0.1%		1.8%

* The High Bay Fluorescent measure group contains the T5 replacing metal halides ESPI measure.
Note: Values with 0.0% have a positive claim, but that claim is less than one tenth of one percent.

Each of the measures that were identified in the ESPI decision contributes varying levels of ex-ante gross portfolio savings and, overall, these savings contributions don't change significantly from 2013 to 2014 (Q2) with the exception of a couple of LED measures. For example, in 2014, the savings contribution for indoor LED lamps has almost tripled. The reasons for these changes will be discussed in Section 3 along with how these changes have affected the sample design for select measures across the two program periods.

As a result, different levels of rigor have been applied to each of the measures and measure-parameters, given the fact that some measures contribute an insignificant percentage of overall savings while others represent more significant savings. These levels of rigor are also informed by the availability and reliability of existing data sources along with the need to gather new primary data. These levels of rigor are presented in Table 1-3 and discussed in more detail below.

Table 1-3: Percent Statewide Portfolio kWh Savings, Levels of Rigor and Data Sources for 2013 Deemed ESPI Measure Groups

Measure Group	2013 Ex-Ante Savings	Level of Rigor	Existing Data Source	New Data Collection		Monitor Source
				Phone Survey	On-Site	
Lighting Indoor CFL > 30 Watts	0.0%	Low	Yes	No	No	Existing
Lighting Indoor CFL Basic	0.2%	Low	Yes	No	No	Existing
Lighting Indoor CFL Fixture	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Indoor CFL Other	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Indoor CFL Reflector	0.1%	Low	Yes	No	No	Existing
Lighting Indoor Controls Wall Or Ceiling Mounted Occupancy Sensor	0.6%	Medium	Yes	Yes	No	Existing
Lighting Indoor Fixture Integrated Occupancy Sensor	0.4%	Medium	Yes	Yes	No	Existing
Lighting Indoor High Bay Fixture Integrated Occupancy Sensor	0.0%	Medium	Yes	Yes	No	Existing
Lighting Indoor High Bay Fluorescent	3.2%	High	Yes	Yes	Yes	Existing
Lighting Indoor LED Fixture	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Indoor LED Lamp	0.8%	High	Yes	Yes	Yes	Existing
Lighting Indoor LED Reflector Lamp	1.1%	High	Yes	Yes	Yes	Existing
Lighting Indoor Linear Fluorescent Delamping	0.0%	Low	Yes	No	No	Existing
Lighting Outdoor CFL > 30 Watts	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Outdoor CFL Basic	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Outdoor CFL Fixture	0.0%	Do Nothing	No	No	No	Do Nothing
Lighting Outdoor LED Fixture	0.1%	Do Nothing	No	No	No	Do Nothing

Note: Values with 0.0% have a positive claim, but that claim is less than one tenth of one percent.

The energy and demand savings associated with each level of rigor (as a percentage of the statewide Deemed ex-ante ESPI savings) is provided below along with a brief discussion of how these levels of rigor have been applied:

- **High** – 78% and 78% of deemed lighting ESPI kWh and kW savings
  - For LED and T5 measures, new primary data has been collected utilizing a phone and on-site survey instrument, including the installation of lighting loggers. Likewise, as part of the 2010-12 Nonresidential Downstream Lighting Impact Evaluation (NRL)[4], LED lamps and reflectors and high bay linear lighting were also evaluated – as well as 2013(Q2) period for LED measures. For that evaluation, installation rates, NTGRs and impact parameters were developed for these measures. The results from that impact evaluation have been combined with those from this evaluation in order to meet the ESPI requirements for these measures. For example, LED logger data collected in the 2010-12 study have been combined with data collected for this study in order to develop operating hours by building type that can then be used as an input into developing UES values for LEDs.
- **Medium** – 14% and 17% of deemed lighting ESPI kWh and kW savings
  - For occupancy sensor measures, new primary data has been collected utilizing a phone survey instrument to update existing NTGRs. These measures were also evaluated in 2010-12, so the results from that impact evaluation have been applied to these measures. No new primary data was collected on-site.
- **Low** – 6% and 5% of deemed ESPI kWh and kW savings
  - For indoor screw-in CFLs and delamping measures, no new primary data has been collected. These measures were also evaluated as part of the 2010-12 Nonresidential Downstream Lighting Impact Evaluation (NRL). Installation rates, impact parameters, NTGRs and gross/net ex-post energy and demand savings were developed for each of these measures. The results from that study serve as inputs into the portfolio parameter estimates for the ESPI evaluation.
- **Do Nothing** – 2% and 1% of deemed ESPI kWh and kW savings
  - For the remaining measures (outdoor lighting and CFL/LED fixtures) there are no existing data sources to utilize and no new primary data has been collected.

[4] http://www.energydataweb.com/cpuc/deliverableView.aspx?did=1155&uid=0&tid=0&cid=

1.3 Overview of Impact Evaluation Approach

For lighting measures, the general approach that will be used to estimate ex-post gross unit energy savings values is based on developing hourly impacts to create an impact load profile. From this profile, impacts can then be aggregated to develop an annual ex-post gross kWh savings value, or averaged over a set of specific hours to develop an ex-post gross kW savings value. The general algorithm applied to estimate energy savings for a specific hour is:

$$\text{Impact\_Hour\_i} = \text{Installation\_Rate} \times \begin{bmatrix} (\text{Baseline\_Wattage} \times \text{Percent\_On\_Pre\_Hour\_i}) \\ -(\text{Post\_Wattage} \times \text{Percent\_On\_Post\_Hour\_i}) \end{bmatrix}$$

Where,

Installation_Rate = the percentage of claimed measures found to have been installed and operable based on on-site visits.

Baseline_Wattage = the wattage associated with the measures that were replaced or with measures corresponding to the industry standard practice for the type of retrofit. As discussed in detail below, some measures will employ a dual baseline over the life of the measure, while others are based solely on industry standard practice (or solely on the replaced wattage).

Post_Wattage = the wattage associated with the measures that were installed.

Percent_On_Pre = the percentage of time the baseline equipment is on during a specific hour i, which is obtained from adjusted self-reported operating hours gathered on site.

Percent_On_Post = the percentage of time the installed equipment is on during a specific hour i, which is obtained from either logger data usage or adjusted self-reported operating hours gathered on site. The Percent_On_Pre and Percent_On_Post are assumed to be equal for all measures, except occupancy sensors.

To develop the UES values, each of the above set of parameters must be estimated. For CFLs, delamping and control measures, all of these parameters are based on existing data sources collected as part of the 2006-08 Small Commercial Contract Evaluation and the 2010-12 NRL evaluation. For T5 and LED measures, these parameters are based on the 2010-12 NRL data supplemented by new primary data collection.

The remainder of this report will discuss how these UES values were generated for each ESPI measure along with the following:

- Section 2 discusses the data sources that were utilized to estimate each of the individual measure-parameters, the sample design and resulting data used in the evaluation.
- Section 3 presents the methods used for estimating each individual impact parameter, including the installation rate, the various wattage values, the pre- and post-operating hours and the NTGRs.
- Section 4 presents the final study results, including a discussion of how the UES values were applied to the population to develop gross and net realization rates and total population level ex-post energy savings values.
- Appendix A presents the participant telephone survey instrument.
- Appendix B presents the on-site survey instrument.

2

Data Sources, Sample Design, and Data Collection

2.1 Data Sources

A number of data sources were utilized to support the development of each impact parameter in order to update UES values, installation rates and NTGRs for the ESPI measures in this study. These data sources were leveraged from past impact evaluation activities as well as from new primary data collection. As discussed in Section 1, the impacts associated with CFL and delamping measures rely exclusively on existing data sources. For occupancy sensors, existing on-site data is leveraged to update gross impacts, but new phone survey data has been collected to update NTG ratios. For T5 and LED measures, new primary on-site data has been combined with existing data to evaluate the gross impacts associated with those measures and new phone surveys have been implemented to generate NTGRs. The various sources of data are discussed in more detail below.

2.1.1 On-Site Data Collection

On-site visits were conducted in order to gather data that supports a number of parameters used in the impact algorithm. This includes measure verification to support installation rates, storage rates, replacement rates, etc., as well as to confirm post-retrofit wattages. Self-report data was also gathered on the wattage of pre-existing equipment when actual equipment replaced was not on site to help support the estimate of pre-retrofit wattages. Likewise, self-report data was gathered on lighting equipment usage schedules to aid in the development of pre- and post-retrofit load shapes.

For CFLs, linear delamping and occupancy sensor measures, data from past evaluations were leveraged as the source to update the gross impact parameters associated with these measures. The 2010-12 Nonresidential Downstream Lighting Impact Evaluation (NRL) was the source for updating verification rates and baseline/replaced wattage information for these measures and a combination of logger data from NRL and the 2006-08 Small Commercial Contract Evaluation (SmCom) served as inputs into updating operating hours for these measures. For LED and T5 measures, the data that was collected from NRL has been combined with new primary data collection in order to update the impacts associated with those measures. The use of the verification data to develop installation rates, the development of operating schedules using self-report data and the development of wattage values are all discussed in Section 3.

2.1.2 Time of Use Lighting Loggers

As part of the on-site visit for LED and T5 measures, a majority of installed lighting equipment was monitored to gather time-of-use data to support the development of operating hours[5]. Lighting loggers using optical sensors were the predominant type used for this study. However, when lighting was not accessible for optical sensors, logging was done at the electrical panel where circuit amperage was collected in order to develop lighting load shapes. The development of lighting usage load shapes using logger data is discussed in detail in Section 3.

2.1.3 Participant Phone Survey

A phone survey was conducted to recruit customers for the on-site visit – for LED and T5 measures – as well as to collect data useful for the net-to-gross (NTG) analysis and various other components of the evaluation – for LED, T5 and occupancy sensor measures. Since no new data collection was performed on CFL and delamping measures, the NTG ratios that were generated from the NRL evaluation have been updated and will serve as inputs into the net savings analysis for these measures. For T5 measures, the phone survey data was also used to identify if customer installations were early replacement (ER) or replacement on burnout (ROB). The ER analysis and the NTG analysis are discussed in more detail in Section 3.

2.1.4 Commercial Market Share Tracking Study Data

The Commercial Market Share Tracking study provided information on lighting equipment installations that occurred outside of the CPUC programs. This information was utilized to develop estimates of industry standard practices for lighting retrofits and is discussed in Section 3.

2.1.5 2006-08 and 2010-12 Logger Data

As mentioned above, logger data from SmCom and NRL were combined to generate operating hours for several of the ESPI measures. These data were also utilized to adjust customer self-reported operating schedules for LED and T5 measures. The use of these data to adjust the self-reported operating schedules is discussed in detail in Section 3.

[5] While lighting loggers were installed on the majority of measures, these data will not be used to update operating hours for PY 2013. Given the timeline of the deliverable, we will rely on adjusted self-report lighting usage schedules. However, these loggers will stay in the field to support future HOU estimates.

2.2 Data Collection

2.2.1 On-Site Sample Design

As mentioned above, the on-site visits collected data to support a number of the impact parameters including the installation rates, pre- and post-wattages and pre- and post-operating hours for LED and T5 measures. The on-site sample was designed to develop statistically significant results at the technology-building type segment level. The 2013-14 Nonresidential Downstream Deemed ESPI Impact Evaluation Research Plan[6] for this study discusses the sample design in greater detail, but the resulting design focuses on developing estimates of key impact parameters that can be used to augment existing data in order to update ex-ante net and gross kW and kWh energy savings values for each ESPI measure.

T5 Sample Design

The sample design for T5 measures was generated using 2013 program participants and was based on the building types associated with the measure installation, the percentage of ex-ante savings associated with the installation and whether or not any existing primary data has already been collected on the measure. As mentioned above, T5 measures were evaluated as part of the 2010-12 NRL study and a number of building types that were evaluated as part of that effort also contribute a significant level of ex-ante savings in the 2013 program period. Table 2-1 below presents the on-site sample design for T5 measures, along with the number of existing data points and the percentage of 2013 ex-ante savings associated with each building type. For the PY 2013 ESPI deliverable, the objective is to supplement the sample such that each of the eight segments has a minimum combined sample size of 20, and that at least ten sites are from the 2013 program period.

This would result in a total of 109 new on-sites being conducted, and a total of 202 on-sites when combined with the 2010-12 data. Based on this combined sample design, it is expected that a sample size of around 20 will provide a relative precision for most parameters at the 90/30 confidence level (assuming a COV of around 0.8). Across all building types, a 90/10 relative precision should be achieved.

[6] http://www.energydataweb.com/cpucFiles/pdaDocs/1210/PY2013-2014%20Deemed%20ESPI%20Research%20Plan_PDA.pdf

Table 2-1: T5 On-Site Sample Design and Existing On-sites by Building Type

Building Type	Population	Ex-Ante kWh Savings	% Ex-Ante Savings	New T5 Sample	Existing T5 Sample
Manufacturing - Light Industrial	180	6,926,735	13%	10	38
Office – Large	77	4,803,615	9%	19	1
Office – Small	180	3,717,761	7%	18	2
Other	245	3,922,150	7%	10	16
Retail – Large	83	4,603,786	8%	10	14
Storage – Conditioned	127	7,383,497	13%	18	2
Storage - Unconditioned	104	6,251,412	11%	14	6
Warehouse	150	5,609,359	10%	10	14
Total	**1,176**	**43,218,315**	**78%**	**109**	**93**

LED Lamp and Reflector Sample Design

The sample design for LED measures was generated using 2013 through Q2 2014 program participants and was based on the building type associated with each measure, the percentage of ex-ante savings associated with the measures and whether or not any existing primary data has already been collected on them. As part of the 2010-12 NRL study, indoor LED lamps and reflectors were evaluated for 2010-12 through Q2 2013. Likewise, the savings associated with each measure are highly concentrated within the same building types that were evaluated in that study.

The sample design for indoor LED lamps and reflectors was extended out into Q2 of 2014 for a couple of reasons. The first is that, since 2013 (Q1-Q2) program participation was included in the 2010-12 study, the extension of the sample frame into 2014 could only increase the potential sample sizes for each segment by augmenting the loss of sampling points in early 2013 with those gained from early 2014. The second is that there has been a significant shift in where LEDs are being installed by program period, which is evident below in Table 2-2 and Table 2-3. Regarding LED lamps, for example, there appears to be a significant increase in hotels, both in the number of sites participating and the percentage of ex-ante claimed kWh savings (18% to 41%). This segment was not evaluated in the 2010-12 period, so extending the sample frame into 2014 allows for a more substantial reach into that segment.

It is important to also note that for many retail and office sites, the large versus small designation was not detailed in the tracking data. CIS usage data was initially used to classify each of these

building types into a size category, but ultimately, phone survey and on-site data was the source for classification. Similarly, the restaurant-unknown segment has been re-allocated to fast food or sit down based on information garnered from the phone survey and on-site visit.

Table 2-2: Indoor Deemed LED Lamp Participation by Building Type and Program Period

Building Type	2013			2014 (Q1-Q2)		
	Sites	Ex-Ante kWh Savings	% of Ex-Ante kWh Savings	Sites	Ex-Ante kWh Savings	% of Ex-Ante kWh Savings
Hotel	84	2,384,154	18%	316	7,710,801	41%
Misc	2,368	1,865,675	14%	1,569	1,459,365	8%
Office – Large	14	13,852	0%	16	137,908	1%
Office – Small	1,200	1,035,430	8%	720	646,500	3%
Office (CIS)	568	336,989	3%	381	358,669	2%
Other	666	556,729	4%	713	2,251,644	12%
Restaurant - Fast Food	811	2,462,867	19%	442	922,505	5%
Restaurant - Sit Down	868	1,299,048	10%	603	929,099	5%
Restaurant - Unknown	218	198,574	2%	101	125,158	1%
Retail – Large	19	122,249	1%	52	1,292,981	7%
Retail – Small	958	795,663	6%	931	825,592	4%
Retail (CIS)	844	689,471	5%	477	402,153	2%
Total	**8,618**	**11,760,701**	**90%**	**6,321**	**17,062,373**	**92%**

Table 2-3: Indoor Deemed LED Reflector Participation by Building Type and Program Period

	2013			2014 (Q1-Q2)		
Building Type	**Sites**	**Ex-Ante kWh Savings**	**% of Ex-Ante kWh Savings**	**Sites**	**Ex-Ante kWh Savings**	**% of Ex-Ante kWh Savings**
Hotel	65	968,079	5%	45	403,542	4%
Misc	1,319	1,726,565	10%	677	794,781	8%
Office – Large	29	209,442	1%	14	41,288	0%
Office – Small	720	1,049,849	6%	325	382,836	4%
Office (CIS)	296	361,415	2%	157	218,730	2%
Other	523	867,715	5%	331	543,617	6%
Restaurant - Fast Food	683	1,848,649	10%	277	665,946	7%
Restaurant - Sit Down	627	1,213,991	7%	324	574,085	6%
Restaurant - Unknown	142	180,535	1%	50	85,050	1%
Retail – Large	105	2,409,706	13%	86	2,131,275	22%
Retail – Small	928	3,266,853	18%	620	1,985,942	21%
Retail (CIS)	679	2,399,809	13%	274	765,309	8%
Total	**6,116**	**16,502,607**	**91%**	**3,180**	**8,592,399**	**89%**

As discussed above, the analysis for LED lamps and reflector lamps includes the data collected for 2010-12 along with new primary data collected under this evaluation. These data include samples already collected for the five building types evaluated under 2010-12 (small office, small retail, large retail, sit down restaurant and fast food restaurant) and two new segments – hotels and miscellaneous/other.

The objective is to supplement the sample such that each of the 10 existing segments has a combined 40 on sites (with a minimum of 10 new on sites), 20 new hotels and 30 miscellaneous/other for both the LED lamp and reflector technologies. The exception to this is the large retail segment where only 20 on sites are prescribed. Because of the small number of participants, 20 may not even be able to be achieved. The number of hotels is also limited to 20 due to the smaller sample frame and complexity of performing the on sites. This will result in 245 newly sampled sites for a total of 479 on sites. The total sample size for LED lamps will be 244 and 235 for LED reflectors. Table 2-4summarizes this sample design.

Based on this combined sample design, it is expected that a sample size of around 40 will provide a relative precision for most parameters at the 90/20 confidence level (assuming a coefficient of variation [COV] of around 0.8[7]), a sample size of 30 will provide around a 90/25 relative precision, and a sample size of 20 around a 90/30 relative precision. Across all building types, a 90/10 relative precision should be achieved for both LED lamps and reflectors.

Table 2-4: LED On-Site Sample Design and Existing On-sites by Building Type

Building Type	New LED Lamp	Existing LED Lamp	New LED Reflector	Existing LED Reflector
Hotels	20	0	20	0
Office – Small	10	36	17	23
Other/Miscellaneous	30	0	30	0
Restaurant – Fast Food	21	19	12	28
Restaurant – Sit Down	12	28	13	27
Retail – Large	20	2	20	5
Retail – Small	10	36	10	30
Total	**123**	**121**	**122**	**113**

2.2.2 New On-Site Data Collection Summary

Table 2-5 through Table 2-6 below summarize the resulting new primary on-site data collection activity conducted for this evaluation by ESPI measure and original sample strata. These summaries represent the number of sites for which new data was collected that supported the development of installation rates, wattage estimates, and operating schedules.

Sample targets were reached for a few segments for both LED and T5 measures. Targets for T5 measures installed in manufacturing – light industry, warehouses and the other segment were all reached while targets were just missed for retail large and storage. The small and large office sample quotas were not met with roughly a third of the expected completes being realized. In total, 78 of the expected 109 were represented in this evaluation. For LED lamps, the hotel and small retail targets were met and for LED reflectors, the small office, sit down restaurant and small retail sample targets were met. In total, 54 of the expected 123 on sites were completed for LED Lamps and 80 of the 122 for LED reflectors.

[7] The COVs can vary significantly depending on the parameter, measure and building type being studied. We find 0.8 to be a reasonable value based on our experience and from reviewing various parameter level results from the 2010-12 study.

Table 2-5: Number of New On-sites Used in the Evaluation for LED Lamps and Reflectors by Building Type

Building Type	LED Lamps	LED Reflectors
Hotels	21	4
Office – Small	1	27
Other/Miscellaneous	3	11
Restaurant – Fast Food	8	5
Restaurant – Sit Down	17	13
Retail – Large	2	6
Retail – Small	2	14
Total	**54**	**80**

Table 2-6: Number of New On-Sites Used in the Evaluation for T5 Linears by Building Type

Building Type	T5 Linears
Manufacturing - Light Industrial	11
Office – Large	6
Office – Small	7
Other	12
Retail – Large	9
Storage – Conditioned	10
Storage - Unconditioned	13
Warehouse	10
Total	**78**

2.2.3 New and Existing On-Site Data Used to Support Pre- and Post-Retrofit Wattage Estimates

As part of the on-site lighting inventory, detailed information was gathered for each rebated measure found on site. This information included a full inventory of fixture/lamp type, lamp wattage, ballast information and fixture configuration. More specifically, information was collected on the lamp manufacturer, model number, lamp quantity, lamp length and diameter (for linear fluorescent measures) and ballast manufacturer and model number. These data were used to perform look-ups, based on product cut sheets, on the manufacturer's rated wattage for the specific fixture. For all measures, except LED measures, these lookups were used to develop post-retrofit wattage values for all measures found on site. For LED measures, make and model information was gathered, but the nominal lamp wattage of the equipment was applied. Likewise, for many of the high bay fluorescent installations, panel metering was performed as discussed above, and spot watt measurements were collected. These spot watt measurements provided an additional source of information regarding the post-retrofit wattage values.

For pre-retrofit wattages, a combination of approaches was utilized. First, if any of the equipment that was replaced was still on site, the auditor would collect the make and model information of that equipment and wattage values were generated as discussed above. Second, if there was equipment still in place that had not been retrofitted, but was reported to be the same as that replaced, the same approach would be taken. Finally, if no existing equipment was found on site, then customer self-report information was used to estimate wattages.

The following tables provide summaries of the wattage data collected on site for each of ESPI measures. The wattage observations for CFLs, linear delamping and occupancy sensors are based on the on-site data collection activities performed throughout the 2010-12 NRL evaluation. For LED and T5 measures, these observations represent a combination of 2010-12 and 2013 on-site data. The pre- and post-wattage values that were generated for each of these measures are discussed in more detail in Section 3.

Table 2-7: CFL Basic and Reflector Manufacturer Look-Ups for Pre- and Post-Wattage Estimates by Measure Category (2010-12)

Measure Category	CFL Basic		CFL Reflectors	
	Pre-Retrofit	Post-Retrofit	Pre-Retrofit	Post-Retrofit
5-13W CFL replacing < 26W	3	3		
5-13W CFL replacing 26-40W	4	4	1	1
5-13W CFL replacing 41-60W	42	42	3	3
5-13W CFL replacing 61-90W	2	2	2	2
5-13W CFL replacing 91-125W	1	1		
14-24W CFL replacing < 26W	1	1	2	2
14-24W CFL replacing 26-40W	5	5	1	1
14-24W CFL replacing 41-60W	42	39	25	25
14-24W CFL replacing 61-90W	27	27	15	15
14-24W CFL replacing 91-125W	12	12	6	6
14-24W CFL replacing 126-200W			2	2
14-24W CFL replacing 201-300W	2	2		
25-30W CFL replacing 26-40W			1	1
25-30W CFL replacing 41-60W	8	8	5	5
25-30W CFL replacing 61-90W	2	2	3	3
25-30W CFL replacing 91-125W	2	2	3	3

Table 2-8: Delamping Manufacturer Look-Ups for Pre- and Post-Wattage Estimates by Measure Configuration (2010-12)

Measure Category	Pre-Retrofit
(1) 4FT-T12 removed	4
(1) 8FT-T12 removed	6
(2) 4FT-T12 removed	37
(2) 8FT-T12 removed	1

Table 2-9: Occupancy Sensor Manufacturer Look-Ups for Controlled Wattage Estimates by Measure Category (2010-12)

Measure Category	Post-Retrofit	Spot Watt Measurement	Total Post-Retrofit
Integrated Occupancy Sensor	54	52	106
Non-Integrated Occupancy Sensor	181	0	181

Table 2-10: LED Lamp Unique Wattage Observations Performed by Measure Category (2010-14 Q2)

Measure Category	Pre-Retrofit	Post-Retrofit
4-7W LED replacing < 26W	4	4
4-7W LED replacing 26-40W	2	2
4-7W LED replacing 41-60W	5	5
4-7W LED replacing 61-90W	3	3
8-11W LED replacing < 26W	11	10
8-11W LED replacing 26-40W	15	15
8-11W LED replacing 41-60W	62	62
8-11W LED replacing 61-90W	26	25
8-11W LED replacing > 90W	5	5
12-17W LED replacing < 26W	3	3
12-17W LED replacing 26-40W	1	1
12-17W LED replacing 41-60W	1	1
12-17W LED replacing 61-90W	3	3
12-17W LED replacing > 90W	2	2

Table 2-11: LED Reflector Unique Wattage Observations Performed by Measure Category (2010-14 Q2)

Measure Category	Pre-Retrofit	Post-Retrofit
4-7W LED replacing < 26W	3	3
4-7W LED replacing 26-40W	12	12
4-7W LED replacing 41-60W	28	28
4-7W LED replacing 61-90W	1	1
4-7W LED replacing > 90W	1	1
8-11W LED replacing < 26W	2	2
8-11W LED replacing 26-40W	4	4
8-11W LED replacing 41-60W	9	9
8-11W LED replacing 61-90W	13	13
8-11W LED replacing > 90W	3	3
12-17W LED replacing < 26W	5	3
12-17W LED replacing 26-40W	2	2
12-17W LED replacing 41-60W	11	11
12-17W LED replacing 61-90W	30	29
12-17W LED replacing > 90W	30	30
> 17W LED replacing 26-40W	5	4
> 17W LED replacing 41-60W	1	1
> 17W LED replacing 61-90W	6	6
> 17W LED replacing > 90W	10	10

Table 2-12: T5 Manufacturer Look-Ups and Spot Watt Measurements Performed by Measure Configuration for T5 Linears (2010-2013)

Measure Category	Pre-Retrofit	Post-Retrofit	Spot Watt Measurement	Total Post-Retrofit
4FT-2L-T5 replacing < 400W	1	1	1	2
4FT-2L-T5 replacing 400-600W	2	0	0	0
4FT-4L-T5 replacing 176-399W	1	0	0	0
4FT-4L-T5 replacing < 400W	38	24	21	45
4FT-4L-T5 replacing 400-600W	67	29	32	61
4FT-6L-T5 replacing < 400W	3	0	2	2
4FT-6L-T5 replacing 400-600W	10	4	2	6
4FT-6L-T5 replacing > 600W	1	1	0	1

2.2.4 2006-08 and 2010-12 Loggers Used for Adjustments

Logger data that was collected throughout the 2006-08 and 2010-12 evaluation periods have been leveraged to develop factors that can be used to adjust the self-reported operating hour schedules that were garnered from the on-site visit. That analysis was performed by combining all the CFL, LED, and linear fluorescent logger data that was collected from these two evaluations. The adjustments were made at the technology, market segment and activity area level. The measures were also combined across technologies to create two general lighting technology categories – a linear category and a non-linear category. For the purposes of developing adjustment factors, all screw- in CFL and LED measures were combined to represent the non-linear technology and all linear measures were combined under the linear category. It was thought that, since LED lamps and reflectors were often replacing incandescent and halogen lighting, that could very well be replaced with CFLs and have similar (or identical) operating schedules, that these adjustments could be applied to LED lighting as well. This approach was tested and the results are presented in Section 3.

Table 2-13 presents the number of sites and number of loggers that were used in the adjustment analysis for each technology by market segment and activity area. Only market segment-activity area combinations for which at least 6 sites were monitored were used in the analysis to ensure reliability in the adjustment factors. For market segment-activity area combinations that were not well-represented, adjustments were also created at the technology-market segment level and at the technology level alone. In total, over 8,000 loggers representing 1,700 sites were used in the adjustment process.

Table 2-13: 2006-08 and 2010-12 Logger Data Used for Adjustment Factors by Building Type and Activity Area

Building Type / Activity Area	Non-Linear		Linear	
	Total Sites	Total Loggers	Total Sites	Total Loggers
Agriculture				
Other Miscellaneous	9	19	7	35
Storage			5	8
Total Agriculture	**9**	**19**	**8**	**43**
Assembly				
Hallway/Lobby	65	122	30	64
Kitchen/Break Room	14	17	26	39
Office	28	47	40	87
Other Miscellaneous	31	56	25	60
Religious Worship	28	52	6	12
Restrooms	48	70	17	40
Storage	35	46	22	29
Recreation	15	36	19	55
Classroom	7	14	30	85
Dining	15	23	14	27
Total Assembly	**115**	**483**	**60**	**509**
Education - Primary/Secondary				
Other Miscellaneous	15	29	25	61
Restrooms	13	19	22	34
Classroom			51	216
Hallway/Lobby			21	37
Kitchen/Break Room			22	31
Office			32	56
Storage	5	6	7	13
Total Education - Primary/Secondary	**23**	**54**	**55**	**448**
Government				
Office			8	17
Other Miscellaneous	7	20	12	36
Total Government	**6**	**20**	**12**	**69**
Grocery				
Other Miscellaneous	6	6	6	10
Total Grocery	**8**	**14**	**14**	**61**

Table 2-13 (cont'd): 2006-08 and 2010-12 Logger Data Used for Adjustment Factors by Building Type and Activity Area

Building Type / Activity Area	Non-Linear		Linear	
	Total Sites	**Total Loggers**	**Total Sites**	**Total Loggers**
Health/Medical – Clinic				
Hallway/Lobby	45	82	41	92
Other Miscellaneous	12	39	15	51
Restrooms	26	39	13	19
Office	26	44	42	112
Comm/Ind Work	6	7	16	27
Kitchen/Break Room	8	9	18	25
Patient Rooms			10	25
Storage	11	16	15	20
Total Health/Medical – Clinic	**72**	**236**	**51**	**371**
Laundry				
Other Miscellaneous			8	16
Total Laundry			**6**	**16**
Lodging				
Guest Rooms	83	551		
Hallway/Lobby	47	103		
Other Miscellaneous	12	23	9	39
Restrooms	34	66		
Total Lodging	**98**	**811**	**9**	**39**
Office – Large				
Conference Room			12	18
Hallway/Lobby	21	42	17	52
Office	6	11	22	94
Other Miscellaneous	8	17	9	15
Storage			10	20
Kitchen/Break Room			10	12
Total Office – Large	**28**	**95**	**22**	**231**

Table 2-13 (cont'd): 2006-08 and 2010-12 Logger Data Used for Adjustment Factors by Building Type and Activity Area

Building Type / Activity Area	Non-Linear		Linear	
	Total Sites	Total Loggers	Total Sites	Total Loggers
Office – Small				
Hallway/Lobby	45	68	52	91
Office	38	60	96	300
Other Miscellaneous	14	17	16	27
Restrooms	73	91	12	15
Conference Room	9	11	22	26
Storage	21	25	33	44
Comm/Ind Work			16	41
Copy Room			12	14
Kitchen/Break Room	11	11	36	43
Total Office – Small	**136**	**283**	**101**	**601**
Other				
Other Miscellaneous	19	61	9	78
Total Other	19	61	9	78
Other Industrial				
Other Miscellaneous	10	11	15	36
Restrooms	24	34	18	34
Comm/Ind Work			82	203
Office	11	17	67	190
Storage	6	8	38	75
Conference Room			15	18
Hallway/Lobby	15	21	42	64
Kitchen/Break Room			22	37
Total Other Industrial	**46**	**91**	**110**	**673**
Restaurant				
Dining	109	190	20	28
Other Miscellaneous	8	9	13	18
Restrooms	59	83		
Storage	50	72	11	14
Hallway/Lobby	44	56		
Kitchen/Break Room	32	35	22	31
Office	15	17		
Total Restaurant	**164**	**487**	**29**	**91**

Table 2-13 (cont'd): 2006-08 and 2010-12 Logger Data Used for Adjustment Factors by Building Type and Activity Area

Building Type / Activity Area	Non-Linear		Linear	
	Total Sites	**Total Loggers**	**Total Sites**	**Total Loggers**
Retail – Large				
Other Miscellaneous	6	7	9	15
Restrooms	11	16	4	6
Retail Sales	21	45	29	66
Comm/Ind Work			6	14
Storage	7	15	33	67
Office	7	7	24	72
Hallway/Lobby			11	20
Kitchen/Break Room			11	12
Total Retail – Large	**36**	**90**	**45**	**296**
Retail – Small				
Hallway/Lobby	21	28	38	57
Office	30	36	81	143
Other Miscellaneous	15	17	20	24
Restrooms	104	132	16	23
Retail Sales	102	160	103	265
Storage			68	112
Auto Repair Workshop	6	11	43	101
Comm/Ind Work	9	16	38	66
Kitchen/Break Room	9	9	27	29
Services	10	14	16	38
Total Retail – Small	**208**	**423**	**197**	**858**
Warehouse				
Other Miscellaneous	10	32	23	41
Restrooms	12	20	13	17
Comm/Ind Work			15	43
Storage			46	110
Hallway/Lobby			23	46
Kitchen/Break Room			18	25
Office			45	150
Conference Room			13	20
Total Warehouse	**20**	**52**	**71**	**452**
All Building Types	**900**	**3,240**	**809**	**4,933**

2.2.5 New and Existing On-site Data Used to Support Pre- and Post-Retrofit Operating Hours

Two sources of data were discussed above that provide data to support the development of 8,760 operating schedules for pre- and post-retrofit lighting usage: lighting logger data and adjusted self-report data. Given the fact that logger data from program participants will not be available for PY 2013, the self-reported operating schedules garnered from the on-site visit will be adjusted using the logger data that was discussed above for LED and T5 measures. Similarly, these adjusted self-reports will be combined with logger data and adjusted self-report data from the 2010-12 data evaluation, in order to develop more statistically significant estimates of operating hours for these measures. For ESPI measures, where no new on-site data collection has been performed – CFL, linear delamping and occupancy sensors – the logger data and adjusted self-reports from the past evaluations will be used to update the PY 2013 operating hours for these measures.

Table 2-14 through Table 2-20 present the number of sites, loggers and unique schedule observations that were developed from these two data sources and were available for use in the development of operating hours. For CFL lamps and reflectors, linear delamping and occupancy sensor measures, these counts represent the data actually used to update the operating hour parameters for these measures in 2013. The "total observations" field in the tables below represents the actual logger data combined with all the adjusted self-report data that was generated from the 2006-08 and 201-12 evaluations. These data are aggregated, as discussed in the operating analysis section, to create a single load shape for that activity area.

It is also important to note that the classification of customers into the building types presented below was based on actual data collected during the on-site visit from the previous evaluations. While the population of 2013 program participants are classified based on tracking data information, we believe the data collected during the on-site visit provides a more accurate assessment of the customer's building type and improves the reliability of the overall results. However, when developing population level results to update load shape impacts, which will be discussed in Section 3, the analysis building types presented below will be aggregated up to building types found in the tracking data.

Table 2-14: Number of Unique Sites, Loggers and Observations for CFL Lamps by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Assembly			
Assembly	7	3	8
Hallway/Lobby	25	30	40
Kitchen/Break Room	6	6	7
Office	11	11	14
Other Miscellaneous	15	25	31
Outdoor	3	0	4
Religious Worship	6	11	11
Restrooms	23	22	34
Storage	15	14	19
Total Assembly	**44**	**122**	**168**
Education – Primary/Secondary School			
Other Miscellaneous	15	21	38
Outdoor	3	0	3
Restrooms	19	25	37
Total Education – Primary/Secondary School	**24**	**46**	**78**
Grocery			
Other Miscellaneous	9	14	17
Total Grocery	**9**	**14**	**17**
Health/Medical – Clinic			
Hallway/Lobby	14	18	24
Other Miscellaneous	16	40	63
Restrooms	19	23	33
Total Health/Medical – Clinic	**31**	**81**	**120**
Lodging			
Guest Rooms	23	207	208
Hallway/Lobby	6	14	14
Other Miscellaneous	6	14	14
Outdoor	1	0	5
Restrooms	8	17	20
Total Lodging	**27**	**252**	**261**
Office – Small			
Hallway/Lobby	10	6	10
Office	7	5	9
Other Miscellaneous	10	9	12
Restrooms	46	47	57
Total Office - Small	**58**	**67**	**88**

Table 2-14 (cont'd): Number of Unique Sites, Loggers and Observations for CFL Lamps by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Other			
Other Miscellaneous	26	41	56
Outdoor	3	0	3
Total Other	**27**	**41**	**59**
Other Industrial			
Other Miscellaneous	10	8	17
Outdoor	2	0	3
Restrooms	21	19	30
Total Other Industrial	**24**	**27**	**50**
Restaurant - Sit Down			
Dining	10	9	21
Other Miscellaneous	4	6	9
Outdoor	2	0	2
Restrooms	11	7	13
Storage	6	6	7
Total Restaurant - Sit Down	**18**	**28**	**52**
Retail – Large			
Other Miscellaneous	6	3	10
Outdoor	3	0	3
Restrooms	7	3	10
Retail Sales	7	2	12
Total Retail - Large	**14**	**7**	**34**
Retail – Small			
Hallway/Lobby	9	7	10
Office	8	5	8
Other Miscellaneous	13	10	16
Outdoor	1	0	1
Restrooms	95	86	116
Retail Sales	17	11	21
Storage	25	19	29
Total Retail - Small	**121**	**138**	**201**
Warehouse			
Other Miscellaneous	3	4	4
Restrooms	12	15	19
Total Warehouse	**14**	**19**	**23**

In general, the distribution of CFL lamp installations is fairly consistent across building types. Restrooms and hallways/lobbies represent the most significant share of installations as well as sales space for retail establishments. For example, of the 121 unique small – retail stores that were evaluated from 2006-08 and 2010-12, unique site level restrooms were represented in 95 of them, 86 loggers monitored activity within those restrooms and a total of 116 unique observations were collected (combined logger and adjusted self-report data).

Table 2-15: Number of Unique Sites, Loggers and Observations for CFL Reflectors by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Assembly			
Other Miscellaneous	14	25	39
Outdoor	4	0	4
Total Assembly	**18**	**32**	**57**
Health/Medical - Clinic			
Hallway/Lobby	10	14	18
Other Miscellaneous	12	10	23
Total Health/Medical - Clinic	**18**	**24**	**41**
Lodging			
Other Miscellaneous	5	19	21
Outdoor	2	0	3
Total Lodging	**7**	**19**	**24**
Office - Small			
Hallway/Lobby	7	4	10
Other Miscellaneous	12	6	24
Total Office - Small	**14**	**10**	**34**
Other			
Other Miscellaneous	20	35	59
Outdoor	6	0	7
Total Other	**25**	**35**	**66**
Other Industrial			
Other Miscellaneous	9	13	19
Outdoor	1	0	1
Total Other Industrial	**9**	**13**	**20**
Restaurant - Sit Down			
Other Miscellaneous	6	9	14
Outdoor	1	0	1
Total Restaurant - Sit Down	**6**	**9**	**15**
Retail - Small			
Other Miscellaneous	16	13	24
Outdoor	7	0	7
Restrooms	9	3	10
Retail Sales	14	14	24
Total Retail - Small	**35**	**30**	**65**

CFL reflectors were generally represented in similar building types as CFL lamps, but the activity area distribution of those installations is different. Restroom installations are less prominent with reflector lamps and the overall spread of measure installations is more evenly distributed throughout a variety of activity areas (The other miscellaneous category combines all the unique site-activity areas that equal less than 6).

Table 2-16: Number of Unique Sites, Loggers and Observations for T5 Linears by Building Type and Activity Area (2006-08, 2010-12 and 2013)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Assembly			
Other Miscellaneous	2	3	4
Recreation	11	17	24
Total Assembly	**13**	**20**	**28**
Education - Primary/Secondary			
OtherMisc	9	35	44
Total Education - Primary/Secondary	**9**	**35**	**44**
Office – Small			
Comm/Ind Work	6	9	10
Other Miscellaneous	4	11	16
Total Office - Small	**9**	**20**	**26**
Other			
Other Miscellaneous	15	39	50
Outdoor	2	0	2
Total Other	**16**	**39**	**52**
Other Industrial			
Other Miscellaneous	15	16	29
Outdoor	1	0	1
Comm/Ind Work	62	116	172
Office	8	14	19
Storage	32	74	97
Total Other Industrial	**89**	**215**	**313**
Retail – Large			
Retail Sales	7	12	15
Other Miscellaneous	8	1	6
Comm/Ind Work	8	10	18
Storage	19	41	57
Total Retail - Large	**33**	**60**	**92**
Retail – Small			
Other Miscellaneous	6	2	9
Retail Sales	9	4	15
Storage	12	9	16
Auto Repair Workshop	23	24	52
Comm/Ind Work	9	14	26
Total Retail - Small	**52**	**53**	**118**

Table 2-16 (cont'd): Number of Unique Sites, Loggers and Observations for T5 Linears by Building Type and Activity Area (2006-08, 2010-12 and 2013)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Warehouse			
Other Miscellaneous	8	9	27
Comm/Ind Work	19	31	51
Outdoor	3	0	1
Storage	59	102	171
Total Warehouse	**80**	**142**	**248**

T5 measures were generally installed in more commercial and industrial applications (warehouses, manufacturing, retail, etc) and the activity area distribution for these installations is represented more predominantly in high bay storage areas and higher usage space types like commercial and industrial work spaces. For example, in the other industrial analysis building type segment, commercial/industrial work space was represented in 62 of the 89 total sites. This space type was represented by 116 loggers and a total of 172 unique observations.

Table 2-17: Number of Unique Sites, Loggers and Observations for LED Lamps by Building Type and Activity Area (2010-12 and 2013-2014 Q2)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Lodging			
Guest Rooms	22	0	124
Hallway/Lobby	10	0	11
Other Miscellaneous	12	0	16
Outdoor	7	0	0
Total Lodging	**23**	**0**	**151**
Office – Small			
Hallway/Lobby	12	7	14
Office	8	2	8
Other Miscellaneous	5	2	7
Restrooms	35	19	39
Outdoor	5	0	3
Storage	8	3	8
Total Office - Small	**46**	**33**	**77**
Other			
Other Miscellaneous	3	3	9
Total Other	**4**	**3**	**9**
Restaurant - Fast Food			
Dining	15	13	21
Other Miscellaneous	8	5	8
Restrooms	14	6	17
Storage	11	7	14
Total Restaurant - Fast Food	**27**	**31**	**60**
Restaurant - Sit Down			
Dining	26	11	32
Kitchen/Break Room	6	0	5
Other Miscellaneous	5	7	11
Restrooms	22	15	24
Storage	13	6	13
Total Restaurant - Sit Down	**41**	**42**	**88**

Table 2-17 (cont'd): Number of Unique Sites, Loggers and Observations for LED Lamps by Building Type and Activity Area (2010-12 and 2013-2014 Q2)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Retail - Small			
Other Miscellaneous	8	9	12
Outdoor	3	0	3
Restrooms	31	19	37
Retail Sales	8	7	9
Storage	9	6	11
Total Retail - Small	**43**	**41**	**71**

LED lamps were predominantly installed in retail establishments, small offices and restaurants. For small offices and retail, restrooms represented the majority of unique site-activity area installations – 35 of 46 sites for small office and 30 of 42 sites for small retail. The distribution of installations for restaurants included more high usage activity areas like dining areas as well as restrooms and storage areas. LED lamps installed in guest rooms were represented in all, but one site for hotels.

Table 2-18: Number of Unique Sites, Loggers and Observations for LED Reflectors by Building Type and Activity Area (2010-12 and 2013-14 Q2)

Building Type Activity Area	Unique Site/Activity Areas	Total Loggers	Unique Observations
Office - Small			
Hallway/Lobby	11	5	15
Office	18	6	22
Other Miscellaneous	15	8	19
Restrooms	8	3	10
Outdoor	4	0	2
Total Office - Small	**38**	**22**	**68**
Other			
Other Miscellaneous	7	0	13
Outdoor	2	0	1
Total Other	**9**	**0**	**14**
Restaurant - Fast Food			
Dining	22	9	24
Kitchen/Break Room	7	3	6
Other Miscellaneous	7	2	9
Outdoor	5	0	3
Retail Sales	6	5	7
Total Restaurant - Fast Food	**38**	**17**	**47**
Restaurant - Sit Down			
Dining	33	14	47
Other Miscellaneous	7	8	17
Outdoor	6	0	3
Hallway/Lobby	12	3	16
Restrooms	6	0	6
Total Restaurant - Sit Down	**39**	**24**	**83**
Retail - Large			
Other Miscellaneous	4	8	13
Outdoor	1	0	0
Retail Sales	8	7	18
Total Retail - Large	**8**	**14**	**29**
Retail - Small			
Office	7	3	6
Other Miscellaneous	13	5	13
Outdoor	6	0	8
Retail Sales	34	31	71
Total Retail - Small	**45**	**39**	**97**

The installation of LED reflector measures is, generally, more evenly distributed than that of LED lamps. While the same building types are represented, measures are being installed in activity areas with higher usage rates like retail sales and dining areas. For the small retail segment, unique retail sales installations were represented in 34 of the 45 sites visited. A similar trend is evident in dining areas for both sit down and fast food restaurants.

Table 2-19: Number of Unique Sites, Loggers and Observations for Linears by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
All Commercial			
Comm/Ind Work	6	16	16
Hallway/Lobby	8	12	12
Office	12	26	26
Other Miscellaneous	15	31	31
Storage	7	14	14
Total All Commercial	**21**	**99**	**99**
Assembly			
Hallway/Lobby	32	47	72
Kitchen/Break Room	30	34	47
Office	45	84	110
Other Miscellaneous	41	71	111
Outdoor	2	0	4
Restrooms	23	33	51
Storage	30	26	44
Recreation	15	21	35
Classroom	30	86	108
Dining	13	25	27
Total Assembly	**63**	**411**	**592**
Education - Primary School			
Other Miscellaneous	26	38	61
Outdoor	1	0	2
Restrooms	36	39	66
Classroom	55	194	255
Hallway/Lobby	26	34	44
Kitchen/Break Room	31	32	47
Office	42	61	88
Storage	15	18	31
Total Education - Primary School	**58**	**401**	**572**
Government			
Office	7	15	21
Other Miscellaneous	12	52	61
Total Government	**12**	**66**	**80**

Table 2-19 (cont'd): Number of Unique Sites, Loggers and Observations for Linears by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Grocery			
Other Miscellaneous	12	22	31
Outdoor	3	0	5
Retail Sales	16	38	43
Total Grocery	**17**	**60**	**79**
Health/Medical - Clinic			
Hallway/Lobby	46	92	108
Other Miscellaneous	17	52	55
Restrooms	18	20	24
Office	46	128	155
Comm/Ind Work	17	28	30
Kitchen/Break Room	25	26	34
Patient Rooms	13	25	31
Storage	22	23	29
Total Health/Medical - Clinic	**56**	**381**	**448**
Laundry			
Other Miscellaneous	7	15	19
Outdoor	1	0	1
Total Laundry	**7**	**15**	**20**
Lodging			
Other Miscellaneous	10	39	44
Outdoor	1	0	2
Total Lodging	**10**	**39**	**46**
Office - Large			
Conference Room	8	8	18
Hallway/Lobby	13	20	40
Office	14	48	77
Other Miscellaneous	9	9	32
Storage	10	11	23
Kitchen/Break Room	9	7	16
Total Office - Large	**17**	**95**	**198**

Table 2-19 (cont'd): Number of Unique Sites, Loggers and Observations for Linears by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Office - Small			
Hallway/Lobby	75	98	148
Office	124	324	404
Other Miscellaneous	26	27	56
Restrooms	24	14	34
Conference Room	36	29	49
Storage	57	49	90
Comm/Ind Work	20	48	52
Copy Room	21	13	23
Kitchen/Break Room	51	47	62
Total Office - Small	**138**	**646**	**915**
Other			
Other Miscellaneous	19	103	165
Outdoor	1	0	1
Total Other	**19**	**103**	**166**
Other Industrial			
Other Miscellaneous	28	33	66
Outdoor	2	1	3
Restrooms	26	30	48
Comm/Ind Work	59	119	183
Office	61	163	245
Storage	43	50	83
Conference Room	16	15	24
Hallway/Lobby	38	50	71
Kitchen/Break Room	28	33	56
Total Other Industrial	**86**	**481**	**763**
Restaurant - Fast Food			
Dining	10	15	19
Other Miscellaneous	5	6	8
Storage	6	6	7
Kitchen/Break Room	10	15	17
Office	6	4	6
Total Restaurant - Fast Food	**13**	**46**	**56**

Table 2-19 (cont'd): Number of Unique Sites, Loggers and Observations for Linears by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Restaurant - Sit Down			
Dining	10	12	18
Other Miscellaneous	4	3	5
Storage	7	9	12
Kitchen/Break Room	12	14	18
Office	6	5	6
Total Restaurant - Sit Down	**17**	**42**	**54**
Retail - Large			
Other Miscellaneous	11	18	44
Outdoor	4	0	7
Restrooms	14	12	24
Retail Sales	18	19	39
Comm/Ind Work	12	11	29
Storage	22	27	50
Office	22	46	83
Hallway/Lobby	11	12	24
Kitchen/Break Room	14	8	20
Total Retail - Large	**32**	**147**	**303**
Retail - Small			
Hallway/Lobby	61	63	92
Office	128	174	241
Other Miscellaneous	29	29	35
Outdoor	6	0	8
Restrooms	35	26	43
Retail Sales	158	298	392
Storage	114	127	191
Auto Repair Workshop	46	82	110
Comm/Ind Work	57	71	110
Kitchen/Break Room	48	39	52
Services	10	23	23
Total Retail - Small	**272**	**929**	**1,294**

Table 2-19 (cont'd): Number of Unique Sites, Loggers and Observations for Linears by Building Type and Activity Area (2006-08 and 2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Warehouse			
Other Miscellaneous	25	29	52
Restrooms	26	19	38
Comm/Ind Work	8	5	10
Outdoor	1	0	2
Storage	37	65	98
Hallway/Lobby	27	34	57
Kitchen/Break Room	18	21	27
Office	49	127	162
Conference Room	18	16	24
Total Warehouse	**64**	**310**	**464**

The greatest wealth of on-site data is from linear measure installations. Linears are well-represented across several different building types (272 in small retail alone) and a variety of space types within each of those buildings. Likewise, there is a significant amount of logger data and unique observation points that have been collected and analyzed as a result of the two past evaluation efforts. These data will be used to help inform the operating hour estimates for delamping measures that have been rebated throughout the 2013 program cycle.

Table 2-20: Number of Unique Sites, Loggers and Observations for Occupancy Sensors by Building Type and Activity Area (2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Assembly			
Assembly	13	21	25
Hallway/Lobby	6	7	10
Kitchen/Break Room	8	6	9
Office	8	10	17
Other Miscellaneous	10	19	23
Restrooms	18	33	43
Storage	10	9	13
Total Assembly	**25**	**103**	**135**
Education - Primary School			
Other Miscellaneous	12	31	48
Restrooms	11	21	32
Office	7	14	16
Total Education - Primary School	**18**	**81**	**122**
Health/Medical - Clinic			
Other Miscellaneous	8	32	42
Restrooms	17	17	31
Total Health/Medical - Clinic	**17**	**49**	**73**
Lodging			
Guest Rooms	7	9	20
Other Miscellaneous	6	13	36
Total Lodging	**7**	**22**	**56**
Office - Small			
Other Miscellaneous	6	25	34
Restrooms	10	9	16
Total Office - Small	**12**	**34**	**50**
Other			
Other Miscellaneous	25	57	79
Total Other	**25**	**57**	**79**

Table 2-20 (cont'd): Number of Unique Sites, Loggers and Observations for Occupancy Sensors by Building Type and Activity Area (2010-12)

Building Type Activity Area	Unique Activity Areas	Total Loggers	Unique Observations
Other Industrial			
Other Miscellaneous	9	26	55
Outdoor	1	0	1
Restrooms	16	14	23
Comm/Ind Work	23	79	101
Storage	19	53	71
Total Other Industrial	**52**	**169**	**246**
Retail - Large			
Other Miscellaneous	8	16	31
Restrooms	7	14	17
Storage	8	28	36
Total Retail - Large	**16**	**55**	**80**
Retail - Small			
Office	6	3	7
Other Miscellaneous	17	34	47
Restrooms	32	28	50
Storage	6	6	10
Total Retail - Small	**44**	**71**	**114**
Warehouse			
Other Miscellaneous	6	9	13
Restrooms	9	19	22
Outdoor	1	0	1
Storage	26	62	105
Total Warehouse	**35**	**90**	**141**

Occupancy sensors are represented by a variety of building types and space types. The vast majority of fixture integrated occupancy sensors were being installed in high bay applications associated with storage and industrial activities, where panel metering was performed. Wall and ceiling mount controls were installed, more generally, in lower usage space types like restrooms. In fact, 32 of the 44 sites that were evaluated in the small retail section, had controls installed in restrooms. Whereas, for warehouses, 26 of the 35 sites had lighting controls installed within storage areas.

3

Evaluation Methodology

This section provides an overview of the methods used to estimate the key impact parameters, the ex-post Unit Energy Savings (UES) values and the NTGRs for the deemed lighting ESPI measures identified for PY 2013.

3.1 Overview of Approach

The primary objective of this evaluation is to perform a measure and/or measure-parameter impact evaluation, utilizing existing evaluation data and new primary evaluation data, in order to update existing gross and/or net savings estimates and inform future savings values for several measures that were identified in the ESPI decision. These parameters, that include operating hours, baseline wattages, installed wattages, installation rates, RULs and estimates of free ridership, can be used to measure ex-post performance for PY 2013.

More specifically, these parameter level results will be aggregated in order to develop kW and kWh unit energy savings (UES) values, impact load shapes and net-to-gross ratios (NTGRs) for the measures that were identified in Appendix 3 of the ESPI decision.

As discussed in more detail below, the impact parameter estimates were developed at different levels of segmentation in order to generate unique UES values by program, market segment and technology. For example, operating hours were generated by program delivery, market segment and technology whereas pre- and post-wattage values were created based on measure configuration. Similarly, installation rates and NTG ratios were developed at the program delivery level.

This section discusses, in detail, the inputs that were used to develop these parameter estimates. They also inform the general approach that was used to develop the unit energy savings (UES) values. The algorithm that was applied to estimate unit energy savings for a specific hour is:

$$\text{Impact\_Hour\_i} = \left[\begin{array}{l} (\text{Baseline\_Wattage} \times \text{Percent\_On\_Pre\_Hour\_i}) \\ -(\text{Post\_Wattage} \times \text{Percent\_On\_Post\_Hour\_i}) \end{array} \right]$$

Where:

Baseline_Wattage = the wattage associated with the measures that were replaced.

Post_Wattage = the wattage associated with the measures that were installed.

Percent_On_Pre = the percentage of time the baseline equipment is on during a specific hour i, which is obtained from adjusted self-reported operating hours gathered on site. These estimates are associated with measures that were installed in conjunction with an occupancy sensor.

Percent_On_Post = the percentage of time the installed equipment is on during a specific hour i, which is obtained from either logger data usage or adjusted self-reported operating hours gathered on site. Often times the Percent_On_Pre and Percent_On_Post are assumed to be equal, except in the case where an occupancy sensor was installed in conjunction with another lighting measure.

The remainder of this section will discuss the following:

- The approach for estimating each individual impact parameter, including the installation rate, the various wattage values and the pre and post operating hours.
- The approach for estimating the Net-to-Gross ratios.

3.2 Installation Rate Analysis

The installation rate is defined as the percentage of equipment found to be installed and operable. The installation rate is estimated for each site based on data gathered during the on-site visit. As part of these on-site visits, an objective of the auditor was to attempt to identify all equipment installed along with a disposition of that equipment.

The key measure count that is identified on site is the number of measures that are currently installed and in working condition (operable). The installation rate is calculated directly from this measurement:

$$\text{Installation Rate} = \frac{\text{Quantity of measures installed and operable from on-site visit}}{\text{Quantity of measures reported installed in tracking system}}$$

In addition to identifying the amount of equipment that was installed and operable, the auditor also identified the amount of equipment that was:

- Failed and in place – The number of measures that are currently installed, but were not in working condition (failed).
- Failed and replaced – The number of measures that had been installed, but then had failed and were replaced with a different technology.

- Removed and not replaced - The number of measures that had been installed, but had been removed (either due to failure or other reasons), but were not replaced, such that the lamp socket is empty.
- In storage – The number of measures that were found in storage and have not yet been installed.

Although the installation rate is defined as the percent found to be in place and operable, an analysis was also conducted to determine the percent of rebated measures that were actually received by a participant (received rate). This would include those in place and operable, burned out or replaced or placed in storage.

Table 3-1 presents the installation rates (defined as installed and operable), received rates (percent of rebated measures determined to have actually been received by the participants), storage rates and failure/removal rates for each ESPI measure. For CFL, delamping and occupancy sensor measures, these installation rates were generated from existing data that was collected as part of the 2010-12 Nonresidential Downstream Lighting Impact Evaluation. For LED and T5 measures, the results that were garnered from that evaluation have been combined with new primary data collection of 2013 participants in order to update the verification rates associated with those measures. Also shown are the sample sizes and resulting relative precision measured at the 90% confidence interval.

Table 3-1: Disposition of Lighting Verification for ESPI Measures by Program Type

ESPI Measure Program Type	Sites	Received Rate Received	Failure Rate	Storage Rate	Removal Rate	Installation Rate	Installation Rate RP
CFL Lamp							
Direct Install	91	90%	0.9%	0.3%	7.8%	81%	7%
Non-Direct Install	111	84%	3.5%	1.0%	0.7%	79%	6%
Total	**202**	**85%**	**3.1%**	**0.9%**	**1.8%**	**79%**	**4%**
CFL Reflector							
Direct Install	55	98%	1.1%	0.6%	5.9%	91%	6%
Non-Direct Install	61	93%	0.5%	2.1%	0.1%	90%	6%
Total	**116**	**94%**	**0.6%**	**1.8%**	**1.3%**	**90%**	**4%**
LED Lamp							
Direct Install	162	92%	2.2%	0.0%	6.5%	83%	5%
Non-Direct Install	32	99%	0.0%	4.1%	2.0%	93%	3%
Total	**194**	**98%**	**0.3%**	**3.5%**	**2.6%**	**91%**	**2%**
LED Reflector							
Direct Install	154	96%	4.3%	1.7%	4.5%	86%	4%
Non-Direct Install	32	97%	0.0%	0.1%	0.1%	97%	4%
Total	**186**	**97%**	**1.4%**	**0.6%**	**1.6%**	**93%**	**2%**
Linear Delamp							
Direct Install	17	92%	0.0%	0.0%	0.0%	92%	13%
Non-Direct Install	139	87%	0.0%	0.0%	0.1%	86%	4%
Total	**156**	**87%**	**0.0%**	**0.0%**	**0.1%**	**87%**	**4%**
Occupancy Sensor							
Direct Install	85	99%	1.4%	0.0%	1.4%	96%	3%
Non-Direct Install	177	96%	0.4%	0.3%	2.3%	93%	2%
Total	**262**	**96%**	**0.4%**	**0.3%**	**2.3%**	**93%**	**2%**
T5 Linear							
Direct Install	9	100%	0.0%	0.0%	0.0%	100%	0%
Non-Direct Install	111	99%	0.3%	0.1%	0.8%	98%	1%
Total	**120**	**99%**	**0.3%**	**0.1%**	**0.8%**	**98%**	**1%**

Overall, the installation rates for each ESPI measure range from 79% for non-direct install program CFL lamps to 100% for T5 linears installed under direct install programs. Reasons for why the installation rates were not 100% at the time of on-site inspection vary among measures. For CFL lamps, roughly 84% of measures were received by customers in non-direct install programs and failure/removal rates contributed to the lower installation rates as well. For LED

lamps and reflectors in direct install programs, removal rates were 6.5% and 4.5%, respectively. By and large, LEDs were removed because the lighting they provided was not aesthetically pleasing, too strong or too directional. T5 linears had the highest received rate and installation rate among all the ESPI measures.

The relative precisions are all within the 90/15 range or better for each measure at the program delivery level and within 90/5 or greater at the measure level alone.

3.3 Operating Hour Analysis

One of the primary inputs into the gross savings calculations are the 8760 load shapes, or percent on, for lighting equipment. There were multiple methodologies employed to develop these percent on load shapes, which are discussed in this section. More specifically, this section will discuss the development of the following:

- Post-Retrofit 8760 load shapes based on logger data
- Self-Report Adjustment Factors using 2006-08 and 2010-12 logger and self-report data
- Post-Retrofit 8760 load shapes based on combining the logger based profiles with the adjusted self-report profiles
- Pre-Retrofit 8760 load shapes based on self-report data and the self-report adjustment factors

3.3.1 Development of 8760 Post-Retrofit Percent-On Load Shapes using Logger Data

As discussed throughout this report, lighting loggers have been installed on a majority of T5 and LED measures, but given the timeline, those logger data will not be available. However, this section provides insight into how lighting load shape profiles were created from logger data in 2006-08 and 2010-12 for the ESPI measures that are being evaluated.

The objective of the lighting logger analysis was to develop 8760 hourly load shapes of the percentage of the hour that the lights are on (percent on) for the post-retrofit equipment. The goal is to develop load shapes for each site and each specific measure monitored at the activity area (or space type) level.

Because loggers were not installed for a full year, the logger data needed to be extrapolated out to a full year of 8760 hours. The 2006-08 Small Commercial lighting logger study investigated the effects of changes in daylighting over the course of the year, and normal changes in business hours that some businesses experience over the course of the year. The study indicated that there was no discernable difference in usage over time that would be related to the effects of changes

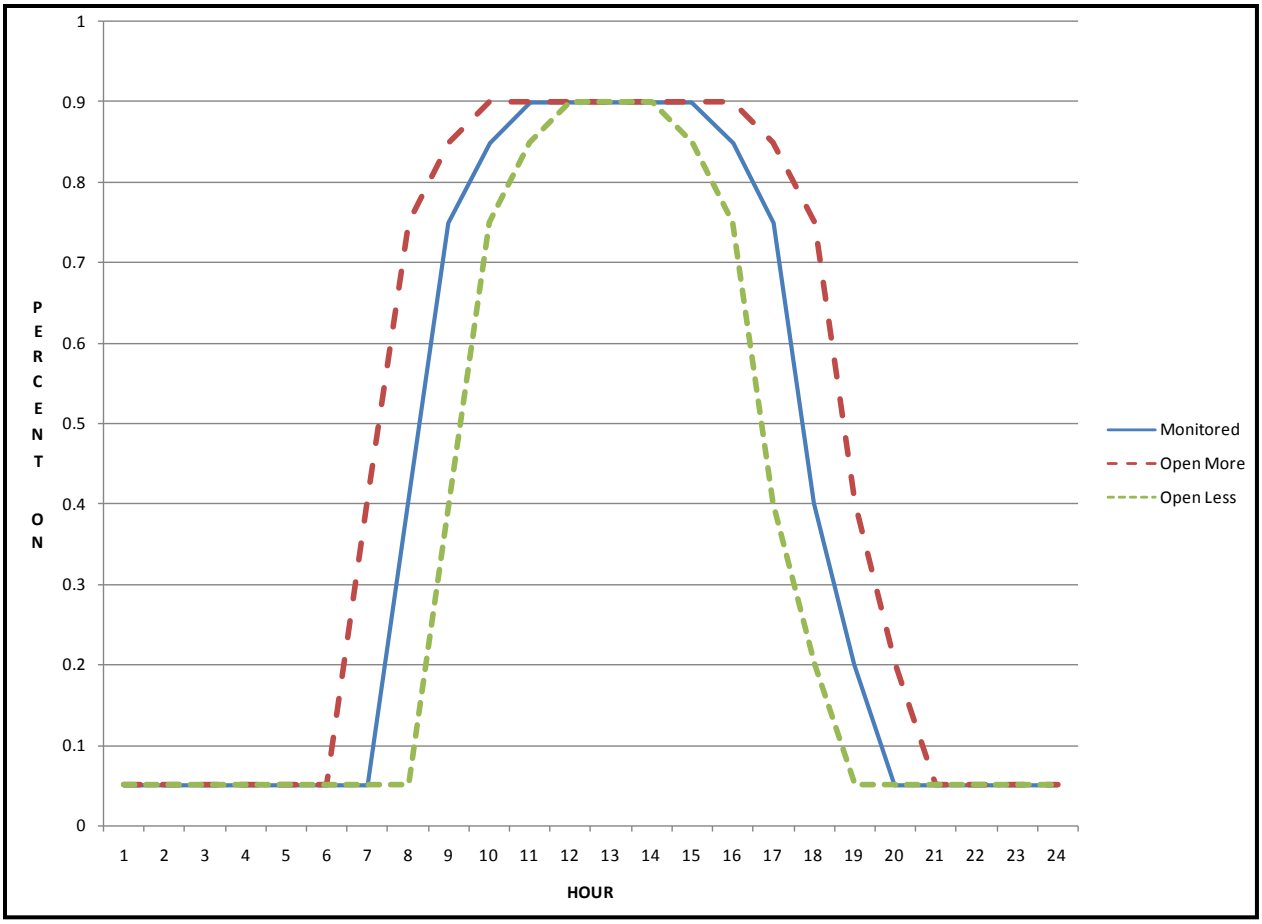
in daylighting. Therefore, our 8760 extrapolation did not directly take into consideration the effects of changes in daylight levels over the year.

Customers did provide their current business hours, and reported if these hours changed over the course of the year. If a customer reported a change in business hours for a portion of the year, the 8760 profile was adjusted accordingly. Using the monitored data, eight average daily profiles were developed for each day of the week, and separately for holidays, for each logger. For each profile, the midpoint of the open period and the midpoint for the closed period were determined. If a business reported being open more hours during another unmonitored time during the year, the profiles were shifted by expanding the profile around the open midpoint, and collapsing the profile around the closed midpoint. The opposite was true if the business reported being closed more hours, so that the profiles were shifted by expanding the profile around the closed midpoint, and collapsing the profile around the open midpoint. The shifting around the midpoints was chosen for two reasons. First, the load shapes tend to be most consistent for the hours around these two points (generally the peak and the trough of the load shape). Second, if a customer reported a shift in the business hours (same number of open hours, but at a different time) this approach would have the effect of simply just shifting the entire profile.[8]

Figure 3-1 provides an example of a business that was open from 9 a.m. to 5 p.m. during the monitored period, and how the load shape would change if the business hours changed from 10 a.m. to 4 p.m., or 8 a.m. to 6 p.m. Essentially the midpoint at 1 p.m. is being stretched out, or the hours around 1 p.m. are being collapsed; and the converse is true around the closed midpoint at 1 a.m.

[8] It is also important to note that this was the same methodology used for the 2006-08 Small Commercial Contract Group Direct Impact Evaluation

Figure 3-1: Example of Load Shape Shift due to Business Hour Changes



The final step after extrapolating each individual logger to an 8760 load profile, is to aggregate each logger up to a site-activity area level by measure. This aggregation only occurs when there is more than one logger at a site in a similar space type. To aggregate the loggers, a weight is associated with each logger that is equal to the number of fixtures/lamps to which the logger corresponds. The result is an 8760 post-retrofit percent-on load shapes, developed at the site, measure, activity area level.

3.3.2 Development of 8760 Post-Retrofit Percent-On Load Shapes using Adjusted Self-Report Schedules

As mentioned previously, since lighting logger data from 2013 program participants will not be available, self-reported schedule data will be used. As part of the 2006-08 Small Commercial evaluation, a set of adjustment factors were developed that can be used to adjust self-reported usage schedules to more accurately reflect actual usage, and develop use shapes. The methodology for developing and applying these self-report adjustment factors is described in the IEPEC conference paper "Is the Customer Always Right? A Cost-Effective Method for

Estimating Lighting Usage in Commercial Buildings", provided in Appendix I of the NRL report.

This evaluation utilized this same approach, but incorporated both the 2006-08 and 2010-12 logger data, to develop adjustment factors to apply to self-reported post-retrofit use shapes for sites that did not have loggers installed. For all measures, detailed self-report schedules were collected that could then be adjusted using the approach documented in Appendix I of the NRL report.

As mentioned, the adjustment factors utilized data collected for both the 2010-12 study as well as the 2006-08 Small Commercial study. This analysis included over 3,200 loggers monitoring CFLs and LEDs in 900 facilities and 4,933 loggers monitoring linear measures in over 800 facilities. As part of the on-site survey for both studies and the 2013 Deemed ESPI Impact Evaluation, participants were asked to estimate their lighting usage by activity area within their building and to provide their business lighting hours. For those customers that were monitored, it was possible to compare the participants' actual lighting usage to both their self-reported lighting usage and their business operating hours. Comparisons were made at the technology, building type and activity area level. Furthermore, rather than simply comparing annual operating hours, comparisons were made for four different use periods (relative to self-reported business hours): Opening Shoulder, Open, Closed Shoulder, or Closed. The Open period was defined as all hours of the day for which the business was open. The Opening and Closing shoulders were defined as the two hours before opening and after closing, respectively. The Closed period was defined as all hours for which the business was closed, and not in one of the two shoulder periods. For the open period, a ratio of actual logger to self-report usage could be estimated by technology, building type, activity area, and usage period. Then these ratios, or adjustment factors, could then be applied to a self-report schedule by building type, activity area, for the open period. However, for the closed and shoulder periods, rather than develop and apply adjustment factors, average usages values were estimated from the logger sample and these usage values were used directly for those time periods. The reason why adjustment factors were not developed and applied to these periods is because the self-reported usage during these periods was often claimed to be zero. A zero value cannot be adjusted by a multiplicative factor, therefore a constant factor was used. Again, this constant factor was the actual average usage found in the logger sample for those time periods, and was applied by technology, building type and activity area.

By applying the adjustment factors to the open time period, and the usage values to the closed and shoulder time periods, an 8,760 load shapes could be developed at the measure and activity area level. Since not all technology, building type and activity area combinations were well represented, adjustment factors and usage rates were also developed at the technology-building type level as well as at the technology level alone.

To validate this process, we took the sample of 2010-12 participants that were monitored in that study and created an adjusted self-report estimate of annual operating hours based on the 2006-08 and 2010-12 factors discussed above. For this sample of monitored participants, we then compared their actual logger results to their adjusted self-report results as well as their unadjusted self-reports. Table 3-2 presents a comparison of operating hours developed from the logger data and the adjusted/non-adjusted self-report method. The adjusted self-report operating hours compare very well to the actual monitored hours. The absolute differences range from .5% for LED reflectors to 5.5% for CFL lamps. The absolute difference between the actual logger data and the unadjusted self-reports range from 2% for linear measures to 15% for LED reflectors. Overall, the differences between the adjusted self-report results and the monitored data are not statistically significant.

Table 3-2: Comparison of Logged Data, Adjusted/Unadjusted Self-Report Operating Hours by Technology

	Logged		Adjusted Self Report		Unadjusted Self Report	
HIM	**HOU**	**SE**	**HOU**	**SE**	**HOU**	**SE**
CFL Lamp	1,970	160	2,079	102	1,760	122
CFL Reflector	3,407	264	3,461	183	3,736	241
T5 Linear	3,660	153	3,720	113	3,544	149
LED Lamp	3,833	198	3,892	159	3,571	179
LED Reflector	3,235	185	3,251	106	2,751	117
Linear	3,415	58	3,379	43	3,336	42

3.3.3 Final 8760 Post-Retrofit Percent-On Load Shapes

As mentioned, both the logger data and adjusted self-report schedules were capable of developing 8760 post-retrofit percent-on load shapes at the site, measure, activity area level. For the purpose of presenting results for this report, these site-measure-activity area level load shapes were aggregated to the building type level. To perform this aggregation, each site-space type profile is weighted to represent the number of lamps/fixtures being represented in the population.

As part of the on-site visit, business and building characteristics were collected and the customer was classified into a building type based on that information. This building type classification is referred to as an "analysis" building type and was leveraged to create the adjustment factors discussed in Section 3. It was felt that this process for classifying a customer's building type was more accurate than the building type associated with the facility in the tracking data. Table 3-3 through Table 3-9 present the post-retrofit annual operating hours and peak coincidence factor (CF) developed at the analysis building type level for each ESPI measure.

In order to produce the final results, however, the intermediate results – at the measure, analysis building type and space type level – have been applied back to the building types that are

associated with ESPI measure installations found in the tracking data. For example, in order to develop adjustment factors for high bay linears in warehouses, all conditioned and unconditioned facilities were combined as warehouses and load shapes were generated at the technology, warehouse, space type level. These adjusted self-reports were then combined with the impacts generated from logger data. The resulting operating hours and peak coincident factors for the "analysis" warehouse were applied to all conditioned and unconditioned warehouses found in the tracking data by technology.

Table 3-3: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for CFL Lamps

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Assembly	44	1,264	15%	19%	22%
Education - Primary/Secondary	24	1,114	27%	21%	34%
Grocery	9	2,435	43%	38%	43%
Health/Medical - Clinic	31	1,259	20%	25%	26%
Lodging	27	676	19%	5%	29%
Office - Small	58	1,131	21%	33%	22%
Other	27	2,911	19%	56%	23%
Other Industrial	24	800	30%	17%	30%
Restaurant - Sit Down	18	1,605	33%	28%	35%
Retail - Large	14	2,625	15%	76%	19%
Retail - Small	121	1,173	18%	23%	16%
Warehouse	14	390	108%	9%	74%
All Building Types	**419**	**1,160**	**7%**	**20%**	**10%**

Table 3-4: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for CFL Reflectors

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Assembly	18	3,960	27%	54%	25%
Health/Medical - Clinic	18	1,816	19%	40%	26%
Lodging	7	2,976	69%	34%	89%
Office - Small	14	1,898	22%	41%	30%
Other	25	2,291	21%	55%	28%
Other Industrial	9	1,538	42%	50%	44%
Restaurant - Sit Down	6	3,336	40%	47%	52%
Retail - Small	35	3,284	9%	74%	11%
All Building Types	**132**	**2,731**	**9%**	**53%**	**9%**

Table 3-5: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for T5 Linears

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Assembly	13	3,965	22%	70%	18%
Education - Primary/Secondary	9	2,683	13%	52%	15%
Office - Small	9	2,729	27%	61%	26%
Other	16	5,250	13%	67%	19%
Other Industrial	89	3,154	8%	64%	6%
Retail - Large	33	4,628	10%	76%	7%
Retail - Small	52	2,147	9%	55%	13%
Warehouse	80	2,827	6%	68%	5%
All Building Types	**301**	**3,200**	**4%**	**66%**	**3%**

Table 3-6: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for LED Lamps

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Lodging	23	882	30%	8%	30%
Office - Small	46	1,024	14%	27%	15%
Other	4	2,522	54%	76%	66%
Restaurant - Fast Food	27	3,623	10%	67%	11%
Restaurant - Sit Down	41	3,277	6%	66%	7%
Retail - Small	43	883	28%	22%	32%
All Building Types	**184**	**1,215**	**10%**	**20%**	**13%**

Table 3-7: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for LED Reflectors

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Office - Small	38	1,822	12%	45%	13%
Other	9	3,655	45%	52%	47%
Restaurant - Fast Food	38	3,908	9%	70%	12%
Restaurant - Sit Down	39	3,625	7%	67%	9%
Retail - Large	8	3,682	16%	98%	6%
Retail - Small	45	3,443	9%	80%	6%
All Building Types	**177**	**3,294**	**6%**	**64%**	**6%**

Table 3-8: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for Linear Fluorescents

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
All Commercial	21	2,373	16%	53%	16%
Assembly	63	1,580	7%	26%	9%
Education - Primary/Secondary	58	1,525	5%	35%	6%
Government	12	2,298	23%	63%	20%
Grocery	17	4,696	11%	88%	9%
Health/Medical - Clinic	56	2,269	9%	52%	7%
Laundry	7	5,145	29%	84%	13%
Lodging	10	1,948	53%	18%	68%
Office - Large	17	3,114	10%	68%	7%
Office - Small	138	2,319	5%	64%	3%
Other	19	3,930	27%	62%	17%
Other Industrial	86	2,645	5%	60%	4%
Restaurant - Fast Food	13	5,218	12%	86%	7%
Restaurant - Sit Down	17	2,572	18%	39%	22%
Retail - Large	32	5,037	6%	75%	5%
Retail - Small	272	2,849	3%	79%	2%
Warehouse	64	2,108	7%	51%	6%
All Building Types	**902**	**2,776**	**2%**	**58%**	**2%**

Table 3-9: Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for Occupancy Sensors

Building Type	Sites	Operating Hours	RP	Coincidence Factor	RP
Assembly	25	773	24%	13%	29%
Education - Primary/Secondary	18	1,455	12%	32%	11%
Health/Medical - Clinic	17	1,060	14%	22%	19%
Lodging	7	485	64%	7%	75%
Office - Small	12	1,256	35%	35%	44%
Other	25	3,460	16%	59%	19%
Other Industrial	52	2,261	12%	51%	9%
Retail - Large	16	2,534	12%	62%	9%
Retail - Small	44	1,027	18%	30%	18%
Warehouse	35	2,186	10%	58%	9%
All Building Types	**251**	**1,736**	**6%**	**40%**	**6%**

As discussed above and in Section 2, the operating hours that were generated for each measure are highly correlated to the activity areas where they were installed. For CFL and LED lamps, these measures were generally installed in lower usage space types like storage areas and restrooms. For certain building types, like retail and restaurants, the operating hours for these measures are higher because the distribution of activity area installations includes higher usage areas like retail space and dining areas. This is true for CFL and LED reflectors as well. These measures have higher operating hours than screw-in lamps because they are generally installed in buildings that have longer open hours and within higher usage areas.

3.3.4 Final 8760 Pre-Retrofit Percent-On Load Shapes

For all measures, except occupancy sensors, it is assumed that the pre-retrofit usage is equal to the post-retrofit usage. The 2006-08 Small Commercial Evaluation had a pre-post monitoring study, where it was found that there was no discernible difference between the pre- and post-retrofit usage for linear fluorescent and CFL measures (about a 1% difference was found, but it was not statistically significantly different from zero at the 90% confidence level[9]). Therefore, it was determined that the pre-retrofit load shape would utilize the post-retrofit load shape.

However, for the occupancy sensor measures, the savings is generated from a change in operation, making it necessary to have a separate estimate of pre-retrofit usage. For measures that are installed in conjunction with an occupancy sensor, the non-control measures are assumed to have an impact that corresponds to the same operating conditions as the previous equipment.

9 2006-08 Small Commercial Contract Group Direct Impact Evaluation, Appendix G.7.2, page G-62.

Therefore, for occupancy sensors and measures installed in conjunction with occupancy sensors, pre-retrofit load shapes were estimated in the same manner as discussed above. As part of the on-site visit, the auditor gathered self-reported pre-retrofit operating schedules from the on-site contact for the activity area prior to the installation of the occupancy sensor. These self-report schedules were adjusted in the same manner as described above to develop 8,760 load shapes at the site, measure and activity area level.

Since no new on-site data has been collected on occupancy sensors, the tables below represent the savings associated with controls from data collected from 2010-12 evaluation. For all LED and T5 lighting measures that were installed in conjunction with an occupancy sensor throughout the 2013 evaluation, the adjusted pre-retrofit operating hours were used for both the pre- and post-retrofit period.

Table 3-10 provides the average pre- and post-retrofit operating hours and coincident peak factors for the 2010-12 on-site sample for occupancy sensors by analysis building type.

Table 3-10: Pre- and Post-Retrofit Annual Hours of Operation and Coincidence Factors by Building Type for Occupancy Sensors

Building Type	Sites	Pre-Operating Hours	Post-Operating Hours	Pre-Coincidence Factor	Post-Coincidence Factor
Assembly	25	1,524	773	27%	13%
Education - Primary/Secondary	18	2,022	1,455	54%	32%
Health/Medical - Clinic	17	1,952	1,060	39%	22%
Lodging	7	695	485	9%	7%
Office - Small	12	1,864	1,256	45%	35%
Other	25	4,508	3,460	75%	59%
Other Industrial	52	3,256	2,261	72%	51%
Retail - Large	16	4,171	2,534	71%	62%
Retail - Small	44	1,929	1,027	56%	30%
Warehouse	35	2,662	2,186	71%	58%
All Building Types	**251**	**2,432**	**1,736**	**53%**	**40%**

Much like the lighting measures that they control, occupancy sensor impacts are highly correlated to the activity areas where they installed. The segments that generate the greatest percent time off (PTO) are assembly, health/medical clinic and small retail building types. As presented in Section 2, occupancy sensors were generally installed in lower usage areas like restrooms and storage areas for these building types. Across all building types, the installation of

controls contributed to roughly a 29% reduction in operating hours and 26% reduction in peak demand.

3.4 Pre- and Post- Retrofit Wattages

Another key set of parameters are the pre- and post-wattages. Various approaches and data sources were utilized to develop these wattage values, which are discussed in this section. More specifically, this section will discuss the development of the following:

- Post-Retrofit Wattages – based on verified data on site
- Pre-Retrofit Wattages – based on self-report data and other information gathered on site
- Standard Practice Baseline Wattages – based on data collected for the Commercial Market Share Tracking (CMST) Study

3.4.1 Post-Retrofit Wattages

Post-retrofit wattages were primarily based on make and model information gathered on site, as discussed in Section 3. For some measures, like basic CFLs and LED lamps, the on-site auditor was able to gather the wattage directly from the lamp. For high bay sites where fixtures were not accessible or when it was not as efficient or accurate to use time-of-use data logging, electric panel logging was performed. When this was the case, spot watt measurements were taken and used to estimate post-retrofit wattages instead of the make and model information. In the limited cases where it was not possible to gather make and model information, or perform spot watt measurements, we attempted to use the IOU measure name, which often times would specify the wattage of the measure being installed. If this was not available, average wattage values were used from the sample that had populated values.

3.4.2 Pre-Retrofit Wattages

Four different approaches were utilized to gather pre-retrofit wattage for each measure on site. In each case, the auditor tried to gather the same information as described above for the post-retrofit wattages. The first was to locate fixtures that were not retrofitted but in the same area or type of area and matched the baseline fixture description. The second approach was to look for spare baseline lamps and ballasts in storage and maintenance areas. The third was to review any documentation regarding the previously installed lamps and fixtures. The fourth approach was to gather the contacts' or maintenance staffs' best recollection of the baseline fixture-lamp information. Finally, if pre-retrofit wattage information was not available, average wattage values were used, similar to what was done for the post-wattage values.

Table 3-11 through Table 3-13 provide estimates of pre- and post-wattage (by measure configuration) along with the number of observations associated with the estimate and the relative precision.

Table 3-11: ESPI Measure Pre- and Post-Wattage Estimates by Measure Category

ESPI Measure Measure Category	Wattage Observations	Pre-Retrofit Wattage	Relative Precision	Post-Retrofit Wattage	Relative Precision
CFL Lamp					
5-13W CFL	79	59	4%	13	4%
14-24W CFL	146	73	6%	20	3%
25-30W CFL	19	76	9%	25	7%
CFL Reflector					
5-13W CFL	8	55	16%	12	13%
14-24W CFL	101	66	5%	19	3%
25-30W CFL	14	84	12%	23	4%
T5 Linear					
4FT-2L-T5	4	394	12%	162	43%
4FT-4L-T5	124	397	1%	215	1%
4FT-6L-T5	14	401	5%	254	12%
LED Lamp					
4-7W LED	24	40	11%	6	3%
8-11W LED	150	55	4%	10	2%
12-17W LED*	15	32	32%	13	4%
LED Reflector					
4-7W LED	60	58	6%	6	2%
8-11W LED	39	56	11%	10	2%
12-17W LED	102	71	4%	16	2%
> 17W LED	33	59	12%	16	9%

* For the 12-17W LED lamps, the majority of measures with this configuration were replacing CFL measures with pre-retrofit wattages in the 23-27W range. The other LED lamp measures were mostly replacing higher wattage incandescent lamps.

Table 3-12: Linear Delamping Pre-Retrofit Estimates by Measure Category

Measure Category	Wattage Observations	Pre-Retrofit Wattage	Relative Precision
(1) 4FT-T12 removed	21	46	10%
(1) 8FT-T12 removed	24	70	5%
(2) 4FT-T12 removed	66	66	3%
(2) 8FT-T12 removed	2	113	40%

Table 3-13: Occupancy Sensor Post-Retrofit Controlled Wattage by Measure Category

Measure Category	Wattage Observations	Post-Retrofit Wattage	Relative Precision
Integrated Occupancy Sensor	110	179	5%
Non-Integrated Occupancy Sensor	181	90	18%

3.4.3 Industry Standard Practice Wattages

Industry standard practice (ISP) baselines will apply only to delamping and T5 measures. For T5 measures replacing metal halides, customers that are ROB utilize a pulse start metal halide for the entire EUL of the measure, which is consistent with Title 20. For customers that are classified as ER, the wattage of the replaced equipment serves as the baseline throughout the RUL of the baseline equipment and the post-RUL period utilizes a pulse start metal halide as the ISP.

For delamping of linear fluorescent measures and T5 linears replacing linear fluorescents, the ISP baselines are developed using data collected for the Commercial Market Share Tracking (CMST) Study on linear fluorescent installations performed during 2009-12. Using the CMST, average wattages were developed by lamp length, the number of lamps per fixture, and if the fixture was installed in a high bay application or not (defined as greater than 12 feet in height). For example, an average wattage was developed for all 3-lamp, 4-foot fixtures that were not high bay applications. This serves as the ISP baseline wattage for all installed non-high bay linear fluorescent measures that were 3-lamp, 4-foot fixtures. Note that this ISP baseline wattage is comprised of various efficiencies of linear fluorescent measures including T8 and T5 fixtures.

Two different averages were taken, one which excluded T12 fixtures and one which excluded both T12 and 700 series T8 fixtures. T12 fixtures are excluded in both because T12 lamps began being phased out in 2012 and the CMST found that only 1% of all installations included T12s. Therefore, T12s were not considered to be industry standard practice. Although 700 series T8 fixtures are also being phased out, the phase out data has been pushed back to July 2014. The CMST also found that a significant portion of the installations during 2010-12 (approximately a

third) included 700 series T8s. For customers that are classified as ROB, their ISP baseline is used for the full EUL, which would take affect when their installation was made. For these participants, their ISP baseline should include 700 series T8s. For customers classified as ER, their ISP baseline is used in the post-RUL period, which typically would begin approximately 5 years after their installation. By this time, 700 series T8s would not be available; therefore, for these participants, their ISP baseline should exclude 700 series T8s.

Table 3-14: Industry Standard Practice Wattages by Lamp Length, Lamps per Fixture, and High Output/Non-High Output

Lamp Length	Lamps Per Fixture	High Output?	ROB ISP Site Count	ROB ISP Wattage	Post-RUL ISP Site Count	Post-RUL ISP Wattage
2'	2	N	15	31	10	31
3'	1	N	4	27	3	27
3'	2	N	4	45	1	45
4'	1	N	25	28	22	30
4'	2	N	198	58	153	58
4'	2	Y	5	98	5	98
4'	3	N	77	84	46	83
4'	4	N	125	120	90	120
4'	4	Y	18	206	18	206
4'	6	N	19	181	16	179
4'	6	Y	6	310	6	310
4'	8	N	2	245	2	245
8'	1	N	4	62	4	62
8'	2	N	18	105	15	105

3.4.4 RUL Analysis

The dual baseline approach will be applied to all T5 measures. In order to estimate a site-specific impact for a participant, it must first be determined if the installation was ROB/NR or ER. If it is determined that the installation was ER, the RUL is estimated as one third of the EUL, following the DEER methodology. For the measures being evaluated, the EUL is defined as:

$$\text{EUL} = \text{Minimum of either } \frac{Service\ Life\ (hours)}{Annual\ Hours\ of\ Use} \text{ or 15 years.}$$

Where,

Service Life = 70,000 for T8s, electronic ballasts; and 20,000 for T12s (based on lamp life)

Annual Hours of Use = the site-specific estimate of post-retrofit annual hours of operation obtained from either logger data usage or adjusted self-reported operating hours gathered on site.

Then, as mentioned above, for ER installations, the replaced equipment will be used to determine baseline wattage during the RUL period and industry standard practice will be used to determine baseline wattage for the post-RUL period. For ROB/NR installations, industry standard practice will be used to determine baseline wattage for the full EUL period.

Below, the approach for determining if a customer is ROB/NR or ER is discussed in detail.

ROB/NR/ER Algorithm

In order to classify an installation as being ER, there must be "a preponderance of evidence that an energy efficiency program activity induced or accelerated equipment replacement. Early retirement measures must provide justification that the existing equipment being replaced would have continued to function and perform its original design intent for a period of time in absence of the replacement."[10]

Therefore, to determine if an installation is ER we first determined if the equipment was replaced on burnout, or was approaching the end of its useful life. If the equipment would not have been able to function as intended for at least a year, the installation is classified as an ROB. If not, we then examine if the program influenced an accelerated replacement, or if the customer was likely to have replaced the equipment at roughly the same time in the absence of the program. If the customer was likely to have replaced the equipment at roughly the same time in the absence of the program, they are considered NR. If not, then the customer will be classified as ER.

Table 3-15 presents the percentage of participants classified as ER by IOU and program delivery.

[10] From CPUC guidance document "Project Basis (RET, ROB, etc.), EUL/RUL Definitions, & Preponderance of Evidence" dated 1/29/14.

Table 3-15: Percent Early Replacement by Gross Program Group for T5 Early Replacers

Program Administrator Gross Program Group	n	Percent Early Replacement	Relative Precision
PGE			
Deemed	50	44%	27%
Direct Install	14	35%	67%
Local Government Partnership	17	79%	22%
Third/Local Party Implementer	27	39%	41%
Total PGE	**108**	**47%**	**17%**
SCE			
Deemed	25	45%	38%
Direct Install	2	100%	0%
SCE Total	**27**	**46%**	**36%**
SDGE			
Deemed	7	84%	34%
Direct Install	4	80%	62%
SDG&E Total	**11**	**83%**	**26%**
Statewide			
Deemed	82	45%	21%
Direct Install	20	43%	46%
Local Government Partnership	17	79%	22%
Third/Local Party Implementer	27	39%	41%
Statewide Total	**146**	**47%**	**15%**

Table 3-16: Percent Early Replacement by Gross Program Group for Delamping Early Replacers

Program Administrator Gross Program Group	n	Percent Early Replacement	Relative Precision
PGE			
Deemed	31	20%	62%
Local Government Partnership	42	65%	19%
Third/Local Party Implementer	24	75%	21%
Total PGE	**97**	**52%**	**16%**
SCE			
Deemed	55	59%	19%
Direct Install	16	84%	20%
Local Government Partnership	4	53%	116%
Third/Local Party Implementer	4	68%	84%
SCE Total	**79**	**69%**	**13%**
SDGE			
Deemed	14	73%	30%
Direct Install	1	100%	0%
SDG&E Total	**15**	**73%**	**28%**
Statewide			
Deemed	100	50%	17%
Direct Install	17	84%	19%
Local Government Partnership	46	64%	19%
Third/Local Party Implementer	28	72%	21%
Statewide Total	**191**	**63%**	**9%**

For T5 linears, at the program administrator level, the percentage of early replacement measures is very similar for PG&E and SCE, but much greater for SDG&E at 83%. Across program types, LGP programs have the highest rate of ER (79%) while direct install, deemed and third party programs are fairly similar. While there is some variability across PAs, the overall statewide ER percentage is roughly 47%.

Similarly for delamping, SDG&E has a higher ER rate (73%) than both PG&E (52%) and SCE (69%). Also, DI (84%), LGP (64%) and third party programs (72%) are all higher than deemed (50%).

3.5 Development of Unit Energy Savings Values

The annual operating hours and peak demand estimates for each building type can then be multiplied by the delta wattage (or installed wattage for controls) associated with each measure configuration for all those segment combinations. Thousands of UES values were generated for each of the ESPI measures as a result. Given the fact that the UES analysis was done at this level of granularity, not all building types where represented. Average operating hours and coincidence factors were applied in the event that a building type was not well represented in the sample.

Table 3-17 presents UES values that were generated for small offices. As discussed in the Section 2 and above, the operating hours are predicated on the distribution of activity areas where the measures are installed. A higher percentage of lower usage areas like restrooms and storage will translate over to lower operating hour estimates. This is true for CFL and LED lamps. For CFL and LED reflectors as well as the linear measures, operating hours tend to be higher as well as the peak demand estimates. The delta wattage values range from 20W (represented here in kW) to 53 watts for CFL and LED lamps. The ranges are generally higher for CFL and LED reflectors. The controlled wattage associated with occupancy sensors is also affected by the application of the measure. Two ranges of controlled wattage were developed for both fixture integrated and non-integrated controls.

While not presented here, for linear measures, there are actually three UES values that are generated. These correspond to the dual baseline classification. One UES is generated for the ROB case and two are generated for the ER installations – one for the RUL period and another for the post-RUL period.

Table 3-17: Ex-Post UES Values for Small Offices

ESPI Measure Configuration	Delta Wattage	Pre Hours	Post Hours	UES kWh	Pre CF	Post CF	UES kW
CFL Lamp							
5-13W CFL	0.045	1,131	1,131	51.0	33%	33%	0.015
14-24W CFL	0.053	1,131	1,131	59.6	33%	33%	0.018
25-30W CFL	0.050	1,131	1,131	57.1	33%	33%	0.017
CFL Reflector							
5-13W CFL	0.044	1,898	1,898	83.3	41%	41%	0.018
14-24W CFL	0.048	1,898	1,898	90.6	41%	41%	0.020
25-30W CFL	0.060	1,898	1,898	114.7	41%	41%	0.025
Linear Delamp							
(1) 4FT-T12 removed	0.044	2,319	2,319	101.4	64%	64%	0.028
(2) 4FT-T12 removed	0.063	2,319	2,319	146.0	64%	64%	0.040
(1) 8FT-T12 removed	0.069	2,319	2,319	161.1	64%	64%	0.044
(2) 8FT-T12 removed	0.086	2,319	2,319	199.9	64%	64%	0.055
LED Lamp							
4-7W LED	0.033	1,024	1,024	34.3	27%	27%	0.009
8-11W LED	0.045	1,024	1,024	46.5	27%	27%	0.012
12-17W LED	0.020	1,024	1,024	20.4	27%	27%	0.005
LED Reflector							
4-7W LED	0.052	1,822	1,822	94.4	45%	45%	0.023
8-11W LED	0.046	1,822	1,822	83.8	45%	45%	0.021
12-17W LED	0.056	1,822	1,822	101.5	45%	45%	0.025
> 17W LED	0.043	1,822	1,822	79.2	45%	45%	0.020
T5 Linear							
4FT-2L-T5	0.081	2,729	2,729	222.2	61%	61%	0.050
4FT-4L-T5	0.117	2,729	2,729	319.2	61%	61%	0.072
4FT-6L-T5	0.050	2,729	2,729	136.6	61%	61%	0.031
Occupancy Sensor							
Integrated (High Wattage)	0.192	1,864	1,256	241.7	45%	35%	0.067
Integrated (Low Wattage)	0.131	1,864	1,256	164.5	45%	35%	0.045
Non-Integrated (High Wattage)	0.371	1,864	1,256	466.5	45%	35%	0.129
Non-Integrated (Low Wattage)	0.085	1,864	1,256	106.2	45%	35%	0.029

3.6 Net-to-Gross Analysis

The approach for estimating net-to-gross ratios (NTGRs) was based on the large non-residential free ridership approach developed by the Net-to-Gross Ratio (NTGR) Working Group and documented in Appendix C, Methodological Framework for Using the Self-Report Approach to Estimating Net-to-Gross Ratios for Non-residential Customers. The NTGR is calculated as the average of three program attribution indices (PAI) known as PAI-1, PAI-2, and PAI-3. Each of these scores represents the highest response or the average of several responses given to one or more questions about the decision to install a program measure. The participant phone survey was the basis for the inputs to each score.

- **Program attribution index 1 (PAI–1)** is a score that reflects the influence of the most important of various program-related elements in the customer's decision to select a given program measure. The PAI-1 score is calculated as the highest program influence factor divided by the sum of the highest program influence factor and the highest non-program influence factor. Some example non-program factors are: previous experience with the measure, recommendation from an engineer, standard practice, corporate policy, compliance with rules or regulations, organizational maintenance or equipment replacement policies and "other – specify." Payback is treated as a program influence factor if the rebate/incentives played a major role in meeting payback criteria, but is treated as a non-program influence factor if it did not play a major role in meeting payback criteria.
- **Program attribution index 2 (PAI–2)** is a score that captures the perceived importance of program factors (including rebate/incentives, recommendation, and training) relative to non-program factors in the decision to implement the specific measure that was eventually adopted or installed. This score is determined by asking respondents to assign importance values to the program and most important non-program influences so that the two total 10. The program influence score is adjusted (i.e., divided by 2) if respondents had made the decision to install the measure before learning about the program. The final score is divided by 10 to be put into decimal form, thus making it consistent with PAI-1.
- **Program attribution index 3 (PAI–3)** is a score that captures the likelihood of various actions the customer might have taken at the given time and in the future if the program had not been available (the counterfactual). This score is calculated as 10 minus the likelihood that the respondent would have installed the same measure in the absence of the program. The final score is divided by 10 to put into decimal form, thus making it consistent with PAI-1 and PAI-2.

The NTGR is estimated as an average of these three scores. If one of the scores is not available (generally due to respondents giving a "don't know" or "refusal" response), then the NTGR is

estimated as the average of the two available scores. If two or more scores were missing, results are discarded from the calculation.

Table 3-18: NTGRs by Program Delivery

ESPI Measure Program Delivery	n	NTGR kWh	Relative Precision	NTGR kW	Relative Precision
CFL					
Deemed	40	0.56	5%	0.57	5%
Direct Install	98	0.63	3%	0.63	3%
Local Government Partnership	137	0.61	3%	0.62	3%
Third/Local Party Implementer	95	0.66	3%	0.66	2%
Total	**370**	**0.61**	**2%**	**0.62**	**2%**
LED					
Deemed	46	0.55	8%	0.56	7%
Local Government Partnership/ Direct Install	174	0.62	3%	0.61	3%
Third/Local Party Implementer	12	0.60	13%	0.61	13%
Total	**232**	**0.59**	**3%**	**0.60**	**3%**
Linear Delamp					
Deemed	100	0.61	4%	0.59	4%
Direct Install	29	0.73	4%	0.73	5%
Local Government Partnership	112	0.62	3%	0.63	3%
Third/Local Party Implementer	66	0.64	6%	0.52	8%
Total	**307**	**0.65**	**2%**	**0.63**	**2%**
Occupancy Sensors					
Deemed	22	0.62	9%	0.61	8%
Local Government Partnership/ Direct Install	29	0.57	8%	0.57	8%
Third/Local Party Implementer	25	0.56	8%	0.58	8%
Total	**76**	**0.61**	**5%**	**0.60**	**4%**
T5 Linear					
Deemed	63	0.64	6%	0.62	6%
Local Government Partnership/ Direct Install	67	0.69	3%	0.69	3%
Third/Local Party Implementer	17	0.55	16%	0.57	16%
Total	**147**	**0.65**	**3%**	**0.65**	**4%**

Table 3-18 presents the NTGRs ratios that were developed for each ESPI measure, weighted by ex-post kWh and kW. There is little variability across measure categories. Linear delamping

and T5 measures are almost identical and are greater than that of CFLs, LEDs and occupancy sensors. Across programs, however, there is certainly more variability. With the exception of controls, direct install programs have a higher NTG ratios than deemed programs, but almost ever estimate is within 5% of the overall measure average.

As discussed throughout the report, CFL and linear delamping NTGs were generated from the 2010-12 program participants that were evaluated under the Nonresidential Downstream Lighting Impact Evaluation. New phone surveys were administered for LED, T5 and occupancy sensors using 2013 program participation.

4

Evaluation Results

This section presents the gross and net realization rates for first year and lifecycle kW and kWh savings, as well as aggregate ex-post population-level savings for first year and lifecycle kW and kWh.

4.1 Gross First Year Realization Rates

Once all the UES values have been created, as discussed in Section 3, these values can be applied to the population of participants. Gross realization rates are then estimated for kWh and kW savings by looking at the ratio of the aggregate evaluated gross savings to the aggregate ex-ante gross savings. Specifically, the Gross Realization Rate (GRR) for PA-Measure segment j is estimated as:

$$Gross\_Realization\_Rate_j = \frac{\sum_{i=1}^{n} Gross\_Ex\_Post\_Impact_{i,j}}{\sum_{i=1}^{n} Gross\_Ex\_Ante\_Impact_{i,j}}$$

Where,

Gross_Ex_Post_Impact$_{i,j}$ is the site-specific gross ex-post impact estimate for customer i, in the population, who is in PA-Measure segment j.

Gross_Ex_Ante_Impact$_{i,j}$ is the site-specific gross ex-ante impact estimate for customer i, in the population, who is in PA-Measure segment j.

Table 4-1 presents the kWh and kW first year gross realization rates, by PA and measure, along with statewide totals. Also shown are the aggregate ex post and ex ante savings values by segment that were used to develop the realization rates.

Table 4-1: First Year Gross kWh and kW Realization Rates by PA and Measure

PA ESPI Measure	Ex Ante Gross kWh Savings	Ex Post Gross kWh Savings	GRR kWh	Ex Ante Gross kW Savings	Ex Post Gross kW Savings	GRR kW
PGE						
CFL	3,421,307	2,455,140	**72%**	552	444	**80%**
Delamping	2,101,161	1,984,106	**94%**	381	409	**107%**
LED	5,712,406	8,541,279	**150%**	1,112	1,981	**178%**
Occupancy Sensors	8,051,970	5,150,400	**64%**	1,244	1,111	**89%**
T5	48,572,305	17,611,374	**36%**	11,348	3,700	**33%**
SCE						
CFL	1,331,220	870,723	**65%**	269	194	**72%**
Delamping	1,956,877	1,773,417	**91%**	342	305	**89%**
Occupancy Sensors	9,429,536	5,535,704	**59%**	3,129	1,067	**34%**
T5	23,229,768	13,178,760	**57%**	5,853	2,705	**46%**
SDGE						
CFL	1,863,522	1,680,068	**90%**	387	353	**91%**
Delamping	480,039	414,643	**86%**	129	112	**86%**
Occupancy Sensors	923,199	660,638	**72%**	204	114	**56%**

The first year gross realization rates vary significantly across measure, but are fairly similar across program administrator for most measures. As discussed throughout Section 3, the ex-post impacts and ex-ante claims are products of several unique parameters that are generated in the impact algorithm. The underlying ex-ante assumptions regarding each parameter vary by measure as do the ex-post impacts. Below is a brief discussion of some of those underlying differences and how they affected the overall realization rates.

The CFL ESPI category represents both screw-in CFL lamps and reflector lamps. As discussed above in the operating hour section, the overall ex-post operating hours were considerably higher for CFL reflectors (2,731 hours compared to 1,160 hours for CFL screw-in lamps). For PG&E and SCE, the first year GRR for CFLs is 72% and 65%, respectively. The main reason for this is higher ex-ante operating hours for CFL lamps relative to ex-post. While the ex-post impacts for CFL lamps are much lower than ex-ante assumptions, the parameters associated with CFL reflectors compare very well from ex-ante to ex-post. This helps explain why the SDG&E GRR is much higher (90%) because SDG&E only rebated CFL reflectors.

For delamping measures, the first year GRR kWh and kW for SDG&E and SCE are very similar. The ex-ante wattage assumptions for each program administrator are fairly close to the ex-post delta wattages. Ex-ante operating hours are a little higher than ex-post, but the main difference is that ex-post installation rates are lower than ex-ante assumptions – 92% for direct install

programs and 86% for non-direct install programs. These rates compare to a 100% ex-ante assumption.

For LED measures, the GRR is much higher than any of the other ESPI measures (150% for kWh and 178% for kW). Like the CFL measure, LEDs represent lamp and reflector lamp measures and, like CFLs, the ex-post impacts associated with LED reflectors are much greater that than those from lamps. This explains the high GRR because the most significant ex-ante impacts for LEDs are generated from reflectors. However, the ex-ante operating hours are much more conservative than ex-post actuals.

For occupancy sensors, the most significant difference in the GRR is reflected in the controlled wattage for the measures. For high and low wattage controlled integrated occupancy sensors, the ex-ante assumptions compare well to ex-post actuals. However, for non-integrated occupancy sensors, the ex-ante controlled wattage assumptions are significantly higher than ex-post actuals. On average, the ex-post UES for high wattage controlled non-integrated sensors is roughly 50% less than ex-ante assumptions and roughly 65% less for lower wattage controls. For PG&E, the first year kW GRR is much greater than the kWh GRR which would suggest that the ex-post percent time off (PTO) is lower than the ex-ante claim.

For T5 linears, the most significant differences in the GRR are reflected in the delta wattages and, to a lesser extent, operating hours. The average ex-post UES kw is roughly 70% less than the average ex-ante UES for PG&E and is roughly 55% less in SCE.

4.2 Lifecycle Gross Realization Rates

Because some measures have a dual baseline, the gross realization rates associated with the first year savings will differ from the gross realization rates associated with lifecycle savings. To estimate lifecycle savings, annual gross savings were estimated for each year through the measure's EUL and aggregated. No net present valuation was made, just a straight aggregation. For measures classified as ROB, the lifecycle savings will equal the first year savings times the EUL. For measures classified as ER, the lifecycle savings will equal the annual RUL period savings times the RUL plus the annual post-RUL savings times the EUL minus the RUL:

*ROB Lifecycle savings = EUL * First Year Savings*

*ER Lifecycle savings = RUL * RUL Period Savings + (EUL-RUL) * Post-RUL Savings*

Gross lifecycle realization rates were then estimated by looking at the ratio of the ex-post gross lifecycle savings to the ex-ante gross lifecycle savings. Table 4-2 presents the kWh and kW lifecycle gross realization rates, by PA and measure, along with PA and statewide totals. Also

shown are the aggregate ex post and ex ante savings values by segment that were used to develop the realization rates.

Table 4-2: Lifecycle Gross kWh and kW Realization Rates by PA and Measure

PA ESPI Measure	Ex Ante Gross kWh Savings	Ex Post Gross kWh Savings	GRR kWh	Ex Ante Gross kW Savings	Ex Post Gross kW Savings	GRR kW
PGE						
CFL	12,304,976	10,012,959	**81%**	1,717	1,440	**84%**
Delamping	9,812,676	9,398,039	**96%**	1,780	1,932	**109%**
LED	34,081,569	51,644,443	**152%**	6,612	11,709	**177%**
Occupancy Sensors	64,415,762	41,203,200	**64%**	9,951	8,884	**89%**
T5	724,836,066	262,941,402	**36%**	169,617	55,310	**33%**
SCE						
CFL	3,777,421	2,649,548	**70%**	757	562	**74%**
Delamping	19,338,764	17,967,475	**93%**	4,056	3,709	**91%**
Occupancy Sensors	75,398,889	44,258,518	**59%**	25,026	8,534	**34%**
T5	309,445,430	196,340,700	**63%**	78,412	24,715	**32%**
SDGE						
CFL	5,525,099	5,056,585	**92%**	1,162	1,060	**91%**
Delamping	7,167,408	6,190,991	**86%**	1,932	1,669	**86%**
Occupancy Sensors	7,492,728	5,325,847	**71%**	1,642	921	**56%**

For CFL and LED measures, the lifecycle realization rate is most affected by the operating hours. When ex-post operating hours are lower than ex-ante, the EUL generally increases which explains why the lifecycle GRR for these measures increases from first year as well. For CFLs, this shift is most evident for PG&E (72% first year to 81% lifecycle) and is marginal for SDG&E (90% to 92%). As discussed above, ex-post operating hours for CFL screw-in lamps were significantly lower than ex-ante, while ex-post reflector hours were more in line with ex-ante claims. The SDG&E CFL measure explicitly focused on reflector lamps whereas PG&E offered a mix of screw-in lamps and reflectors.

Occupancy sensors have a fixed EUL of 8 years and are not affected by hours of operation. This is the reason why lifecycle and first year GRRs are virtually identical for these measures.

For linear delamp and T5 retrofits, the EUL will often max out at 15 years, so lower operating hours will not increase the EUL beyond the 15 year maximum. These measures are also subject to a dual baseline, so the post-RUL impacts are typically much lower than the impact during the RUL period. Likewise, the ex-post delta wattage associated with the post-RUL period for ER

measures is generally smaller than ex-ante wattage assumptions. These conditions have the effect of making the lifecycle GRR less than the first year.

4.3 Net First Year Realization Rates

Net savings are estimated in a manner similar to the gross savings. UES values are multiplied by the corresponding NTGRs to get net savings values. Net realization rates are then estimated for kWh and kW savings by looking at the ratio of the aggregate evaluated gross savings to the aggregate ex-ante gross savings. Specifically, the Net Realization Rate (NRR) for PA-Measure segment j is estimated as:

$$Net\_Realization\_Rate_j = \frac{\sum_{i=1}^{n} Net\_Ex\_Post\_Impact_{i,j}}{\sum_{i=1}^{n} Net\_Ex\_Ante\_Impact_{i,j}}$$

Where,

$Net\_Ex\_Post\_Impact_{i,j}$ is the site-specific net ex-post impact estimate for customer i, in the population, who is in PA-Measure segment j.

$Net\_Ex\_Ante\_Impact_{i,j}$ is the site-specific net ex-ante impact estimate for customer i, in the population, who is in PA-Measure segment j.

Table 4-3 presents the kWh and kW first year net realization rates, by PA and measure, along with statewide totals. Also shown are the aggregate ex post and ex ante savings values by segment that were used to develop the realization rates

Table 4-3: First Year Net kWh and kW Realization Rates by PA and Measure

PA ESPI Measure	Ex Ante Net kWh Savings	Ex Post Net kWh Savings	NRR kWh	Ex Ante Net kW Savings	Ex Post Net kW Savings	NRR kW
PGE						
CFL	2,486,141	1,492,390	**60%**	412	276	**67%**
Delamping	1,870,033	1,436,594	**77%**	339	290	**86%**
LED	4,840,109	4,932,101	**102%**	942	1,159	**123%**
Occupancy Sensors	4,873,823	3,130,373	**64%**	747	672	**90%**
T5	37,213,409	11,361,930	**31%**	8,699	2,353	**27%**
SCE						
CFL	1,104,925	524,650	**47%**	223	118	**53%**
Delamping	1,660,284	1,153,012	**69%**	290	169	**58%**
Occupancy Sensors	7,073,497	3,315,862	**47%**	2,451	635	**26%**
T5	17,533,048	8,516,156	**49%**	4,401	1,717	**39%**
SDGE						
CFL	1,106,494	1,016,907	**92%**	230	214	**93%**
Delamping	293,741	252,020	**86%**	79	66	**84%**
Occupancy Sensors	572,596	401,344	**70%**	126	68	**54%**

The NRRs differ for the same reasons discussed above for GRRs, however, they are also influenced by differences between ex-post and ex-ante NTGRs. For the most part, the ex-post NTGRs are less than ex-ante NTGRs, which explains why NRRs are lower than GRRs. The only exception to this is an increase from 90% GRR to 92% NRR for SDG&E CFLs. This is because the ex-post NTGR for this measure was slightly larger than the ex-ante ratio.

4.4 Lifecycle Net Realization Rates

Net lifecycle realization rates are estimated in a similar way as gross lifecycle realization rates, by looking at the ratio of the evaluated ex-post net lifecycle savings to the ex-ante net lifecycle savings. The approach is identical to that for the gross lifecycle realization rates, but using net savings instead of gross.

Table 4-4 presents the kWh and kW lifecycle net realization rates, by PA and measure, along with PA and statewide totals. Also shown are the aggregate ex post and ex ante savings values by segment that were used to develop the realization rates.

Table 4-4: Lifecycle Net kWh and kW Realization Rates by PA and Measure

PA ESPI Measure	Ex Ante Net kWh Savings	Ex Post Net kWh Savings	NRR kWh	Ex Ante Net kW Savings	Ex Post Net kW Savings	NRR kW
PGE						
CFL	8,429,771	5,956,136	**71%**	1,228	878	**71%**
Delamping	8,733,281	6,799,445	**78%**	1,584	1,368	**86%**
LED	28,852,256	29,779,755	**103%**	5,594	6,818	**122%**
Occupancy Sensors	38,990,586	25,042,986	**64%**	5,977	5,372	**90%**
T5	555,167,842	169,605,540	**31%**	129,988	35,171	**27%**
SCE						
CFL	3,114,816	1,586,004	**51%**	626	340	**54%**
Delamping	16,412,857	11,691,092	**71%**	3,440	2,037	**59%**
Occupancy Sensors	56,565,532	26,510,188	**47%**	19,604	5,080	**26%**
T5	232,451,965	126,886,325	**55%**	58,677	15,677	**27%**
SDGE						
CFL	3,276,638	3,061,098	**93%**	688	642	**93%**
Delamping	4,386,214	3,762,888	**86%**	1,179	987	**84%**
Occupancy Sensors	4,645,052	3,235,547	**70%**	1,018	552	**54%**

Appendix A

Nonresidential Downstream Impact Evaluation Phone Survey

Participant Survey for CPUC
2013-2014 Commercial Evaluation

INTRODUCTION AND FINDING CORRECT RESPONDENT

OUTCOME1

This is _____ calling on behalf of the CPUC, from ITRON CONSULTING. THIS IS NOT A SALES CALL NOR A SERVICE CALL. May I please speak with ...<%CONTACT> ...<%OLDCONTACT> ... <%BUSINESS> ... the person at your organization that is most knowledgeable about your participation in <%UTILITY>'s <%PROGRAM> program.
!___[IF NEEDED]...This is a fact-finding survey only, authorized by the California Public Utilities Commission.

1	Yes (go to next screen)	Continue
2	Make appointment	Make appt and record time
3	Busy/engaged	Record Response and T&T
4	No Answer	Record Response and T&T
5	Refused	Record Response and T&T
6	Disconnected	Record Response and T&T
7	Answering Machine - no message	Record Response and T&T
8	Duplicate	Record Response and T&T
9	DRNA	Record Response and T&T

10	Disability	Record Response and T&T
11-12	Language Barriers	Record Response and T&T
13	Answering Machine - left message	Record Response and T&T
14	NO SCREEN - Participant	Record Response and T&T
15	Hang up	Record Response and T&T
16	Residence	Record Response and T&T
17	Fax	Record Response and T&T
18	Quota full	Record Response and T&T
19	Wrong Address	Record Response and T&T
20	Home office	Record Response and T&T
21	Max attempts	Record Response and T&T
24	General callback	Record Response and T&T
25	Name/Number changed	Record Response and T&T

Thank & Terminate PBLOCK NO_ONE	Thank you for your time. For this study, we need to speak to someone about your organization's installation of energy efficient equipment that your organization installed through <%UTILITY>'s <%PROGRAM> program.	END

Q1B

[IF YOU ARE TRANSFERRED TO ANOTHER PERSON OTHER THAN THE BEST CONTACT]Who would be the person most familiar about your organization's participation in <%UTILITY>'S <%PROGRAM> program? [ENTER NEW CONTACT NAME AND MOVE ON]
[IF NEEDED] This is not a sales call.
[IF NEEDED] This is a fact-finding survey only, and responses will not be connected with your firm in any way. The California Public Utilities Commission wants to better understand how businesses think about and manage their energy consumption.

77	There is no one here who can help you	T&T
1	Continue Q1B until you find appropriate contact person, record as &NEW CONTACT NAME	Intro3:s

Intro3:S

[IF BEST CONTACT IS AVAILABLE]
Hello, my name is _____%n_____ and I am calling on behalf of the California Public Utilities Commission from Itron Consulting. THIS IS NOT A SALES CALL. We are interested in speaking with the person most knowledgeable about your organization's participation in ... <%UTILITY>'s <%PROGRAM> program...I was told that would be you.
...Your organization participated in <%UTILITY>'s <%PROGRAM>

by installing lighting equipment around 2013 or 2014.

Through this program, your oganization installed....
<%CUSTOM_MEASURE>
<%QTY_1> ... <%UNITS_1> ... <%MEASURE_1>
<%QTY_2> ... <%UNITS_2> ... <%MEASURE_2>
<%QTY_3> ... <%UNITS_3> ... <%MEASURE_3>
Are you the best person to speak to about your organization's participation in this program?

1	Yes	Person:s
2	No, there is someone else	Intro3:s
3	No and I don't know who to refer you to	Appoint
5	Property management company handles this	PMNAME
99	Don’t know/refused	T&T

Ext Is there a phone extension or phone number you recommend we use when we call back?

77	Record Extension or Phone Number, &PHONE	Thank&Terminate
88	Refused	Thank&Terminate
99	Don’t know	Thank&Terminate

PMNAME May I have the name and contact information of your property management company?

1	Yes - RECORD	Record Response and T&T
2	No	Thank&Terminate
88	Refused	Thank&Terminate
99	Don't Know	Thank&Terminate

Appoint [IF RECOMMENDED CONTACT IS NOT CURRENTLY AVAILABLE]
When would be a good day and time for us to call back?

77	Record day of the week, time of day and date to call back, as &APPOINT	Record Response and T&T
88	Refused	Intro3(99)
99	Don’t know	Intro3(99)

If Person(3)

Intro3(99)	Thank you for your time. We need to speak with the person at your organization that is most familiar with this facility's energy using equipment. Those are all of the questions I have for you today.	Abandoned User30

PBLOCK Hi Who would be the person at this location who is most knowledgeable about this facility's energy using equipment? [Enter New Contact Name and move on.]

77	Record Name, as &CONTACT	May_I

88	Refused	Thank&Terminate
99	Don't know	Intro3(99)

May_I May I speak with him/her?

77	Yes	Intro3:s
88	No (not available right now@, set cb)	Abandoned Appointment

PERSON:s

According to our records, your organization participated in <%UTILITY>'s <%PROGRAM> program by installing energy saving equipment around ... <%DEEM_PAID_DATE1> <%CUST_PAID_DATE>
Through this program, your organization installed....
<%CUSTOM_MEASURE>
<%QTY_1> ... <%UNITS_1> ... <%MEASURE_1>
<%QTY_2> ... <%UNITS_2> ... <%MEASURE_2>
<%QTY_3> ... <%UNITS_3> ... <%MEASURE_3>
Are you the person most knowledgeable about your organization's participation in ...<%UTILITY>'s <%PROGRAM> Program?

1	Yes	Continue
2	Yes, need to make appointment	Appoint
4	No, but I will give you a name	Thank&Terminate
99	No one knows about the energy using equipment	Thank&Terminate

DISPLAY

If you need to provide validation for this survey, provide the following contact name and number: Mona Dzvova (LAST NAME PRONOUNCED 'ZOVA'), (415) 703-1231, and the following website: **www.cpuc.ca.gov/eevalidation**

Before we start, I would like to inform you that for quality control purposes, this call may be monitored by my supervisor.Today we're conducting a very important study on the energy needs and perceptions of organizations like yours. We are interested in how organizations like yours think about and manage their energy consumption.Your input will allow the California Public Utilities Commission to build and maintain better energy savings programs for customers like you. And we would like to remind you, your responses will not be connected with your organization in any way.

SCREENER

VERIFY For verification purposes only, may I please have your name?

77	Get name	Scrn_Addr
88	Refused	Scrn_Addr
99	Don't know	Scrn_Addr

DISPLAY

For the sake of expediency, I will refer to ....<%UTILITY>'s <%PROGRAM> ...program as the PROGRAM.

Scrn_Addr First, I'd like to ask you a few questions about your organization and facility. Our records show your organization is located at %ADDRESS in %CITY. Is that correct?
[CONTINUE IF ADDRESS REPORTED BY RESPONDENT IS SIMILAR ENOUGH]

1	Yes	Bus_Name
2	No	CORRECT
88	Refused	COMMENT
99	Don't Know	COMMENT

COMMENT We were attempting to reach <%UTILITY>'s customer at <%ADDRESS> and since you cannot confirm this address, those are all the questions that we have for you today, on behalf of the California Public Utilities Commission, thank you for your time.

CORRECT May I have your correct address?

%CORRECT	Corrected Address	COMPARE

COMPARE Are these addresses similar or totally different?
Computer Address - %ADDRESS
Corrected Address - &CORRECT

1	Similar	Bus_Name
2	Totally Different	COMMENT2

COMMENT2	We were attempting to reach the <%UTILITY> customer at <%ADDRESS> in <%CITY> and since that does not match your address, then we must have mis-dialed the telephone number. Those are all the questions that we have for you today, on behalf of the California Public Utilities Commission. Thank you for your time and cooperation.	Thank and Terminate

BUS_NAME Our records show your organization's name as: <%BUSINESS> <%CONTACT> <%OLDCONTACT>. Is that correct?

1	Yes	INCENT
2	No	Bus_Correct
88	Refused	COMMENT
99	Don't Know	COMMENT

BUS_CORRECT What is the correct name for your organization?

&BUS_CORRECT	Corrected Business	INCENT

INCENT What percentage of the cost of your rebated equipment was covered by the program?

77	RECORD RESPONSE	A1gg
88	REFUSED	FM050
99	DON'T KNOW	FM050

IF INCENT <> 100 then ask; Else skip to FM050

A1gg What incentive amount did your organization receive from the program towards your energy efficient equipment installation?

77	RECORD VERBATIM	FM050
88	Refused	FM050
99	Don't know	FM050

FM050 What is the main business ACTIVITY at this facility? [DO NOT READ]

1	Offices (non-medical)	FM050a
2	Restaurant/Food Service	FM050b
3	Food Store (grocery/liquor/convenience)	FM050c
4	Agricultural (farms, greenhouses)	FM050d
5	Retail Stores	FM050e
6	Warehouse	FM050f
7	Health Care	FM050g
8	Education	FM050h
9	Lodging (hotel/rooms)	FM050i
10	Public Assembly (church, fitness, theatre, library, museum, convention)	FM050j
11	Services (hair, nail, massage, spa, gas, repair)	FM050k
12	Industrial (food processing plant, manufacturing)	FM050l
13	Laundry (Coin Operated, Commercial Laundry Facility, Dry Cleaner)	FM050m
14	Condo Assoc./Apartment Mgr (Garden Style, Mobile Home Park, High-rise, Townhouse)	FM050n
15	Public Service (fire/police/postal/military)	FM050o
77	OPEN\Record Other Service Shop	LANG
88	Refused	LANG
99	Don’t know	LANG

FM050a Which of the following types of offices best describes this facility? Would you say...[READ]

1	Administration and management	LANG
2	Financial/Legal	LANG
3	Insurance/Real Estate	LANG
4	Data Processing/Computer Center	LANG
5	Mixed-Use/Multi-tenant	LANG
6	Lab/R&D Facility	LANG
7	Software Development	LANG
8	Government Services	LANG
9	Office with Warehouse	LANG
10	Contractor's Offices	LANG
11	Telecommunications Center (call center)	LANG
12	Travel Services (Travel Agent)	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don’t know	LANG

FM050b Which of the following types of restaurants or food service best describes this facility? Would you say… [READ]

1	Fast Food or Self Service	LANG
2	Specialty/Novelty Food Service	LANG
3	Table Service	LANG
4	Bar/Tavern/Nightclub/Brew Pub or Microbrewery/Other entertainment	LANG
5	Caterer	LANG
6	Other Food Service	LANG
88	Refused	LANG
99	Don't know	LANG

FM050c Which of the following types of food stores best describes this facility? Would you say...[READ]

1	Supermarkets	LANG
2	Small General Grocery	LANG
3	Specialty/Ethnic Grocery/Deli	LANG
4	Convenience Store	LANG
5	Liquor Store	LANG
6	Retail Bakery	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050d What type of agricultural facility is this? [READ]

1	Commercial Greenhouse	LANG
2	Commercial Farm	LANG
3	Dairy/Ranch	LANG
4	Vineyard/Orchard	LANG
5	Agricultural Storage (Grain Elevators, etc.)	LANG
6	Equine Facility (Horse Boarding/Grooming/Racing/Breeding)	LANG
77	OPEN\Describe type of agricultural facility	LANG
88	Refused	LANG
99	Don't know	LANG

FM050e Which of the following types of retail stores best describes this facility? Would you say… [READ]

1	Department/Variety Store	LANG
2	Retail Warehouse/Club	LANG
3	Shop in Enclosed Mall	LANG
4	Shop in Strip Mall	LANG
5	Auto/Truck/Motorcycle Sales	LANG
6	Art Gallery	LANG
7	Auction House	LANG
8	Heavy Equipment Sales	LANG
9	Facility is a Mall/Strip Mall	LANG

77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050f Which of the following types of warehouses best describes this facility? Would you say… [READ]

1	Refrigerated Warehouse	LANG
2	Unconditioned Warehouse, High Bay (lighting higher than 13 ft.)	LANG
3	Unconditioned Warehouse, Low Bay	LANG
4	Conditioned Warehouse, High Bay (lighting higher than 13 ft.)	LANG
5	Conditioned Warehouse, Low Bay	LANG
6	Shipping/Distribution Center	LANG
7	Garage/Parking/Storage for Commercial Fleet	LANG
8	Public Self Storage Facility	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050g Which of the following types of health care centers best describes this facility? Would you say… [READ]

1	Hospital	LANG
2	Nursing Home	LANG
3	Medical/Dental Office	LANG
4	Clinic/Outpatient Care	LANG
5	Medical/Dental Lab	LANG
6	Alcohol/Drug Treatment/Rehabilitation	LANG
7	Doctor's Office	LANG
8	Dentist's Office	LANG
9	Veterinary Hospital/Clinic	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050h Which of the following types of educational centers best describes this facility? Would you say… [READ]

1	Daycare or Preschool	LANG
2	Elementary School	LANG
3	Middle/Secondary School	LANG
4	College or University	LANG
5	Vocational or Trade School	LANG
6	Instructional Studio (Dance/Music/Martial Arts)	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050i Which of the following types of lodging best describes this facility? Would you say… [READ]

1	Hotel	LANG
2	Motel	LANG
3	Resort	LANG
4	Bed and Breakfast	LANG
5	Campground/Trailer Camping/KOA	LANG
6	Residential Hotel/Motel	LANG
7	Dormitory/Sorority/Fraternity	LANG
8	Activity Camp/Summer Camp	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050j Which of the following types of public assembly buildings best describes this facility? Would you say… [READ]

1	Religious Assembly (worship only)	LANG
2	Religious Assembly (mixed use)	LANG
3	Health/Fitness Center/Athletic Center/Gym	LANG
4	Movie Theaters	LANG
5	Theater/Performing Arts Venue	LANG
6	Library/Museum	LANG
7	Conference/Convention Center	LANG
8	Community Center/Activity Center	LANG
9	Country Club	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050k Which of the following types of service buildings best describes this facility? Would you say...[READ]

1	Hair Salon	LANG
2	Nail Salon	LANG
3	Massage Spa	LANG
4	Day Spa	LANG
5	Gas Station/Auto Repair	LANG
6	Gas Station w/Convenience Store	LANG
7	Repair (Non-Auto)	LANG
8	Copy Center/Printing	LANG
9	Package Delivery (Fed Ex/UPS/DHL)	LANG
10	HVAC Repair Installation	LANG
11	Aircraft Maintenance/Repair	LANG
12	Airport	LANG
13	Parking Lot/Commuter Service	LANG
14	Marina	LANG

15	Amusement (mini-golf/go-carts/skating/bowling)	LANG
16	Pet Care/Grooming	LANG
17	Car Rental	LANG
18	Car Wash	LANG
19	Cemetery/Mortuary/Crematorium	LANG
20	Equipment Rental	LANG
21	Fleet Fueling Services	LANG
22	Pest Control	LANG
23	Photographer	LANG
24	Vehicle Inspections	LANG
25	Transportation	LANG
26	Upholstery	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050l Which of the following types of buildings best describes this facility? Would you say...[READ]

1	Assembly/Light Manufacturing	LANG
2	Food Processing Plant	LANG
3	Recycling Center	LANG
4	Commercial/Industrial Bakery	LANG
5	Commercial Brewery/Winery	LANG
6	Chemical/Petrochemical Production	LANG
7	Industrial Process	LANG
8	Radio/Television/Film/Music Production	LANG
9	Energy Generation/Distribution	LANG
10	Machine Shop	LANG
11	Pharmaceutical Production/Manufacturing	LANG
12	Mail Sorting	LANG
13	Mining	LANG
77	OPEN\DO NOT USE unless necessary	LANG
88	Refused	LANG
99	Don't know	LANG

FM050m What type of laundry facility is this? [READ]

1	Coin Operated	LANG
2	Commercial Laundry Facility	LANG
3	Dry Cleaners	LANG
77	OPEN\Record other building type	LANG
88	Refused	LANG
99	Don't know	LANG

FM050n Which of the following types of buildings best describes this facility? Would you say...[READ]

1	Garden Style	LANG
2	Mobile Home	LANG
3	High-rise	LANG
4	Townhouse	LANG
5	Condominium	LANG
6	Apartment	LANG
7	Artists' Studio/Live Work/Loft	LANG
8	Assisted Living	LANG
77	OPEN\Record other building type	LANG
88	Refused	LANG
99	Don’t know	LANG

FM050o Which of the following types of buildings best describes this facility? Would you say...[READ]

1	Police station	LANG
2	Fire station	LANG
3	Post office	LANG
4	Military	LANG
5	Ambulance Service	LANG
6	Jail/Correctional facility	LANG
7	Courthouse	LANG
8	Library	LANG
9	Water/Waste Water Treatment	LANG
10	General Government (Municipal/State/Federal Agency Buildings)	LANG
11	Public Park	LANG
77	OPEN\Record other building type	LANG
88	Refused	LANG
99	Don’t know	LANG

LANG Is another language besides English used to conduct business at this facility?

1	Yes	OTH_LANG
2	No	CC2a
88	Refused	CC2a
99	Don't Know	CC2a

OTH_LANG Which languages are used to conduct business at this facility?

1	Spanish	CC2a
2	Chinese	CC2a
3	Korean	CC2a
4	Vietnamese	CC2a
5	Japanese	CC2a
6	Hindi	CC2a
77	OPEN	CC2a

88	Refused	CC2a
99	Don't know	CC2a

CUSTOMER CHARACTERISTICS

Now, I'd like to ask you questions regarding your facility.

CC2a What is the total square footage at this facility?

77	RECORD Square feet	CC2c
888888	Refused	CC3
999999	Don't know	CC3

IF CC2a IN (88, 99)

CC3 Would you say that the floor area is ...?

1	less than 1,500 sq. ft.	CC2c
2	1,500 - 5,000 sq. ft.	CC2c
3	5,000 - 10,000 sq. ft.	CC2c
4	10,000 – 25,000 sq. ft.	CC2c
5	25,000 – 50,000 sq. ft.	CC2c
6	50,000 – 75,000 sq. ft.	CC2c
7	75,000 – 100,000 sq. ft.	CC2c
8	over 100,000 sq. ft. (ag area)	CC2c
88	Refused	CC2c
99	Don't know	CC2c

CC2c Is the entire floor area of this facility heated or cooled?

1	Yes	CC3a
2	No	CC2d
88	Refused	C0
99	Don't know	C0

CC2d What percentage of the floor area is heated or cooled?

77	Percent	CC3a
101	Refused	C0
102	Don't know	C0

If CC2d > 0 or CC2c = 1; else skip to C0

CC3a Is your space heated using electricity or gas or something else?

1	Electricity	C0
2	Gas	C0
3	Both electricity and gas	C0
4	Propane	C0
77	OPEN\Other-record	C0
88	Refused	C0

99	Don't know	C0

C0 About what percentage of your operating costs does energy account for?

1	Less than 1 percent	CC4
2	1-2 percent	CC4
3	3-5 percent	CC4
4	6-10 percent	CC4
5	11-15 percent	CC4
6	16-20 percent	CC4
7	21-50 percent	CC4
8	Over 51 percent	CC4
88	Refused	CC4
99	Don't Know	CC4

CC4 Does your organization own, lease, or manage the facility?

1	Own	C5
2	Lease/Rent	C5
3	Manage	C5
88	Refused	C5
99	Don't know	C5

C5 How many locations does your organization have. Is it....

1	This facility only	CC6
2	2 to 4 locations	CC6
3	5 to 10 locations	CC6
4	11 to 25 locations	CC6
5	more than 25 locations	CC6
88	Don't know	CC6
99	Refused	CC6

CC6 How active a role does your organization take in making purchase decisions related to energy using equipment at this facility? Would you say you are…

1	Very active – involved in all phases and have veto power	CC8
2	Somewhat active – we approve decisions and provide some input and review	CC8
3	Slightly active – we have a voice but it's not the dominant voice	CC8
4	Not active at all – we're part of a larger firm	CC8
5	Not active at all – our firm doesn't get involved in these issues	CC8
88	Refused	CC8
99	Don't know	CC8

CC8 In what year was the facility built?

7777	Year	CC11
8888	Refused	CC10

9999	Don't know	CC10

If CC8 in (88, 99) then ask; else skip to CC11

CC10 If don't know, would you say it was…

1	After 2010	CC11
2	2000s	CC11
3	1990s	CC11
4	1980s	CC11
5	1970s	CC11
6	1960s	CC11
7	1950	CC11
8	Before 1950	CC11
88	Refused	CC11
99	Don't know	CC11

CC11 In what year was this facility last remodeled? [PROBE FOR BEST GUESS]

7777	Year	CC12a
6666	Never Remodeled	CC12a
8888	Refused	CC11a
9999	Don't know	CC11a

Ask if CC11 in (88, 99); else skip to CC12a

CC11a Would you say the last remodeling was done …. [READ RESPONSES.]

1	Between 2010 and present	CC12a
2	Between 2006 and end of 2009	CC12a
3	Between 2000 and the end of 2005	CC12a
4	During the 1990s	CC12a
5	Before the 1990s	CC12a
88	Refused	CC12a
99	Don't know	CC12a

CC12a In what year was this organization established at this location?

7777	Year	BC090
8888	Refused	CC12b
9999	Don't know	CC12b

If CC12a in (88, 99) then ask; else skip to BC090

CC12b Would you say it was…

1	After 2010	BC090
2	Between 2006 and 2010	BC090
3	Between 2000 and 2005	BC090
4	In the 1990s	BC090
5	In the 1980s	BC090
6	In the 1970s	BC090

7	In the 1960s or	BC090
8	Before 1960	BC090
88	Don't know	BC090
99	Refused	BC090

ADDITIONAL FACILITY CHARACTERISTICS

BC090 Has the square footage of the facility increased, decreased or remained the same since January 2012?

1	Increase in square footage	BC100
2	Decrease in square footage	BC110
3	Stayed the same	CA15
88	Refused	CA15
99	Don't know	CA15

If BC090 = 1 then ask; else skip to BC110

BC100 How many square feet were added?

77	Square feet	BC120
88	Refused	BC120
99	Don't know	BC120

If BC090 = 2 then ask; else skip to BC120

BC110 By how many square feet was the facility reduced?

77	Square feet	BC120
88	Refused	BC120
99	Don't know	BC120

If BC090 in (1, 2) then ask; else skip to CA15

BC120 In what year did this <%BC090> occur?

1	2012	V1
2	2013	V1
3	2014	V1
88	Refused	V1
99	Don't know	V1

ROLE OF CONTRACTORS

V1 Did you use a contractor/vendor to install any of the the energy efficient measures that were purchased through the program?

1	Yes	V2
2	No	AP9
88	Refused	AP9
99	Don't Know	AP9

If V1 = 1 then ask; else skip to AP9

V2 How did you come into contact with the contractor/vendor?

1	They contacted you	V2b
2	You contacted them	V3
3	You had worked with them before	V2a
77	OTHER - Record	V3
88	Refused	V3
99	Don't Know	V3

Ask if V2 = 3; else skip to V2b

V2a In relation to this project, did the vendor/contractor approach you about your energy efficient equipment retrofit/installation?

1	Yes	V2b
2	No	V3
88	Refused	V3
99	Don't Know	V3

Ask if V2 = 1 or V2a = 1; else skip to V3

V2b On a scale of 0 - 10, with 0 being NOT AT ALL LIKELY and 10 is VERY LIKELY, how likely is it that your organization would have installed this new equipment had the contractor/vendor not contacted you?

1	0-10 response	V3
88	Refused	V3
99	Don't Know	V3

V3 Did the contractor/vendor tell you about or recommend the program?

1	Yes	V4
2	No	AP9
88	Refused	AP9
99	Don't Know	AP9

Ask if V3 = 1; else skip to AP9

V4 Prior to coming into contact with the contractor/vendor, did your organization have plans to replace/install this equipment?

1	Yes	V4a
2	No	V4a
88	Refused	V4a
99	Don't Know	V4a

V4a Using the same scale of 0 - 10 as before, how likely is it that your organization would have installed the new energy efficient equipment had the contractor/vendor not recommended it?

1	0-10 response	V4b

88	Refused	V4b
99	Don't Know	V4b

V4b Using the same scale, how likely is it that your organization would have installed the energy efficient equipment with the same level of efficiency if the contractor/vendor had not recommended to do so?

1	0-10 response	V40
88	Refused	V40
99	Don't Know	V40

V40 On a scale of 0 - 10, with 0 being not at all important and 10 being very important, how important was the input from the contractor you worked with in deciding which specific equipment to install?

1	0-10 response	AP9
88	Refused	AP9
99	Don't Know	AP9

PROGRAM AWARENESS

Next, I'd like to ask you about various energy efficiency programs and what influenced your program participation.

AP9 How did you FIRST learn about <%UTILITY>'s program? [DO NOT READ ANSWERS]

1	Bill insert	AP9a
2	Program literature	AP9a
3	Account representative	AP9a
4	Program approved vendor	AP9a
5	Program representative	AP9a
6	Utility or program website	AP9a
7	Trade publication	AP9a
8	Conference	AP9a
9	Newspaper article	AP9a
10	Word of mouth	AP9a
11	Previous experience with it	AP9a
12	Company used it at other locations	AP9a
13	Contractor	AP9a
14	Result of an audit	AP9a
15	Part of a larger expansion or remodeling effort	AP9a
77	Other (RECORD VERBATIM)	AP9a
88	Refused	A1b
99	Don’t know	A1b

If AP9 in (1-77) then ask; else skip to A1b

How ELSE did you learn about <%UTILITY>'s program? [DO NOT READ LIST, ACCEPT MULTIPLES]

AP9a

1	Bill insert	N33
2	Program literature	N33
3	Account representative	N33
4	Program approved vendor	N33
5	Program representative	N33
6	Utility or program website	N33
7	Trade publication	N33
8	Conference	N33
9	Newspaper article	N33
10	Word of mouth	N33
11	Previous experience with it	N33
12	Company used it at other locations	N33
13	Contractor	N33
14	Result of an audit	N33
15	Part of a larger expansion or remodeling effort	N33
77	Other (RECORD VERBATIM)	N33
88	Refused	N33
99	Don't know	N33

If AP9 = 3 or AP9A = 3 then ask; else skip to A1b
You mentioned that you have a Utility or Program Administrator Account Rep.
Can you give me his or her name?
!!___Do you have his/her email address?
!___Do you have a phone number for him/her?
!___Do you have a cell phone number for him/her?\,

N33

77	RECORD NAME, Phone, Email, etc.	A1b
88	Refused	A1b
99	Don't know	A1b

INTEGRATED DEMAND SIDE MANAGEMENT

If AUDIT = 1 then ask; else skip to ID0
According to our records, your organization also received an AUDIT from <%UTILITY>. Is this correct?

A1b

1	Yes	ID0
2	No	ID0
88	Refused	ID0
99	Don't know	ID0

If AUDIT <> 1

ID0 To the best of your knowledge, has the facility located at this address received a <%UTILITY>-sponsored energy audit within the past 3 years?

1	Yes	ID1
2	No	ID1
88	Refused	ID1
99	Don't Know	ID1

ID1 Are you aware of other programs, other than the one we mentioned earlier, or resources that are designed to help organizations like yours reduce its energy bills?

1	Yes	ID2
2	No	ID3
88	Refused	ID3
99	Don't Know	ID3

If ID1 = 1 then ask; else skip to ID3

ID2 What types of programs can you recall? **[RECORD ALL MENTIONS]** [After each response prompt with "Can you recall any others?"]

1	Rebates/incentives (include mentions of SPC and Express)	ID3
2	Building Commissioning (Retrocommissioning, Monitoring based commissioning)	ID3
3	Business energy audits and feasibility studies	ID3
4	Energy Centers (Pacific Energy Center, SCE CTAC)	ID3
5	Seminars, classes, and workshops	ID3
6	Solar or other Distributed Generation Programs (CSI, SGIP)	ID3
7	Demand Response Programs (Flex Your Power, Peak Choice, BIP, DBP, Aggregator, PDP) ID3	ID3
8	Upstream HVAC and Motors Program	ID3
77	Other programs [SPECIFY:]_____	ID3
88	Refused	ID3
99	Don't Know	ID3

ID3 Has your Account Representative, or any Program Staff or Program Vendors discussed solar, wind or other self-generation equipment opportunities with you?

1	Yes, Account Representative	ID3a
2	Yes, Program Staff	ID3a
3	Yes, Program Vendor	ID3a
4	No	ID3a
88	Refused	ID3a
99	Don't Know	ID3a

ID3a Has your Account Representative, Program Staff, or Program Vendors discussed Demand Reduction programs, technologies, or opportunities with you? (Select all that apply)

1	Yes, Account Representative	Program_Lighting
2	Yes, Program Staff	Program_Lighting
3	Yes, Program Vendor	Program_Lighting
4	No	Program_Lighting
88	Don't Know	Program_Lighting
99	Refused	Program_Lighting

PROGRAM LIGHTING EQUIPMENT

Ask if LIGHTING = 1; else skip to NEXT BATTERY

Comment	One way that organizations like yours can reduce their energy use is to install more energy efficient lighting equipment. I would like to ask you about the lighting changes you made as part of your participation in <%UTILITY>'s program.	LI99

CONTINUE IF CUSTOM = 1; ELSE SKIP TO A3A
IF DEEMED = 1

LI99 Our records indicate that your organization installed CUSTOM LIGHTING EQUIPMENT through the program. It is described as <%CUSTOM_MEASURE>. Is this correct?

1	Yes	LI100
2	No	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY

Ask if LI99 in (2-99); else skip to LI100.

DISPLAY	We can not continue this study unless we can speak to someone at your organization that is familiar with the lighting equipment that was installed through the program.	A3A

Ask if LI99 = 1; else skip to A3A.

LI100 What types of fixtures, ballasts, or light controls were installed as part of this lighting installation? <$2>

1	High performance T8 (1" diameter bulbs)	LI101A <$1>
2	T8 fluorescent fixtures (1" diameter bulbs)	LI101A <$1>
3	T10 fluorescent fixtures	LI101A <$1>
4	Compact HID (High Density Discharge) Fixtures	LI101A <$1>
5	Screw-in modular CFLs	LI101A <$1>
6	Hardwire CFL fixtures	LI101A <$1>
7	CFL Exit Signs	LI101A <$1>

8	Led Exit Signs	LI101A <$1>
9	Halogen bulbs	LI101A <$1>
10	Reflectors	LI101A <$1>
11	Electronic Ballasts	LI101A <$1>
12	Lighting Controls, Time Clock	LI101A <$1>
13	Lighting Controls, Occupancy Sensor	LI101A <$1>
14	Lighting Controls, Bypass/Delay Timers	LI101A <$1>
15	Lighting Controls, Photocell	LI101A <$1>
16	Other Fluorescent	LI101A <$1>
17	Skinny/Thin Tubes	LI101A <$1>
18	T5 Fixtures (5/8" diameter)	LI101A <$1>
19	Screw-in LEDs	LI101A <$1>
20	Screw-in LEDs Reflector Lamps	LI101A <$1>
21	LED Fixtures or Panels (e.g., replacement for linear fixtures)	LI101A <$1>
77	Other (PLEASE SPECIFY)	LI101A <$1>

IF CUSTOM = 1 START MACRO <LI99> FOR CUSTOM MEASURES (LI101A THROUGH LI101H)

LI101A ($1) Approximately how many <$2> were installed through the program?

77	Record #	LI101C <$4>
8888	Refused	LI101B <$3>
9999	Don't know	LI101B <$3>

If LI101A <$1> in (88, 99) the ask; else skip to LI101C <$4>

LI101B ($3) Would you say that the number of <$2> installed under the program are…

1	less than 10 units	LI101C <$4>
2	11 - 50 units	LI101C <$4>
3	50 - 100 units	LI101C <$4>
4	More than 100 units	LI101C <$4>
88	Refused	LI101C <$4>
99	Don't know	LI101C <$4>

LI101C ($4) Were any of the program provided <$2> placed/installed at another facility? If so, what percentage would you estimate?

1	Yes, #record percentage	LI101D <$5>
2	No	LI101D <$5>
101	Refused	LI101D <$5>
102	Don't know	LI101D <$5>

LI101D ($5) What type of lighting equipment was removed and replaced when you installed <$2> through the program?

1	High performance T8 (1" diameter bulbs)	LI101F <$7>
2	T8 fluorescent fixtures (1” diameter bulbs)	LI101F <$7>
3	T10 fluorescent fixtures	LI101F <$7>
4	T12 Fixtures (1.5” diameter bulbs)	LI101F <$7>
5	Compact HID (High Density Discharge) Fixtures	LI101E <$6>
6	Screw-in Modular CFLs	LI101F <$7>
7	Hardwire CFL Fixtures	LI101F <$7>
8	Incandescent bulbs	LI101F <$7>
9	CFL Exit Signs	LI101F <$7>
10	LED Exit Signs	LI101F <$7>
11	Halogen bulbs	LI101F <$7>
12	Reflectors	LI101F <$7>
13	Electronic Ballast	LI101F <$7>
14	Magnetic Ballast	LI101F <$7>
15	Manual Switches	LI101F <$7>
16	Lighting Controls, Time Clock	LI101F <$7>
17	Lighting Controls, Occupancy Sensor	LI101F <$7>
18	Lighting Controls, Bypass/Delay Timers	LI101F <$7>
19	Lighting Controls, Photocell	LI101F <$7>
20	Other Fluorescent	LI101F <$7>
21	Fat/Thick Tubes	LI101F <$7>
22	Skinny/Thin Tubes	LI101F <$7>
23	T5 Fixtures (5/8” diameter)	LI101F <$7>
24	Screw-in LEDs	LI101F <$7>
25	Screw-in LEDs Reflector Lamps	LI101F <$7>
26	LED Fixtures or Panels (e.g., replacement for linear fixtures)	LI101F <$7>
66	Did not replace anything - new equipment	LI90
77	Other (PLEASE SPECIFY)	LI101F <$7>

Ask if LI101D <$5> = 5; else skip to LI101F

LI101E ($6) Were the HID lamps you removed High Pressure Sodium, Metal Halide, Mercury Vapor or Incandescent?

1	High pressure sodium	LI101F <$7>
2	Metal Halide	LI101F <$7>
3	Mercury Vapor	LI101F <$7>
4	Incandescent	LI101F <$7>
88	Refused	LI101F <$7>
99	Don't know	LI101F <$7>

Ask if LI101D <$5> <> 66; else skip to LI90

LI101F ($7) Approximately how old was the lighting that was removed and replaced with <$2>? Would you say...

1	Less than 5 years old	LI101G <$8>

2	Between 5 and 10 years old	LI101G <$8>
3	Between 10 and 15 years old	LI101G <$8>
4	More than 15 years old	LI101G <$8>
88	Refused	LI101G <$8>
99	Don't know	LI101G <$8>

LI101G ($8) How would you describe the removed equipment's condition? Would you say they were in…

1	Poor condition	LI101H <$9>
2	Fair condition	LI101H <$9>
3	Good condition	LI101H <$9>
88	Refused	LI101H <$9>
99	Don't know	LI101H <$9>

LI101H ($9) Approximately what percentage of the lighting equipment that was removed and replaced was broken or not working prior to installing <$2>?

%	Percent	LI90
101	Refused	LI90
102	Don't know	LI90

END MACRO FOR CUSTOM MEASURES; RESTART LOOP IF NEEDED FOR ADDITIONAL MEASURES SELECTED IN LI100; ELSE GO TO LI90

Ask if LI100 = 5

LI90 Of the CFLs you received through the program,what percentage do you estimate were placed into storage for later use?

77	Open Record	LI901
101	Refused	LI901
102	Don't know	LI901

Ask if LI100 = 19

LI901 Of the LEDs you received through the program,what percentage do you estimate were placed into storage for later use?

77	Open Record	LI902
101	Refused	LI902
102	Don't know	LI902

Ask only if LI100 = 20

LI902 Of the LED Reflector Lamps you received through the program,what percentage do you estimate were placed into storage for later use?

77	Open Record	CUST_INSTALL_DATE_NU

101	Refused	CUST_INSTALL_DATE_NU
102	Don't know	CUST_INSTALL_DATE_NU

CUST_INSTALL_DATE_NU

IF UNRECORDED <> CUST_INSTALL_DATE;
Our records indicate that your company installed this CUSTOM LIGHTING EQUIPMENT on <%CUST_INSTALL_DATE>. Is this correct?

1	Yes	NTGCHECK
2	No	CUST_INSTALL_YEAR
88	Refused	CUST_INSTALL_YEAR
99	Don't know	CUST_INSTALL_YEAR

DISPLAY

IF UNRECORDED(CUST_INSTALL_DATE) & ^UNRECORDED(CUST_PAID_DATE);
According to our records, your organization received a rebate for the installation of your CUSTOM LIGHTING EQUIPMENT on ... <%CUST_PAID_DATE>.

CUST_INSTALL_ YEAR

IF CUST_INSTALL_DATE_NU = 2 OR (UNRECORDED = CUST_INSTALL_DATE AND UNRECORDED <> CUST_PAID_DATE);
In what year did you install this CUSTOM LIGHTING EQUIPMENT (PROBE FOR BEST GUESS)

1	2013	CUST_INSTALL_MONTH
2	2014	CUST_INSTALL_MONTH
88	Refused	NTGCHECK
99	Don't know	NTGCHECK

If CUST_INSTALL_YEAR in (1-3) then ask; else skip to A3a

CUST_INSTALL_ MONTH

And in which Month. If you don't know the MONTH, could you remember the SEASON?

1	January	NTGCHECK
2	February	NTGCHECK
3	March	NTGCHECK
4	April	NTGCHECK
5	May	NTGCHECK
6	June	NTGCHECK
7	July	NTGCHECK
8	August	NTGCHECK
9	September	NTGCHECK
10	October	NTGCHECK
11	November	NTGCHECK
12	December	NTGCHECK

13	Fall	NTGCHECK
14	Winter	NTGCHECK
15	Spring	NTGCHECK
16	Summer	NTGCHECK
88	Refused	NTGCHECK
99	Don't know	NTGCHECK

NTGCHECK

GO TO NTG BATTERY IF NTGCUSTOM = 1; ELSE CONTINUE

IF DEEMED = 1 START LOOP FOR DEEMED MEASURES (<%LT_MEAS_x>, WHERE x = 1, 2, or 3); ELSE SKIP TO LI30

A3[A-C]

According to our records, your organization (MxDELAMP = 0) installed/delamped <%LT_QTY_x> <%LT_MEAS_x> through <%UTILITY>'s program, is this correct? [IF MxDELAMP == 1, READ: delamping occurs when you retrofit your T12s to T8s and reduce the number of lamps in a fixutre or simply reduce the number of fixtures]

1	Yes - Quantity is Correct	DEEMED_INSTALL_DATE_NU
2	Yes - Installed Different Quanity	A3_QTY
3	No, did not install	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY

DISPLAY

IF A3[A-C](3 - 99), READ: "We must conduct this study with someone that knows about the installation of this measure." and ABANDON USER. Else continue with A3[A-C]_QTY

A3[A-C]_QTY

Ask if A3[A-C] = 2 or LT_QTY_x = 0
Approximately how many units of <%LT_MEAS_x> were (MxDELAMP = 0) installed/delamped under the %PROGRAM program?

77	Record #	DEEMED_INSTALL_DATE_NU
8888	Refused	A3_OTH
9999	Don't know	A3_OTH

A3[A-C]_OTH

IF A3_QTY IN (88, 99)
Would you say that the number of <%LT_MEAS_x> (MxDELAMP = 0) installed/delamped are…

1	less than 10 units	DEEMED_INSTALL_DATE_NU
2	11 - 50 units	DEEMED_INSTALL_DATE_NU
3	50 - 100 units	DEEMED_INSTALL_DATE_NU
4	More than 100 units	DEEMED_INSTALL_DATE_NU

88	Refused	DEEMED_INSTALL_DATE_NU
99	Don't know	DEEMED_INSTALL_DATE_NU

IF ^UNRECORDED(DEEM_INSTALL_DATEx)

DEEM_INSTALL_DATEx_NU Our records indicate that your organization <(MxDELAMP = 0)/installed/delamped> ...<%LT_MEAS_x> on <%DEEM_INSTALL_DATEx>. _____Is this correct?

1	Yes	LI18
2	No	DEEM_INSTALL_YEAR
88	Refused	DEEM_INSTALL_YEAR
99	Don't know	DEEM_INSTALL_YEAR

IF UNRECORDED(DEEM_INSTALL_DATEx) & ^UNRECORDED(DEEM_PAID_DATEx)

DISPLAY According to our records, your organization received a rebate for the (MxDELAMP = 0) installation/delamping> of ...<%LT_MEAS_x>... on <%DEEM_PAID_DATEx>.

IF DEEM_INSTALL_DATEx_NU in (2,88,99) | (UNRECORDED(DEEM_INSTALL_DATEx) & ^UNRECORDED(DEEM_PAID_DATEx))

DEEM_INSTALL_YEARx In what year did you (MxDELAMP = 0) install/delamp <%LT_MEAS_x>? (PROBE FOR BEST GUESS)

1	2013	DEEM_INSTALL_MONTHx
2	2014	DEEM_INSTALL_MONTHx
88	Refused	LI18
99	Don't know	LI18

IF DEEM_INSTALL_YEARx in (1-3)

DEEM_INSTALL_MONTHx And what month? {If they can not recall month, try to get the season.}

1	January	LI18
2	February	LI18
3	March	LI18
4	April	LI18
5	May	LI18
6	June	LI18
7	July	LI18
8	August	LI18
9	September	LI18
10	October	LI18

11	November	LI18
12	December	LI18
13	Fall	LI18
14	Winter	LI18
15	Spring	LI18
16	Summer	LI18
88	Refused	LI18
99	Don't know	LI18

If A3[A-C] is 1 or 2;
Ask only if CFLx = 1; else skip to LI181[A-C]
LI18[A-C] Of the CFLs you received through the program, what percentage do you estimate were placed into storage for later use?

77	Open Record	LI181
101	Refused	LI181
102	Don't know	LI181

Ask only if LEDx = 1; else skip to LI182[A-C]
LI181[A-C] Of the LEDs you received through the program,what percentage do you estimate were placed into storage for later use?

77	Open Record	LI182
101	Refused	LI182
102	Don't know	LI182

ASK ONLY IF LEDRLx = 1
LI182[A-C] Of the LED Reflector Lamps you received through the program,what percentage do you estimate were placed into storage for later use?

77	Open Record	LI19
101	Refused	LI19
102	Don't know	LI19

LI19[A-C] Were any of the program provided <%LT_MEAS_x> (MxDELAMP = 0) installed/delamped at another facility? If so, what percentage would you estimate?

77	Yes, #record percentage	LI20
101	Refused	LI20
102	Don't know	LI20

IF MxDELAMP = 0; else skip to end of DEEMED MEASURE LOOP
LI20[A-C] What type of lighting was removed and replaced when you installed <%LT_MEAS_x> through the program?

1	High performance T8 (1" diameter bulbs)	LI22
2	T8 fluorescent fixtures (1” diameter bulbs)	LI22

3	T10 fluorescent fixtures	LI22
4	T12 Fixtures (1.5” diameter bulbs)	LI22
5	Compact HID (High Density Discharge) Fixtures	LI21
6	Screw-in Modular CFLs	LI22
7	Hardwire CFL Fixtures	LI22
8	Incandescent	LI22
9	CFL Exit Signs	LI22
10	LED Exit Signs	LI22
11	Halogen bulbs	LI22
12	Reflectors	LI22
13	Electronic Ballast	LI22
14	Magnetic Ballast	LI22
15	Manual Switches	LI22
16	Lighting Controls, Time Clock	LI22
17	Lighting Controls, Occupancy Sensor	LI22
18	Lighting Controls, Bypass/Delay Timers	LI22
19	Lighting Controls, Photocell	LI22
20	Other Fluorescent	LI22
21	Fat/Thick Tubes	LI22
22	Skinny/Thin Tubes	LI22
23	T5 Fixtures (5/8” diameter)	LI22
24	Screw-in LEDs	LI22
25	Screw-in LEDs Reflector Lamps	LI22
26	LED Fixtures or Panels (e.g., replacement for linear fixtures)	LI22
66	DID NOT REMOVE ANYTHING-ADDITIONAL EQUIP ONLY	NTGCHECK1
77	Other (PLEASE SPECIFY)	LI22

IF MxDELAMP = 0;
ASK IF LI20[A-C] = 5; else skip to LI22[A-C]

LI21[A-C] Were the HID lamps you removed High Pressure Sodium, Metal Halide, Mercury Vapor or Incandescent?

1	High pressure sodium	LI22
2	Metal Halide	LI22
3	Mercury Vapor	LI22
4	Incandescent	LI22
88	Refused	LI22
99	Don't know	LI22

If LI20[A-C]^= 66 then ask; else skip to end of DEEMED Loop

LI22[A-C] Approximately how old was the equipment that were removed and replaced? Would you say…

1	Less than 5 years old	LI23
2	Between 5 and 10 years old	LI23

3	Between 10 and 15 years old	LI23
4	More than 15 years old	LI23
88	Refused	LI23
99	Don't know	LI23

LI23[A-C] How would you describe the removed equipment's condition? Would you say they were in…

1	Poor condition	LI24
2	Fair condition	LI24
3	Good condition	LI24
88	Refused	LI24
99	Don't know	LI24

LI24[A-C] Approximately what percentage of the lighting equipment that was removed and replaced was broken or not working prior to installing <%LT_MEAS_x>?

%	Percent	NTGCHECK1
101	Refused	NTGCHECK1
102	Don't know	NTGCHECK1

NTGCHECK1

GO TO NTGBATTERY IF NTGDEEMED =1; ELSE RESTART LOOP IF NEEDED FOR <%LT_MEAS_x> WHERE x = 2, 3

AFTER ALL DEEMED MEASURES HAVE GONE THROUGH LOOP AND THE NTGBATTERY HAS BEEN COMPLETED FOR A LIGHTING MEASURE, ASK LI30

ASK IF LIGHTING=1

LI30 Considering all of the lighting changes we just discussed, approximately what percentage of the facility's lighting was affected by those changes?

%	Percent	HB1
101	Refused	HB1
102	Don't know	HB1

HIGH BAY AND DELAMPING

If LINEAR = 1 or LI100 in (1, 2, 3, 16, 17, 18, 77); else skip to HB1a

HB1 Thinking about all of the types of linear fluorescent bulbs that were installed through the program, what is the highest height, in feet, above the area they light? [IN FEET]

1	Record number of feet	HB2
66	Did not install linear fluorescent lamps	HB1a
88	Refused	HB2
99	Don't know	HB2

IF HB1 < 13 then ask; else skip to HB3
Just to double check, was any of the linear fluorescent lighting installed through the program at a height of 13 or more feet above the area it is meant to light? This would qualify as HIGH BAY lighting.

HB2

1	Yes	HB3
2	No	HB1a
88	Refused	HB1a
99	Don't know	HB1a

ASKI IF IF (HB1 >> 12 & HB1 <> 66 & HB1 <> 88 & HB1 <> 99) | HB2(1); else skip to HB1a
What is the main kind of linear fluorescent bulbs located at this height?

HB3

1	T8s	HB1a
2	T5s	HB1a
77	OPEN\RECORD OTHER	HB1a
88	Refused	HB1a
99	Don't know	HB1a

Ask if NON_LINEAR = 1 or LI100 in (4, 5, 6, 9, 77); else skip to DEL1
Is any of the lighting installed through the program considered to be High Bay? (If needed, lighting higher than 13 ft)

HB1a

1	Yes	HB2a
2	No	DEL1
88	Refused	DEL1
99	Don't know	DEL1

Ask if HB1a = 1 else skip to DEL1
What kind of High Bay Lighting is it?

HB2a

1	HID (High-intensity discharge) High pressure sodium	DEL1
2	HID Metal halide	DEL1
3	HID Mercury Vapor	DEL1
4	HID - I don't know what type	DEL1
5	CFLs	DEL1
77	OPEN\RECORD OTHER	DEL1
88	Refused	DEL1
99	Don't know	DEL1

Ask if DELAMP = 1; else skip to DEL1a
We also show that you delamped linear fluorescent fixtures. Is this correct? (If needed: delamping occurs when you retrofit your T12s to T8s and reduce the number of lamps in a fixture or simply reduce the number of fixtures.)

DEL1

1	Yes	DEL2

2	No	Gas
88	Refused	Gas
99	Don't know	Gas

Ask if DELAMP ^= 1 and LINEAR = 1 and M1DELAMP ^= 1 and M2DELAMP ^= 1 and M3DELAMP ^= 1 OR LI100(1-3, 16-18, 77);

DEL1a As part of the lighting installation you had completed during your participation in program did you have any delamping done? (If needed: delamping occurs when you retrofit your T12s to T8s and reduce the number of lamps in a fixture or simply reduce the number of fixtures.)

1	Yes	DEL2
2	No	Gas
88	Refused	Gas
99	Don't know	Gas

Ask if DEL1 = 1 or DEL1a = 1 or (M1DELAMP = 1 and A3A in (1, 2)) or (M2DELAMP = 1 and A3B in (1, 2)) or (M3DELAMP = 1 and A3C in (1, 2))

There are a few different types of delamping that can take place. Today we will be asking about 3 types in partciular. One type of delamping occurs when fixtures are simply removed (removal only). Another type of delamping occurs when the fixtures themselves are removed and replaced with new fixtures containing less bulbs (remove and replace fixtures). The final type is where the current fixtures are retrofitted, not replaced, to accomodate less bulbs (reduce # of bulbs).

DEL2 Have you had Removal only Delamping done within your facility since January 2012?

1	Yes	DEL2a
2	No	DEL3
88	Refused	DEL3
99	Don't know	DEL3

If DEL2 = 1 then ask; else skip to DEL3

DEL2a What percent of the original fixtures within the delamped area were removed?

77	Record percentage	DEL3
101	Refused	DEL3
102	Don't know	DEL3

DEL3 Have you had Remove and Replace delamping done within your facility since 2012? Remove and replace occurs when the fixutres themselves are removed and replaced with new fixtures containing less bulbs.

1	Yes	DEL3a
2	No	DEL4

88	Refused	DEL4
99	Don't know	DEL4

If DEL3 = 1 then ask; else skip to DEL4

DEL3a What type of fixtures were removed?

77	Open Record	DEL3b
88	Refused	DEL3b
99	Don't know	DEL3b

DEL3b What type of fixtures were installed?

77	Open Record	DEL3c
88	Refused	DEL3c
99	Don't know	DEL3c

DEL3c How many lamps per fixture were present prior to the delamping retrofit?[PROBE FOR BEST GUESS IF DON'T KNOW]

1	1	DEL3d
2	2	DEL3d
3	3	DEL3d
4	4	DEL3d
5	5	DEL3d
6	6	DEL3d
7	7	DEL3d
8	8	DEL3d
88	Refused	DEL3d
99	Don't know	DEL3d

DEL3d How many lamps per fixture are present now, after the delamping retrofit? [PROBE FOR BEST GUESS IF DON'T KNOW]

1	1	DEL3E
2	2	DEL3E
3	3	DEL3E
4	4	DEL3E
5	5	DEL3E
6	6	DEL3E
7	7	DEL3E
8	8	DEL3E
88	Refused	DEL4
99	Don't know	DEL4

DEL3E Approximately how old were the fixtures that were removed and replaced as a result of this Remove and Replace delamping? Would you say…

1	Less than 5 years old	LI23
2	Between 5 and 10 years old	LI23

3	Between 10 and 15 years old	LI23
4	More than 15 years old	LI23
88	Refused	LI23
99	Don't know	LI23

DEL3F How would you describe the condition of the fixtures that were Removed and Replaced as a result of the remove and replace delamping? Would you say they were in…

1	Poor condition	LI24
2	Fair condition, or	LI24
3	Good condition	LI24
88	Refused	LI24
99	Don't know	LI24

DEL3G Approximately what percentage of the fixtures that were removed and replaced were broken or not working prior to the Remove and Replace delamping?

%	Percent	LI30
101	Refused	LI30
102	Don't know	LI30

DEL4 Have you had a delamping retrofit to reduce the number of lamps per fixture within your facility since 2012? This is where the current fixtures are retrofitted, not replaced, to accomodate less bulbs (reduce # of lamps).

1	Yes	DEL4a
2	No	DEL5
88	Refused	DEL5
99	Don't know	DEL5

If DEL4 = 1 then ask; else skip to DEL5

DEL4a How many lamps per fixture were present prior to the delamping retrofit?[PROBE FOR BEST GUESS IF DON'T KNOW]

77	Open Record	DEL4b
88	Refused	DEL4b
99	Don't know	DEL4b

DEL4b How many lamps per fixture are present now, after the delamping retrofit? [PROBE FOR BEST GUESS IF DON'T KNOW]

77	Open Record	DEL5
88	Refused	DEL5
99	Don't know	DEL5

DEL5 Is the amount of lighting better, worse, or the same than before your delamping job?

1	Better	Gas
2	Worse	DEL11
3	Same	Gas
88	Refused	DEL11
99	Don't know	DEL11

If DEL5 in (2, 88, 99) then ask; else skip to G1

DEL11 Did you install additional lighting equipment to increase the amount of lighting in the delamped area(s)?

1	Yes	Gas
2	No	Gas
88	Refused	Gas
99	Don't know	Gas

GAS EQUIPMENT

Ask if CC3a(2|3) (respondent said organization has gas heating) or GAS=1; else skip to NEXT BATTERY

DISPLAY In this next section we will be discussing the GAS EQUIPMENT present at your facility.

G1 Which of the following natural gas equipment is present at your facility?...

1	Water Heater	G25
2	Gas Furnace	G25
3	Gas Boiler	G25
4	Gas Stove	G25
5	Gas Clothes Dryer	G25
66	No natural gas	Refrigeration
77	Other (specify)	G25
88	Refused	G25
99	Don't know	G25

G25 Does your organization have any plans to install any high efficiency gas equipment within the next 12 months?

1	Yes	Refrigeration
2	No	Refrigeration
88	Refused	Refrigeration
99	Don't Know	Refrigeration

REFRIGERATION EQUIPMENT

Ask R9 through CD4 if REFRIGERATION = 1; else skip to NEXT BATTERY

READ IF ^UNRECORDED(RF_MEAS_x) where x = 1, 2, 3….

DISPLAY In this section of the survey we would like to ask you about the refrigeration equipment changes you made as part of your participation in <%UTILITY>'s program.

R9_x According to our records, your organization installed <%RF_QTY_x> ... <%RF_UNITS_x>...<%RF_MEAS_x> through the <%UTILITY> program, is this correct?

1	Correct as stated	R5b_x
2	Refrigeration equipment installed but not as described	R9X_x
3	No refrigeration equipment installed through the program	Next Measure/Greenhouse
88	Refused	Greenhouse
99	Don't know	Greenhouse

ASK IF IF R9_x(2)

R9X_x Approximately how many units of ...<%RF_MEAS_x>... were installed under the Program?

77	Record #	Calc
88	Refused	R5b_x
99	Don't know	R5b_x

Calc If <%ClaimInstal_RF_x>/<%RFx_QTY_x> <75% then ask RF9Y_x; else if <%ClaimInstal_RF_x>/<%RFx_QTY_x> > 125% ask RF9Z_x; else skip to R5b_x

ASK R9Y IF R9X_x <> 88888 & R9X_x <> 99999; R9X_x << RFxUNDER

R9Y_x Perhaps you could help us to understand the difference between our records and what has been installed…Do you have any suggestions as to why our numbers differ? Were any of these <%RF_MEAS_x> put into storage, perhaps installed at another facility, or never received? It is okay if you don't know why there is a difference, but if you had any ideas of why our counts don't match, it would really help us to evaluate the program's record keeping?

1	Have no idea why numbers differ	R5b_x
2	Did not install all of the refrigeration equipment, Put some in storage	R5b_x
3	Installed at another facility	R5b_x
4	Did not receive all of the <%RF_MEAS_x>	R5b_x
77	Other	R5b_x
88	Refused	R5b_x
99	Don't know	R5b_x

ASK R9Z_x IF R9X_x >> RFxOVER

R9Z_x Perhaps you can help us to understand the difference between our records and what has been installed....Do you have any suggestions as to why our numbers differ? Did your facility participate multiple times in the program since 2013 and maybe we don't have these other records? Did you install additional equipment outside of the program that you are including in these numbers? It is okay if you don't know why there is a difference, but if you had any ideas of why our counts don't match, it would really help us to evaluate the program's record keeping?

1	Have no idea why numbers differ	R5b_x
2	Multiple participation	R5b_x
3	Installed equipment outside of the program	R5b_x
77	Other	R5b_x
88	Refused	R5b_x
99	Don't know	R5b_x

R5b_x **ASK IF R9_x(1|2);**
What type of refrigeration equipment was removed and replaced when you installed <%RF_MEAS_x>?

1	Old Strip curtains	R5c_x
2	Older Main door cooler/freezer door gaskets	R5c_x
3	Older Anti-sweat heat controllers	R5c_x
4	Same Equipment, just newer	R5c_x
5	Older Display cases without doors	R5c_x
66	NONE - Not a replacement	R5c_x
77	Other (Specify)	R5c_x
88	Refused	R5c_x
99	Don't know	R5c_x

R5c_x **ASK IF IF R5b_x(1||65|77)**
How would you describe the condition of refrigeration equipment that was removed and replaced? Was it…

1	Inoperable (broken)	R5d_x
2	Poor condition	R5d_x
3	Fair condition	R5d_x
4	Good condition	R5d_x
88	Refused	R5d_x
99	Don’t know	R5d_x

R5d_x Approximately how old was the refrigeration equipment that was removed and replaced by the refrigeration equipment we just discussed? Would you say…

1	Less than 5 years old	R9d1_x
2	Between 5 and 10 years old	R9d1_x
3	10 to 20 years old	R9d1_x
4	more than 20 years old	R9d1_x
88	Refused	R9d1_x
99	Don't know	R9d1_x

ASK IF ^UNRECORDED(RF_INSTDTx); ELSE GO TO DISPLAY

R9d1_x Our records indicate that your company installed the refrigeration equipment in <%RF_INSTDTx> through the <%PROGRAM> program, is this correct?

1	Yes	NTGCHECK3
2	No	DISPLAY; RF9f1_x
88	Refused	DISPLAY; RF9f1_x
99	Don't know	DISPLAY; RF9f1_x

ASK IF ^UNRECORDED(RF_CHKDTx) & UNRECORDED(RF_INSTDTx)

DISPLAY Our records indicate that your company received a rebate for the refrigeration equipment installed through the program in <%RF_CHKDTx>.

ASK IF (^UNRECORDED(RF_CHKDTx) & UNRECORDED(RF_INSTDTx)) | R9D1_x(2)

RF9f1_x In what year did you install <%RF_MEAS_x>? (PROBE FOR BEST GUESS) Was it in….

1	2013	R9f2
2	2014	R9f2
88	Refused	NTGCHECK3
99	Don't know	NTGCHECK3

ASK IF RF9F1_x(1||2)

RF9f2_x And what month? {If they can not recall month, try to get the season.}

1	January	NTGCHECK3
2	February	NTGCHECK3
3	March	NTGCHECK3
4	April	NTGCHECK3
5	May	NTGCHECK3
6	June	NTGCHECK3
7	July	NTGCHECK3
8	August	NTGCHECK3
9	September	NTGCHECK3
10	October	NTGCHECK3
11	November	NTGCHECK3
12	December	NTGCHECK3
13	Fall	NTGCHECK3
14	Winter	NTGCHECK3
15	Spring	NTGCHECK3
16	Summer	NTGCHECK3
88	Refused	NTGCHECK3
99	Don't know	NTGCHECK3

NTGCHECK3 **IF NTGREFRIG == 1 PERFORM NTG BATTERY; ELSE CONTINUE….**

END REFRIGERATION MEASURE LOOP; GO TO R9_x if ^UNRECORDED(RF_MEAS_x) WHERE x = 2, 3; ELSE CONTINUE WITH SURVEY

IF CASES = 1 ASK CD2 THROUGH CD4 ; ELSE SKIP TO NEXT BATTERY

CD2 What is the length across the front (linear feet) of your display case? An approximation would be fine.

77	Record length of case and number of cases	CD3
88	Refused	CD3
99	Don't know	CD3

CD3 Does your new display case have efficient lighting (T-8 or LED lighting) installed?

1	Yes	CD4
2	No	CD4
88	Refused	CD4
99	Don't know	CD4

CD4 Does your new display case have a variable speed fan motor installed?

1	Yes	Greenhouse
2	No	Greenhouse
88	Refused	Greenhouse
99	Don't know	Greenhouse

GREENHOUSE HEAT CURTAINS

Ask if CONTROLS = 1 and FM050 in 4 (Agricultural - farms/greenhouses), 8 (Education), or 12 (Industrial); else skip to NEXT BATTERY

GG1 Does your facility have any greenhouses?

1	Yes	GG1a
2	No	Cooling
88	Refused	Cooling
99	Don't know	Cooling

Ask if GG1=1; else skip to NEXT BATTERY

GG1a How many square feet of greenhouses do you have at your facility?

66	We do not have any greenhouses	Cooling
77	Square feet	GG1b
88	Refused	GG1a1
99	Don’t know	GG1a1

Ask if GG1a IN (88, 99)

GG1a1 Can you identify the appropriate size range from the following list?

1	< 1,500 sq ft	Cooling
2	1,500 - 5,000 sq ft	Cooling
3	5,000 - 10,000 sq ft	Cooling
4	10,000 – 25,000 sq ft	Cooling
5	25,000 – 50,000 sq ft	Cooling
6	50,000 – 75,000 sq ft	Cooling
7	75,000 – 100,000 sq ft	Cooling
8	> 100,000 sq ft	Cooling
88	Refused	Cooling
99	Don't know	Cooling

COOLING EQUIPMENT

Now we would like to discuss your cooling equipment.

CL1 What type of equipment is used to cool this facility? (allow multiples)

1	No A/C	PipeInsulation
2	Split system (two components; compressor is separate from the supply air fan, air conditioner, or heat pump)	CL2
3	Packaged systems (one component; rooftop units)	CL2
4	Package Terminal A/C or Heat Pump (e.g., Hotel/Motel units)	CL2
5	Evaporative coolers (swamp coolers)	CL2
6	Water Chiller (Central plant)	CL2
7	Individual A/C or Heat Pump Units (e.g., Unitary Equipment, Central A/C with multiple units, single unit for small business) NOTE: ASK IF SPLIT OR PACKAGED SYSTEM	CL2
8	Window/Wall Units	CL2
77	Other (Specify)	CL2
88	Refused	CL2
99	Don't Know	CL2

Ask if CL1<>1; else skip to NEXT BATTERY

CL2 How would you describe the condition of the primary cooling equipment currently in use at your facility? Would you say the cooling equipment is in ...

1	In poor condition	CL3
2	In fair condition	CL3
3	Good condition	CL3
88	Refused	CL3
99	Don't know	CL3

CL3 How old is this cooling equipment currently in use at your facility? Would you say…

1	Less than 5 years old	CL4
2	Between 5 and 10 years old	CL4
3	10 to 20 years old	CL4
4	more than 20 years old	CL4
88	Refused	CL4
99	Don't know	CL4

CL4 What is the primary fuel used by this cooling equipment?

1	Electricity	CL35
2	Natural Gas	CL35
3	Both Electricity and Gas	CL35
77	Other (PLEASE SPECIFY)	CL35
88	Refused	CL35
99	Don't Know	CL35

CL35 Does your company have any plans to install high efficiency cooling equipment within the next 12 months?

1	Yes	PipeInsulation
2	No	PipeInsulation
88	Refused	PipeInsulation
99	Don't Know	PipeInsulation

PIPE INSULATION

DISPLAY

ASK IF PIPE = 1; else skip to NEXT BATTERY
In the next section we'll be discussing the pipe insulation present at your facility.

ASK IF ^UNRECORDED(PI_INSTDT); ELSE GO TO DISPLAY/PI1a

PI1 We'd like to confirm that new pipe insulation was installed at your facility on approximately <%PI_INSTDT>. Is this correct?

1	Yes	PI3
2	No	DISPLAY; PI1a
88	Refused	DISPLAY; PI1a
99	Don't know	DISPLAY; PI1a

DISPLAY

ASK IF ^UNRECORDED(PI_CHKDT) & UNRECORDED(PI_INSTDT)
Our records indicate that your company received a rebate for the pipe insulation installed through the program in <%PI_CHKDT>.

ASK IF (^UNRECORDED(PI_CHKDT) & UNRECORDED(PI_INSTDT)) | PI1(2)

PI1a In what year did you install the pipe insulation?

1	2013	PI1b
2	2014	PI1b
88	Refused	PI3
99	Don't know	PI3

ASK IF PI1A(1||2)

PI1b And what month? {If they can not recall month, try to get the season.}

1	January	PI3
2	February	PI3
3	March	PI3
4	April	PI3
5	May	PI3
6	June	PI3
7	July	PI3
8	August	PI3
9	September	PI3
10	October	PI3
11	November	PI3
12	December	PI3
13	Fall	PI3
14	Winter	PI3
15	Spring	PI3
16	Summer	PI3
88	Refused	PI3
99	Don't know	PI3

PI3 Our records indicate that <%PI_QTY> feet of pipe insulation was installed at your facility. Is this about right?

1	Yes	PI7
2	No	PI3a
88	Refused	PI3a
99	Don’t know	PI3a

ASK IF PI3(2||99)

PI13a How many total linear feet of pipe insulation is present at your facility? Your best estimate is okay.

66	No pipe insulation	Sprinklers_Ag
77	Total linear feet of pipe insulation	PI7
88	Refused	P13aa
99	Don't know	P13aa

ASK IF PI3a = 88,99

P13aa Can you estimate what percent of the pipes present at your facility were insulated through the program?

1	Total linear feet of pipe insulation:	PI7
2	Percentage of pipe insulation replaced:	PI7
101	Refused	PI7
102	Don't know	PI7

ASK IF PI3a <> 66;

PI7 Was the pipe insulation installed on new pipes or was it a retrofit of older pipes or both?

1	ONLY NEW	PI7b
2	ONLY OLDER	PI7b
3	BOTH NEW AND OLDER	P17a
88	Refused	PI8
99	Don't know	PI8

ASK IF PI7 = 3; else skip

PI7a What percentage of the pipe insulation was installed on new pipes?

Record	(record percentage)	PI7b
77	Other	PI7b
101	Refused	PI7b
102	Don't know	PI7b

ASK IF PI7(2|3);

PI7b How many years old were the pipes receiving the pipe insulation?

Record	(record in # of years)	PI8
77	Other	PI8
88	Refused	PI8
99	Don't know	PI8

PI8 Was insulation already present on the pipes before the insulation was installed through the program?

1	Yes	P21
2	No	P25
77	Other	P25
88	Refused	P25
99	Don’t know	P25

ASK IF PI8(1);

P21 Was the existing insulation removed and replaced, or was additional insulation added to existing insulation?

1	old insulation removed and replaced	P23
2	Additional insulation added over old insulation	P23
3	Both	P23
88	Refused	P23

99	Don't know	P23

P23 What condition was your old pipe insulation in at the time of the replacement?

1	Good	P25
2	Fair	P25
3	Poor	P25
4	Not a replacement	P25
88	Refused	P25
99	Don't know	P25

ASK ALL

P25 Are boilers present at your facility?

1	Yes	P27
2	No	P33
77	Other [Record Verbatim]	P33
88	Refused	P33
99	Don't know	P33

ASK IF PI25(1)

P27 Have the boilers been repaired or replaced since you installed the pipe insulation through the program?

1	Yes	P29
2	No	P33
77	Other [Record Verbatim]	P33
88	Refused	P33
99	Don't know	P33

ASK IF PI27(1)

P29 How long ago in months was the most recent boiler repair or replacement?

#	Record DATE or # of months ago	P33
77	Other [Record Verbatim]	P33
88	Refused	P33
99	Don't know	P33

ASK IF PI3A<>66666

P33 Whose idea was it to install new pipe insulation?

1	Me or someone at my facility	P35
2	Contractor	P35
3	Utility company contact	P35
4	Manufacturer	P35
77	Other (specify)	P35
88	Refused	P35
99	Don't know	P35

P35 What percentage of the pipe insulation cost would you estimate the program rebate covered?

1	Rebate covered all of the cost	P37
2	Rebate covered most of the cost	P37
3	Rebate covered less than half of the cost	P37
4	Other	P37
88	Refused	P37
99	Don't know	P37

P37 How effective was the new pipe insulation in reducing your natural gas bill? Would you say there were…

1	Considerable gas savings	P39
2	Some gas savings	P39
3	No noticeable savings	P39
88	Refused	P39
99	Don't know	P39

P39 Have you noticed any problems with the pipe insulation since the installation?

1	Yes	P40
2	No	NTGCHECK4
88	Refused	NTGCHECK4
99	Don't know	NTGCHECK4

ASK IF P39(1)

P40 What problems have you noticed since the pipe insulation was installed?

77	RECORD RESPONSE	NTGCHECK4
88	Refused	NTGCHECK4
99	Don't know	NTGCHECK4

NTGCHECK4 GO TO NTG BATTERY IF NTGPIPES = 1; ELSE CONTINUE

AGRICULTURAL SPRINKLERS

ASK IF SPRINKLERS = 1; ELSE SKIP TO NEXT BATTERY

DISPLAY Now, I would like to ask you about the low-pressure sprinkler nozzles you installed on your irrigation system as part of your participation in <%UTILITY>'s program.

ASK IF AG_QTY > 0

AG1 Our records indicate that <%AG_QTY> low-pressure sprinkler nozzles were installed on either portable or permanent irrigation systems. Is this correct?

1	Yes, correct	AG40
2	Yes, but a different quantity	AG200

3	Did not install	Computer_Power_Mgmt
88	Refused	Computer_Power_Mgmt
99	Don't know	AG40

ASK IF AG1(2) | AG_QTY = 0

AG200 How many low-pressure sprinkler nozzles were installed through the program?

77	Record	AG40
88	Refused	AG40
99	Don't know	AG40

ASK IF ^AG1(3);
ASK IF ^UNRECORDED(AG_INSTDT); ELSE GO TO DISPLAY/AG41

AG40 Our records indicate that you installed the low-pressure sprinkler nozzles around <%AG_INSTDTx> through the <%PROGRAM> program, is this correct?

1	Yes	AG5
2	No	DISPLAY; AG41
88	Refused	DISPLAY; AG41
99	Don't know	DISPLAY; AG41

ASK IF ^UNRECORDED(AG_CHKDT) & UNRECORDED(AG_INSTDT)

DISPLAY Our records indicate that your company received a rebate for the low-flow sprinkler nozzles installed through the program in <%AG_CHKDT>.

ASK IF (^UNRECORDED(AG_CHKDT) & UNRECORDED(AG_INSTDT)) | AG40(2);

AG41 In what year did you install low-flow sprinkler nozzles? (PROBE FOR BEST GUESS) Was it in….

1	2013	AG42
2	2014	AG42
88	Refused	AG42
99	Don't know	AG42

ASK IF AG41(1||2)

AG42 And what month? {If they can not recall month, try to get the season.}

1	January	AG5
2	February	AG5
3	March	AG5
4	April	AG5
5	May	AG5
6	June	AG5
7	July	AG5

8	August	AG5
9	September	AG5
10	October	AG5
11	November	AG5
12	December	AG5
13	Fall	AG5
14	Winter	AG5
15	Spring	AG5
16	Summer	AG5
88	Refused	AG5
99	Don't know	AG5

ASK IF AG1(1 | 99);

AG2 On what type of irrigation systems are the low-pressure sprinkler nozzles installed? Portable, permanent, or some combination of the two?

1	Portable irrigation system	AG5
2	Permanent irrigation system	AG5
3	Both portable and permanent irrigation systems	AG3
66	Neither	Computer_Power_Mgmt
88	Refused	Computer_Power_Mgmt
99	Don't know	Computer_Power_Mgmt

READ IF AG2 = 3; ELSE SKIP TO AG5

AG3 Since you have low-pressure sprinkler nozzles installed on both portable and permanent irrigation systems, I'd like for you to tell me what share is installed on each type of irrigation system. Adding up to 100 percent, what share is installed on each type of irrigation system? What percent is installed on PORTABLE irrigation systems?

77	Record percentage	AG4
101	Refused	AG4
102	Don't know	AG4

ASK IF AG3 < 100;

AG4 Of all the low-pressure sprinkler nozzles you have installed, what percent is installed on permanent irrigation systems?

77	Record percentage	CHECKSUM
101	Refused	CHECKSUM
102	Don't know	CHECKSUM

CHECKSUM **IF AG3 < 101 AND (AG3 + AG4 ^ = 100) REDO AG3 AND AG4; ELSE AG3a**

IF AG3 = 102 ASK AG3a;

AG3a Can you estimate the percentage installed on portable irrigation systems. Is it….

1	1 to 10 percent	AG4a
2	11 to 20 percent	AG4a
3	21 to 30 percent	AG4a
4	31 to 40 percent	AG4a
5	41 to 50 percent	AG4a
6	51 to 60 percent	AG4a
7	61 to 70 percent	AG4a
8	71 to 80 percent	AG4a
9	81 to 90 percent	AG4a
10	91 to 100 percent	AG4a
101	Refused	AG4a
102	Don't know	AG4a

AG4a If you are not sure, can you estimate the percentage installed on permanent irrigation systems. Is it…

1	1 to 10 percent	CHECK_EST_SUM
2	11 to 20 percent	CHECK_EST_SUM
3	21 to 30 percent	CHECK_EST_SUM
4	31 to 40 percent	CHECK_EST_SUM
5	41 to 50 percent	CHECK_EST_SUM
6	51 to 60 percent	CHECK_EST_SUM
7	61 to 70 percent	CHECK_EST_SUM
8	71 to 80 percent	CHECK_EST_SUM
9	81 to 90 percent	CHECK_EST_SUM
10	91 to 100 percent	CHECK_EST_SUM
88	Refused	CHECK_EST_SUM
99	Don't know	CHECK_EST_SUM

CHECK_EST_SUM **PERFORM A CHECK SO THAT AG3+AG4 = 100% OR AG3a+AG4a=100%**

AG5 What type(s) of crops are grown in the areas irrigated with the installed low-pressure sprinkler nozzles? [ACCEPT MULTIPLES…]

1	Asparagus	AG5a
2	Tomatoes	AG5a
3	Almonds	AG5a
4	Grapes	AG5a
5	Apricots	AG5a
77	Other [RECORD] - list only one other crop	AG5a
88	Refused	AG5a
99	Don't know	AG5a

ASK IF AG5(77); ELSE SKIP TO AG5b

AG5a Is there another crop grown in theses irrigated areas?

66	No other crop	AG5_1
77	Other - list only one crop	AG5b
88	Refused	AG5_1
99	Don't know	AG5_1

ASK IF AG5a(77); ELSE SKIP TO AG5_1

AG5b Is there another crop grown in theses irrigated areas?

66	No other crop	AG5_1
77	Other - list only one crop	AG5_1
88	Refused	AG5_1
99	Don't know	AG5_1

ASK IF AG5(1); ELSE SKIP TO AG5_2

AG5_1 What is the growing season, in months, for ASPARAGUS? If you cannot, the season will do.

1	January	AG5_2
2	February	AG5_2
3	March	AG5_2
4	April	AG5_2
5	May	AG5_2
6	June	AG5_2
7	July	AG5_2
8	August	AG5_2
9	September	AG5_2
10	October	AG5_2
11	November	AG5_2
12	December	AG5_2
13	Fall	AG5_2
14	Winter	AG5_2
15	Spring	AG5_2
16	Summer	AG5_2
88	Refused	AG5_2
99	Don't know	AG5_2

ASK IF AG5(2); ELSE SKIP TO AG5_3

AG5_2 What is the growing season, in months, for TOMATOES? If you cannot, the season will do.

1	January	AG5_3
2	February	AG5_3
3	March	AG5_3
4	April	AG5_3
5	May	AG5_3
6	June	AG5_3
7	July	AG5_3

8	August	AG5_3
9	September	AG5_3
10	October	AG5_3
11	November	AG5_3
12	December	AG5_3
13	Fall	AG5_3
14	Winter	AG5_3
15	Spring	AG5_3
16	Summer	AG5_3
88	Refused	AG5_3
99	Don't know	AG5_3

ASK IF AG5(3); ELSE SKIP TO AG5_4

AG5_3 What is the growing season, in months, for ALMONDS? If you cannot, the season will do.

1	January	AG5_4
2	February	AG5_4
3	March	AG5_4
4	April	AG5_4
5	May	AG5_4
6	June	AG5_4
7	July	AG5_4
8	August	AG5_4
9	September	AG5_4
10	October	AG5_4
11	November	AG5_4
12	December	AG5_4
13	Fall	AG5_4
14	Winter	AG5_4
15	Spring	AG5_4
16	Summer	AG5_4
88	Refused	AG5_4
99	Don't know	AG5_4

ASK IF AG5(4); ELSE SKIP AG5_5

AG5_4 What is the growing season, in months, for GRAPES? If you cannot, the season will do.

1	January	AG5_5
2	February	AG5_5
3	March	AG5_5
4	April	AG5_5
5	May	AG5_5
6	June	AG5_5
7	July	AG5_5
8	August	AG5_5

9	September	AG5_5
10	October	AG5_5
11	November	AG5_5
12	December	AG5_5
13	Fall	AG5_5
14	Winter	AG5_5
15	Spring	AG5_5
16	Summer	AG5_5
88	Refused	AG5_5
99	Don't know	AG5_5

ASK IF AG5(5); ELSE SKIP AG5_77

AG5_5 What is the growing season, in months, for APRICOTS? If you cannot, the season will do.

1	January	AG5_77
2	February	AG5_77
3	March	AG5_77
4	April	AG5_77
5	May	AG5_77
6	June	AG5_77
7	July	AG5_77
8	August	AG5_77
9	September	AG5_77
10	October	AG5_77
11	November	AG5_77
12	December	AG5_77
13	Fall	AG5_77
14	Winter	AG5_77
15	Spring	AG5_77
16	Summer	AG5_77
88	Refused	AG5_77
99	Don't know	AG5_77

ASK IF AG5(77); ELSE SKIP TO AG5a_77

AG5_77 What is the growing season, in months, for <%AG5>? If you cannot, the season will do.

1	January	AG5a_77
2	February	AG5a_77
3	March	AG5a_77
4	April	AG5a_77
5	May	AG5a_77
6	June	AG5a_77
7	July	AG5a_77
8	August	AG5a_77
9	September	AG5a_77

10	October	AG5a_77
11	November	AG5a_77
12	December	AG5a_77
13	Fall	AG5a_77
14	Winter	AG5a_77
15	Spring	AG5a_77
16	Summer	AG5a_77
88	Refused	AG5a_77
99	Don't know	AG5a_77

ASK IF AG5a(77); ELSE SKIP TO AG5b_77

AG5a_77 What is the growing season, in months, for <%AG5a>? If you cannot, the season will do.

1	January	AG5b_77
2	February	AG5b_77
3	March	AG5b_77
4	April	AG5b_77
5	May	AG5b_77
6	June	AG5b_77
7	July	AG5b_77
8	August	AG5b_77
9	September	AG5b_77
10	October	AG5b_77
11	November	AG5b_77
12	December	AG5b_77
13	Fall	AG5b_77
14	Winter	AG5b_77
15	Spring	AG5b_77
16	Summer	AG5b_77
88	Refused	AG5b_77
99	Don't know	AG5b_77

ASK IF AG5b(77); ELSE SKIP TO AG6

AG5b_77 What is the growing season, in months, for <%AG5b>? If you cannot, the season will do.

1	January	AG6
2	February	AG6
3	March	AG6
4	April	AG6
5	May	AG6
6	June	AG6
7	July	AG6
8	August	AG6
9	September	AG6
10	October	AG6

11	November	AG6
12	December	AG6
13	Fall	AG6
14	Winter	AG6
15	Spring	AG6
16	Summer	AG6
88	Refused	AG6
99	Don't know	AG6

AG6 Are the fields with low-pressure sprinkler nozzles irrigated during non-growing seasons?

1	Yes	AG6a
2	No	AG7
88	Refused	AG7
99	Don't know	AG7

ASK IF AG6(1)

AG6a Can you provide the months during which those fields are irrigated?

1	January	AG7
2	February	AG7
3	March	AG7
4	April	AG7
5	May	AG7
6	June	AG7
7	July	AG7
8	August	AG7
9	September	AG7
10	October	AG7
11	November	AG7
12	December	AG7
13	Fall	AG7
14	Winter	AG7
15	Spring	AG7
16	Summer	AG7
88	Refused	AG7
99	Don't know	AG7

AG7 Can you estimate the size of the fields, in acres, irrigated with the low-pressure sprinkler nozzles?

77	Record number of acres	AG8
88	Refused	AG8
99	Don't know	AG7a

ASK IF AG7=99

AG7a If you are unable to give an exact number of acres, can you estimate a range of the size of the fields irrigated with low-pressure sprinkler nozzles. Is it…

1	1-25 acres	AG8
2	26-50 acres	AG8
3	51-100 acres	AG8
4	101-200 acres	AG8
5	201+ acres	AG8
88	Refused	AG8
99	Don't know	AG8

AG8 How many irrigation pumps were affected by the installation of low-pressure sprinkler nozzles?

1	1	AG9_1
2	2	AG9_1
3	3	AG9_1
4	4	AG9_1
5	5	AG9_1
6	More than 5 pumps	AG9_1
88	Refused	AG9_1
99	Don't know	AG9_1

ASK IF AG8(1||6); ELSE SKIP TO AG9_2

AG9_1 What is the rated horsepower of the 1st pump? Would you say it is....

1	Less than 15 hp	AG9_2
2	15-30 hp	AG9_2
3	35-55 hp	AG9_2
4	60 hp or greater	AG9_2
88	Refused	AG9_2
99	Don't know	AG9_2

ASK IF AG8(2||6); ELSE SKIP TO AG9_3

AG9_2 What is the rated horsepower of the 2nd pump? Would you say it is....

1	Less than 15 hp	AG9_3
2	15-30 hp	AG9_3
3	35-55 hp	AG9_3
4	60 hp or greater	AG9_3
88	Refused	AG9_3
99	Don't know	AG9_3

ASK IF AG8(3||6); ELSE SKIP TO AG9_4

AG9_3 What is the rated horsepower of the 3rd pump? Would you say it is....

1	Less than 15 hp	AG9_4
2	15-30 hp	AG9_4

3	35-55 hp	AG9_4
4	60 hp or greater	AG9_4
88	Refused	AG9_4
99	Don't know	AG9_4

ASK IF AG8(4||6); ELSE SKIP TO AG9_5

AG9_4 What is the rated horsepower of the 4th pump? Would you say it is....

1	Less than 15 hp	AG9_5
2	15-30 hp	AG9_5
3	35-55 hp	AG9_5
4	60 hp or greater	AG9_5
88	Refused	AG9_5
99	Don't know	AG9_5

ASK IF AG8(5||6); ELSE SKIP TO AG10

AG9_5 What is the rated horsepower of the 5th pump? Would you say it is....

1	Less than 15 hp	AG10
2	15-30 hp	AG10
3	35-55 hp	AG10
4	60 hp or greater	AG10
88	Refused	AG10
99	Don't know	AG10

AG10 Whose idea was it to install new the low-pressure sprinkler nozzles?

1	Me or someone at my facility	AG11
2	Contractor	P35
3	Utility company contact	P35
4	Manufacturer	P35
77	Other (specify)	P35
88	Refused	P35
99	Don’t know	P35

AG11 Have you noticed any problems with the low-pressure sprinkler nozzles since the installation?

1	Yes	AG12
2	No	NTGCHECK5
88	Refused	NTGCHECK5
99	Don't know	NTGCHECK5

ASK AG12 if AG11(1)

AG12 What problems have you noticed since the sprinkler nozzles were installed?

77	RECORD RESPONSE	NTGCHECK5
88	Refused	NTGCHECK5

99	Don't know	NTGCHECK5

NTGCHECK5 **GO TO NTG BATTERY IF NTGSPRINKLERS = 1; ELSE CONTINUE**

PC POWER MANAGEMENT SOFTWARE

ASK IF PCPOWER = 1; ELSE SKIP TO NEXT BATTERY

DISPLAY In the next section we'll be discussing the PC power management software present at your facility.

IF PC_QTY > 0; ELSE SKIP TO PC200

PC100 According to our records, your organization purchased <%PC_QTY> power management software licenses through the program, is this correct?

1	Yes, correct	PC1a
2	Yes, but different amount	PC200
3	Did not purchase any	NEXT BATTERY
88	Refused	PC200
99	Don't know	PC200

IF PC_QTY = 0 | PC100(2)

PC200 Approximately how many power management software licenses were purchased through the program?

77	Record amt	PC1a
88	Refused	PC1a
99	Don't know	PC1a

IF PC100 ^=3

ASK IF ^UNRECORDED(PC_CHKDT); ELSE SKIP TO PC1b

PC1a Our records indicate that your company received a rebate for the software licenses purchased through the program in <%PC_CHKDT>. Is this correct?

1	Yes	PI3
2	No	PC1b
88	Refused	PC1b
99	Don't know	PC1b

ASK IF PC1a(2||99) OR UNRECORDED(PC_CHKDT);

PC1b In what year did you purchase the software licenses through the program? Was it in…

1	2013	PC1c
2	2014	PC1c
88	Refused	PC1
99	Don't know	PC1

ASK IF PC1b(1||2);

PC1c And what month? {If they can not recall month, try to get the season.}

1	January	PI3
2	February	PI3
3	March	PI3
4	April	PI3
5	May	PI3
6	June	PI3
7	July	PI3
8	August	PI3
9	September	PI3
10	October	PI3
11	November	PI3
12	December	PI3
13	Fall	PI3
14	Winter	PI3
15	Spring	PI3
16	Summer	PI3
88	Refused	PI3
99	Don't know	PI3

PC1 How many desktop computers are present at this location? We are not counting LAPTOPS.....Your best estimate is fine. DO NOT READ....if they say don't know, then ask them if it is more or less than 50, then find another number within a range and try to get the estimate from that.

Record	Total number of computers	PC2
88	Refused	PC1A
99	Don't know	PC1A

PC2 How many desktop computers are controlled by the power management software at this location?

Record	Total number of computers	PC3
88	Refused	PC2A
99	Don't know	PC2A

ASK IF PC2 = 88,99

PC2A What percent of the desktop computers at this location are controlled by the software?

Record	Percentage of desktop computers controlled	PC3
88	Refused	PC3
99	Don't know	PC3

PC3 What is the predominant type of computer processor installed within your desktop computers? Is it….(READ LIST)

1	AMD Athlon	PC3a
2	Intel Pentium 3	PC3a
3	Intel Pentium 4	PC3a

77	Other [Record Verbatim]	PC3a
88	Refused	PC3a
99	Don't know	PC3a

PC3a What is the predominant type of monitor that is controlled by the software at this location? Is it... (READ LIST)

1	CRT	PC3b
2	LCD	PC3b
3	LED	PC3b
77	Other [Record Verbatim]	PC3b
88	Refused	PC3b
99	Don't know	PC3b

PC3b What is the predominant size (in inches) of the monitors that are controlled by the software at this location?

1	(record in # of inches)	PC4
77	Other [Record Verbatim]	PC4
88	Refused	PC4
99	Don't know	PC4

PC4 How often do you upgrade/replace your desktop computers/monitors at this location?

1	Number of years	PC5
77	Other [Record Verbatim]	PC5
88	Refused	PC5
99	Don't know	PC5

PC5 Is the central server that controls the installed network software located at this facility?

1	Yes	PC6
2	No	PC8
77	Other	PC8
88	Refused	PC8
99	Don't know	PC8

ASK IF PC5=1

PC6 Does this server control desktop computers aside from those located at this facility?

1	Yes	PC7
2	No	PC8
77	Other	PC8
88	Refused	PC8
99	Don't know	PC8

ASK IF PC6=1

PC7 How many desktop computers are controlled by the power management software at this other location(s)?

Record	Total number of computers	PC8
88	Refused	PC8
99	Don't know	PC8

PC8 Does the software monitor and provide reports on the usage of individual or groups of network computers?

1	Yes	PC9
2	No	PC9
77	Other [Record Verbatim]	PC9
88	Refused	PC9
99	Don't know	PC9

PC9 How effective was the desktop computer power management software at reducing your energy bill? Would you say you have achieved…

1	Considerable energy savings	PC10
2	Some energy savings	PC10
3	No noticeable savings	PC10
88	Refused	PC10
99	Don't know	PC10

PC10 Have you noticed any problems with the software performance since the installation?

1	Yes	PC10a
2	No	PC11
77	Other [Record Verbatim]	PC11
88	Refused	PC11
99	Don't know	PC11

ASK PC10a if PC10(1)

PC10a What problems have you noticed since the software was installed?

77	RECORD RESPONSE	PC11
88	Refused	PC11
99	Don't know	PC11

PC11 Whose idea was it to install the power management software?

1	Me or someone at my facility.	PC12
2	Contractor.	PC12
3	Utility company contact.	PC12
4	Manufacturer.	PC12
77	Other (specify)	PC12
88	Refused	PC12
99	Don't know	PC12

PC12 Did your facility have any guidelines or protocols in place for turning off equipment or putting equipment in sleep mode while not in use before the power management software was installed?

1	Yes	PC13
2	No	NTGCHECK6
77	Other [Record Verbatim]	PC13
88	Refused	NTGCHECK6
99	Don't know	NTGCHECK6

PC13 **ASK IF PC12=1**
What specific guidelines or protocols were in place before the software was installed?

1	[Record Verbatim]	NTGCHECK6
88	Refused	NTGCHECK6
99	Don't know	NTGCHECK6

NTGCHECK6 **Go to NTG BATTERY IF NTGPC = 1; ELSE CONTINUE WITH SPILLOVER BATTERY**

FINANCE QUESTIONS

DISPLAY I would like to ask you about funding this project. Funding could include external financing such as a company credit card, getting financing through a contractor or retailer, getting a bank loan or internal financing such as using retained earnings.

FIN1 Did you use internal or external funding for this project?

1	Internal funding	SURVEY_OP_HOURS
2	External funding	FIN2
3	Combination of internal and external funding	FIN2
88	Refused	SURVEY_OP_HOURS
99	Don't know	SURVEY_OP_HOURS

FIN2 **[ASK IF FIN1 = 2, 3]**
We are interested in known what type of external financing you used? Did you use….[READ THROUGH FULL LIST, RECORD 1=Yes, 2=No, 88=Refused, 99=Don't Know]

FIN2A	Contractor financing	Y, N, Ref, DK
FIN2B	Vendor financing [FOR INTERVIEWER: for example, taking a store loan from SEARS to buy an appliance]	Y, N, Ref, DK
FIN2C	Secured loan from bank [FOR INTERVIEWER: a loan using property or assets as collateral or lien on the business]	Y, N, Ref, DK
FIN2D	Unsecured loan from bank [FOR INTERVIEWER: a loan which does not require a collateral]	Y, N, Ref, DK
FIN2E	Line of credit	Y, N, Ref, DK

FIN2F	Equipment financing or leasing	Y, N, Ref, DK
FIN2G	Company credit card	Y, N, Ref, DK
FIN2H	Energy efficiency financing program (please specify)	Y, N, Ref, DK
FIN2HA	Please specify which EE financing program. [ASK IF FIN2H=1]	
FIN2I	&UTILITY sponsored on-bill financing	Y, N, Ref, DK
FIN2J	Property Assessed Clean Energy (PACE) Financing	Y, N, Ref, DK
FIN2K	Any other type of financing (please specify)	NONE, OPENEND

SPILLOVER BATTERY - LIGHTING

Comment

Thanks for discussing the new equipment that you installed through the program. Next I would like to discuss any equipment you might have installed OUTSIDE of the <%UTILITY> <%PROGRAM> program.

SP1

ASK ALL

SP1

Since receiving the PROGRAM INCENTIVE we just discussed, did you implement any additional energy efficiency equipment without any assistance from the ...<%UTILITY> program... either at this facility or at other locations?

1	Yes, only at this facility	SP2
2	Yes, only at other locations	SP2
3	Yes, at this facility and other locations	SP2
4	No	End
88	Refused	End
99	Don't know	End

If SP1(1||3); else skip out of spillover battery

SP2

What type of equipment did you install? Was the equipment related to lighting, air conditioning, heating, refrigeration, motors or something else? (SELECT ALL THAT APPLY AND RECORD ADDITIONAL INFO)

1	Lighting	SP2L
2	HVAC or Cooling equipment	OT5
3	Water Heating Equipment	OT5
4	Compressed Air Equipment	OT5
5	Food Service Equipment	OT5
6	Refrigeration Equipment	OT5
7	Gas Equipment	OT5
77	Other (SPECIFY)	OT5
88	Refused	OT5
99	Don't Know	OT5

Ask if SP2 = 1; else OT5

SP2L	What type of fixtures, ballasts, or lighting controls were installed as part of this lighting retrofit without any assistance from the utility program? [SELECT ALL THAT APPLY, AFTER EACH RESPONSE, PROMPT WITH,]	<$2>
1	High performance T8 fluorescent fixtures (1” diameter bulbs)	High
2	T8 fluorescent fixtures (1” diameter bulbs)	High
3	T10 fluorescent fixtures	Low
4	T12 Fixtures (1.5” diameter bulbs)	Low
5	HID (High Density Discharge) Fixtures, Compact	High
6	Screw-in Modular CFLs	High
7	Hardwire CFLs	High
8	Incandescent bulbs	None
9	Compact Fluorescent Exit Signs	High
10	LED Exit Signs	High
11	Halogen	Low
12	Installed Reflectors	High
13	Electronic Ballast	Low
14	Magnetic Ballast	Low
15	Time Clock Lighting Controls	High
16	Occupancy Sensors Lighting Controls	High
17	Bypass/Delay Timers Lighting Controls	High
18	Photocell Lighting Controls	High
19	Other Fluorescent	Low
20	Fat/Thick Tubes	Low
21	Skinny/Thin Tubes	High
22	T5 Fixtures (5/8” diameter)	High
23	Generic Screw-Based LEDs	High
77	Other (PLEASE SPECIFY)	Low
88	Refused	None
99	Don't Know	None

ASK IF SP2L = 5; ELSE SKIP TO MSP2a

LI17	Were the HID lamps you installed High Pressure Sodium, Metal Halide, Mercury Vapor or Incandescent?	
1	High pressure sodium	MSP2a
2	Metal Halide	MSP2a
3	Mercury Vapor	MSP2a
4	Incandescent	MSP2a
88	Refused	MSP2a
99	Don't know	MSP2a

BEGIN MACRO HIGH
PERFORM MACRO HIGH OR LOW FOR FIRST THREE MEASURES MENTIONED IN SP2L

Ask if SP1 in (1|3); else skip to MSP2b <$3>

MSP2a <$1> How many <$2> products did you buy on your own for this facility?

1	{Record Number} for this facility	MSP2b <$3>
88	Refused	MSP2b <$3>
99	Don't know	MSP2b <$3>

Ask if SP1 in (2|3); else skip to SP2bL <$4>

MSP2b <$3> How many <$2> products did you buy on your own for other locations?

1	{Record Number} for other locations	SP2bL <$4>
88	Refused	SP2bL <$4>
99	Don't know	SP2bL <$4>

SP2bL <$4> Did you receive an incentive or rebate, or do you expect to receive an incentive or rebate for &LIGHT_TECH1B from elsewhere, such as another utility or from another organization such as the government?

1	Yes, Received/expect to receive an incentive from ANOTHER utility program	SP2cU <$5>
2	Yes, Received/expect to receive an incentive from a program offered by an organization other than a utility (e.g. a government program	SP2c <$6>
3	Yes, Received/expect to receive an incentive from the manufacturer	SP5L <$7>
4	No, did not receive/expect to receive an incentive	SP5L <$7>

ASK IF SP2bL <$4> = 1

SP2cU <$5> From what utility program did you receive/expect to receive an incentive or rebate?

77	Record	RESTART MACRO

ASK IF SP2bL <$4> = 2

SP2c <$6> From what organization or program did you receive/do you expect to receive an incentive or rebate?

77	Record	SP5L <$7>

Ask if SP2bL <$4> ^ = 1

SP5L <$7> Why did you install this energy efficiency equipment without receiving a rebate or incentive from the &UTILITY program? {DO NOT READ; INDICATE ALL THAT APPLY}

1	Too much paperwork	SP5c <$9>
2	Takes too long to get approval	SP5c <$9>
3	No time to participate, needed equipment immediately	SP5c <$9>
4	The program had ended	SP5c <$9>
5	The equipment would not qualify {PROBE: Why not?}	<$8>

6	The amount of the rebate wasn't important enough	SP5c <$9>
7	Did not know the program was available	SP5c <$9>
8	There was no program available	SP5c <$9>
9	Received rebate from an organization other than a utility	SP5c <$9>
10	Received a larger incentive from another organization	SP5c <$9>
11	Took the first incentive offered	SP5c <$9>
77	Other {SPECIFY}	SP5c <$9>
88	Refused	SP5c <$9>
99	Don't know	SP5c <$9>

ASK IF SP5L <$7> = 5; ELSE SKIP TO SP5c

<$8> Why would this equipment not qualify?

77	Record reason…	SP5c <$9>
88	Refused	SP5c <$9>
99	Don't know	SP5c <$9>

SP5c <$9> Was this equipment specifically recommended by a PROGRAM or UTILITY sponsored audit?

1	Yes	SP5d <$10>
2	No	SP5d <$10>
88	Refused	SP5d <$10>
99	Don't know	SP5d <$10>

SP5d <$10> Can you briefly explain why you decided to implement this equipment? (Note to interviewer, if the respondent mentions the utility programs as a factor in deciding to install the measure, record the open ended response in the appropriate response below)

77	Response not related to utility program (record verbatim)	SP5eL <$11>
78	Response related to utility program (record verbatim)	SP5f <$12>

If $10 is not 78

SP5eL <$11> Did your experience participating in the <%UTILITY> in 2013-2014 encourage you in any way to implement <$2>?

1	Yes	SP5f <$12>
2	No	SP5h <$15>
88	Refused	SP5f <$12>
99	Don't Know	SP5f <$12>

SP5f <$12> How influential was your experience in the <PROGRAM> in your decision to implement this equipment, using a scale of 0 to 10, where 0 is not at all influential and 10 is extremely influential?

	{Record Response (0-10)} _____	SP5f_CONCHECK <$13>
88	Refused	SP5f_CONCHECK <$13>
99	Don't Know	SP5f_CONCHECK <$13>

IF ($10(78) | $11(1)) & $12(11|1|2|3|4); else skip to SP5gL

SP5f_CONCHECK <$13> Earlier you indicated that the program encouraged you to implement this equipment, but now you've scored the program fairly low. Why is that?

77	Record VERBATIM [REVISE SP5f IF NECESSARY]	SP5h <$15>

If they would like to give a new rating, type it in the open end below and the reason\,

IF $12(5||10); else skip to SP5h

SP5gL <$14> Can you explain specifically how your experience with the PROGRAM influenced your decision to install this additional energy efficient equipment?

77	Record VERBATIM	MEAS2_1 <$17>
88	Don't know	MEAS2_1 <$17>
99	Refused	MEAS2_1 <$17>

IF $12(11|1|2|3|4);

SP5h <$15> Using a 0 to 10 scale where 0 is not at all likely and 10 is extremely likely, how likely would you have been to install this equipment...<$2>...if you had not participated in the program?

#	Record 0 to 10 likelihood rating (_____)	SP5h_CONCHECK <$16>
88	Refused	SP5h_CONCHECK <$16>
99	Don't know	SP5h_CONCHECK <$16>

IF $15 (11 or 1 - 4) & ($10(77) | $11(2)); else skip to MEAS2_1 <$17>

SP5h_CONCHECK <$16> Earlier you indicated that the program did not encourage you to implement this equipment, but now say that you would have been less likely to install the measure without the program. Why is that?

77	Record VERBATIM [REVISE SP5h IF NECESSARY]	MEAS2_1 <$17>

MEAS2_1 <$17> In what year did you install <$2>? (PROBE FOR BEST GUESS)

1	2013	MSP20 <$18>
2	2014	MSP20 <$18>
88	Refused	MSP20 <$18>
99	Don't know	MSP20 <$18>

MSP20 <$18> What type of lighting was removed and replaced when you installed <$2>?

1	High performance T8 (1" diameter bulbs)	MSP25 <$19>
2	T8 fluorescent fixtures (1" diameter bulbs)	MSP25 <$19>
3	T10 fluorescent fixtures	MSP25 <$19>
4	T12 Fixtures (1.5" diameter bulbs)	MSP25 <$19>

5	HID (High Density Discharge) Fixtures, Compact	MSP25 <$19>
6	Compact Fluorescent, Screw-in Modular	MSP25 <$19>
7	Compact Fluorescent, Hardwire	MSP25 <$19>
8	Incandescent	MSP25 <$19>
9	Exit Signs, Compact Fluorescent	MSP25 <$19>
10	Exit Signs, LED	MSP25 <$19>
11	Halogen	MSP25 <$19>
12	Install Reflectors	MSP25 <$19>
13	Electronic Ballast	MSP25 <$19>
14	Magnetic Ballast	MSP25 <$19>
15	Lighting Controls, Time Clock	MSP25 <$19>
16	Lighting Controls, Occupancy Sensor	MSP25 <$19>
17	Lighting Controls, Bypass/Delay Timers	MSP25 <$19>
18	Lighting Controls, Photocell	MSP25 <$19>
19	Other Fluorescent	MSP25 <$19>
20	Fat/Thick Tubes	MSP25 <$19>
21	Skinny/Thin Tubes	MSP25 <$19>
22	T5 Fixtures (5/8" diameter)	MSP25 <$19>
66	NOTHING, EQUIPMENT WAS ONLY ADDED, NOT REPLACED	
77	Other (PLEASE SPECIFY)	MSP25 <$19>
88	Refused	MSP25 <$19>
99	Don't know	MSP25 <$19>

ASK IF ^$18(66)

MSP25 <$19> Approximately how old was this light equipment that you removed/replaced? Would you say…

1	Less than 5 years old	MSP26 <$20>
2	Between 5 and 10 years old	MSP26 <$20>
3	Between 10 and 15 years old	MSP26 <$20>
4	More than 15 years old	MSP26 <$20>
88	Refused	MSP26 <$20>
99	Don't know	MSP26 <$20>

MSP26 <$20> How would you describe the condition of this removed equipment? Would you say they were…

1	In poor condition	MSP27 <$21>
2	Fair condition, or	MSP27 <$21>
3	Good condition	MSP27 <$21>
88	Refused	MSP27 <$21>
99	Don't know	MSP27 <$21>

MSP27 <$21> Approximately what percentage of this removed lighting equipment was broken or not working prior to installing…

%	Percent	MACRO LOW
101	Refused	MACRO LOW

102	Don't know	MACRO LOW

BEGIN MACRO LOW

<$1> In what year did you install <$2>? (PROBE FOR BEST GUESS)

1	2013	<$3>
2	2014	<$3>
88	Refused	<$3>
99	Don't know	<$3>

<$3> What type of lighting was removed and replaced when you installed <$2>?

1	High performance T8 (1" diameter bulbs)	<$4>
2	T8 fluorescent fixtures (1" diameter bulbs)	<$4>
3	T10 fluorescent fixtures	<$4>
4	T12 Fixtures (1.5" diameter bulbs)	<$4>
5	HID (High Density Discharge) Fixtures, Compact	<$4>
6	Compact Fluorescent, Screw-in Modular	<$4>
7	Compact Fluorescent, Hardwire	<$4>
8	Incandescent	<$4>
9	Exit Signs, Compact Fluorescent	<$4>
10	Exit Signs, LED	<$4>
11	Halogen	<$4>
12	Install Reflectors	<$4>
13	Electronic Ballast	<$4>
14	Magnetic Ballast	<$4>
15	Lighting Controls, Time Clock	<$4>
16	Lighting Controls, Occupancy Sensor	<$4>
17	Lighting Controls, Bypass/Delay Timers	<$4>
18	Lighting Controls, Photocell	<$4>
19	Other Fluorescent	<$4>
20	Fat/Thick Tubes	<$4>
21	Skinny/Thin Tubes	<$4>
22	T5 Fixtures (5/8" diameter)	<$4>
66	NOTHING, EQUIPMENT WAS ONLY ADDED, NOT REPLACED	<$4>
77	Other (PLEASE SPECIFY)	<$4>
88	Refused	<$4>
99	Don't know	<$4>

ASK IF ^$3(66)

<$4> Approximately how old was this light equipment that you removed/replaced? Would you say…

1	Less than 5 years old	<$5>
2	Between 5 and 10 years old	<$5>
3	Between 10 and 15 years old	<$5>
4	More than 15 years old	<$5>

88	Refused	<$5>
99	Don't know	<$5>

<$5> How would you describe the condition of this removed equipment? Would you say they were…

1	In poor condition	<$6>
2	Fair condition, or	<$6>
3	Good condition	<$6>
88	Refused	<$6>
99	Don't know	<$6>

<$6> Approximately what percentage of this removed lighting equipment was broken or not working prior to installing…

%	Percent	CFL1A
88	Refused	CFL1A
99	Don't know	CFL1A

IF SP2L = 6; else skip to VEND1

CFL1A Where did you purchase the CFLs that were installed OUTSIDE the program? [ACCEPT MULTIPLES]

1	Home Depot	CFL3A
2	Costco	CFL3A
3	Orchard Supply Hardware	CFL3A
4	ACE Hardware	CFL3A
5	Lowe's	CFL3A
6	SaveMart	CFL3A
7	K-Mart	CFL3A
8	Sam's Club	CFL3A
9	Smart & Final	CFL3A
10	Yardbirds Home Center	CFL3A
11	Fry's Electronics	CFL3A
12	True Value	CFL3A
65	CONTRACTOR INSTALLED	CFL3A
66	Did not install CFLs	VEND1
77	OTHER [Specify:]	CFL3A
88	Refused	CFL3A
99	Don't know	CFL3A

ASK IF ^CFL1A(66)

CFL3A Were all these CFLs installed or were some put in storage for later use?

1	All installed	VEND1
2	All in storage	VEND1
3	Some in storage, Some installed	CFL4
88	Refused	VEND1

99	Don't Know	VEND1

IF CFL3A = 3

CFL4 What percentage were installed?

77	Open Record	CFL5
88	Refused	CFL5
99	Don't know	CFL5

IF CFL3A = in (2, 3)

CFL5 Why were they put in storage?

77	Open Record	VEND1
88	Refused	VEND1
99	Don't know	VEND1

ROLE OF CONTRACTORS

ASK IF SP2L(1|2|5|6|7|9|10|12|15|16|17|18|21|22|23)

VEND1 Now I would like to find out, did you use a contractor/vendor to install the non-rebated energy efficient lighting?

1	Yes	VEND2
2	No	ENDLOOP
3	Received a rebate	ENDLOOP
88	Refused	ENDLOOP
99	[DO NOT READ] Don't know/No Answer	ENDLOOP

IF VEND1 = 1

VEND2 On a scale of 0 - 10, with 0 being very unimportant and 10 being very important. How important was the input from the contractor you worked with in deciding which specific equipment to install? Was it …

1	0-10 response	VEND3
88	Refused	VEND3
99	Don't know	VEND3

Ask if VEND2(7||10); Else LI30_A;

VEND3 Can you give me your contractor's name? Do you have his/her email address? Do you have a phone number for him/her?

77	RECORD NAME, Phone, Email ETC	LI30_A
88	Refused	LI30_A
99	Don't know	LI30_A

ASK IF SP2L(1||77)

LI30_1 Considering all of the lighting changes we just discussed (purchases outside the programs), approximately what percentage of the facility's lighting was affected by those changes?

%	Percent	OT5

101	Refused	OT5
102	Don't know	OT5

SPILLOVER BATTERY - OTHER

IF SP2(2||77)

Comment Next I would like to discuss any equipment you might have installed OUTSIDE of the &UTILITY program.

DISPLAY Earlier you mentioned that your organization installed...<(SP2(2))/HVAC or COOLING EQUIPMENT/> <(SP2(3))/WATER HEATING EQUIPMENT/> <(SP2(4))/COMPRESSED AIR EQUIPMENT/> <(SP2(5))/FOOD SERVICE EQUIPMENT/> <(SP2(6))/GAS EQUIPEMNENT/> %O<%SP2> outside of the program without any benefit of incentive or rebate. I would like to ask you a few questions about this equipment.

Response names in the following questions will have endings "_#" where # signifies the response number to SP2 (# = 1, 2, or 3)

MACRO OTHER

<$1> Was this equipment ...<$2> ...installed at this facility or another facitility or was it installed in both?

1	This facility	<$3>
2	Another facility	<$2>
3	Both this and another facility	<$3>
66	Was not installed	NEXT MEASURE
88	Refused	NEXT MEASURE
99	Don't know	NEXT MEASURE

Ask if <$1> in (1,3)

<$3> Please describe the type of <$2> that you installed at this facility.

77	Record verbatim	<$4>
88	Refused	<$4>
99	Don't know	<$4>

<$4> Please describe the quantity of <$2> that was installed at this facility.

77	Record verbatim	<$5>
88	Refused	<$5>
99	Don't know	<$5>

<$5> Please describe the efficiency level of <$2> that was installed at this facility.

1	Standard Efficiency	<$6>
2	High Efficiency	<$6>
3	Energy Star	<$6>
88	Refused	<$6>
99	Don't know	<$6>

Ask if <$1> in (2-3)

<$6> Please describe the type of <$2> that you purchased and installed at your other facility

77	Record verbatim	<$7>
88	Refused	<$7>
99	Don't know	<$7>

<$7> Please describe the quantity of <$2> that was installed at your other facility

77	Record verbatim	<$8>
88	Refused	<$8>
99	Don't know	<$8>

<$8> Please describe the efficiency level of <$2> that was installed at your other facility

1	Standard Efficiency	<$9>
2	High Efficiency	<$9>
3	Energy Star	<$9>
88	Refused	<$9>
99	Don't know	<$9>

<$9> Did you receive an incentive or rebate, or do you expect to receive an incentive or rebate for &OT_TECH1B from elsewhere, such as another utility or from another organzation such as the government?

1	Yes, Received/expect to receive an incentive from ANOTHER utility program	<$10>
2	Yes, Received/expect to receive an incentive from a program offered by an organization other than a utility (e.g. a government program	<$11>
3	Yes, Received/expect to receive an incentive from the manufacturer	<$12>
4	No, did not receive/expect to receive an incentive	<$12>

ASK IF $9 = 1

<$10> From what utility program did you receive/expect to receive an incentive or rebate?

77	Record	end for this measure

ASK IF $9 = 2

<$11> From what organization or program did you receive/expect to receive an incentive or rebate?

77	Record	SP5O

ASK IF ^$9(1)

<$12> Why did you purchase this equipment without the financial assistance available through &UTILITY program? {DO NOT READ; INDICATE ALL THAT APPLY}

1	Too much paperwork	<$14>
2	Takes too long to get approval	<$14>
3	No time to participate, needed equipment immediately	<$14>
4	The program had ended	<$14>
5	The equipment would not qualify {PROBE: Why not?}	<$13>
6	The amount of the rebate wasn't important enough	<$14>
7	Did not know the program was available	<$14>
8	There was no program available	<$14>
10	Received a larger incentive from another organization	<$14>
11	Took the first incentive offered	<$14>
77	Other {SPECIFY}	<$14>
88	Refused	<$14>
99	Don't know	<$14>

ASK IF <$12> = 5

<$13> Why would this equipment not qualify?

77	Record answer	<$14>
88	Refused	<$14>
99	Don't know	<$14>

<$14> Was this equipment... <$2>... specifically recommended by a PROGRAM/UTILITY sponsored audit?

1	Yes	<$15>
2	No	<$15>
88	Refused	<$15>
99	Don't know	<$15>

<$15> Can you briefly explain why you decided to implement this equipment? (Note to interviewer, if the respondent mentions the utility programs as a factor in deciding to install the measure, record the open ended response in the appropriate response below

77	Response not related to utility program (record verbatim)	<$17>
78	Response related to utility program (record verbatim)	<$16>
88	Refused	<$17>
99	Don't know	<$17>

ASK IF <$15> ^= 78

Did your experience participating in the <%UTILITY> <%PROGRAM> program in 2013-2014 encourage you in any way to implement

<$16> &OT_TECH1B?

1	Yes	<$17>
2	No	<$17>
88	Refused	<$17>
99	Don't Know	<$17>

<$17> How influential was your experience in the PROGRAM in your decision to implement this equipment, using a scale of 0 to 10, where 0 is not at all influential and 10 is extremely influential?

	{Record Response (0-10)} _____	<$18>
88	Refused	<$18>
99	Don't Know	<$18>

ASK IF ($15(78) | $16(1)) & $17(11|1|2|3|4)

<$18> Earlier you indicated that the program encouraged you to implement this equipment, but now you've scored the program fairly low. Why is that?

77	Record VERBATIM [REVISE <$17> IF NECESSARY]	

ASK IF IF $17(5||10)

<$19> Can you explain specifically how your experience with the <%PROGRAM> program influenced your decision to install this additional energy efficient equipment?

77	Record VERBATIM	
88	Don't know	
99	Refused	

ASK IF $17(11|1|2|3|4)

<$20> Using a 0 to 10 scale where 0 is not at all likely and 10 is extremely likely, how likely would you have been to install this equipment...<$2>...if you had not participated in the program?

#	Record 0 to 10 likelihood rating (_____)	
88	Refused	
99	Don't know	

ASK IF $20(11|1|2|3|4) & ($15(77) | $16(2))

<$21> Earlier you indicated that the program did not encourage you to implement this equipment ...<$2> >.., but now say that you would have been less likely to install the equipment without the program. Why is that?

77	Record VERBATIM [REVISE xxx IF NECESSARY]	

<$22> In what year did you install <$2>

1	2013	VEND1
2	2014	VEND1
88	Refused	VEND1
99	Don't know	VEND1

ROLE OF CONTRACTORS

ASK IF SP2(2||77)

OTVEND1 Now I would like to find out, did you use a contractor/vendor to install the non-rebated energy efficient equipment?

1	Yes	OTVEND2
2	No	ENDOTHERLOOP
88	Refused	ENDOTHERLOOP
99	[DO NOT READ] Don't know/No Answer	ENDOTHERLOOP

ASK IF OTVEND1(1)

OTVEND2 On a scale of 0 - 10, with 0 being very unimportant and 10 being very important. How important was the input from the contractor you worked with in deciding which specific equipment to install? Was it …

1	0-10 response	VEND3
88	Refused	VEND3
99	Don't know	VEND3

IF OTVEND2(7||10)

OTVEND3_(1-3) Can you give me your contractor's name?
Do you have his/her email address?
Do you have a phone number for him/her?

77	RECORD NAME, Phone, Email ETC	ENDOTHERLOOP
88	Refused	ENDOTHERLOOP
99	Don't know	ENDOTHERLOOP

ENDOTHERLOOP **END OTHER MEASURE LOOP; IF FINISHED OTHER MEASURES OR NO MORE OTHER MEASURES, GO ON TO NEXT BATTERY**

OPERATING HOURS

DISPLAY We are almost finished. The next few questions are to help us get a full understanding of your organization's operational hours.

ALWAYS Is your organization operation 24 hours a day, 7 days a week?

1	Yes	HOLIDAYS
2	No	HOLIDAYS
88	Refused	HOLIDAYS

HOLIDAYS	Dose your facility closed for any holidays during the year? If so, which one(s)?	
1	New Year's Day - January 1	DAYS
2	Martin Luther King Jr. Day - January 18, 2010 (3rd Monday in January)	DAYS
3	President's Day - February 15, 2010 (3rd Monday in February)	DAYS
4	Memorial Day - May 31, 2010 (Last Monday in May)	DAYS
5	Independence Day - July 4th (Or Surrounding Monday/Friday if July 4 is a weekend)	DAYS
6	Labor Day - September 6, 2010 (First Monday in September)	DAYS
7	Thanksgiving - November 26, 2010 (4th Thursday in November)	DAYS
8	Day after Thanksgiving	DAYS
9	Christmas Eve - December 24	DAYS
10	Christmas Day - December 25	DAYS
66	NO HOLIDAY CLOSURES	DAYS
77	Other - Specify	DAYS
88	Refused	DAYS
99	Don't Know	DAYS

DAYS	**Ask if ALWAYS = 2; else skip to OS_REC;** Is your facility closed any of the 7 days of the week? If so, which days are you CLOSED?	
1	Monday	MONDAY_OPEN
2	Tuesday	MONDAY_OPEN
3	Wednesday	MONDAY_OPEN
4	Thursday	MONDAY_OPEN
5	Friday	MONDAY_OPEN
6	Saturday	MONDAY_OPEN
7	Sunday	MONDAY_OPEN
66	Open EVERYDAY	MONDAY_OPEN
88	REFUSED	MONDAY_OPEN
99	DON'T KNOW	MONDAY_OPEN

MONDAY_OPEN	**Ask if ALWAYS(2)&^DAYS(1); else skip to TUESDAY_OPEN;** What time do you open your facility on MONDAY?	
	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	MONDAY_CLOSE
88	REFUSED	MONDAY_CLOSE
99	DON'T KNOW	MONDAY_CLOSE

IF MONDAY_OPEN(1||64)

MONDAY_CLOSE What time do you close your facility on MONDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	TUESDAY_OPEN
88	REFUSED	TUESDAY_OPEN
99	DON'T KNOW	TUESDAY_OPEN

Ask if ALWAYS(2)&^DAYS(2); else skip to WEDNESDAY_OPEN;

TUESDAY_OPEN What time do you open your facility on TUESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	TUESDAY_CLOSE
88	REFUSED	TUESDAY_CLOSE
99	DON'T KNOW	TUESDAY_CLOSE

IF TUESDAY_OPEN(1||65)

TUESDAY_CLOSE What time do you close your facility on TUESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	WEDNESDAY_OPEN
88	REFUSED	WEDNESDAY_OPEN
99	DON'T KNOW	WEDNESDAY_OPEN

Ask if ALWAYS(2)&^DAYS(3); else skip to THURSDAY_OPEN;

WEDNESDAY_OPEN What time do you open your facility on WEDNESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	WEDNESDAY_CLOSE
88	REFUSED	WEDNESDAY_CLOSE
99	DON'T KNOW	WEDNESDAY_CLOSE

IF WEDNESDAY_OPEN(1||65)

WEDNESDAY_CLOSE What time do you close your facility on WEDNESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	THURSDAY_OPEN
88	REFUSED	THURSDAY_OPEN
99	DON'T KNOW	THURSDAY_OPEN

Ask if ALWAYS(2)&^DAYS(4); else skip to FRIDAY_OPEN;

THURSDAY_OPEN What time do you open your facility on THURSDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	THURSDAY_CLOSE
88	REFUSED	THURSDAY_CLOSE
99	DON'T KNOW	THURSDAY_CLOSE

IF THURSDAY_OPEN(1||65)

THURSDAY_CLOSE What time do you close your facility on THURSDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	FRIDAY_OPEN
88	REFUSED	FRIDAY_OPEN
99	DON'T KNOW	FRIDAY_OPEN

Ask if ALWAYS(2)&^DAYS(5); else skip to SATURDAY_OPEN;

FRIDAY_OPEN What time do you open your facility on FRIDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	FRIDAY_CLOSE
88	REFUSED	FRIDAY_CLOSE
99	DON'T KNOW	FRIDAY_CLOSE

IF FRIDAY_OPEN(1||65)

FRIDAY_CLOSE What time do you close your facility on FRIDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SATURDAY_OPEN
88	REFUSED	SATURDAY_OPEN
99	DON'T KNOW	SATURDAY_OPEN

Ask if ALWAYS(2)&^DAYS(6); else skip to SUNDAY_OPEN;

SATURDAY_OPEN What time do you open your facility on SATURDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SATURDAY_CLOSE
88	REFUSED	SATURDAY_CLOSE
99	DON'T KNOW	SATURDAY_CLOSE

IF SATURDAY_OPEN(1||65)

SATURDAY_CLOSE What time do you close your facility on SATURDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SUNDAY_OPEN
88	REFUSED	SUNDAY_OPEN
99	DON'T KNOW	SUNDAY_OPEN

Ask if ALWAYS(2)&^DAYS(7); else skip to DIFF_SCHEDULE;

SUNDAY_OPEN What time do you open your facility on SUNDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	SUNDAY_CLOSE
88	REFUSED	SUNDAY_CLOSE

99	DON'T KNOW	SUNDAY_CLOSE

IF SUNDAY_OPEN(1||65)

SUNDAY_CLOSE What time do you close your facility on SUNDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	DIFF_SCHEDULE
88	REFUSED	DIFF_SCHEDULE
99	DON'T KNOW	DIFF_SCHEDULE

DIFF_SCHEDULE Some organizations have different schedules for certain times of the year. Does your organization maintain a different schedule for certain months of the year?

1	Yes	MONTHS
2	No	OS_REC
88	REFUSED	OS_REC
99	DON'T KNOW	OS_REC

Ask if DIFF_SCHEDULE = 1; Else skip to OS_REC;

MONTHS Which months of the year does the schedule vary from the times I just recorded?

1	January	ALT_DAYS
2	February	ALT_DAYS
3	March	ALT_DAYS
4	April	ALT_DAYS
5	May	ALT_DAYS
6	June	ALT_DAYS
7	July	ALT_DAYS
8	August	ALT_DAYS
9	September	ALT_DAYS
10	October	ALT_DAYS
11	November	ALT_DAYS
12	December	ALT_DAYS
88	REFUSED	ALT_DAYS
99	DON'T KNOW	ALT_DAYS

ALT_ALWAYS Is your organization operation 24 hours a day, 7 days a week?

1	Yes	HOLIDAYS
2	No	HOLIDAYS
88	Refused	HOLIDAYS

If ^ALT_ALWAYS(1) then ask; Else skip to OS_REC;

ALT_DAYS During this alternate schedule, is your facility closed any of the 7 days of the week? If so, which days are you CLOSED?

1	Monday	ALT_MONDAY_OPEN
2	Tuesday	ALT_MONDAY_OPEN
3	Wednesday	ALT_MONDAY_OPEN
4	Thursday	ALT_MONDAY_OPEN
5	Friday	ALT_MONDAY_OPEN
6	Saturday	ALT_MONDAY_OPEN
7	Sunday	ALT_MONDAY_OPEN
66	Open EVERYDAY	ALT_MONDAY_OPEN
88	REFUSED	ALT_MONDAY_OPEN
99	DON'T KNOW	ALT_MONDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(1);
else skip to ALT_TUESDAY_OPEN;

ALT_MONDAY_OPEN For the alternate schedule, what time do you open your facility on MONDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_MONDAY_CLOSE
88	REFUSED	ALT_MONDAY_CLOSE
99	DON'T KNOW	ALT_MONDAY_CLOSE

IF ALT_MONDAY_OPEN(1||64)

ALT_MONDAY_CLOSE What time do you close your facility on MONDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_TUESDAY_OPEN
88	REFUSED	ALT_TUESDAY_OPEN
99	DON'T KNOW	ALT_TUESDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(2);
else skip to ALT_WEDNESDAY_OPEN;

ALT_TUESDAY_OPEN What time do you open your facility on TUESDAY during your alternate schedule?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_TUESDAY_CLOSE
88	REFUSED	ALT_TUESDAY_CLOSE
99	DON'T KNOW	ALT_TUESDAY_CLOSE

IF ALT_TUESDAY_OPEN(1||65)

ALT_TUESDAY_CLOSE What time do you close your facility on TUESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_WEDNESDAY_OPEN
88	REFUSED	ALT_WEDNESDAY_OPEN
99	DON'T KNOW	ALT_WEDNESDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(3);
else skip to ALT_THURSDAY_OPEN;

ALT_WEDNESDAY_OPEN What time do you open your facility on WEDNESDAY during your alternate schedule?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_WEDNESDAY_CLOSE
88	REFUSED	ALT_WEDNESDAY_CLOSE
99	DON'T KNOW	ALT_WEDNESDAY_CLOSE

IF ALT_WEDNESDAY_OPEN(1||65)

ALT_WEDNESDAY_CLOSE What time do you close your facility on WEDNESDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_THURSDAY_OPEN
88	REFUSED	ALT_THURSDAY_OPEN
99	DON'T KNOW	ALT_THURSDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(4);
else skip to ALT_FRIDAY_OPEN;

ALT_THURSDAY_OPEN What time do you open your facility on THURSDAY during your alternate schedule?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_THURSDAY_CLOSE
88	REFUSED	ALT_THURSDAY_CLOSE
99	DON'T KNOW	ALT_THURSDAY_CLOSE

ALT_THURSDAY_OPEN(1||65)

ALT_THURSDAY_CLOSE What time do you close your facility on THURSDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_FRIDAY_OPEN
88	REFUSED	ALT_FRIDAY_OPEN
99	DON'T KNOW	ALT_FRIDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(5);
else skip to ALT_SATURDAY_OPEN;

ALT_FRIDAY_OPEN What time do you open your facility on FRIDAY during this alternate schedule?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_FRIDAY_CLOSE
88	REFUSED	ALT_FRIDAY_CLOSE
99	DON'T KNOW	ALT_FRIDAY_CLOSE

IF ALT_FRIDAY_OPEN(1||65)

ALT_FRIDAY_CLOSE What time do you close your facility on FRIDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SATURDAY_OPEN
88	REFUSED	ALT_SATURDAY_OPEN
99	DON'T KNOW	ALT_SATURDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(6);
else skip to ALT_SUNDAY_OPEN;

ALT_SATURDAY_OPEN I recorded that during your alternate schedule you are also open on Saturday. What time do you open your facility on SATURDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SATURDAY_CLOSE
88	REFUSED	ALT_SATURDAY_CLOSE
99	DON'T KNOW	ALT_SATURDAY_CLOSE

IF ALT_SATURDAY_OPEN(1||65)

ALT_SATURDAY_CLOSE What time do you close your facility on SATURDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SUNDAY_OPEN
88	REFUSED	ALT_SUNDAY_OPEN
99	DON'T KNOW	ALT_SUNDAY_OPEN

Ask if
DIFF_SCHEDULE(1)&^ALT_DAYS(7);
else skip to OS_REC;

ALT_SUNDAY_OPEN I recorded that during your alternate schedule you are also open on Sunday. What time do you open your facility on SUNDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	ALT_SUNDAY_CLOSE
88	REFUSED	ALT_SUNDAY_CLOSE
99	DON'T KNOW	ALT_SUNDAY_CLOSE

IF ALT_SUNDAY_OPEN(1||65)

ALT_SUNDAY_CLOSE What time do you close your facility on SUNDAY?

	Record Time 1AM - 12:30 AM in 12 hour format by half hour as 1-24	OS_REC
88	REFUSED	OS_REC
99	DON'T KNOW	OS_REC

NET TO GROSS

DISPLAY For the sake of expediency, during this next battery we will be referring to the ..... program as THE PROGRAM and we will be referring to the installation of ...<%NTGMEASURE>... as THE MEASURE.

A3 There are usually a number of reasons why an organization like yours decides to participate in energy efficiency programs like this one. In your own words, can you tell me why you decided to participate in this program?

1	To replace old or outdated equipment	N2
2	As part of a planned remodeling, build-out, or expansion	N2
3	To gain more control over how the equipment was used	N2
4	Maintenance downtime/associated expenses for old equip were too high	N2
5	Had process problems and were seeking a solution	N2
6	To improve equipment performance	N2
7	To improve production as a result of the change in equipment	N2
8	To comply with codes set by regulatory agencies	N2
9	To improve visibility/plant safety	N2
10	To comply with company policies regarding regular equipment retrofits or remodeling	N2
11	To get a rebate from the program	N2
12	To protect the environment	N2
13	To reduce energy costs	N2
14	To reduce energy use/power outages	N2
15	To update to the latest technology	N2
16	To improve the comfort level of the facility	N2
77	RECORD VERBATIM	N2
88	Don't know	N2
99	Refused	N2

N2 Did your organization make the decision to install this new equipment before or after you became aware of rebates/cost reduction available through the PROGRAM?

1	Before	N3a
2	After	N3a
88	Refused	N3a
99	Don't know	N3a

DISPLAY Next, I'm going to ask you to rate the importance of the program as well as other factors that might have influenced your decision to install this equipment through the program. Using a scale of 0 to 10 where 0 means not at all important and 10 means extremely important, how would you rate the importance of...

N3a The age or condition of the old equipment

#	Record 0 to 10 score (_____)	N3aa
88	Refused	N3b

99	Don't know	N3b

IF N3a > 5 and NTG_TYPE >= 2 THEN ASK

N3aa How, specifically, did this enter into your decision to install/delamp this equipment?

77	RECORD VERBATIM	N3b
88	Don't know	N3b
99	Refused	N3b

N3b Availability of the PROGRAM rebate/cost reduction

#	Record 0 to 10 score (_____)	N3bb
88	Refused	N3c
99	Don't know	N3c

IF N3b > 7 AND NTG_TYPE >= 2, THEN ASK

N3bb Why do you give it this rating?

77	Record VERBATIM	N3c
88	Refused	N3c
99	Don't know	N3c

IF A1B(1)|ID0(1) THEN ASK; ELSE SKIP TO N3d

N3c Please rate the degree of importance of information provided through...A1B(1)|<ID0(1)/The Facility or System AUDIT/>

#	Record 0 to 10 score (_____)	N3cc
88	Refused	N3d
99	Don't know	N3d

IF N3c > 7 and NTG_TYPE >= 2, THEN ASK

N3cc Why do you give it this rating?

77	Record VERBATIM	N3d
88	Refused	N3d
99	Don't know	N3d

If V1 = 1 THEN ASK; ELSE SKIP TO N3e

N3d Recommendation from an equipment vendor that sold you the equipment and/or installed it for you **[VENDOR_1]**

#	Record 0 to 10 score (_____)	N3e
88	Refused	N3e
99	Don't know	N3e

N3e Your previous experience with energy efficient projects?

#	Record 0 to 10 score (_____)	N3f
88	Refused	N3f
99	Don't know	N3f

N3f Your previous experience with <%UTILITY>'s program or a similar utility program?

#	Record 0 to 10 score (_____)	N3g
88	Don't know	N3g
99	Refused	N3g

NTG_TYPE >= 3 THEN ASK, ELSE N3h

N3g Information from the Program, Utility, or Program Administrator training course?

#	Record 0 to 10 score (_____)	N3gg
88	Refused	N3h
99	Don't know	N3h

IF N3g > 5, THEN ASK

N3gg What type of information was provided during the training?

77	Record VERBATIM	N3ggg
88	Refused	N3h
99	Don't know	N3h

N3ggg How, specifically, did this enter into your decision to install/delamp this equipment?

77	RECORD VERBATIM	N3h
88	Don't know	N3h
99	Refused	N3h

N3h Information from the Program, Utility, or Program Administrator Marketing materials?

#	Record 0 to 10 score (_____)	N3hh
88	Refused	N3j
99	Don't know	N3j

IF N3h > 5 and NTG_TYPE >= 2, THEN ASK

N3hh What type of information was provided that pertained to the PROJECT?

77	Record VERBATIM	N3hhh
88	Refused	N3j
99	Don't know	N3j

IF N3hh = 77, THEN ASK

N3hhh How, specifically, did this enter into your decision to install/delamp this energy efficient equipment?

77	RECORD VERBATIM	N3j
88	Don't know	N3j
99	Refused	N3j

IF NTG_TYPE >= 2

N3j Standard practice in your business/industry

#	Record 0 to 10 score (_____)	N3k

88	Refused	N3k
99	Don't know	N3k

If AP9 = 3 or AP9a = 3 THEN ASK; ELSE SKIP TO N3m

N3l Endorsement or recommendation by your account rep?

#	Record 0 to 10 score (_____)	N3ll
88	Refused	N3m
99	Don't know	N3m

IF N3l > 5 & NTG_TYPE >= 2 THEN ASK

N3ll What did they recommend?

77	Record VERBATIM	N3lll
88	Refused	N3m
99	Don't know	N3m

IF N3LL(77)

N3lll How specifically did this enter into your decision to install this project using energy efficient equipment?

77	RECORD VERBATIM	N3m
88	Don't know	N3m
99	Refused	N3m

IF NTG_TYPE >= 2, ASK

N3m Corporate policy or guidelines

#	Record 0 to 10 score (_____)	N3mm
88	Refused	N3n
99	Don't know	N3n

IF N3m > 5, THEN ASK

N3mm How, specifically, did this enter into your decision to install/delamp this equipment?

77	RECORD VERBATIM	N3n
88	Don't know	N3n
99	Refused	N3n

N3n Payback or return on investment of installing this equipment

#	Record 0 to 10 score (_____)	N3o
88	Refused	N3o
99	Don't know	N3o

N3o Improved product quality

#	Record 0 to 10 score (_____)	N3oo
88	Refused	N3p
99	Don't know	N3p

IF N3o > 5, THEN ASK

N3oo How, specifically, did this enter into your decision to install/delamp this equipment?

77	RECORD VERBATIM	N3p
88	Don't know	N3p
99	Refused	N3p

IF FM050 = 12 AND NTG_TYPE = 4, THEN ASK, ELSE SKIP TO N3r

N3p Compliance with state or federal regulations such as Title 24, air quality, OSHA, or FDA regulations

#	Record 0 to 10 score (_____)	N3pp
88	Refused	N3r
99	Don't know	N3r

IF N3p > 5, THEN ASK

N3pp How, specifically, did this enter into your decision to upgrade to energy efficient equipment?

77	RECORD VERBATIM	N3r
88	Don't know	N3r
99	Refused	N3r

ASK IF NTG_TYPE >= 3

N3r Compliance with your organization's normal remodeling or equipment replacement practices?

#	Record 0 to 10 score (_____)	N3rrr
88	Refused	N3s
99	Don't know	N3s

IF A3(2|10)&N3R(6||10);

N3RRR What is your normal cycle in number of years for which you typically retrofit your equipment to comply with your organization@'s normal remodeling or equipment replacement practices?

# yrs	Record Number of Years	N3rr
88	Refused	N3rr
99	Don't know	N3rr

IF N3r > 5, THEN ASK

N3rr How, specifically, did this enter into your decision to install/delamp this equipment?

77	RECORD VERBATIM	N3s.
88	Don't know	N3s.
99	Refused	N3s.

N3s Were there any other factors we haven't discussed that were influential in your decision to install/delamp this MEASURE?

1	Nothing else influential	CC1
77	Record verbatim	N3ss
88	Refused	CC1
99	Don't know	CC1

ASK IF N3s = 77

N3ss Using the same zero to 10 scale, how would you rate the influence of this factor?

#	Record 0 to 10 score (_____)	CC1
88	Refused	CC1
99	Don't know	CC1

CONSISTENCY CHECKS ON N3p, N3q and N3r
If NTG_TYPE = 4
IF A3 = 8, AND N3p < 4, THEN ASK

CC1 You indicated earlier that compliance with codes or regulatory policies was one of the reasons you did the project. However, just now you scored the importance of compliance with state or federal regulations or standards such as Title 24, air quality, OSHA, or FDA regulations in your decision making fairly low, why is that?

77	RECORD VERBATIM	CC1a
88	Don't know	CC1a
99	Refused	CC1a

IF A3 ^= 8, and N3p > 7, THEN ASK

CC1a You indicated earlier that compliance with codes or regulatory policies was not one of the primary reasons you did the project. However, just now you scored the importance of compliance with state or federal regulations or standards such as Title 24,air quality, OSHA, or FDA regulations in your decision making fairly high, why is that?

77	RECORD VERBATIM	CC3
88	Don't know	CC3
99	Refused	CC3

IF A3 = 2 or 10, AND N3r < 4, THEN ASK

NCC3 You indicated earlier that a regularly scheduled retrofit was one of the reasons you did the project. However, just now you scored the importance of compliance with your company's regularly scheduled retrofit or equipment replacement in your decision making fairly low, why is that?

77	RECORD VERBATIM	CC3a
88	Don't know	CC3a
99	Refused	CC3a

IF A3 ^= 2 and A3 ^= 9 and A3^=10 AND N3r > 7 THEN ASK

NCC3a You indicated earlier that a regularly scheduled retrofit was NOT one of the reasons you did the project. However, just now you scored the importance of compliance with your company's regularly scheduled retrofit or equipment replacement in your decision making fairly high, why is that?

77	RECORD VERBATIM	N33
88	Don't know	N33
99	Refused	N33

PAYBACK BATTERY

If INCENT <> 100 AND NTG_TYPE >= 2, THEN ASK; ELSE SKIP TO N33

P1 What financial calculations does your company typically make before proceeding with the installation of energy efficient equipment like you installed through the program?

1	Payback	P2A
2	Return on investment	P2B
77	Record VERBATIM	P3
88	Don't know	P3
99	Refused	P3

If P1 = 1 THEN ASK; ELSE SKIP TO P2B

P2A What is your threshold in terms of the payback or return on investment your company uses before deciding to proceed with installing energy efficient equipment like you installed through the program? Is it…

1	0 to 6 months	P3
2	6 months to 1 year	P3
3	1 to 2 years	P3
4	2 to 3 years	P3
5	3 to 5 years	P3
6	Over 5 years	P3
88	Don't know	P3
99	Refused	P3

IF P1 = 2 THEN ASK

P2B What is your ROI?

1	Record ROI____;	P3

P3 Did the rebate move your energy efficient equipment project within this acceptable range?

1	Yes	P4
2	No	P3a
88	Don't know	P3a
99	Refused	P3a

If P3 = 1 THEN ASK; ELSE SKIP TO P3A

P4 On a scale of 0 to 10, with a 0 meaning Not At All Important and a 10 meaning a Very Important, how important in your decision was it that the project was now in the acceptable range?

#	Record 0 to 10 score (_____)	P3a
88	Refused	P3a
99	Don't know	P3a

CONSISTENCY CHECKS ON N3b and P3

IF P3 = 1, AND N3b < 5, THEN ASK

P3a The rebate seemed to make the difference between meeting your financial criteria and not meeting them, but you are saying that the rebate didn't have much effect on your decision, why is that?

77	Record VERBATIM	P3e
88	Don't know	P3e
99	Refused	P3e

IF P3 = 2, AND N3b > 5, THEN ASK

P3e The rebate didn't cause the installation of energy efficient equipment to meet your company's financial criteria, but you said that the rebate had an impact on the decision to install this energy efficient equipment. Why did it have an impact?

77	Record VERBATIM	N33
88	Don't know	N33
99	Refused	N33

IF N3A(8||10) | N3D(8||10) | N3E(8||10) | N3F(8||10) | N3J(8||10) | N3M(8||10) | N3N(8||10) | N3O(8||10) | N3P(8||10) | N3R(8||10);

DISPLAY Next, I would like you to rate the importance of the PROGRAM in your decision to implement this MEASURE as opposed to other factors that may have influenced your decision such as...(SCAN BELOW AND READ TO THEM THOSE ITEMS WHERE THEY GAVE A RATING OF 8 or higher)

<%N3A> Age or condition of old equipment,	...@[%N3A>@
<%N3D> Equipment Vendor recommendation	...@[%N3D>@
<%N3E> Previous experience with this measure	...@[%N3E>@
<%N3F> Previous experience with this program	...@[%N3F>@
<%N3J> Standard practice in your business/industry	...@[%N3J>@
<%N3M> Corporate policy or guidelines	...@[%N3M>@
<%N3N> Payback on investment.	...@[%N3N>@
<%N3O> To improve production as a result of lighting,	...@[%N3O>@
<%N3P> Compliance with state or federal regulations or standards such as Title 24, air quality, OSHA, or FDA regulations	...@[%N3P>@
<%N3R> Compliance with normal maintenance or retrocommissioning policies or your companies regularly scheduled retrofit or lighting replacement	...@[%N3R>@

DISPLAY If you were given 10 points to award in total, how many points would give to the importance of the program and how many points would you give to these other factors?\

N41 How many of the ten points would you give to the importance of the PROGRAM in your decision?

#	Record 0 to 10 score (_____)	N42
88	Refused	N42
99	Don't know	N42

N42 and how many points would you give to all of these other factors?\

#	Record 0 to 10 score (_____)	N41a
88	Refused	N41a

99	Don't know	N41a

If N41 <> 88 and N41 <> 99 and N42 <> 88 and N42 <> 99, computer N41 + N42. While N41+N42 <> 10, display:
__We want these two sets of numbers to equal 10.
<%N41> for Program influence and
<%N42> for Non Program factors

IF DELAMP <> 1;
REPLACE Was the installion of this measure....<%NTGMEASURE> ...a replacement of existing equipment or was it additional equipment you installed in your facility?

1	Replace	DISPLAY
2	Add-on	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY

DISPLAY Now I would like you to think about the action you would have taken with regard to the installation of this equipment if the program had not been available.

IF REPLACE(1) | DELAMP == 1
N5 Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same program qualifying energy efficient equipment that you did in this project?

#	Record 0 to 10 score (_____)	N5a
88	Refused	N5B
99	Don't know	N5B

IF REPLACE(2) THEN ASK; ELSE SKIP TO N6
N5aa Using a likelihood scale from 0 to 10, where 0 is Not at all likely and 10 is Extremely likely, if THE PROGRAM had NOT BEEN AVAILABLE, what is the likelihood that you would have installed exactly the same energy efficient equipment at the same time as you did?

#	Record 0 to 10 score (_____)	N6
88	Don't know	N6
99	Refused	N6

CONSISTENCY CHECKS
IF N3b > 7 and N5 > 7, THEN ASK

N5a When you answered ...<%N3B> ... for the question about the influence of the rebate, I would interpret that to mean that the rebate was quite important to your decision to install. Then, when you answered ..<%N5>... for how likely you would be to install the same equipment **without** the rebate, it sounds like the rebate was not very important in your installation decision.
I want to check to see if I am misunderstanding your answers or if the questions may have been unclear. Will you explain in your own words, the role the rebate played in your decision to install this efficient equipment?

77	Record VERBATIM	NN5aa
88	Don't know	NN5aa
99	Refused	NN5aa

NN5aa Would you like for me to change your score on the importance of the rebate that you gave a rating of <%N3B> and/or change your rating on the likelihood you would install the same equipment without the rebate which you gave a rating of <%N5> and/or we can change both if you wish?

1	No change	N5b
77	Record how they would rate rebate influence and how they would rate likelihood to install without the rebate	N5b
88	Don't know	N5b
99	Refused	N5b

ASK IF REPLACE(1)

N5b Using the same scale as before, if the program had not been available, what is the likelihood that you would have done this project at the same time as you did?

#	Record 0 to 10 score (_____)	DISPLAY
88	Refused	DISPLAY
99	Don't know	DISPLAY

DEFERRED FREE RIDERSHIP FOLLOW-UP
DISPLAY If N5b < 9; ELSE SKIP TO N6

DISPLAY Next, I'd like to ask a couple of questions to help us estimate at what point in the future you would definitely have replaced your existing equipment. We understand that you can't know exactly when you would have done this, especially so far into the future. We're just trying to get a sense of how long you think the current equipment or process would have kept serving your company's needs before you had to or chose to replace it. TD1

TD1 If the program had not been available, how likely is it that you would have replaced your existing equipment within one year of when you did?

1	Definitely would have (1.0 probability)	N9bb
2	Probably would have (0.75 probability)	TD2
3	50-50 chance (0.50 probability)	TD2
4	Probably not (0.25 probability)	TD2
5	Definitely not (0.0 probability)	TD2

IF TD1 = 2, 3, 4, 5 ASK TD2, ELSE GO TO N9bb

TD2 If the program had not been available, how likely is it that you would have replaced your existing equipment within three years of when you did?

1	Definitely would have (1.0 probability)	N9bb
2	Probably would have (0.75 probability)	TD3
3	50-50 chance (0.50 probability)	TD3
4	Probably not (0.25 probability)	TD3
5	Definitely not (0.0 probability)	TD3

IF TD2 = 2, 3, 4, 5 ASK TD3; ELSE GO TO N6

TD3 If the program had not been available, how likely is it that you would have replaced your existing equipment within five years of when you did?

1	Definitely would have (1.0 probability)	N9bb
2	Probably would have (0.75 probability)	N9bb
3	50-50 chance (0.50 probability)	N9bb
4	Probably not (0.25 probability)	N9bb
5	Definitely not (0.0 probability)	N9bb

CONSISTENCY CHECK ON AGE

IF (N3a > 6 AND TD3 = 3, 4 or 5) THEN ASK; ELSE SKIP TO N6

N9bb Earlier when I asked about the influence of the age/condition of the old equipment on your decision to install this new equipment, you gave me a rating of <%N3A> out of ten. I would interpret this to mean that the age/condition was quite influential in your decision to install this new equipment when you did. Perhaps I have either recorded something incorrectly or maybe you could explain in your own words the role the age/condition of the existing equipment played in your decision to install this new energy efficient equipment.

77	Record VERBATIM	N6
88	Don't know	N6
99	Refused	N6

ADDITIONAL BASELINE INPUT

N6 Now I would like you to think one last time about what action you would have taken if the program had not been available. Which of the following alternatives would you have been MOST likely to do?

1	Install/Delamped fewer units	N7
2	Install standard efficiency equipment or whatever required by code	N7
3	Installed equipment more efficient than code but less efficient than what you installed through the program	N7
4	Done nothing (keep existing equipment as is)	N7
5	Done the same thing I would have done as I did through the program	N7
6	Repair/rewind or overhaul the existing equipment	N7
77	Something else (specify what _____)	N7
88	Don't know	N7
99	Refused	N7

Ask if N6 = (1, 2, 3, 4) and (N5 > 8 and N5b > 8 OR N5aa > 8)

N7 In an earlier response, you said that if the program had not been available, there was a very high likelihood that you would have installed exactly the same equipment as you did through the program. However, just now you have indicated that you would not have installed the same equipment as you did without the benefit of the program. Can you explain to me why there is this difference?

77	Record VERBATIM	N6a
88	Don't know	N6a
99	Refused	N6a

Ask if N6(1);

N6a How many fewer units would you have installed/Delamped? (It is okay to take an answer such as ...HALF...or 10 percent fewer ... etc.)

77	RECORD VERBATIM	ER2
88	Refused	ER2
99	Refused	ER2

Ask if N6(3);

N6b Can you tell me what model or efficiency level you were considering as an alternative? (It is okay to take an answer such as … 10 percent more efficient than code or 10 percent less efficient than the program equipment)

77	RECORD VERBATIM	ER2
88	Don't know	ER2
99	Refused	ER2

Ask if N6(6);

N6c How long do you think the repaired equipment would have lasted before requiring replacement?

77	RECORD VERBATIM	ER2
88	Don't know	ER2
99	Refused	ER2

EARLY REPLACEMENT BATTERY

[IF N5b < 8 and A3 = 1, 4, 8, or 10 THEN ASK. ELSE SKIP TO SP1]

DISPLAY Earlier, when I asked you a question about why you decided to implement the project using high efficiency equipment, you gave reasons related to <A3> Now I would like to ask you some follow up questions regarding these responses you gave me. ER2

IF REPLACE(1);

ER2 How many more years do you think your equipment would have gone before failing and required replacement?

77	___ Estimated Remaining Useful Life (in years)	ER6
88	Don't know	ER6
99	Refused	ER6

IF A3 = 4, THEN ASK

ER6 How much downtime did you experience in the past year?

77	_____Downtime Estimate (in weeks)	ER9
88	Don't know	ER9
99	Refused	ER9

ER9 In your opinion, based on the economics of operating this equipment, for how many more years could you have kept this equipment functioning?

Yrs	___ Estimated Remaining Useful Life	ER11
88	Don't know	ER11
99	Refused	ER11

IF A3 = 8, THEN ASK

ER15 Can you briefly describe the specific code/regulatory requirements that this project addressed?

77	RECORD VERBATIM	ER19
88	Don't know	ER19
99	Refused	ER19

IF A3 = 10, THEN ASK

ER19 Can you briefly describe the specific company policies regarding regular/normal maintenance/replacement policy(ies) that were relevant to this project? Or briefly describe the specific company policies regarding regular equipment retrofits and remodeling?

77	RECORD VERBATIM	PP1
88	Don't know	PP1
99	Refused	PP1

PROCESS QUESTIONS - ASK ALL

PP1 What do you believe the PROGRAM'S primary strengths are?

77	Record VERBATIM	PP2
88	Don't know	PP2
99	Refused	PP2

PP2 What concerns do you have about the PROGRAM, if any? (IF NEEDED: What do you view as the primary features that need to be improved?)

77	Record VERBATIM	PP4
88	Don't know	PP4
99	Refused	PP4

PP4 On a scale of 0 - 10, where 0 is completely dissatisfied and 10 is completely satisfied, how would you rate your OVERALL satisfaction with the <%PROGRAM>?

#	Record 0 to 10 score (_____)	PP5
88	Refused	PP5
99	Don't know	PP5

IF PP4 < 4 THEN ASK; ELSE SKIP TO PP5A

PP5 Why do you say that?

77	Record VERBATIM	PP5A
88	Don't know	PP5A
99	Refused	PP5A

PP5A Using the same 0 - 10 scale, how would you rate your OVERALL satisfaction with the performance of the energy efficient measures you had installed?

#	Record 0 to 10 score (_____)	PP5B
88	Refused	PP6
99	Don't know	PP6

IF PP5A < 6 THEN ASK; ELSE SKIP TO PP6

PP5B Why do you say that?

77	Record VERBATIM	PP6
88	Don't know	PP6
99	Refused	PP6

PP5C Using the same 0 - 10 scale, how would you rate your OVERALL satisfaction with the quality of the installers' work?

#	Record 0 to 10 score (_____)	PP5D
88	Refused	PP5E
99	Don't know	PP5E

PP5D Why do you say that?

77	Record VERBATIM	PP5E
88	Don't know	PP5E
99	Refused	PP5E

PP5E From your perspective, what if anything could be done to improve the quality of the installers' work?

77	Record VERBATIM	PP6
88	Don't know	PP6
99	Refused	PP6

In qsl: IF ^UNRECORDED(IMPLEMENTER);

ASK IF %IMPLEMENTER = "a local government", "state government", or "an independent firm"; ELSE PP10

PP6 The program you participated in was run by %IMPLEMENTER. Has your organization participated in energy efficiency programs run by <%UTILITY> in the past three years?

1	Yes	PP8
2	No	PP10
88	Refused	PP10
99	Don't know	PP10

ASK IF PP6=1

Please consider your recent experience with the PROGRAM run by %IMPLEMENTER versus your past experience with the program run by <%UTILITY>. Are there any differences between the two that stand out?

PP8 Any there attributes or services that seemed better in one or the other?

1	No differences	PP10
77	Yes, Record DIFFERENCES	PP10
88	Don't know	PP10
99	Refused	PP10

ASK IF IOU_PROG = 1 (utility administered program); ELSE PP12

The program you participated in was run by <%UTILITY>. Have you participated in programs run by governments, institutions, or other

PP10 independent firms in the past three years? (select all that apply)

1	Local Government	PP14
2	State Government or Institution	PP14
3	Independent Firm	PP12
88	Refused	PP16
99	Don't know	PP16

ASK IF PP10 = 3;

Please consider your experiences with the program run by an independent firm versus your recent experience with the program run by an independent firm versus your recent experience with <%UTILITY>'s program. Are there any differences between the two that stand out? Are there attributes or services that seemed better in one or the other? (NOTE: SPECIFY WHICH

PP12 ENTITY IS REFERRED TO IN EACH COMMENT)

1	No differences	PP16
77	Yes, RECORD DIFFERENCES	PP16
88	Refused	PP16
99	Don't know	PP16

ASK if PP10 in (1, 2)

Please consider your experiences with the program run by a government or institution versus your recent experience with <%UTILITY>'s PROGRAM. Are there any differences between the two that stand out? Are there attributes that seemed better in one or the other? (NOTE: SPECIFY WHICH ENTITY

PP14 IS REFERRED TO IN EACH COMMENT)

77	Yes, Record VERBATIM	PP16
78	No differences	PP16
88	Refused	PP16
99	Don't know	PP16

ASK if PP6 = 1 AND PP10 = 1, 2 or 3. ELSE PP3

Which entity, the <%UTILITY> program or the <%IMPLEMENTER> <%PP10> program was more effective in supporting your organization's

PP16 decision making process?

1	%IMPLEMENTER	PP18
2	%UTILITY	PP18

3	Very little difference	PP18
88	Refused	PP18
99	Don't know	PP18

If PP16 in (1, 2) then ask; else skip to PP20

PP18 How significant was this difference, would you say…

1	Very Significant	PP20
2	Somewhat Significant	PP20
3	Not very significant	PP20
88	Refused	PP20
99	Don't know	PP20

PP20 Which entity had a better technical understanding of the energy use at your facility and provided the best technical assistance in specifying the project?

1	%IMPLEMENTER	PP22
2	%UTILITY	PP22
3	Very little difference	PP22
88	Refused	PP22
99	Don't know	PP22

If PP20 in (1, 2) then ask; else skip to PP24

PP22 How significant was this difference, would you say…

1	Very Significant	PP24
2	Somewhat Significant	PP24
3	Not Very Significant	PP24
88	Refused	PP24
99	Don't know	PP24

PP24 Which entity was more effective in supporting you through the application process

1	%IMPLEMENTER	PP26
2	%UTILITY	PP26
3	Very little difference	PP26
88	Refused	PP26
99	Don't know	PP26

If PP24 in (1, 2) then ask; else skip to PP3;

PP26 How significant was this difference, would you say…

1	Very Significant	PP3
2	Somewhat Significant	PP3
3	Not very significant	PP3
88	Refused	PP3
99	Don't know	PP3

PP3 Do you have any comments on the current incentive structure of the PROGRAM?

1	No	ID1
77	Yes - RECORD COMMENTS_____	ID1
88	Don't know	ID1
99	Refused	ID1

LONG TERM INFLUENCE
If NTG_TYPE >= 2
IF N3f > 4, THEN ASK, ELSE CCC12A

DISPLAY Now I'd like you to think about your organization's experiences with %UTILITY's energy efficiency programs and efforts over the longer term, for example, over the past 5, 10, or even 20 years.
In an earlier question, you indicated that your previous experience with utility energy efficiency programs was a factor that influenced your decision to implement this PROJECT. I would like to ask you a few questions about this experience. LT2

LT2 For how many years have you been participating in %UTILITY's energy efficiency programs?

# yrs	Record Number of Years	LT3
88	Refused	LT3
99	Don't know	LT3

LT3 During this time, how many times has your organization participated in these PROGRAM(s)?

1	7 to 10 times, or more	CA6
2	4 to 7 times	CA6
3	2 to 4 times	CA6
4	less than 2 times	CA6
88	Refused	LT6
99	Don't know	LT6

IF LT3(1||4);

CA6 What type of equipment did you install through this (these) program(s)? [READ RESPONSE CATEGORIES]

1	Indoor lighting	LT6
2	Cooling equipment	LT6
3	Natural gas equipment, such as water heater, furnace or appliances	LT6
4	Insulation or windows	LT6
5	Refrigeration	LT6
6	Industrial process equipment	LT6
7	Greenhouse heat curtains	LT6
8	Food service equipment	LT6
77	OPEN \SOMETHING OTHER (specify)	LT6
88	Refused	LT6
99	Don't Know	LT6

LT6 What factors led you to participate in these program(s)?

77	Record VERBATIM	LT7
88	Refused	LT7
99	Don't know	LT7

LT7 And exactly how did that experience help to convince you to install this energy efficient equipment?

77	Record VERBATIM	LT8
88	Refused	LT8
99	Don't know	LT8

IF LT3 = 1 or 2, THEN ASK. ELSE CCC12A.

LT8 Have these programs had any long-term influence on your organization's energy efficiency related practices and policies that go beyond the immediate effect of incentives on individual projects? [DO NOT READ: Examples are causing them to add energy efficiency procurement policies, internal incentive or reward structures for improving energy efficiency, or adoption of energy management best practices.]

1	Yes	LT9
2	No	CC12A
88	Refused	CC12A
99	Don't know	CC12A

If LT8 = 1 then ask; else skip to CA2;

LT9 Has your organization developed a specification policy for the selection of energy efficient equipment? [EXAMPLES... REQUIREMENTS THAT ALL NEW FLUORESCENT LIGHTING SYSTEMS USE ELECTRONIC BALLAST, OR THAT ALL NEW MOTORS BE PREMIUM EFFICIENCY]

1	Yes	LT10
2	No	LT10
88	Refused	LT10
99	Don't know	LT10

LT10 Has your organization assigned responsibility for controlling energy usage and costs to any of the following?

1	An in-house staff person	LT11
2	A group of staff	LT11
3	An outside contractor	LT11
4	NONE OF THESE	LT11
88	Refused	LT11
99	Don't know	LT11

LT11 Does your organization have any internal incentive or reward policies for business units or staff responsible for managing energy costs?

1	Yes	LC7
2	No	CA2
88	Refused	CA2
99	Don't know	CA2

Ask if LT11(1)

LC7 How do these incentive/reward structures work?

77	OPEN/Record	CA2
88	Refused	CA2
99	Don't know	CA2

CA2 In marketing materials or in communications with customers, does your company highlight the ways in which your business is environmentally conscious?

1	Yes	RETURN TO REMAINDER OF SURVEY
2	No	RETURN TO REMAINDER OF SURVEY
77	OPEN\RECORD OTHER	RETURN TO REMAINDER OF SURVEY
88	Refused	RETURN TO REMAINDER OF SURVEY
99	Don't know	RETURN TO REMAINDER OF SURVEY

ONSITE RECRUITING

TO SCHEDULE INSTALLATION OF MONITORING EQUIPMENT

If LOGGER= 1; Else Skip to Comment1

DISPLAY In order to improve this program's performance, <%UTILITY> would also like to make an accurate measurement of the energy savings associated with the energy efficient equipment installed by collecting and analyzing information from selected customers. If you agree to participate, Itron, on behalf of <%UTILITY>, will come to your business to install monitoring devices on your equipment to record when the equipment is in use. The monitoring devices will be installed in an unobtrusive place and would be removed by us at the end of the research project. We expect the site visit to take about two hours. We'll come back and remove the monitoring devices within 3-6 months. Note, the electric use data will be used strictly for the study of the <%PROGRAM> and will not affect your electric service at all. You will need to sign a brief participation agreement. LOG_REC

LOG_REC Are you interested in participating in this project?

1	Yes	LOG_NAME
2	No	Comment1
88	Refused	Comment1

99	Don't know	Comment1

ASK IF LOG_REC(1)

LOG_NAME	May I have the name of the person that our technician should contact to make an appointment?	LOG_PHONE
LOG_PHONE	What would be the most convenient phone number for our technecian to contact ....<%LOG_NAME>?	LOG_ALT
LOG_ALT	In the even that ....<%LOG_NAME> ... is unavailable, would there be an alternate contact that we could schedule an appointment with?	LOG_PH_ALT
LOG_PH_ALT	What would be the most convenient phone number to reach this person?	LOG_NOTE
LOG_NOTE	Are there any notes that would facilitate our technician@'s ability to make an appointment? For example, are some days of the week better for making contacts, are early mornings better or are afternoons better?	

66	No Notes	OS_NAME1
77	Record Notes	OS_NAME1

IF ONSITE = 1

TO SCHEDULE ONSITE VERIFICATION

COMMENT1	As we've discussed, the <%PROGRAM> is an important component of the California Public Utilities Commission's ongoing efforts to save energy and reduce emissions affecting climate change. In order to improve this program's performance, the CPUC would like to make an accurate measurement of the energy savings associated with energy efficiency equipment installed by collecting and analyzing information from selected customers. Your input to this research is extremely important. By receiving a rebate through the <%PROGRAM>, your firm has agreed to allow verification of the installation of the equipment rebated through the program.	
OS_NAME1	Our verification technician will need to meet a facilities representative of your company. This should be either the manager of the facility or part of the facilities staff. May I please have the name of the person who our technician can call you to set up an appointment time?	

1	Same as for logger	HB_Lift
77	Record Name	OS_PHONE1
99	Don't know	T&T

IF OS_NAME1(77)

OS_PHONE1	May I also have the best phone number for the technician to reach this person?	
&OS_PHONE1	PHONE FOR PRIMARY CONTACT	OTHER
88	Refused	T&T
99	Don't know	T&T

OTHER	Is there another person that the engineer might speak with at your company, if this primary person is not available?	
&OTHER	Get name	OS_NAME2

88	Refused	T&T
99	Don't know	T&T

OS_NAME2 May I please have their name so our technician can call them at another time?

&OS_NAME2	Get name	OS_PHONE2
88	Refused	T&T
99	Don't know	T&T

OS_PHONE2 May I also have the best phone number for the technician to reach them?

&OS_PHONE2	Get phone number	HB_Lift
88	Refused	T&T
99	Don't know	T&T

Ask if HIGHBAY = 1 or (HB1 > 12 and HB1<>66 and HB1<>88 and HB1<>99) or HB2 = 1 or HB1a = 1; Else skip to OS_Business

HB_Lift Do you have some form or a lift or ladder available to reach the lighting at your facility that is located 13ft or more above ground?

1	Yes	OS_Business
2	No	OS_Business
88	Refused	T&T
99	Don't know	T&T

OS_Business Do you have a sign or business name other than <%BUSINESS> that our technicians should look for when they visit your site?

1	Yes	OS_Bus_Name
2	No	Vendor_Name
88	Refused	T&T
99	Don't know	T&T

Ask if OS_BUSINESS(1)

OS_Bus_Name What is the sign or business name they should be looking for?

1	Get name	Vendor_Name

VISIT_NOTES DO NOT READ.....If you have any special notes about the on@-site visit or the installation of loggers, add these notes here.

1	No additional notes	Vendor_Name
77	Record Notes	Vendor_Name

Ask if V1(1)

Vendor_Name	Earlier you stated that you had a vendor/contractor that helped you with the installation of the lighting equipment that was installed through the 2010-2012 <%UTILITY> Program. Could you provide me with their name and phone number?	
1	Cannot provide	END
77	Record Name, Phone Number, Email Address or any other information they can provide. More is better.	END
88	Refused	END
99	Don't know	END

END	Those are all the questions I have for you today. On behalf of the CPUC, I would like to thank you very much for your kind cooperation. Have a good day.	

Appendix B

Nonresidential Downstream ESPI Impact Evaluation Onsite Survey Instrument

CPUC 2013-14 Non-Residential Downstream On-Site Verification Survey Form

General Site Information (from phone survey & IOU tracking database)

Itron SiteID			
Sample Strata		What to Do	
Evaluation Phase		What to Log	

Corporate (Multi-Site) Name			
Business Name (Tracking Data)			
Actual Business Name			
Service Address			
City		Zip Code	
CORRECTIONS TO SITE INFORMATION			
Revised Corp. (Multi-Site) Name			
Revised Business Name			
Revised Service Address			
Revised City		Revised Zip	

Site Contact Information

PS Completion Date:		Length (min)		Respondent:		Date of Install:	

	Contacted	Contact Name	Phone Number	Alternate Phone	Email Address
OS Primary	☐				
OS Back-up	☐				
OS Other	☐				

Note: Use the "Contacted" check box to indicate the actual contact(s) for the site visit.

Scheduling Notes/Special Instructions for On-site Visit: _____

Survey Tracking Information

Survey Company:		Assigned Surveyor's Initials:	
Survey Travel Mileage:	miles	Total Travel Time	hrs
Survey Duration (24 hr clock)	Start:	Survey Duration (24 hr clock)	End:
Total Onsite Time	hrs	Total Time to Fill Out Survey Form	hrs

	Date:	Initials
Field survey completed:	__ __ / __ __ / __ __	__ __ __
Survey received from surveyor:	__ __ / __ __ / __ __	__ __ __
Initial QC check completed:	__ __ / __ __ / __ __	__ __ __
Survey sent back to surveyor (*if needed*):	__ __ / __ __ / __ __	__ __ __
Received from surveyor (*if needed*):	__ __ / __ __ / __ __	__ __ __
Itron QC completed:	__ __ / __ __ / __ __	__ __ __
Data entry (DE) completed:	__ __ / __ __ / __ __	__ __ __
Logger extraction DE complete:	__ __ / __ __ / __ __	__ __ __
Follow-up Logger Extraction DE complete:	__ __ / __ __ / __ __	__ __ __

IOU Tracking Data Measure Summary Sheet

This is a summary of all of the measures implemented at this site as extracted from the IOU tracking database. All of the measures listed here should also be found on the measure-level verification forms.

Measure Category	Meas ID	Measure Code	IOU MeasureName	Unit Basis	Rebated # of Units	Reference Meas Code

Lighting Other Description

Measure Code	Revised MeasureName Description	Rebated # of Units

Phone Survey Self-Reported Measure Counts for Calculated kWh Measures

CATI Measure Category-RebatedUnits-UnitBasis	Self Report # of Units

Phone Survey High Bay Information

High Bay?	Max Fixture Height (ft)	Access to fixtures via lift or ladder?

Custom Measure Summary

Meas ID	Measure Name	Measure State	Activity Area	Unit Basis	Qty	Lamps per Fixture	Length	Type	Watts

Site & Business Characteristics

PRIMARY BUSINESS TYPE DESCRIPTION: *(do not leave blank)*	

Phone Survey	**Phone Survey Building Type:**	*FM050*
	Detailed Building Type:	*FM050a-j*

Recent Survey Area Changes: Give a brief description about any changes made to this site since January 2011 that significantly impacted energy usage.		
Percent of Site Lighting Retrofitted: What percent of the site lighting was retrofitted? Describe whether it was almost all of the lighting or just certain areas.		%

Fields in this table will be populated as much as possible with data from the phone survey. However, any fields that are blank should be completed during the on-site verification. Any fields that are incorrect should also be corrected.

Electric Utility	PGE SCE SDGE SMUD LADWP OT _____		
Gas Utility	PGE SCG SDGE AllElec/None Propane LBGO SWG OT _____		
Is this premise owner-occupied (**O**) or leased (**L**)?	*CC4*	Revised	O L
How many full-time equivalent employees work at this premise?	*FM070*	Revised	
What is the total occupied floor area of this premise? (exclude prkg garage)	*CC2a / CC2b* ft^2	Revised	_____ft^2
-- If the premise has an enclosed parking garage, what is the floor area?	_____ft^2		
What percent of the total floor area is heated or cooled?	*CC2c / CC2d* %	Revised	_____%
How many buildings are part of this premise?			
What year was the majority of the facility built?	*CC8*	Revised	
Cooling Type: 1=No A/C 2=Split-System 3=PkgRooftop 4=PTAC/PTHP 5=EvapCool 6=Chiller 7=IndivAC/HP 8=WLHP OT=Other		Revised	
Heating Fuel Type: 1=Electric 2=Gas 3=Both 4=Propane 5=None OT=Other		Revised	
What kind of site is this? **P** = Part of a bldg **B** = Single building **SM** = Small multi-building **CM** = Campus (multi-bldg, subsampled bldgs) **OT** = Other _____			
For single, stand-alone buildings or partial buildings: Number of stories/floors			

Premise-Level Schedule Definitions

Standard Holidays *(check all that apply)* ☐ N/A

Indicate below which, if any, standard holidays that the business is closed or operation deviates drastically from normal/typical operations, and indicate on Form BUS_HRS what the holiday operation hours are. Indicate any additional holidays in the comment block.

New Year's Eve	☐	July 4th Celebrated	☐
New Year's Day	☐	Labor Day	☐
New Year's Day Celebrated	☐	Columbus Day	☐
Martin Luther King Day	☐	Veterans' Day	☐
Presidents' Day	☐	Thanksgiving	☐
St. Patrick's Day	☐	Thanksgiving Friday	☐
Easter Sunday	☐	Christmas Eve	☐
Memorial Day	☐	Christmas Day	☐
Flag Day	☐	Christmas Day Celebrated	☐
July 4th	☐	Caesar Chavez Day	☐
Other (1) _____	☐	Other (2)_____	☐

Seasonal Operation Periods ☐ N/A

Define seasonal operation periods for significant periods of time where business hours and/or equipment operation differs significantly from normal or typical business hours and/or equipment operation. To indicate seasonal operation periods, provide a brief description of the period (e.g. "spring break", "winter break", "summer break", "extended holiday hours"), and list the beginning/ending months (1-12) and days for up to three time periods.

Typical Schedule			**Seasonal Time Period**					
1			**2**			**3**		
Description _____			Description _____			Description _____		
Begin Month/Day			Begin Month/Day			Begin Month/Day		
End Month/Day			End Month/Day			End Month/Day		
Begin Month/Day			Begin Month/Day			Begin Month/Day		
End Month/Day			End Month/Day			End Month/Day		
Begin Month/Day			Begin Month/Day			Begin Month/Day		
End Month/Day			End Month/Day			End Month/Day		

Holiday and Seasonal Operation Comments:

_____
_____
_____
_____
_____
_____

Business Schedule

Primary Business Hours

Define typical operation for <u>all</u> Day Types listed below and specify hours in military time (00 to 24). For partial (i.e. not full) operation days, also indicate the approximate % of full operation as Partial Op %.

Day Type	From Phone Survey	Corrected Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to _____	from _____ to_____			
Tuesday	from _____ to _____	from _____ to_____			
Wednesday	from _____ to _____	from _____ to_____			
Thursday	from _____ to _____	from _____ to_____			
Friday	from _____ to _____	from _____ to_____			
Saturday	from _____ to _____	from _____ to_____			
Sunday	from _____ to _____	from _____ to_____			
Holidays	from _____ to _____	from _____ to_____			

Seasonal Operation Business Hours – Time Period 2

☐ N/A

Day Type	From Phone Survey	Corrected Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to _____	from _____ to_____			
Tuesday	from _____ to _____	from _____ to_____			
Wednesday	from _____ to _____	from _____ to_____			
Thursday	from _____ to _____	from _____ to_____			
Friday	from _____ to _____	from _____ to_____			
Saturday	from _____ to _____	from _____ to_____			
Sunday	from _____ to _____	from _____ to_____			
Holidays	from _____ to _____	from _____ to_____			

Seasonal Operation Business Hours – Time Period 3

☐ N/A

Day Type	Business Hours	Closed All Day?	Open 24 hrs?	PartialOp%
Monday	from _____ to_____	Y N	Y N	
Tuesday	from _____ to_____	Y N	Y N	
Wednesday	from _____ to_____	Y N	Y N	
Thursday	from _____ to_____	Y N	Y N	
Friday	from _____ to_____	Y N	Y N	
Saturday	from _____ to_____	Y N	Y N	
Sunday	from _____ to_____	Y N	Y N	
Holidays	from _____ to_____	Y N	Y N	

Activity Area Definitions

Activity Area ID# Assignments *Identify an Area ID# for each distinct Activity Area type within the surveyed area. Indicate each area on the Site Plan sketch, Form PREM_SKETCH. Also consider lighting system controls and operation when defining these areas.*

Area ID#	Activity Area Code (AA Code)	Surveyor's Description of Area (include floor and Bldg identifiers if needed)	% of Total Premise Floor Area	Windows or Skylights	Conditioned Space Type Code	Total Qty of this Area Type On-site
1				W S		
2				W S		
3				W S		
4				W S		
5				W S		
6				W S		
7				W S		
8				W S		
9				W S		
10				W S		
11				W S		
12				W S		
13				W S		
14				W S		
15				W S		
16				W S		
17				W S		
18				W S		
19				W S		
20				W S		
21				W S		
22				W S		
23				W S		
24				W S		
25				W S		

Conditioned Space Type Codes				
CH = Cooled & Heated	CL = Only Cooled	HT = Only Heated	ECH = EvapCooled & Heated	ECL = Only EvapCool
NU = HVAC present but not used	RF = Refrigerated	UN = Unconditioned	OU = Outside	OT = Other (describe in comments)

COMMENTS:

Premise/Site-Plan Sketch

This sketch should provide a high-level view of the premise and its surroundings as it is actually configured. Attach site plans and floor plans available from other sources. Sketch all buildings and the closest streets/roadways in both directions. Mark the orientation of True North. Use multiple sheets/drawings if necessary. Also indicate the "front" or primary entrance for each building. A site map or site plans can be used in place of this, as long as streets can be shown.

Premise/Site-Plan sketch comments:

Premise/Site-Plan Sketch

Premise/Site-Plan sketch comments:

_____

_____

_____

_____

Hourly Operation Schedules

Use this form if equipment operation is independent of Business Hours as indicated on Form BUS_HRS. Use one block for each end use. Indicate the applicable daytypes for each day type schedule, and account for all day types including holidays. Specify the % of max. occupancy or equipment-on for all time periods, and be sure to accurately capture transition periods. Pay attention to lighting control type as a separate schedule is needed for different control types.

Hour	12-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		% Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		% Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		% Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Hourly Operation Schedules

Use this form if equipment operation is independent of Business Hours as indicated on Form BUS_HRS. Use one block for each end use. Indicate the applicable daytypes for each day type schedule, and account for all day types including holidays. Specify the % of max. occupancy or equipment-on for all time periods, and be sure to accurately capture transition periods. Pay attention to lighting control type as a separate schedule is needed for different control types.

Hour	**12-1**	**1-2**	**2-3**	**3-4**	**4-5**	**5-6**	**6-7**	**7-8**	**8-9**	**9-10**	**10-11**	**11-12**

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		**%** Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		**%** Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Schedule #___ End Use:______ LtgCtrlType:_____ Description_________________

Applicable DayTypes		**%** Equipment On											
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												
M T W T F S S H	AM												
	PM												

Lighting Logger Installation Form

Use this table to record information for installed measurement devices such as lighting loggers.

Installation Date		**Extraction Date**	
Installer's Initials		**Extraction Initials**	
Scheduled Extraction Date			

Installation

Logger Serial Number					
Primary or Backup Logger?	P B	P B	P B	P B	P B
Placement Area ID# (ref only)					
Lighting Tech Type (HIM)	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**
Logger Placement on Fixture	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)
Placement Description Include building, floor, room #, etc. and be descriptive enough that it can be located for extraction.					
Schedule #					

Extraction

Logger Intact? See Legend Belo	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***
Logger Tested "OK" (On/Off)	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA
% "ON" Time	%	%	%	%	%
Extraction Comments					
Logger Date&Time (HH:MM)					
Computer Date&Time (HH:MM)					
Alternate Extraction Date					

Logger Intact: "Y" – If logger is as originally installed, does <u>not</u> appear to be tampered with, and display indicates the logger is working
Logger Tested "OK" – <u>If Logger Intact was "Y"</u> then <u>is it</u> properly logging the light ON/OFF, "Y" or "N"? <u>If Logger Intact was "N"</u> use "NA"

Lighting Logger Installation Form (continued)

Use this table to record information for installed measurement devices such as lighting loggers.

Installation

Logger Serial Number					
Primary or Backup Logger?	P B	P B	P B	P B	P B
Placement Area ID# (ref only)					
Lighting Tech Type (HIM)	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**
Logger Placement on Fixture	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)
Placement Description Include building, floor, room #, etc. and be descriptive enough that it can be located for extraction.					
Schedule #					

Extraction

Logger Intact? (L=Lost/missing)	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***
Logger Tested "OK" (On/Off)	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA
% "ON" Time	%	%	%	%	%
Extraction Comments					
Logger Date&Time (HH:MM)					
Computer Date&Time (HH:MM)					
Alternate Extraction Date					

Logger Intact: "Y" – If logger is as originally installed, does <u>not</u> appear to be tampered with, and display indicates the logger is working
Logger Tested "OK" – <u>If Logger Intact is "Y"</u> then is it properly logging the light ON/OFF, "Y" or "N"? <u>If Logger Intact is "N"</u> use "NA"

Lighting Logger Installation Form (continued)

Use this table to record information for installed measurement devices such as lighting loggers.

Installation

Logger Serial Number					
Primary or Backup Logger?	P B	P B	P B	P B	P B
Placement Area ID# (ref only)					
Lighting Tech Type (HIM)	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**	**CF LF HID LED HB**
Logger Placement on Fixture	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)	**I**(nt) **E**(xt) **O**(ther)
Placement Description Include building, floor, room #, etc. and be descriptive enough that it can be located for extraction.					
Schedule #					

Extraction

Logger Intact? (L=Lost/missing)	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***	**Y N L *P***
Logger Tested "OK" (On/Off)	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA	**Y N** NA
% "ON" Time	%	%	%	%	%
Extraction Comments					
Logger Date&Time (HH:MM)					
Computer Date&Time (HH:MM)					
Alternate Extraction Date					

Logger Intact: "Y" – If logger is as originally installed, does <u>not</u> appear to be tampered with, and display indicates the logger is working
Logger Tested "OK" – <u>If Logger Intact is "Y"</u> then is it properly logging the light ON/OFF, "Y" or "N"? <u>If Logger Intact is "N"</u> use "NA"

Indoor/Outdoor CFL Compact Fluorescent Lighting Measures

IOU Tracking Data	Measure Category	CFL_MeasCategory			
	Measure Code	CFL_OS_MeasCode			
	Measure Name	CFL_OS_MeasName			
	Rebated #of Units	CFL_IOUUnitQtyRebated			
	IOU Unit Basis	CFL_IOUUnitBasis			
	Correct Unit Basis (if incorrect above above)				
	Can Rebated measures be clearly identified?	Y N			
Visual Verification Data	Inside or outside lighting?	**I O**			
	Total number of fixtures				
	Number of lamps per fixture				
	Total number of lamps				
	Ltg Application Type Code				
	Fixture Mount Type Code				
	Ltg Control Code				
	Multilevel: Fixture or Lamp switched?	Y N			
Verification Counts	**(A) Installed & Operational # of units (ex post quantity)**		#		
	-- Was subsampling or estimation used?	**Y N**			
	-- # of lamps burned out in partial operation fixtures				
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place		#		
	(C) # of Units in Storage/Spares		#		
	-- Utility rebate sticker observed on packages?	**Y N**			
Physical Inspection Data	*Check box if Lamps/Fixtures are NOT accessible (explain in comments)*	☐			
	Number of units physically inspected				
	*If more than one type	**Primary**	***Secondary**		
	Lamp Wattage				
	Make/Manufacturer				
	Model/Lamp Code				
	Energy Star Observed				
	CFL Lamp Shape Code				
	Ballast configuration: M=Modular I=Integral	**M I**	**M I**		
	Lamp Base Type:	**Screw Pin Other**	**Screw Pin Other**		
	# of lamps				
Baseline System Summary Data (Observed or Self-Reported)	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**		
	-- If pre-retrofit operation was different, specify Sched #				
	Approximate age of existing lighting system prior to retrofit (years)		**B SC E**		
	Lamp Type Code		**B SC E**		
	Lamp Wattage		**B SC E**		
	Control Type Code		**B SC E**		
	Number of lamps per fixture		**B SC E**		
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)		**E M L OT**			
If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)				
	Others purchased since rebated units installed				
	(D) # of units located at Other Affiliated Sites	#			

Baseline Sources:

- **B** – Baseline equipment (includes physical inspection, documentation, or building/energy management system)
- **SC** – Site Contact
- **E** – Engineering estimate

Failed (and Replaced) <u>Rebated</u> Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?	
	(E) # of rebated units that Failed, but replaced w/ incandescent	#
	# of rebated units that Failed but were replaced in-kind (Ref)	
Removed <u>Rebated</u> Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced	#
	-- When were the units removed? (month/year if possible)	
	-- Describe why units were removed in comments	
(Sum A-F) Total # of units accounted for on-site		**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?	
	# that were purchased at Retailer?	
	# that were received from utility give-away program?	
	# that were obtained from OTHER means (describe in comments)?	
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)	
	# of rebated units, unaccounted for	

CFL – Activity Area Assignment Table

Measure Code:_____

Use this table to associate CFL # of units to Activity Areas, equipment operation schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the total # of installed and operational units in the table above.

Area ID #	Sched #	Item #	Primary or Secondary Type	Control type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
						%	<= Totals # of Installed & Operational Units check *(no data entry)*			

Comments:_____

Indoor/Outdoor Linear Fluorescent Lighting Measures

IOU Tracking Data	Measure Category	LINFLUOR_MeasCategory	
	Measure Code	*LINFLUOR_OS_MeasCode*	
	Measure Name	LINFLUOR_OS_MeasName	
	Rebated #of Units	LINFLUOR_IOUUnitQtyRebated	
	IOU Unit Basis	*LINFLUOR_IOUUnitBasis*	
	Correct Unit Basis (if incorrect above above)		
	Can Rebated measures be clearly identified?	Y N	
	Associated DELAMP Measure Code *(if applicable)*		
	All associated CASCADE Measure Code(s) *(if applicable)*		
Visual Verification Data	Inside or outside lighting?	**I O**	
	Ceiling height in ft		
	Fixture height from floor in ft		
	Total number of fixtures		
	PREDOMINANT # of lamps per fixture		
	Total number of lamps		
	Tube Length in ft. (e.g. 1.5 2 3 4 8)		
	Tube Diameter (T5 T8 T12)	**T8 T5 T12**	
	Multilevel: Fixture or Lamp switched?	**Y N**	
	Ltg Application Code		
	Fixture Mount type code		
	Shiny/polished reflector?	**Y N**	
Verification Counts	**(A) Installed & Operational # of units (ex post quantity)**		
	-- Was sub sampling or estimation used?	**Y N**	
	-- # of lamps burned out in partial operation fixtures		
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place		
	(C) # of Rebated Units in Storage/Spares		
Physical Inspection Data	*Check box if Lamps/Fixtures are NOT accessible (explain in comments)*	☐	
	Number of units physically inspected		
	Lamp Wattage		
	Lamp Make/Manufacturer		
	Lamp Model/Lamp Code		
	Ballst type: **M**=Magnetic **E**=Electronic **A**=Advanced	**M E A**	
	Ballast Type Code		
	Predominant Fixture Type: # of ballasts per fixture		
	Ballast Model #		
	Ballast Manufacturer/Brand		
	Secondary Fixture Type: # of ballasts per fixture		
	Ballast Model #		
	Ballast Manufacturer/Brand		
Baseline System Summary Data (Observed or Self-Reported)	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**
	-- If pre-retrofit operation was different, specify Sched #		
	Baseline Sources: ▪ B – Baseline equipment ▪ SC – Site Contact ▪ E – Engineering estimate B = (physical inspection, documentation, or BMS/EMS) — Lamp Type Code		**B SC E**
	Lamp Wattage		**B SC E**
	Control type Code		**B SC E**
	Tube Length (ft)		**B SC E**
	Tube Diameter (e.g. T8, T12)		**B SC E**
	Number of lamps per fixture		**B SC E**
	Ballast type: **M**=Magnetic **E**=Electronic **A**=Advanced	**M E A**	**B SC E**
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)		**E M L OT**	

If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)	
	Others purchased since rebated units installed	
	(D) # of units located at Other Affiliated Sites	
Failed (and Replaced) Rebated Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?	
	(E) # of rebated units that Failed, but were replaced w/different tech	
	# of rebated units that Failed but were replaced in-kind (Ref)	
Removed Rebated Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced	
	-- When were the units removed? (month/year if possible)	
	-- Describe why units were removed in comments	
(Sum A-F) Total # of units accounted for on-site		**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?	
	# that were obtained from OTHER means (explain in comments)?	
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)	
	# of rebated units, unaccounted for	

Linear - Activity Area Assignment Table (AAAT) Measure Code: _____

*Use the AAAT below to associate lighting units to Activity Areas, equipment oper. schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the **total # of Installed and Operational** units in the table above.*

- *If ONLY FIXTURE **DENT LL**: Only fill out **AAAT** below.*
- *If **DENT LL & (DENT CT or HOBO)**: Fill out **AAAT** with logger info **&** the **HIGHBAY** Form for Panel Metering*
- *If ONLY **PANEL METERING**: Check **N/A** box and only fill out **HIGHBAY** Form.*

***Circle all that apply:** (If Verify Only, circle 'NA', and fill out AAAT)*

Metering Type:	DENT LL	DENT CT	HOBO	NA

☐ **N/A**

Area ID #	Sched #	Item #	Control Type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%	<= Total # of Installed & Operational Units check *(no data entry)*			

Comments (for delamping, explain how counts were confirmed: tombstone shadows observed, etc.)**:** _____

Baseline Technology Characterization

Approximate age of existing lighting system prior to retrofit (years)	
Prior to retrofit, if original lamps were replaced, were they replaced with **Energy Saver** lamps?	**Y N**
Since original fixtures were installed, approximately how many **ballasts** had been replaced?	
Were the replacement ballasts **M**agnetic, **E**lectronic or **A**dvanced?	**M E A**
Condition of original fixtures prior to retrofit (**G**ood, **F**air, **P**oor)	**G F P**
What % of original fixtures were completely burned out?	
What % of original fixtures were partially burned out?	
On a scale of 1-10, Please rate the following topic on its level of influence for retrofitting the lighting fixtures:	
Burned out fixtures	

Comments: _____

_____

_____

_____

Indoor/Outdoor Delamping Lighting Measures

IOU Tracking Data	Measure Category	DELAMP_MeasCategory	
	Measure Code	*DELAMP_OS_MeasCode*	
	Measure Name	DELAMP_OS_MeasName	
	Rebated #of Units	DELAMP_IOUUnitQtyRebated	
	IOU Unit Basis	*DELAMP_IOUUnitBasis*	
	Correct Unit Basis (if incorrect above above)		
	Can Rebated measures be clearly identified?	Y N	
	Associated LINFLUOR Measure Code *(if applicable)*		
Visual Verification Data	Inside or outside lighting?	**I O**	
	Ceiling height in ft		
	Fixture height from floor in ft		
	Total number of fixtures (onsite right now)		
	Number of lamps per fixture (in the fixture right now)		
	Number of **lamps/fixture REMOVED** from original fixtures		
	Total number of lamps onsite (installed right now)		
	Tube Length in ft. (e.g. 1.5 2 3 4 8)		
	Tube Diameter (T5 T8 T12)	**T8 T5 T12**	
	***Multilevel:* Fixture or Lamp switched?**	**Y N**	
	Ltg Application Code		
	Fixture Mount type code		
	Shiny/polished reflector?	**Y N**	
Verification Counts	**(A) Delamped # of units (ex post quantity = Installed & Operable)**		
	-- Was subsampling or estimation used?	**Y N**	
	-- # of lamps burned out in partial operation fixtures		
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place		
	(C) # of Rebated Units in Storage/Spares		
Physical Inspection Data	*Check box if Lamps/Fixtures are NOT accessible (explain in comments)*	☐	
	Number of fixtures physically inspected (for evidence of delamping)		
	Installed Lamp Wattage		
	Installed Lamp Make/Manufacturer		
	Installed Lamp Model/Lamp Code		
	Ballst type: **M**=Magnetic **E**=Electronic **A**=Advanced	**M E A**	
	Ballast Type Code		
	Predominant Fixture Type: # of ballasts per fixture		
	Ballast Model #		
	Ballast Manufacturer/Brand		
	Secondary Fixture Type: # of ballasts per fixture		
	Ballast Model #		
	Ballast Manufacturer/Brand		

Baseline System Summary Data (Observed or Self-Reported)	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**
	-- If pre-retrofit operation was different, specify Sched #		
	Approximate age of existing lighting system prior to retrofit (years)		**B SC E**
	Lamp Type Code		**B SC E**
	Lamp Wattage		**B SC E**
	Tube Length (ft)		**B SC E**

Baseline Sources:

- **B** – Baseline equipment (includes physical inspection, documentation, or building/energy management system)
- **SC** – Site Contact **E** – Engineering estimate

Baseline System Summary Data (Observed or	Tube Diameter (e.g. T8, T12)		**B SC E**
	Number of lamps per fixture		**B SC E**
	Ballast type: **M**=Magnetic **E**=Electronic **A**=Advanced		**M E A**
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)			**E M L OT**
If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)		
	Others purchased since rebated units installed		
	(D) # of units located at Other Affiliated Sites		
Failed (and Replaced) Rebated Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?		
	(E) # of rebated units that Failed, but were replaced w/different tech		
	# of rebated units that Failed but were replaced in-kind (Ref)		
Removed Rebated Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced		
	-- When were the units removed? (month/year if possible)		
(Sum A-F) Total # of units accounted for on-site			**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?		
	# that were obtained from other means (explain in comments)?		
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)		
	# of rebated units, unaccounted for		

Delamping – Activity Area Assignment Table **Measure Code:**_____

For fixtures that are covered by both a* LF *and a* Delamping *measure, the logger information should be recorded on the LF form and copied below, making sure to check all Ref. Logger boxes. *Use this table to associate lighting units to Activity Areas, equipment operation schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the total # of installed and operational units in the table above.*

Area ID #	Sched #	Item #	Control Type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Comments
					%	
					%	
					%	
					%	
					%	
					%	
					%	
					%	
					%	
					%	
					%	<= Total # of Installed & Operational Units check *(no data entry)*

Comments (for delamping, explain how counts were confirmed: tombstone shadows observed, etc. and any discrepancies in observed versus rebated quantities)**:** _____

Occupancy Sensor Lighting Measures (1 of 2): Verification Totals

NOTE: If any lighting measures are associated with the Occupancy Sensors, **FIRST** fill out the lighting measure forms, then fill out this form, making sure to link the Occ. Sensor **Item #'s** to the other measure forms.

IOU Tracking Data	Measure Category	LIGHTINGCONTROL_MeasCategory	
	Measure Code	LIGHTINGCONTROL _OS_MeasCode	
	Measure Name	LIGHTINGCONTROL _OS_MeasName	
	Rebated #of Units	LIGHTINGCONTROL _IOUUnitQtyRebated	
	IOU Unit Basis	LIGHTINGCONTROL _IOUUnitBasis	
	Correct Unit Basis (if incorrect above above)		
	Can Rebated measures be clearly identified?	Y N	
Verification Counts and Physical Inspection Data	Inside or Outside Occupancy Sensors		**I O**
	Installed & Operational # of Occupancy Sensor Units (A)		
	Was subsampling or estimation used?		**Y N**
	Number of Non-Operable (broken/non-powered) Units in place (B)		
	Occupancy Sensor Make/Manufacturer		
	Occupancy Sensor Model		
	Number of Units in Storage/Spares (C)		
	Check box if Lamps/Fixtures are NOT accessible (explain in comments)		☐
	Number of units physically inspected		
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)			**E M L OT**
If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)		
	Others purchased since rebated units installed		
	(D) # of units located at Other Affiliated Sites		
Failed (and Replaced) Rebated Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?		
	(E) # of rebated units that Failed, but were replaced w/different tech		
	# of rebated units that Failed but were replaced in-kind (Ref)		
Removed Rebated Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced		
	-- When were the units removed? (month/year if possible		
	-- Describe why units were removed in comments		
(Sum A-F) Total # of units accounted for on-site			**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects		
	# that were obtained from OTHER means (explain in comments)		
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)		
	# of rebated units, unaccounted for		

Comments:_____

Occ. Sensor Ltg Measures (2 of 2): Controlled Watts Detail **Measure:**_____

Control Information								
OccupancySensor Item #								
Associated **Panel Meter Item #**: *(if applicable)*								
Installed & Operational *(OP)* or Non-Operable *(N-OP)*	OP	N-OP		OP	N-OP		OP	N-OP
Inside or Outside Occupancy Sensor(s)	I	O		I	O		I	O
Area ID # / Sched #								
Control Type Code								
If Non-Operable, **Control Type Code** now controlling fixtures								
Associated Lighting Measure Code(s) If '**N**' & applicable								
Lamp Type code								
Total # of Controls represented here: ***(A)***								
# of Fixtures on EACH control ***(B)***								
# of Lamps Per Fixture Controlled by Occ. Sensor ***(C)***								
# of Lamps per fixture								
Total number of lamps burnt out ***(D)***								
Number of Fixtures physically inspected								
Lamp Make/Manufacturer								
Lamp Model								
Lamp Wattage ***(E)***								
Total Controlled Lamp Wattage: ***(A*B*C*E)-(D*E)*** ***(F)***								
Tube diameter (T8 or T5)								
Ballst type:	**M**	**E**	**A**	**M**	**E**	**A**	**M**	**E**	**A**
Ballast Type Code								
# of Ballasts per fixture								
Ballast Manufacturer/Brand								
Ballast Model #								
Baseline System Summary Data (observed or self-eported)								
Pre-retrofit Control Type Code		**B SC E**			**B SC E**			**B SC E**
(required) Pre-retrofit operation Sched #		**B SC E**			**B SC E**			**B SC E**
Approximate age of existing lighting system prior to retrofit		**B SC E**			**B SC E**			**B SC E**
Logger Information								
Logger Type: ***(DCT** = DENT CT, **H**=HOBO, **DLL**=DENT LL)*	DCT	H	DLL	DCT	H	DLL	DCT	H	DLL
Primary Logger S/N:								
Reference Logger: *(Check if logger info already exists on this form or another)*	☐			☐			☐		
Backup Logger S/N:								
Logger Channel # HOBO								
CT Amp size HOBO								

KEY:

Baseline Sources:

- **B** – Baseline equipment
- **SC** – Site Contact
- **E** – Engineering estimate

* Baseline equipment includes physical inspection, documentation, or building/energy management system

Comments:
(Make sure to provide detailed comments about the information above and/or logger, if it is associated with other measures, Acitvity Area Assignement Tables, or Panel Metering)

Indoor/Outdoor (HID) High Intensity Discharge Lighting Measures

IOU Tracking Data	Measure Category	HID_MeasCategory		
	Measure Code	HID_OS_MeasCode		
	Measure Name	HID_OS_MeasName		
	Rebated #of Units	HID_IOUUnitQtyRebated		
	IOU Unit Basis	HID_IOUUnitBasis		
	Correct Unit Basis (if incorrect above above)			
	Can Rebated measures be clearly identified?	Y N		
Visual Verification Data	Inside or outside lighting?	**I O**		
	Lamp Type Code			
	Ceiling height in ft			
	Fixture height from floor in ft			
	Total number of fixtures			
	Number of lamps per fixture			
	Multilevel: Fixture or Lamp switched?	**Y N**		
	Total number of lamps			
	Ltg Control Type Code			
	Ltg Application Code			
	Fixture Mount type code			
Verification Counts	**(A) Installed & Operational (or delamped) # of units (ex post quantity)**			
	-- Was subsampling or estimation used?	**Y N**		
	-- # of lamps burned out in partial operation fixtures			
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place			
	(C) # of Rebated Units in Storage/Spares			
Physical Inspection Data	*Check box if Lamps/Fixtures are NOT accessible (explain in comments)*	☐		
	Number of units physically inspected			
	Lamp Wattage			
	Lamp Make/Manufacturer			
	Lamp Model/Lamp Code			
	Ballst type: **M**=Magnetic **E**=Electronic **A**=Advanced	**M E A**		
	Ballast Type Code			
	Predominant Fixture Type: # of ballasts per fixture			
	Ballast Model #			
	Ballast Manufacturer/Brand			
	Secondary Fixture Type: # of ballasts per fixture			
	Ballast Model #			
	Ballast Manufacturer/Brand			
Baseline System Summary Data (Observed or Self-Reported)	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**	
	-- If pre-retrofit operation was different, specify Sched #			
	Approximate age of exisiting lighting system prior to retrofit (years)		**B SC E**	
	Lamp Type Code		**B SC E**	
	Lamp Wattage		**B SC E**	
	Tube Length (ft)		**B SC E**	
	Tube Diameter (e.g. T8, T12)		**B SC E**	
	Number of lamps per fixture		**B SC E**	
	Ballast type: **M**=Magnetic **E**=Electronic **A**=Advanced	**M E A**	**B SC E**	
	Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)	**E M L OT**		

Baseline Sources:

- **B** – Baseline equipment (includes physical inspection, documentation, or building/energy management system)
- **SC** – Site Contact **E** – Engineering estimate

If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)	
	Others purchased since rebated units installed	
	(D) # of units located at Other Affiliated Sites	
Failed (and Replaced) Rebated Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?	
	(E) # of rebated units that Failed, but were replaced w/different tech	
	# of rebated units that Failed but were replaced in-kind (Ref)	
Removed Rebated Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced	
	-- When were the units removed? (month/year if possible)	
	-- Describe why units were removed in comments	
(Sum A-F) Total # of units accounted for on-site		**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?	
	# that were obtained from OTHER means (explain in comments)?	
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)	
	# of rebated units, unaccounted for	

HID Lighting – Activity Area Assignment Table (AAAT) Measure Code: _____

Use the AAAT below to associate lighting units to Activity Areas, equipment oper. schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the total # of installed and operational units in the table above.

- *If only **DENT LL**: Only fill out **AAAT** below.*
- *If **DENT LL & (DENT CT or HOBO)**: Fill out **AAAT** with **DENT LL** info, & **HIGHBAY** Form for Panel Metering*
- *If only **DENT CT** or **HOBO**: Check **N/A** box and only fill out **HIGHBAY** Form.*

***Circle all that apply:** (If Verify Only, circle 'NA', and fill out AAAT)*

Metering Type:	DENT LL	DENT CT	HOBO	NA

☐ **N/A**

Area ID #	Sched #	Item #	Control Type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%	<= Total # of Installed & Operational Units check *(no data entry)*			

Comments:_____

Indoor/Outdoor LED Lamp Lighting Measures

IOU Tracking Data	Measure Category	LED_MeasCategory	
	Engineering Estimation Method	LED_EngEstMethod	
	Measure Code	LED_OS_MeasCode	
	Measure Name	LED_OS_MeasName	
	Rebated #of Units	LED_IOUUnitQtyRebated	
	IOU Unit Basis	LED_IOUUnitBasis	
	Correct Unit Basis (only if incorrect above)		
	Can Rebated measures be clearly identified?	Y N	
Visual Verification Data	Inside or outside lighting?	**I O**	
	Total number of fixtures		
	Number of lamps per fixture		
	Total number of lamps		
	Ltg Application Type Code		
	Fixture Mount Type Code		
	Ltg Control Code		
	Multilevel: Fixture or Lamp switched?	**Y N**	
Verification Counts	**(A) Installed & Operational # of units (ex post quantity)**		
	-- Was subsampling or estimation used?	**Y N**	
	-- # of lamps burned out in partial operation fixtures		
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place		
	(C) # of Units in Storage/Spares		
	-- Utility rebate sticker observed on packages?	**Y N**	

Physical Inspection Data	*Lamps/fixtures are NOT accessible (Check box & explain in comments)*	☐	
	Number of units physically inspected		
	*If more than one type	**Primary**	***Secondary**
	Lamp Wattage		
	Make/Manufacturer		
	Model/Lamp Code		
	Lamp Shape/Features Code		
	Lamp Base Type Code:	**P M C I MO ADP GU24 OT**	**P M C I MO ADP GU24 OT**
	Installed and OP # of lamps		

Baseline System Summary Data (Observed or Self-Reported)	Is post-installation operation the same as pre-retrofit operation?	**Y N**	**B SC E**
	-- If pre-retrofit operation was different, specify Sched #		
	Lamp Type Code		**B SC E**
	Watts per lamp		**B SC E**
	Number of lamps per fixture		**B SC E**
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)		**E M L OT**	
If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)		
	Others purchased since rebated units installed		
	(D) # of units located at Other Affiliated Sites		

Baseline Sources:

- **B** – Baseline equipment (includes physical inspection, documentation, or building/energy management system)
- **SC** – Site Contact
- **E** – Engineering estimate

Failed (and Replaced) <u>Rebated</u> Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?	
	(E) # of rebated units that Failed, but replaced w/ incandescent	
	# of rebated units that Failed but were replaced in-kind (Ref)	
Removed <u>Rebated</u> Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced	
	-- When were the units removed? (month/year if possible)	
	-- Describe why units were removed **in comments**	
(Sum A-F) Total # of units accounted for on-site		**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?	
	# that were obtained from OTHER means (explain in comments)?	
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)	
	# of rebated units, unaccounted for	

LED – Activity Area Assignment Table **Measure Code:**_____

Use this table to associate LED # of units to Activity Areas, equipment operation schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the total # of installed and operational units in the table above.

Area ID #	Sched #	Item #	Primary or Secondary Type	Control type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
			P S			%		☐		
						%	<= Totals # of Installed & Operational Units check *(no data entry)*			

Comments:_____

Baseline Characterization

Please describe why these lights were changed to LEDs instead of any other lighting technology	

Approximate age of existing lighting system prior to retrofit (years)	
Condition of original fixtures prior to retrofit (**G**ood, **F**air, **P**oor)	**G F P**
What % of original fixtures were completely burned out?	
What % of original fixtures were partially burned out?	
On a scale of 1-10, Please rate the following topics on their level of influence for retrofitting the lighting fixtures:	
Burned out fixtures	
Adequate lighting levels	
Major Renovation / Re-Modeling	
Safety of Occupants	
Productivity of Occupants	
Lowering energy consumption and energy bills	
Long lamp life	
Low maintenance	
Going green	
Utility Incentive	
Other (*describe in comments*)	
Considering all of the influential factors above, in the absence of an energy efficiency rebate program: How long would you have continued to operate the original fixtures before replacing them? (years)	

Comments: _____

Indoor/Outdoor LED Hardwired Fixture Lighting Measures

IOU Tracking Data	Measure Category	LEDFixture _MeasCategory		
	Measure Code	LEDFixture _*OS_MeasCode*		
	Measure Name	LEDFixture_OS_MeasName		
	Rebated #of Units	LEDFixture _IOUUnitQtyRebated		
	IOU Unit Basis	*LEDFixture_IOUUnitBasis*		
	Correct Unit Basis (if incorrect above above)			
	Can Rebated measures be clearly identified?	Y N		
Visual Verification Data	Inside or outside lighting?	**I O**		
	Ceiling height in ft			
	Fixture height from floor in ft			
	Ltg Application Code			
	Fixture Mount type code			
	Total number of fixtures			
	If LED Linear Tubes or Track lighting fixtures: Fixture Replacement or Lamp Replacement	**FR LP**		
	If LED Linear Tubes or Track lighting fixtures: PREDOMINANT # Lamps per Fixture			
	If LED Linear Tubes or Track lighting fixtures: Total number of lamps			
	Lamp Shape/Features Code			
	If LED **bar, strip, string, or tape**: Provide length (ft)			
	If LED **panel/head**: Provide dimensions (length X width in ft)	Length _____X_____Width (ft)		
	If LED **linear fixture:** Fixture dimensions (length X width in ft) and Tube length (ft)	Length _____X_____Width (ft)		
	Multilevel: Fixture or Lamp switched?	**Y N**		
Verification Counts	**(A) Installed & Operational # of units (ex post quantity)**			
	-- Was sub sampling or estimation used?	**Y N**		
	(B) # of Non-Operable (broken/entire fixture burned-out) Units in place			
	(C) # of Rebated Units in Storage/Spares			
Physical Inspection Data	*Check box if Fixtures are NOT accessible (explain in comments)*	☐		
	Number of units physically inspected			
	If the Unit Basis = Lamp: Provide Lamp information instead of Fixture info: Fixture Wattage:			
	Fixture Make/Manufacturer			
	Fixture Model Number			
Baseline System Summary Data (Observed or	Is post-installation operation the same as pre-retrofit operation?	**Y N**		**B SC E**
	-- If pre-retrofit operation was different, specify Sched #			
	Control type Code			**B SC E**
	Lamp Type Code			**B SC E**
	(If LF Baseline) - Tube Length and Diameter (e.g. 4ft T12)			**B SC E**
	# Lamps/Fixture			**B SC E**
	Lamp Wattage			**B SC E**
	If **NOT** LF Baseline: Fixture Description (i.e. unique characteristics)			**B SC E**
Observed versus Rebated # of Units is: E=Equal M=More L=Less OT (describe)		**E M L OT**		

Baseline Sources:

- **B** – Baseline equipment (includes physical inspection, documentation, or building/energy management system)
- **SC** – Site Contact
- **E** – Engineering estimate

If Disposition Not Equal: Site Contact/Self-Report Questions	Self-Reported # of rebated units onsite (probe for rebated under 10-12)	
	Others purchased since rebated units installed	
	(D) # of units located at Other Affiliated Sites	
Failed (and Replaced) Rebated Units (Indirect/Self-Report)	How long did units typically operate before failure (months)?	
	(E) # of rebated units that Failed, but were replaced w/different tech	
	# of rebated units that Failed but were replaced in-kind (Ref)	
Removed Rebated Units (Indirect/Self-Report)	**(F)** # of rebated units that were Removed and not replaced	
	-- When were the units removed? (month/year if possible)	
	-- Describe why units were removed **in comments**	
(Sum A-F) Total # of units accounted for on-site		**(reqd)**
Total # of units (A-F) MORE than Rebated # of Units	# that were rebated by other programs/projects?	
	# that were obtained from OTHER means (explain in comments)?	
Total # of units (A-F) LESS than Rebated # of Units	# of rebated units, other site contact explanation (note in comments)	
	# of rebated units, unaccounted for	

LED Fixture - Activity Area Assignment Table (AAAT) Measure Code: _____

*Use the AAAT below to associate lighting units to Activity Areas, equipment oper. Schedules, and lighting loggers. The values in the "Represented # of Units" column must add up to the **total # of Installed and Operational** units in the table above.*

- *If ONLY FIXTURE **DENT LL**: Only fill out **AAAT** below.*
- *If **DENT LL & (DENT CT or HOBO)**: Fill out **AAAT** with logger info **&** the **HIGHBAY** Form for Panel Metering*
- *If ONLY **PANEL METERING**: Check **N/A** box and only fill out **HIGHBAY** Form.*

***Circle all that apply:** (If Verify Only, circle 'NA', and fill out AAAT)*

Metering Type:	DENT LL	DENT CT	HOBO	NA

☐ **N/A**

Area ID #	Sched #	Item #	Control Type Code	Repres. # of Units	% of Total Inst&Op. Units (Ref)	Primary Logger S/N	Ref. Logger	Back-up Logger S/N	Comments
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		
					%		☐		

% <= Total # of Installed & Operational Units check *(no data entry)*

Comments _____

Baseline Characterization

Please describe why these lights were changed to LEDs instead of any other lighting technology	

Approximate age of existing lighting system prior to retrofit (years)	
Condition of original fixtures prior to retrofit (**G**ood, **F**air, **P**oor)	**G F P**
What % of original fixtures were completely burned out?	
What % of original fixtures were partially burned out?	
On a scale of 1-10, Please rate the following topics on their level of influence for retrofitting the lighting fixtures:	
Burned out fixtures	
Adequate lighting levels	
Major Renovation / Re-Modeling	
Safety of Occupants	
Productivity of Occupants	
Lowering energy consumption and energy bills	
Long lamp life	
Low maintenance	
Going green	
Utility Incentive	
Other (*describe in comments*)	
Considering all of the influential factors above, in the absence of an energy efficiency rebate program: How long would you have continued to operate the original fixtures before replacing them? (years)	

Comments: _____

General Comments

Item #	Form Name	Comments

Site Photo Log

Record site photo information here including the PhotoID (i.e. digital file name) and a brief description of the photo where needed. Site Photos should include the site entrance and entire building, rebated measures, and close-up photos of nameplates, lamp codes, and other make/model identification. Refer to the training manual for more on what photos to take. Photo/file naming conventions is SiteID_Item# or SiteID 00# (e.g. PGE_056789_1.jpg, PGE_056789 001.jpg).

Item #	Description/Comments/Measure Code *(no data entry)*
1	
2	
3	
4	
5	
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11	
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Incentive Payment

My signature acknowledges that I received a participation incentive in the form of a $____ gift card for the survey effort.

Print Name		**Date Received**	
Gift Card Company		**Gift Card Serial #**	
Signature			

Panel Meter - Circuit Spot Measurement Table: (REFERENCE ONLY – NO DATA ENTRY)

Note 1: Fill this table out, then fill out the ***Consolidated Logging Circuit Table*** below.

Circuit Label #	Phase	# Fixtures Controlled *(DD)*	# Lamps per Fixture *(EE)*	Watts per Lamp (FF)	# Lamps Burnt Out (GG)	*(DD*EE*FF) -(FF*GG)* Calc. Circuit Watts *(HH)*	Measured Circuit Watts (MW) *(II)*	PF (JJ)	Measured Volts *(KK)*	Measured Amps *(LL)*	Measured Parasistic Watts *(MM)*	Comments

Panel Meter – Consolidated Logging Circuit Table: (REFERENCE ONLY – NO DATA ENTRY)

Note 1: After each circuit measurement is recorded in the table above, fill out the table below; here you can roll up >1 circuit into a single CT channel (if on the same phase).
Note 2: You will copy **ALL** values from the table below into their fields on the ***Panel Meter – Final Spot Measurement and Logging*** form.
Note 3: The "**Item #**" below should correlate to the "**Item #**" on the ***Panel Meter – Final Spot Measurement and Logging*** form.

Item # *(A)*	*From table above* Circuit Label #*(s)* *(B)*		*From table above* Phase *(C)*	*DCT or HOBO* Logger Type *(X)*	Logger ID *(Y)*	*(HOBO)* CT Channel # *(Z)*	*From applicalbe fields in table above* Total Fixtures Controlled *(D)*	# Lamps per Fixture *(E)*	Watts per Lamp *(F)*	# Lamps Burnt Out *(G)*	Sum Circuit Watts *(H)*	*From applicalbe fields in table above* Sum Meas. Watts *(I)*	Avg. *PF* (J)	Avg. Meas. Volts *(K)*	Sum *Meas. Amp* *(L)*	Sum Parasitic Watts *(M)*

Panel Meter – Final Spot Measurement and Logging – (DATA ENTRY)

Breaker Circuit and Point of Control (POC) Assessment				
Panel Meter Item #:	***(A)***			
Associated Measure Code(s)				
IOU Unit Basis				
Panel number/identifier (if applicable)				
Circuit Label Number(s):	***(B)***			
Phase of Circuit(s):	***(C)***	A B C	A B C	A B C
Control Type Code (CTC)				
# Wall switches connected to this Circuit				
Circuit Configuration Code (CCC)				
Schedule #				
Area ID #: *(if >1 AA, enter from left to right)*				
# Rebated Controls per Activity Area(s) above:				
Fixture Verification and Nominal Watt Calculation				
Circuit(s) tested (On/Off)?		Y N	Y N	Y N
# of Rebated **Units** on Circuit(s)		`		
# of Rebated Fixtures controlled by Circuit(s):	***(D)***			
# of Rebated Lamps per Fixture:	***(E)***			
Rated Lamp Wattage:	***(F)***			
# of Lamps Burned-out or Non-Operable:	***(G)***			
Total Nominal Rebated Circuit(s) Watts: ***(D*E*F)-(F*G)***	***(H)***			
Spot Measurements				
Max Measured Wattage: (with all fixtures on Circuit ON):	***(I)***	G N	G N	G N
Power Factor: *(if 2 circuits on 1 CT, average the PF)*:	***(J)***			
Measured Circuit(s) Voltage: (to Ground or Neutral):	***(K)***			
Max Measured Amperage: (with all fixtures 'ON'):	***(L)***			
% Meas. vs. Calc. Watts: ***(I/H*100)***; Is this between 90-110%?		% Y N	% Y N	% Y N
Non-Rebated or Parsitic Loads				
Do Non-Rebated or Parasitic Loads exist on this Circuit?		Y N DK	Y N DK	Y N DK
Is the parasitic load Constant or Variable?		C V NA	C V NA	C V NA
Parasitic Wattage: (only if a contant parasitic load):	***(M)***			
Logger Information				
Logger Type: ***(DCT** = DENT CT, **H**=HOBO)*	***(X)***	DCT H	DCT H	DCT H
Primary Logger S/N:	***(Y)***			
Logger Channel #	***(Z)***			
Reference Logger:		☐	☐	☐
Reference Channel:		☐	☐	☐
CT Amp size				
Logger Installation Comments				

Panel Meter – Final Spot Measurement and Logging – (DATA ENTRY)

Breaker Circuit and Point of Control (POC) Assessment				
Panel Meter Item #:	***(A)***			
Associated Measure Code(s)				
IOU Unit Basis				
Panel number/identifier (if applicable)				
Circuit Label Number(s):	***(B)***			
Phase of Circuit(s):	***(C)***	A B C	A B C	A B C
Control Type Code (CTC)				
# Wall switches connected to this Circuit				
Circuit Configuration Code (CCC)				
Schedule #				
Area ID #: *(if >1 AA, enter from left to right)*				
# Rebated Controls per Activity Area(s) above:				
Fixture Verification and Nominal Watt Calculation				
Circuit(s) tested (On/Off)?		Y N	Y N	Y N
# of Rebated **Units** on Circuit(s)		`		
# of Rebated Fixtures controlled by Circuit(s):	***(D)***			
# of Rebated Lamps per Fixture:	***(E)***			
Rated Lamp Wattage:	***(F)***			
# of Lamps Burned-out or Non-Operable:	***(G)***			
Total Nominal Rebated Circuit(s) Watts: ***(D*E*F)-(F*G)***	***(H)***			
Spot Measurements				
Max Measured Wattage: (with all fixtures on Circuit ON):	***(I)***	G N	G N	G N
Power Factor: *(if 2 circuits on 1 CT, average the PF)*:	***(J)***			
Measured Circuit(s) Voltage: (to Ground or Neutral):	***(K)***			
Max Measured Amperage: (with all fixtures 'ON'):	***(L)***			
% Meas. vs. Calc. Watts: ***(I/H*100)***; Is this between 90-110%?		% Y N	% Y N	% Y N
Non-Rebated or Parsitic Loads				
Do Non-Rebated or Parasitic Loads exist on this Circuit?		Y N DK	Y N DK	Y N DK
Is the parasitic load Constant or Variable?		C V NA	C V NA	C V NA
Parasitic Wattage: (only if a contant parasitic load):	***(M)***			
Logger Information				
Logger Type: ***(DCT** = DENT CT, **H**=HOBO)*	***(X)***	DCT H	DCT H	DCT H
Primary Logger S/N:	***(Y)***			
Logger Channel #	***(Z)***			
Reference Logger:		☐	☐	☐
Reference Channel:		☐	☐	☐
CT Amp size				
Logger Installation Comments				