

Final Report

# **Evaluation of the RightLights Program**

*Prepared for:*  
Ecology Action

*In partnership with*  
Energy Solutions  
and  
Center for Energy and Environment

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quantec

**Prepared by:**  
**Quantec, LLC**

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**Quantec Offices**

6229 SE Milwaukie Ave.  
Portland, OR 97202  
(503) 228-2992  
(503) 228-3696 fax  
[www.quantecllc.com](http://www.quantecllc.com)

3445 Grant St.  
Eugene, OR 97405  
(541) 484-2992  
(541) 683-3683 fax

1722 14th St., Suite 230  
Boulder, CO 80302  
(303) 998-0102  
(303) 998-1007 fax

6 Ridgeland Rd  
Barrington, RI 02806  
(401) 289-0059  
(401) 289-0287 fax

212 E Main St., Suite G  
Reedsburg, WI 53959  
(608) 524-4844  
(608) 524-6361 fax

20022 Cove Circle  
Huntington Beach, CA 92646  
(714) 287-6521



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# Executive Summary

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Ecology Action's RightLights Program offers PG&E customers within Santa Cruz, Monterey, and San Benito Counties an opportunity to increase the energy efficiency of their lighting systems through a turnkey process of evaluation and installation of retrofit lighting measures. Ecology Action designed and implemented the program in partnership with Energy Solutions (program design and marketing) and Center for Energy and Environment (program design and software tools). Hard-to-reach non-residential customers are targeted for the Program through an initial site audit, installation of a Quick Saver Package (QSP), followed by recommendations for additional lighting efficiency measures to be installed and subsequent lighting retrofits.

The QSP measures (screw-in Compact Fluorescent Lamps (CFLs) and/or LED Exit Sign upgrades), valued at up to \$250, are free to customers. Incentives are provided based on the total amount of expected energy savings from additional lighting upgrades and the customer's rate schedule.

As of December 31, 2003, 611 of the estimated potential 20,000 small business retrofits were completed, translating to 3% market penetration. Initial goals for the Program included 595 participants, 5,024,231 kWh in energy savings and 964 kW in demand savings. These targets were substantially exceeded.

The program evaluation consisted of

- A review of the Program tracking database
- Verification of specific parameters in savings algorithms not considered deemed values
- Verification of achievement of unit-based marketing activities
- Verification of the quantities and types of equipment installed
- Determination of verified peak kW and kWh impacts

The database review concluded that the deemed values used for each of the market sectors/business types were consistent with those approved for the California Express Efficiency Program, which targets small- and medium-sized nonresidential customers.

Quantec verified that both the coincident demand savings and the energy savings equations were being properly calculated in the FACET<sup>®</sup> program database. In addition, we verified that the fourth quarter 2003 report correctly presented these values from the Program database.

Quantec staff conducted 69 site visits to verify that the measures from the Program database were installed and operating as predicted under the *ex ante* assumptions. We then calculated the verified energy and demand savings based on the results of our site visits. The overall savings realization rate is 97%.

Table ES.1 compares expected Program energy savings to evaluated savings by measure type.

**Table ES.1: Evaluated Program Energy and Demand Savings by Measure Type**

Measure	Energy Savings		Demand Savings		Realization Rate %
	Expected (kWh)	Evaluated (kWh)	Expected (kW)	Evaluated (kW)	
CFLs	3,716,695	3,545,735	716	683	95%
Tubular Fluorescents	5,112,780	5,050,381	1,037	1,025	99%
LED Exits and Misc.	198,626	198,626	29	29	100%
<b>Total</b>	<b>9,028,101</b>	<b>8,794,742</b>	<b>1,782</b>	<b>1,737</b>	<b>97%</b>

Based on our review of the calculations and databases, we offer a few recommendations:

- Quantec recommends that a standard number of operating hours (as they do in the Express Efficiency Program) and coincident diversity factor apply to exterior lights for all market sectors.
- In addition, RightLights should consider migrating towards the SPC naming conventions for more measures and standardizing the measure input fields. This will facilitate both internal and external reporting.
- We also recommend additional quality assurance (QA) to ensure consistency and accuracy between measure and project level reporting from the database.

We found that RightLights is implementing a successful mix of marketing activities to exceed its target population of small, “hard to reach” nonresidential customers. The Quick Saver Package is a successful tool for winning the attention and trust of participants and should be continued. Overall, customer satisfaction is very high due to the ease of participation, professional manner of installers, and significant realized energy savings.

# I. Introduction

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## Program Description

The RightLights Program (Program) provides lighting efficiency improvement services to nonresidential electrical customers with demand less than 500kW in Santa Cruz, Monterey, and San Benito Counties.

In order to implement energy-efficient lighting solutions in the hard-to-reach small business market, the Program is designed to provide a complete package of services through a single, objective point of contact for the customer. Program participants benefit from a turn-key process supervised by a trusted source and maximized energy savings through comprehensive lighting retrofits.

A RightLights Lighting Specialist visits potential participants, performs a detailed analysis of the current lighting system, and identifies inefficiencies. The data are then entered into FACET<sup>®</sup>, a proprietary software program that computes the potential energy savings and costs of the project. A complete report detailing retrofit costs, rebate amount, annual utility savings, payback period, and energy savings is generated by the software and provided to the business. When the customer accepts the proposed project cost<sup>1</sup> and decides to participate in the Program, project installation begins.

The Program also offers a Quick Saver Package (QSP) of screw-in Compact Fluorescent Lamps (CFLs) and/or LED Exit Sign upgrades, valued at up to \$250. Any site participating in a RightLights lighting analysis is eligible for this package, which is installed at the time of the initial lighting analysis at no cost to the participant.

Ecology Action of Santa Cruz is the designated implementer of this Program. Subcontractors include Energy Solutions and Center for Energy and the Environment.

The Program began delivering services in October 2002 and completed 611 small business retrofits by December 31, 2003. Ecology Action estimates that there are 20,000 eligible small businesses in the Monterey Bay Region, translating to 3% market penetration in the 15-month period.

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<sup>1</sup> Proposed project customer cost is the total project cost less customer rebate. The rebate rate varies by rate schedule and the total dollar savings is calculated from expected energy savings due to project installation.

## Evaluation Approach

The goals of this evaluation are to:

- Evaluate the Program tracking database to ensure that the *ex ante* estimates were calculated properly (i.e., formulas are correct and deemed parameters were input appropriately)
- Verify specific parameters in the per unit kW and kWh savings algorithms that are not considered deemed values
- Verify achievement of unit-based marketing activities
- Verify the quantities and types of equipment installed
- Based on deemed savings and installed quantities, verify peak kW and kWh impacts

In order to fulfill the goals of this study, Quantec conducted a number of research activities, including:

- A technical review of the Program database to verify that the *ex ante* estimates are being calculated properly
- A review of marketing materials and status reports
- On-site measure verification via 69 site visits
- Preparation of net Program impacts based on the findings from the site visits

Each of these activities is discussed in the following chapters. Chapter II examines the savings calculations; Chapter III reviews the marketing activities; Chapter IV presents the findings from our site-visit verifications and savings calculations; while Chapter V presents our conclusions and recommendations.

## II. Review of Savings Calculations

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Quantec carefully reviewed the Program database to verify that:

- The inputs for *ex ante* estimates (deemed parameters) are correct
- The formulas to calculate project costs and expected savings are being calculated properly

### Program Database

The RightLights Program uses a customized Microsoft Access database called FACET<sup>©</sup>. The database has a proprietary front end developed by the Center for Energy and the Environment that automates the process of calculating the costs and savings for energy efficiency projects.<sup>2</sup> Users enter in a new project name, an area (e.g., office, hallway, etc.), and the measures; the program then calculates the following:

***The cost of the project.*** Participating RightLights Program Contractors have agreed to fixed labor rates, equipment markups, and labor factors, which are included in the database and allow the Program to deliver fixed-price bids to the customer. As a result of Ecology Action's previous negotiations with the contractors and equipment suppliers, both the cost of the hourly labor rate and the equipment are often well below market cost. Participants pay the contractor only for the price of the project less the rebate, thereby getting the rebate "up front." Ecology Action pays the rebate amount directly to the Contractor once the work is complete, which acts as an additional quality control mechanism. Ecology Action then invoices the utility for the amount of the rebate.

***Rebate amounts.*** The rebates are based on the estimated energy savings. During the second quarter of 2003, Program incentive levels were adjusted:

- Rate schedule A1 and A6, less than 100 kW demand: 13.5 cents per first-year kWh saved, with a maximum rebate of 100% of the project cost.
- Rate schedule A10 or customers with peak demand of less than 100 kW: 13.5 cents per first-year kWh saved, with a maximum rebate of 85% of the project cost

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<sup>2</sup> FACET is an acronym for FACilities Evaluation Tool, and can also be used for measures other than lighting.



- Customers with over 100 kW in peak demand: 9 cents per first-year kWh saved, with a maximum rebate of 80% of project costs

Table II.1 summarizes Program participation and rebate distribution by rate class.

**Table II.1: Program Participation and Rebate Distribution**

Rate Class	No. Participants	Total Rebates (\$)	Rebate % of Program Total	Avg. Rebate per Site (\$/Participant)
A1	497	\$199,129	33%	\$401
A6	10	\$10,691	2%	\$1,069
A10	99	\$385,537	64%	\$3,894
E19S	5	\$9,310	2%	\$1,862
<b>Total</b>	<b>611</b>	<b>\$604,666</b>	<b>100%</b>	<b>\$990</b>

FACET computes the kWh savings based on the reported hours of operation, but the final Program energy and demand savings are based on the deemed hours of operation. Consequently, the rebate is based on the customers' reported hours of operation, while final Program savings are calculated from the deemed hours of operation.

## Deemed Parameters

The FACET database uses deemed values for a number of inputs included in the savings calculation. The deemed values were implicitly defined as part of the cost-effectiveness calculations for the Program Implementation Plan and were formally approved later during meetings with PG&E.

## Operating Hours, Interactive Effects, and Coincident Diversity Factors

Table II.2 shows the deemed values used for each of the market sectors/business types. These values were consistent with those approved for the California Express Efficiency Program, which targets small- and medium-sized nonresidential customers. The operating hours vary by business type, except for exit signs, which were assumed to be on continuously at all sites.<sup>3,4</sup>

Demand and energy savings estimated for the Express Efficiency Program also included savings attributed to the reduction in cooling loads produced by energy-efficient lighting. The RightLights Program included an adjustment for these additional Demand Interactive Effects (DIE) and Energy Interactive Effects (EIE) by market sector. These adjustment factors are averages applied

<sup>3</sup> These values were based on a 1997 study of the Program by Quantum Consulting.

<sup>4</sup> In addition, exit lights were assigned a conditional diversity factor of 1.0 for all sectors.

to all sites of the same business type uniformly. Finally, the Express Efficiency Program study included Coincident Diversity Factors (CDFs) to estimate the demand savings that are coincident with peak demand. The values for these three multipliers and operating hours are presented in Table II.2.

**Table II.2: Deemed Values for Operating Hours, Interactive Effects, and Coincident Diversity Factors**

PG&E Market Sector*	FACET Business Type	Annual Operating Hours**	Demand Interactive Effects	Coincident Diversity Factors***	Energy Interactive Effects
Office	Small Office	4,000	1.25	0.81	1.17
Retail	Small Retail	4,450	1.19	0.88	1.11
College	Small Institutional	3,900	1.22	0.68	1.15
School	Small Institutional	2,150	1.23	0.42	1.15
Grocery	Convenience Store	5,800	1.25	0.81	1.13
Restaurant	Entertainment	4,600	1.26	0.68	1.15
Health Care/Hospital	Small Institutional	4,400	1.26	0.74	1.18
Hotel/Motel	Small Hotel/Motel	5,500	1.14	0.67	1.14
Warehouse	Warehouse	3,550	1.09	0.84	1.06
Process Industrial	Light Manufacturing	5,300	1.20	0.78	1.09
Assembly Industrial	Light Manufacturing	4,900	1.20	0.80	1.09
All Other	Other	4,500	1.13	0.76	1.08

\* Source: Pacific Gas and Electric Company, Express Efficiency Program, November 2000

\*\* Exit signs were assumed to operate for 8,760 hours for all business types

\*\*\* Exit signs were assumed to have a CDF of 1.0 for all business types.

Quantec verified that these approved values were included in the FACET database. While the deemed values were generally implemented according to the approach described in the Program plan, two items of interest were discovered:

- Six sites (two retail, two restaurants, an office, and a school) were assigned to the “other” category for all deemed values (hours, DIE, CDF, and EIE). For our analysis, we reassigned these sites to the identified category and calculated Program savings using these corresponding deemed values.<sup>5</sup>
- In addition to exit lights, the Express Efficiency Program assigned the same number of hours, for all sectors, to exterior lights. The RightLights Program, however, was originally designed for interior lights only, so default values for exterior lights were never added to the database. Instead, the deemed values for outside lights were

<sup>5</sup> This reassignment produced less than a 1% reduction in expected energy and demand savings.

assumed to be the same as interior lights. Ecology Action and the Center for Energy and the Environment plan to add a standard value for hours of operation and the CDF for exterior lights in the 2004 Program.

### **Fixture Wattages**

The FACET database also incorporated deemed values for wattage levels for each measure, including the existing and the replacement measures. These levels were based on values from the 2001 Standard Performance Contract Program (SPC) Lighting Fixture Demand Tables.<sup>6</sup> For the few measures that were not included in the SPC tables, CEE used other accepted sources, such as the Advanced Ballast Catalog, to populate the demand levels.

Data entry errors are minimized for the wattage fields because the FACET database was constructed so that wattages were fixed for all measures except CFLs and incandescents. In other words, users can only modify wattages for these fields.

In order to verify that the deemed wattages were used, Quantec selected a sample of approximately ten detailed measures, focusing on the most common existing and replacement measures. Matching specific measures to the SPC tables, however, posed a number of difficulties:

- In several instances, the same measure was listed using various spelling/space combinations, with only slight differences between them
- Ballast factors, which determine wattages, were sometimes included in the system name field and in other cases in a separate field (i.e., the naming conventions were not consistent in terms of including or excluding the ballast factor)
- In many cases, multiple fixtures were included in the New Fixture field, making it difficult to verify specific wattages associated with any one measure
- In some cases, the FACET naming conventions differed substantially from the SPC's
- The contractor for the Monterey Public School sites (Sun Industries) used a different naming convention than the other sites

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<sup>6</sup> Under the SPC Program the Program administrators (including PG&E) offer a fixed-price incentive to end users or third-party energy-efficiency service providers (EESPs) for measured kilowatt-hour (kWh) energy savings achieved by the installation of energy-efficient measures. The utility pays a variable incentive amount to a third-party EESP, or to a customer acting as their own EESP, based on measured energy savings using a mutually agreed upon measurement protocol (the SPC Tables).

For the measures we examined, we found that the analysis in the FACET database properly incorporated the deemed values from the 2001 SPC tables. The site visits offer an additional indication of how well the deemed values were incorporated into the savings estimates.

## Cost and Savings Calculations

As discussed earlier, the RightLights Program incorporated both cooling interactive effects and the coincident diversity factor into the savings calculations that are reported in the quarterly reports. The savings are calculated as:

$$\text{Coincident (Peak) kW Savings} = \text{Connected load kW savings} * \text{CDF} * \text{DIE}$$

Where:

- Connected load kW savings = Load of the existing fixture less the load of the new fixture
- CDF = Coincident Diversity Factor
- DIE = Demand Interactive Effects

And:

$$\text{kWh Savings} = \text{Connected load kW savings} * \text{Deemed annual operating hours} * \text{EIE}$$

Where:

- Deemed annual operating hours = Deemed annual hours based on business sector (with exceptions for exit lights)
- EIE = Energy Interactive Effects

Quantec verified that both of these equations were being properly calculated in the FACET program database. In addition, we verified that the fourth quarter 2003 report correctly presented these values from the Program database.

### III. Review of Marketing Activities

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Ecology Action implemented an aggressive marketing strategy to ensure that they met or exceeded their Program participation goals. Their marketing strategy contained the following five primary elements:

**Cold Calls.** Three employees of Ecology Action (the RightLights Lighting Specialists) conducted “cold call” visits to businesses throughout the three-county region. Ecology Action reported that this “on foot” marketing was their most effective means of enrolling customers. They achieved exceptionally high participation rates, as approximately 95% of the sites they visited participated. The Quick Saver Package was an important component of their success, acting as a “door opener” to win business interest and trust. In the case of many of the smallest facilities that had all incandescent lights, the QSP actually served as a comprehensive retrofit for the facility (i.e., there was no other lighting equipment remaining to upgrade).

**Community Marketing Partners.** Ecology Action formed close alliances with chamber of commerce offices to get them to promote the Program to the small business community. They conducted personal meetings with five chamber offices to discuss strategies and timelines for collaboration and to identify “model retrofit” businesses that were used in marketing material testimonials. They also joined each chamber in order to provide additional credibility and trust during audits. In addition, they used the chamber membership lists to do mailings and participate in flyer distributions to promote the Program.

**Media Outreach.** Ecology Action held a major press event in spring 2003 to help promote the Program. Speakers included the president of the local chamber of commerce, the local congressional representative, and a CPUC Commissioner. There were a number of articles in local papers, and even a radio interview about the Program. These often led to spikes in Program inquiries.<sup>7</sup> In addition, Ecology Action developed an informational video that was shown when they were awarded a 2003 Governor’s Environmental and Economic Leadership Award (largely because of their work with the RightLights Program).

**Marketing Materials.** Ecology Action developed professional-looking brochures and a user-friendly website to promote the Program. Both the brochures and Web site provided detailed Program information, including benefits and information about how to participate. The website is comprehensive, covering frequently asked questions, testimonials, sample

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<sup>7</sup> One article in the paper, for example, led to as many as eight inquiries the next week.

reports, and an enrollment application. Both the brochure and website have Program information available in Spanish. In the most recent four-week period, the website received 8,574 page views from 648 unique visitors. Additional marketing collateral materials, such as magnetic stickers, were also developed as “leave behinds,” and participants received Program certificates to display in their stores.

**Targeted Solicitations.** Ecology Action conducted targeted solicitation activities to attract participants with large potential savings to the Program. For example, Program implementers targeted the Monterey Peninsula Unified Schools District (MPUSD), whose participation resulted in demand savings of 812 kW (84% of the demand savings goal). Targeted mailings were also sent to nonprofit organizations, encouraging them to participate, and to contractors, explaining that they could increase their lighting business by educating their customers about the rebates.

As shown in Table III.1, the RightLights marketing activities were successful in reaching the hard-to-reach small business customer, as the Program exceeded each of its goals in terms of the targeted population.

**Table III.1: Achievement of Hard to Reach Program Goals**

Hard to Reach Population	Program Goal	Actual Program Participants
Leased Space	25%	66%
Non-English speaking	3%	8%
Business Size (small/very small)	45%	79%

In addition, the multifaceted marketing strategy was successful, allowing the RightLights implementation team to exceed their participation and expected savings goals. These results are summarized in Table III.2.

**Table III.2: Achievement of Program Participation and Savings Goals<sup>8</sup>**

	Program Goal	Actual Installations	Percent of Goal
Number of Participants*	595	611	103%
Estimated kWh Savings	5,024,231	9,028,101	180%
Estimated kW Savings	964	1,791	186%

\* Participant actually refers to the meter. Certain sites had multiple meters and were counted as more than one participant. Other sites with multiple tenants but only one meter counted as just one participant.

<sup>8</sup> Actual installations as of January 26, 2004 FACET database extrapolation.

## IV. Installation Verification and Savings Analysis

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Quantec staff conducted 69 site visits to verify that the measures from the Program database were installed and operating as predicted under the *ex ante* assumptions. We then calculated the verified energy and demand savings based on the results of our site visits.

### Installation Verification

#### Sample Size

The California Public Utilities Commission requested evaluation estimates with a 90% confidence level and 10% precision (90/10), requiring a sample size of 61 site visits.<sup>9</sup> To allow for data cleaning and attrition, we conducted 69 site visits.

#### Sample Selection and Stratification

Quantec implemented a stratified random-sampling approach for selected sites. As shown in Table IV.1, the Monterey Peninsula Unified School District (MPUSD) sites represented 5% of participants and 44% of estimated kWh savings, while non-MPUSD sites represented 95% of participants and 56% of estimated kWh savings. Because the MPUSD sites had unique characteristics compared to the commercial sites – they were larger, portions were closed during the summer, a different contractor was used – and represented a large share of the savings, we divided the sample into two strata:

- We randomly selected five of the MPUSD sites
- The remaining site visits were selected randomly from the non-MPUSD sites, although we targeted the ten largest non-MPUSD sites to ensure representation of other large sites

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<sup>9</sup> With a very large population, 68 sites would be required to attain these levels of confidence and precision. However, with small population sizes, we could apply a *population correction factor* that would allow us to achieve 90/10 confidence/precision with a smaller sample size.

**Table IV.1: Participants and Estimated Savings by Strata**

Participant Category	Number of Participants	Estimated Savings	
		Adjusted kWh*	Adjusted kW**
MPUSD	33	44%	45%
Non-MPUSD	578	56%	55%
<b>Total</b>	<b>611</b>	<b>100%</b>	<b>100%</b>

\* Adjusted for energy interactive effects

\*\* Adjusted for demand interactive effects and coincident diversity

### Scheduling Appointments

Quantec conducted the site visits between January 12 and 28, 2004. For most participants, it was unnecessary to schedule site visits in advance, and we were able to gain customer approval and cooperation in person, at the time of the site visit. In addition, the flexibility of a walk-in approach allowed Quantec to cost-effectively visit sites geographically clustered in commercial districts within the Program area. However, for the MPUSD site visits, we called in advance and scheduled our site visits with the maintenance manager.

### Site Visit Protocol

Quantec prepared a site visit worksheet and interview instrument (Appendix A). During site visits, we examined a number of items, including:

- Are the lighting measures properly installed and functioning?
- For measures no longer in place, when were they removed? What were the primary reasons?
- Do the installed lighting measures match the Program database (e.g., is the installed wattage consistent with that recorded in the database)?
- What baseline equipment was replaced by the Program installation?
- Is the customer satisfied with the Program? Does the customer have any recommendations for improvement?

### Findings

All the site visits were completed successfully in about two weeks, including the five school visits. During the site visits, a high occurrence of failures of one brand of CFL fixtures was noted. Ecology Action is working with the manufacturer to address this issue by replacing any failed lamps from this manufacturer even if they are outside the normal warranty period.

Overall, customers were very helpful during the site visits and provided constructive feedback on the program. Forty-five out of 65 non-MPUSD customers provided a rating of their experience with the Program on a scale



from 1 to 5, with 5 being extremely satisfied. Of those 45 respondents, 65% rated their satisfaction level as a 5, 24% rated their satisfaction level as a 4, and customers at the remaining (3) sites were less satisfied overall.

Customers with high ratings noted the ease of participation, professional manner of installers, and realized energy savings as being their main reasons for being satisfied. Less satisfied customers focused on lighting quality as either being too bright or not bright enough for their specific needs. They thought the new lights did not provide the appropriate level of lighting for their business and, consequently, either went back to using the old fixtures or brought back some of the old ones in addition to the new lights.

Several customers suggested areas for improvement. These suggestions included the addition of a six-month check-in to see how the lights were working and the provision for replacing failed CFLs. Some customers mentioned difficulty in finding replacement equipment locally and thought they might need help locating replacements. These comments were mainly directed at equipment failure and not at the Program implementation. All comments and recommendations gathered during the site visits are presented in Appendix A.

## **Energy and Demand Savings Analysis**

### **Method**

The estimation of net energy and demand impacts was based on the findings from our site visits where we verified the presence of measures and estimated an installation realization rate based on the verified equipment.<sup>10</sup> The individual installation realization rates were then averaged over similar measures for similar business types within the site visit sample and then extrapolated to the population of participating sites to achieve net energy and demand savings impacts. This subsection discusses each step in more detail and presents the analysis results.

### **Measure Categorization**

Within the Program, customers are offered a wide range of energy-efficient lighting fixtures to best meet their needs. Equipment from several manufacturers with slightly varying wattages was used for the new installations. For overall Program reporting, the Program implementer has grouped the fixtures into three measure types: CFLs, Tubular Fluorescents, and LED Exits and Miscellaneous fixtures such as metal halide and high

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<sup>10</sup> The installation realization rate indicates what share of the expected installed measures was observed during the site visits. The rate could be less than one if measures were not actually installed or had been removed. The rate could be greater than one if the site visit count indicates that more of the same measures were observed than expected.

output fixtures. Table IV.2 shows the distribution of expected installations by measure across all Program participants and within our site visit sample.

**Table IV.2: Expected Installations by Measure Type**

Measure	Fixtures in Program		Fixtures in Site Visit Sample	
	Frequency	%	Frequency	%
CFLs	13,109	37%	1,844	31%
Tubular Fluorescents	21,704	61%	3,972	68%
LED Exits and Misc	528	2%	49	1%
<b>Total</b>	<b>35,341</b>	<b>100%</b>	<b>5,865</b>	<b>100%</b>

### Installation Realization Rate Calculation

For each measure installation at each site, the quantity and wattage of new fixtures were verified against the expected FACET database values. Customers were also asked to verify the previous equipment that was replaced by the new installations. The installation realization rate for each measure was calculated based on the verified data.

Our estimate of the installation realization rate was affected by customers' responses to failed fixtures. If we observed failed lights or fixtures and a customer said they intended to replace them with similar equipment (or if the failed product was the one problematic brand that was being replaced by the Program) no penalty was noted. On the other hand, if the customer indicated that they had no intention of looking for an energy-efficient replacement, the installation realization rate was decreased. In cases where we observed fewer efficient fixtures or lights than expected, we inquired whether the customer had gone back to the original equipment. If so, the rate was decreased appropriately.

If, for example, the Program documentation at a site indicated that ten CFLs were installed replacing incandescent bulbs and ten CFL fixtures of the expected wattage were observed and operating, this measure received an installation realization rate of 100%. However, if we observed that the customer had reinstalled one of the original lights or fixtures, the installation realization rate would be 90%.

### Installation Realization Rate Estimates

The results for each measure at all 69 sites were grouped together into a matrix of average realization rates per measure per business type. A few of the original business categories were combined together because of similarities or because the number of installations was very small. The results are shown in Table IV.3.

The results for all sites combined are based on the estimates for individual business types, weighted by the expected number of installations in each business type. The installation realization rate was 91% or higher for all measures and business types except Light Manufacturing, which had a rate of 86% for Tube Fluorescents and 89% for CFLs. For the complete sample, the realization rate ranged from 95% to 100%, and was the smallest for CFLs.

**Table IV.3: Installation Realization Rate by Measure and Business Type**

Business Type	Measure Category		
	CFLs	Tubular Fluorescents	LED Exits and Misc.
MPUSD*	93%	100%	100%
Small Retail	97%	95%	100%
Entertainment/ Restaurant	92%	100%	100%
Small Office	99%	101%	100%
Small College and Other Schools	93%	99%	100%
All Other**	100%	96%	100%
Convenience Store/ Grocery	100%	100%	100%
Healthcare	100%	100%	100%
Light Manufacturing	89%	86%	100%
<b>All Buildings</b>	<b>95%</b>	<b>99%</b>	<b>100%</b>

Note: Expected and verified measures in a few cases were 0 since the measures had not been installed at the sites we sampled. LED Exits and Misc installations at all sites were either exactly the expected quantity or the expected and verified quantities were both 0. All calculated realization rates met the “90/10” statistical requirement.

\* Monterey Peninsula Unified School District (MPUSD) sites comprised most of the larger participants and are designated as a separate category for purposes of analysis.

\*\* Motels, Warehouses, and Assembly were combined with the original Other category because the installations in these buildings were a very small proportion of the total.

The site visit sample included just over 10% of the sites participating in the Program and represented 16% of expected energy savings. Using the corresponding results from Table IV.3, an adjusted quantity of fixtures was calculated for each measure in the FACET database. This adjusted fixture quantity was then used in the calculations for adjusted energy and demand savings listed in Section 2 under Cost and Savings Calculations, resulting in net program savings. The connected load kW savings are described as a per-fixture savings. To get total savings per customer, the connected load kW savings were multiplied by the adjusted quantity of fixtures.

## Results

The overall savings realization rate is 97%. Table IV.4 compares expected program energy savings to evaluated savings by measure type.

**Table IV.4: Evaluated Program Energy and Demand Savings  
by Measure Type**

Measure	Energy Savings		Demand Savings		Realization Rate %
	Expected (kWh)	Evaluated (kWh)	Expected (kW)	Evaluated (kW)	
CFLs	3,716,695	3,545,735	716	683	95%
Tubular Fluorescents	5,112,780	5,050,381	1,037	1,025	99%
LED Exits and Misc.	198,626	198,626	29	29	100%
<b>Total</b>	<b>9,028,101</b>	<b>8,794,742</b>	<b>1,782</b>	<b>1,737</b>	<b>97%</b>

The evaluated energy savings by business type are shown in Table IV.5 along with the energy savings realization rates in order of savings. For those business types that were combined during the site visit data analysis, the resulting combined realization rate was applied to each individual type. Small offices, convenience stores, and health care facilities show the highest energy savings realization rates at 100% of expected savings.

**Table IV.5: Evaluated Program Savings by Business Type**

Business Type	Savings		
	Expected (kWh)	Evaluated (kWh)	Realization Rate %
MPUSD	3,949,500	3,883,917	98%
Small Retail	2,129,416	2,047,201	96%
Entertainment/Restaurant	823,255	772,779	94%
Small Office	617,363	616,736	100%
All Other	341,914	334,836	98%
Convenience Store/Grocery	283,117	283,117	100%
Small Motel/Hotel	261,164	259,651	99%
Small Institutional School	216,996	215,626	99%
Light Manufacturing Process	131,161	114,777	88%
Small Institutional Healthcare	115,122	115,122	100%
Small Institutional College	67,665	62,649	93%
Warehouse	55,209	53,344	97%
Light Manufacturing Assembly	36,217	34,985	97%
<b>All Buildings</b>	<b>9,028,101</b>	<b>8,794,742</b>	<b>97%</b>

## V. Conclusions and Recommendations

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In order to evaluate the RightLights Program, Quantec conducted a technical review of the Program database; reviewed the marketing materials; verified that measures were installed and operational through site visits at randomly selected locations; calculated installation, energy, and demand savings realization rates; and calculated verified energy and demand savings.

We found from our review that the Program is calculating the *ex ante* estimates, including deemed parameters and formulas, according to Program planning requirements. The database used by the Program is a comprehensive and useful tracking and analysis tool. We did identify the potential for some minor inconsistencies to occur between different FACET extract reports, however. It appears that project timing and status changes can lead to differences between tracking data snapshots extracted at the measure or project levels. On the occasion when we encountered this, the Program implementers were able to identify the cause of the differences and reconcile them. Based on our review of the calculations and databases, we offer a few recommendations:

- Quantec recommends that exterior lights receive a standard number of operating hours (as they do in the Express Efficiency Program) and coincident diversity factor for all market sectors.
- In addition, RightLights should consider migrating towards the SPC naming conventions for more measures and standardizing the measure input fields. This will facilitate both internal and external reporting.
- When measure- and project-level data are extracted, the analyst should note that, at a given point in time, slight differences might occur due to timing issues. If differences are observed, they should be trued up to maintain internal consistency.

We also found that RightLights is implementing a successful mix of marketing activities to exceed its target population of small, hard-to-reach nonresidential customers. The Quick Saver Package is a successful tool for winning the attention and trust of participants, and should be continued.

Our site visits revealed that the installed measures were consistent with those reported in the Program database. Overall, the installation realization rates for Fluorescent Tube and LED Exit and Miscellaneous fixtures were high. The overall installation realization rate for CFLs was a little less than the other measure categories, at 95% overall. Removal of measures due to failure or customer dissatisfaction was low. Only one measure appeared to be

problematic – defective CFL products manufactured by a specific manufacturer. To ensure Program savings, RightLights is proactively replacing all these products, even those that have not yet failed.

Overall, the energy and demand savings realization rates are quite high for all the measures aggregated across the business types. These rates are driven primarily by the installation realization rates by measure and business type. The overall energy savings realization rate is smallest for CFLs at 95%.

Customer satisfaction with the program is very high due to the professional quality of customer service received, which requires little time and inconvenience for participants. Providing an additional contact with customers after installation to check on equipment performance and satisfaction would help to resolve problems identified by less satisfied customers.

# **Appendix A. Site Visits Summary and Worksheet**

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This appendix provides a summary of the data collected during our site visits. Table A.1 presents the data for the MPUSD Sites.

**Table A.1: Site Visit Data for Monterey Peninsula Unified Schools District**

School	CFLs			Fluorescent Tubular			Exit/Misc		
	Expected	Verified	RR	Expected	Verified	RR	Expected	Verified	RR
MPUSD - School #1	186	159	0.85	651	659	1.01	7	7	1.00
MPUSD - School #2	97	95	0.98	343	341	0.99	4	4	1.00
MPUSD - School #3	566	529	0.93	1,589	1,585	1.00	46	46	1.00
MPUSD - School #4	203	190	0.94	601	622	1.03	19	19	1.00
MPUSD - School #5	125	119	0.95	481	466	0.97	5	5	1.00
Total	1,177	1,092	0.93	3,665	3,673	1.00	81	81	1.00

Data for all other sites are presented in an Excel worksheet, APP A Table 2.xls.

# Evaluation of the RightLights Program

## APPENDIX A Table 2

### Measure Codes

Existing Equip	Existing Equip_code	New Equip	New Equip_cod
INC 090R-1L	1	CFL-S 019WReflector-1L	1
INC 1000A-1L	2	CFL_Spiral: 20W; [TCP 18920]	2
INC 075R-1L	3	CFL-S 016W-Flood-1L	3
INC 075A-1L	4	CFL-S 020W-Spiral-1L-[TCP 18920]	4
T12 SLIM 8' 75M2-2L	5	Ballast: 4' F32 T8-2L, IS, NBF	5
T12 4' 40M2-2L	6	T8 4' 32 LBF_E2-2L	6
INC 060A-1L	7	T8 4' 32 LBF_E2-IL-8'Brkt	7
T12 4' 40M2-4L	8	CFL-S 014W-Spiral-1L	8
T12 4' 40S2-4L	9	T8 4' 32E2-2L HBF- W	9
INC 050A-1L	10	T8 4' 32E2-2L - HBF	10
INC 090R-1L	11	T8 4' 32E4-4L	11
INC 060A-1L	12	23W White Halo Sytle [TCP 59323WH]	12
INC 040A-1L	13	CFL-S 020W-Flood-1L [Sylvania CF20EL	13
INC 075A-1L	14	CFL-S 014W-Spiral-1L [TCP 18914]	14
INC 065R-1L	15	CFL-S 014W-A-Bulb-1L	15
INC 120A-1L	16	CFL-S 020W-Spiral-1L	16
T12 4' 40M2-2L	17	CFL-S 014WReflector-1L	17
Exit 15A-2L	18	CFL-S 042WSpiral-1L	18
T12 4' 40M1-1L	19	Exit-LED 2W-2L	19
INC 065R-1L,INC 100A-1L,INC 120A-1L	20	T8 4' 32 LBF_E1-1L	20
INC 100A-1L	21	CFL-S 019W-Flood-1L	21
INC 065R-1L,No Existing Fixtures	22	T8 4' 32E2-2L	22
INC 100A-1L	23	CFL-S 019WReflector-1L-[TCP1P3819]	23
INC 050A-1L	24	CFL-S 027W-Spiral-1L [TCP 18927]	24
T12 HO 8' 95S2-2L	25	T8 4' 32E4-4L-8'Brkt - Tom Special	25
T12 4' 40M2-4L	26	T8 4' 32 HBF_E2-2L w/ refl	26
T12 SLIM 8' 60M2-2L	27	T8 4' 32 HBF_E2-2L	27
MH 400S1-1L	28	CFL-S 240W-Capsule-1L	28
T12 4' 40S2-4L	29	CFL-S 014W-Spiral-1	29
INC 090G-1L	30	T8 4' 32 LBF_E4-4L	30
T12 4' 40S2-2L	31	CFL_G30 Globe: 14W	31
MP - 2F48HOT12 (75W)	32	Ballast: 4' F32 T8-2L, IS, HBF	32
T12 HO 8' 95S2-2L	33	CFL-S 023W - TCP 59023 - Promo	33



Existing Equip	Existing Equip_code	New Equip	New Equip_cod
T12 4' 40S2-2L	34	CFL-S 023W - TCP 59023	34
INC 500A-1L	35	INC 035MR-1L	35
INC 300A-1L	36	4' conversion to 1 T8 lamp	36
T12 SLIM 8' 75M2-2L	37	T8 4' 32E2 lamp ballast cover HBF	37
INC 065A-1L	38	CFL-S 019WReflector-1L-[TCP1R4019]	38
INC 200A-1L	39	CFL-S 016W-Flood-1L [TCP 1R3016]	39
T12 2' 20M1-1L	40	150 watt metal halide fixture,70 watt metal halideFlood fixture	40
T12 2' 20W, EEM-2, 2L	41	CFL-S 042W-Spiral-1L	41
T12 4' 40S1-1L	42	TCP 55815WH WALL FIXTURE	42
INC 075R-1L	43	CFL-S 009WGlobe-1L	43
INC 085A-1L	44	Exit-LED Green 2W-2L	44
INC 150A-1L	45	CFL-S 014W-Flood-1L	45
MP - 175W MH	46	CFL_R30 Flood: 14W	46
INC 120 WATT R-FLOOD-1L	47	TCP 11360 WHITE mushroom	47
T12 4' 34M2-4L (WS)	48	4' wrap fixture	48
INC 040G-1L	49	T8 4' 32E2-2L - wash lens	49
INC 300A-1L	50	T8 4' 32E2-2L - Copy - Copy	50
T12 SLIM 8' 75M2	51	T8 2' 17E1-1L	51
INC 085R-1L	52	T8 2' 17 LBF_E2-2L	52
INC 025A-1L	53	T8 4' 32E1-1L	53
INC 75W-1L	54	CFL-S 020W-Spiral-1L-3500K	54
INC 250W-1L - Copy	55	Ballast: 4'F32 T8_2L, IS NBF - Copy	55
INC 090PAR-1L	56	T8 4' 32E2-2L - Copy - Copy - Copy	56
INC 500A-1L	57	T8 4' 32E2-2L - w/lens	57
INC 060G-1L	58	CFL_Hi-Temp: 19W 2800K	58
		4' F32 T8-2L, IS, HBF	59
		CFL-S 020WReflector-1L	60
		TCP 11630 WHITE mushroom	61
		CFL-S 023W-A-track light	62
		CF20EL	63
		T8 4' 32E2-2L HBF	64
		T8 4' 32E2-2L HBF - W	65
		T8 4' 32E2-2L HBF - W	66
		CFL-S 027W-Spiral-1L	67
		26W Flood Track Head (w/Ls)	68
		CFL_R40 Flood: 19W	69
		NEW 4' WRAP FIXTURE	70
		Track Light 32W White Halo Style	71

Existing Equip	Existing Equip_code	New Equip	New Equip_cod
		CFL_R30 Flood: 16W	72
		T8 4' 32E2-2L w/ Brkt (WS)	73
		4' F32 T8-2L, IS, NBF	74
		CFL-S 011W-Globe-1L	75
		CFL-S 065W-Spiral-1L	76
		M2-4L / new 4-lamp T8 fixture strip	77
		T8 4' 32E2-2L NBF-W/Ballast Cover	78
		35 Watt MR Lamp,CFL-S 023W-Flood-1L	79
		CFL_R20 Flood: 14W	80
		CFL-S 018W-Flood-1L	81
		CFL-S 015W-Flood-1	82
		T8 4' 32E2-2L - Copy	83
		CFL-S 018W-Flood-1L-Duplicate	84
		CFL-S 018W-Flood-1L - Copy	85
		CFL-S 018W-Flood-1L+CTRL	86
		T8 4' 32 HBF_E2-2L - Copy	87
		T8 4' 32E2-2L - W/Reflector - Copy	88
		CFL-S 011W-Flood-1L+CTRL	89
		CFL_R30 Flood: 11W Instabright	90
		T8 4' 32E2-2L-Duplicate	91
		CFL_R40 Flood: 18W 3pc	92
		Exit-LED 2W-2L,Exit-LED Red 2W-2L	93
		CFL Outdoor Floodlight Fixture - 42W	94
		CFL-S 023W-Flood-1L	95
		CFL-S 014WGlobe-1L	96
		CFL-S 019WGlobe-1	97
		NEW 100 watt metal halide	98
		150 watt metal halide	99
		CFL-S 015W-Flood-1L	100
		8' T8 ballast cover	101

# Evaluation of the RightLights Program

## APPENDIX A Table 2

### Site Visits Results

Site Number	Business Type	Existing Equip. Code	New Equip. Code	Dbase Msr Qty	Dbase kW per existing unit	New kW per unit	Qty Verified	Working? (Y/N)	Removals? If Yes, when removed and why	Customer Satisfaction (1=extremely dissatisfied and 5=extremely satisfied)	Why satisfied/dissatisfied?	Recommendations
1	ENT	1	1	2	0.090	0.019	2	Yes	none	5	good concept, like the program, use the lights at home	none
2	CS	2	2	10	0.1	0.02	10	Yes	0	2		
2	CS	2	2	78	0.1	0.02	85	Yes	Many turned off during day, but all but three are functioning. Contact complained of poor light quality.	2		
2	CS	3	3	18	0.075	0.016	18	Yes	0	2		
2	CS	2	2	2	0.1	0.02	2	Yes	0	2		
2	CS	4	4	3	0.075	0.02	3	Yes	0	2		
2	CS	5	5	9	0.168	0.059	9	Yes	0	2		
2	CS	6	6	5	0.088	0.052	5	Yes	0	2		
2	CS	5	7	3	0.168	0.059	3	Yes	0	2		
3	SO	7	8	11	0.060	0.014	11	Yes	none	no comment	no comment	no comment
4	SO	5	9	21	0.168	0.079	23	Yes	None	5	Extremely happy with program, thought it improved light quality and brightened up his shop.	
4	SO	8	10	2	0.176	0.079	2	Yes	0	5		
4	SO	4	4	1	0.075	0.02	1	Yes	0	5		
4	SO	9	11	8	0.192	0.112	8	Yes	0	5		
4	SO	10	12	6	0.05	0.023	6	Yes	0	5		
4	SO	10	12	0	0	0	0	0	0	5		
5	SIC	11	13	2	0.09	0.02	1	Yes	One was removed because the light caused eye pain. Removed shortly after install.	5	Easy and nice	
5	SIC	12	14	5	0.06	0.014	3	Yes	2 have been removed. Have been sitting on shelf since participation	5		
5	SIC	12	14	2	0.06	0.014	2	Yes	0	5	It was difficult to tell what the program had installed and what the owner had put in on her own. She had liked the cfls and added additional bulbs are her own.	
6	SO	13	15	2	0.040	0.014	2	Yes	none	5	Pleased, no burn outs, quick and professional	
6	SO	7	15	2	0.060	0.014	2	Yes	none	5		
6	SO	7	15	2	0.060	0.014	2	Yes	none	5		
6	SO	14	16	1	0.075	0.02	1	Yes	none	5		
7	ENT	15	17	6	0.065	0.014	6	Yes	none that they know of	no comment	no comment	none
7	ENT	15	17	1	0.065	0.014	1	Yes	none			
7	ENT	15	17	3	0.065	0.014	3	Yes	none			
7	ENT	16	18	6	0.120	0.042	6	Yes	none			
7	ENT	17	6	2	0.088	0.052	2	Yes	none			
7	ENT	18	19	3	0.030	0.004	3	Yes	none			

Site Number	Business Type	Existing Equip. Code	New Equip. Code	Dbase Msr Qty	Dbase kW per existing unit	New kW per unit	Qty Verified	Working? (Y/N)	Removals? If Yes, when removed and why	Customer Satisfaction (1=extremely dissatisfied and 5=extremely satisfied)	Why satisfied/dissatisfied?	Recommendations
7	ENT	19	20	5	0.050	0.027	5	Yes	none			
7	ENT	17	6	1	0.088	0.052	1	Yes	none			
7	ENT	20	21	4	0.096	0.019	4	Yes	none			
8	CS	17	22	29	0.088	0.059	29	28 working	none	5		none
9	SR	7	8	2	0.06	0.014	2	1	Burned out	5	Didn't want to retro T12 fixtures because they like the way the current bulbs make the art look. They do however have lots of trouble with burnouts and have to replace ballast and lamps frequently.	
9	SR	15	3	1	0.065	0.016	1	0	Burned out	5		
9	SR	15	1	1	0.065	0.019	1	1	0	5		
9	SR	21	1	1	0.1	0.019	1	1	0	5		
10	SR	22	13	4	0.04875	0.02	4	Yes	0	5		
10	SR	23	23	1	0.1	0.019	1	Yes	0	5		
10	SR	23	4	1	0.1	0.02	1	Yes	0	5		
10	SR	23	24	4	0.1	0.027	4	Yes	0	5		
11	SR	24	17	9	0.050	0.014	9	Yes	2 replaced with CFLS	5	good lightbulbs, happy	none
12	MAN	25	25	15	0.227	0.112	15	Yes	none	4.5	mostly satisfied but they missed the shop area and he has to fill out another form and get the process started for the shop.	Increase the rebate amount to 50% of cost.
12	MAN	17	6	30	0.088	0.052	30	Yes	none			
12	MAN	26	26	45	0.176	0.079	32	31	none			
12	MAN	27	27	5	0.123	0.079	5	Yes	none			
12	MAN	28	28	33	0.458	0.24	33	Yes	none			
13	SR	12	14	4	0.06	0.014	4	Yes	None	4	Wished he had decided to fully participate, sat on the second audit form and missed out.	
14	ENT	23	24	3	0.1	0.027	1	Yes	Yes, two of the bulbs were removed for being too bright (wanted more romantic lighting) and are sitting on the shelf near the cash register.	5	Free bulbs are always good.	
15	SR	7	8	4	0.06	0.014	4	3	One was burned out.	4	Appreciate the bulbs, but they only worked for her in the window displays	
15	SR	7	8	1	0.06	0.014	1	Yes	0	4		
15	SR	7	16	2	0.06	0.02	0	NA	Did like the light, so the light was removed.	4		
16	SR	15	17	10	0.065	0.014	10	7	2 replaced with old lights, one just not replaced - TCPS	5	free lights	none
17	ENT	1	1	8	0.090	0.019	8	7 working	Yes, 3 total recently have burned out TCPs	4	satisfied, energy savings, easy	none
17	ENT	1	1	12	0.090	0.019	12	Yes				
17	ENT	7	29	1	0.060	0.014	1	Yes				
17	ENT	7	29	3	0.060	0.014	3	Yes				
17	ENT	29	30	1	0.192	0.102	1	Yes				
177	ENT	30	31	8	0.090	0.014	8	Yes				

Site Number	Business Type	Existing Equip. Code	New Equip. Code	Dbase Msr Qty	Dbase kW per existing unit	New kW per unit	Qty Verified	Working? (Y/N)	Removals? If Yes, when removed and why	Customer Satisfaction (1=extremely dissatisfied and 5=extremely satisfied)	Why satisfied/dissatisfied?	Recommendations
17	ENT	29	32	8	0.192	0.079	8	Yes				
18	ENT	1	1	8	0.090	0.019	8	0	Yes, 4 replaced with original 90w lights	4	satisfied but need more lights	more lights
18	ENT	1	1	32	0.090	0.019	23	Yes	9 from the rear room have been returned to original bulbs for more intense light. These nine have been used to replace burned out bulbs from the from room and now they're out of replacements and using old lights to replace burn outs.			
18	ENT	31	22	4	0.096	0.059	4	Yes	no			
19	ENT	15	17	8	0.065	0.014	8	Yes	5 burned out and replaced with old lights	4.5	satisfied/likes the lightbulbs and energy savings	need a 6 month follow up and opportunity to get replacement bulbs
19	ENT	15	17	35	0.065	0.014	35	30				
20	SR	24	33	5	0.050	0.023	5	Yes		3	Lighting wasn't suitable for clothing store, need more light	Need more light, tailor the program to each type of business, different lighting needs
20	SR	15	34	21	0.105	0.023	11	Yes	no removals but 10 old lights brought back in to provide more light. Customers were having a hard time seeing the colors of the clothes and were taking them outside. To avoid embarrassment, she brought the old ones.			
20	SR	24	35	6	0.050	0.035	6	Yes				
20	SR	24	34	6	0.075	0.023	6	Yes				
21	ENT	7	8	1	0.060	0.014	0	n	yes, one in bathroom, not bright enough	5	replaced bathroom bulb with higher output, 75w equivalence but someone stole it. Replaced it and it was stolen again. Now it's back to incandescent due to theft.	
21	ENT	7	8	3	0.060	0.014	3	Yes	n		Tim replaced all the lights and added a more efficient cooler to meet the 20/20 program during the energy crisis. For this program, they were able to replace the 8 bulbs that had been burned out and replaced with old Incandescent he had from earlier.	
21	ENT	7	8	3	0.060	0.014	3	Yes				
21	ENT	7	8	1	0.060	0.014	1	Yes				
22	MOTEL	32	36	2	0.132	0.03	2	Yes	0	5	Provides much better night lighting around the hotel, especially the back of the building.	

Site Number	Business Type	Existing Equip. Code	New Equip. Code	Dbase Msr Qty	Dbase kW per existing unit	New kW per unit	Qty Verified	Working? (Y/N)	Removals? If Yes, when removed and why	Customer Satisfaction (1=extremely dissatisfied and 5=extremely satisfied)	Why satisfied/dissatisfied?	Recommendations
22	MOTEL	33	37	4	0.227	0.079	4	Yes	0	5		
22	MOTEL	34	22	2	0.096	0.059	2	Yes	0	5		
22	MOTEL	11	38	3	0.09	0.019	3	Yes	0	5		
22	MOTEL	3	39	3	0.075	0.016	3	Yes	0	5		
22	MOTEL	12	14	4	0.06	0.014	4	Yes	0	5		
22	MOTEL	35	40	6	0.583333	0.10833	6	Yes	0	5		
22	MOTEL	36	41	13	0.4	0.042	11	Yes	could not find other two, asked for assistance, but they did know where any additional lights were located.	5		
23	SR	7	42	16	0.060	0.015	16	n	all being replaced, equipment defect	4	would have had a higher rating if exterior lights experience better. Only an equipment problem, people have been good to work with. Have noticed 40% savings on bills	
23	SR	7	8	3	0.060	0.014	3	Yes	none			
23	SR	7	8	11	0.060	0.014	11	Yes	2 replaced with CFLS, burned out			
23	SR	37	32	9	0.168	0.079	9	Yes	none			
24	SO	13	43	1	0.04	0.009	1	Yes	0	0		
24	SO	7	8	1	0.06	0.014	1	Yes	0	0		
24	SO	7	8	3	0.06	0.014	2	Yes	Could not find third bulb.	0		
24	SO	7	8	2	0.06	0.014	2	Yes	0	0		
25	ENT	18	44	2	0.030	0.004	2	Yes	none	3	replaced one of 3 under the counter, didn't do the other 2. Not really needed though	none
25	ENT	15	45	3	0.065	0.015	1	Yes	2 never installed above counter			
26	SR	38	46	18	0.065	0.014	18	Yes	none	5	energy savings, easy for them even though they rent and don't pay the electric bill they are willing participants.	none
26	SR	38	46	7	0.065	0.014	7	Yes	none			
27	SIS	1	1	2	0.090	0.019	2	Yes	none	4	Lights are great but they don't pay the electric bill, it's included in their rent. Although they got a rent reduction, don't see the benefit really and they had 2 covers fall down in the teacher's area and crack. Not safe.	none
27	SIS	14	16	9	0.075	0.02	9	Yes	none			
27	SIS	39	47	8	0.200	0.04	8	Yes	none			
27	SIS	29	48	4	0.288	0.059	4	Yes	none			
27	SIS	29	22	30	0.192	0.059	30	Yes	none			
27	SIS	29	49	95	0.192	0.059	95	Yes	none			
27	SIS	31	50	31	0.096	0.059	31	Yes	none			
27	SIS	29	30	6	0.192	0.102	4	4	2 not installed		Two were not replaced, old lights	
27	SIS	31	6	6	0.096	0.052	6	1 not working	none		One not working, in process of fixing	

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27	SIS	40	51	1	0.025	0.02	1	Yes	none			
27	SIS	41	52	5	0.050	0.03	5	Yes	none			
27	SIS	42	53	2	0.060	0.031	2	Yes	none			
27	SIS	14	54	2	0.075	0.02	2	1 not working TCP	none		TCP will be replaced	
27	SIS	26	55	17	0.176	0.059	17	Yes	none			
27	SIS	31	56	11	0.096	0.059	11	Yes	none			
27	SIS	29	30	10	0.192	0.102	10	Yes	none			
27	SIS	29	57	21	0.192	0.059	21	Yes	none			
28	ENT	43	3	6	0.075	0.016	6	Yes	none	no comment	no comment	none
28	ENT	14	58	3	0.075	0.019	3	2	1 replaced with old when blew out			
29	HEALTH	17	22	4	0.088	0.059	4	Yes	none	5	work done well, easy to work with. Better lights.	none
29	HEALTH	14	16	1	0.075	0.02	1	Yes	none			
29	HEALTH	17	22	13	0.088	0.059	13	Yes	none			
29	HEALTH	17	22	5	0.088	0.059	5	Yes	none			
29	HEALTH	29	59	16	0.192	0.079	16	Yes	none			
29	HEALTH	29	59	1	0.192	0.079	1	Yes	none			
29	HEALTH	1	60	10	0.090	0.02	10	Yes	none			
29	HEALTH	1	60	4	0.090	0.02	4	Yes	none			
29	HEALTH	7	61	1	0.120	0.03	1	Yes	none			
30	SR	12	62	4	0.06	0.023	4	Yes		5	Easy, very nice.	
31	SR	10	63	7	0.050	0.02	7	Yes	According to the woman working, they had replaced all the lights at the business - 64 t8 2 lamp fixtures and all cfls			
31	SR	10	63	5	0.050	0.02	5	Yes				
31	SR	10	63	11	0.050	0.02	11	Yes				
31	SR	8	64	6	0.176	0.079	6	Yes				
31	SR	8	65	43	0.176	0.079	52	Yes				
31	SR	10	38	6	0.050	0.019	6	Yes				
31	SR	8	66	6	0.176	0.079	6	Yes				
32	SO	12	14	2	0.06	0.014	1	Yes	One of the bulbs was never installed and are sitting in the reception area.	4	Would like to participate, but the costs were too high. He was a little confused about why the the retrofit cost the guy across the street 40 dollars and his estimate was sevreal hundred. Please contact in the future if prices drop or subsidy increases.	
33	SR	21	67	4	0.100	0.027	4	3	none	4	no one responding to their request for a new bulb and for reimbursement for the track which cost \$80. They were told they would be reimbursed and haven't been	
33	SR	21	68	4	0.100	0.026	4	Yes	none			

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34	SR	44	69	11	0.085	0.019	11	Yes	none	5	happy the lights still work and they were installed at the right price but the output is too dim for a display case. They get a glare on the window and need powerful lights to counteract the problem. Need a cooler light color for displays.	Currently has to go to Salinas to get more lightbulbs, make them easier to get replacements.
35	OTHER	14	16	2	0.075	0.02	2	Yes	yes, one replaced, burned out	5	cool program, good attitudes and good for the environment	none
35	OTHER	43	45	2	0.075	0.014	2	1 working	none			
36	CS	14	16	2	0.075	0.02	2	Yes	None	4	Just two bulbs, not a big deal.	
37	SO	15	45	7	0.065	0.014	7	Yes	None	4	no real comment	
38	SO	29	30	20	0.192	0.102	19	2 burned out 1 4L really a 2L	no removals, 2 burned out but not removed	5	30% savings, \$80/mo, very efficient and quick service	Increase awareness, he learned through a friend
39	SIC	14	16	10	0.075	0.02	8	Yes	Two incandescents had been overlooked	5	At first they hated the color of the lights, but the contractor came back out and replaced all of them with a warmer temperature tube. He was really nice about and as a result, they love the program.	no recommendations
39	SIC	14	16	2	0.075	0.02	2	Yes	0	5		
39	SIC	45	18	7	0.15	0.042	7	Yes	0	5		
39	SIC	45	18	4	0.15	0.042	4	Yes	0	5		
39	SIC	46	70	15	0.215	0.112	15	Yes	0	5		
39	SIC	46	70	1	0.215	0.112	1	Yes	0	5		
39	SIC	47	71	1	0.12	0.032	1	Yes	0	5		
39	SIC	47	71	49	0.12	0.032	49	Yes	0	5		
39	SIC	47	71	4	0.15	0.032	2	Yes	Could not find last two bulbs backstage	5		
40	SR	21	67	10	0.100	0.027	10	Yes	none	5	more efficient, happy that they came in and told them about the program	
41	SR	43	72	8	0.075	0.016	8	7	2 replaced with CFLS	5	better lightbulbs, very cordial to work with, good experience	
41	SR	21	3	3	0.100	0.016	3	Yes				
42	SO	48	73	14	0.144	0.059	14	Yes	All the trouffers were replaced in the larger sister office next door as well. Also part of program?	0		
43	SR	29	74	12	0.192	0.059	12	Yes	none	not provided	likes the program, good to work with, energy savings	none
43	SR	49	75	3	0.040	0.011	3	Yes	none			
43	SR	7	8	1	0.060	0.014	1	Yes	none			
43	SR	50	76	4	0.300	0.065	4	Yes	none			
43	SR	51	77	74	0.336	0.112	74	Yes	none			
43	SR	26	10	4	0.176	0.079	4	Yes	none			
43	SR	26	10	2	0.176	0.079	2	Yes	none			
43	SR	17	6	2	0.088	0.052	2	Yes	none			



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43	SR	17	6	4	0.088	0.052	4	Yes	none			
43	SR	37	78	2	0.168	0.059	2	Yes	none			
43	SR	17	6	1	0.088	0.052	1	Yes	none			
43	SR	26	10	2	0.176	0.079	2	Yes	none			
43	SR	29	11	12	0.192	0.112	0	n	never installed, more complicated than first thought due to paint room special fixtures.			
44	SR	11	38	7	0.09	0.019	7	6	One bulb was burned out	5	Installed lights are overwhelmed by the rooms T8 fixtures so its not a big deal.	
45	SR	12	14	4	0.06	0.014	4	Yes	0	5	Really likes the program and cfls, has over time tried to install cfls in all incandescent fixtures.	
45	SR	12	4	6	0.06	0.02	6	Yes	0	5		
46	SO	14	16	11	0.075	0.02	11	Yes	None	5	Wished they would have been able to do the rest of the building - the owner would only allow them to switch out the lights in and around the parking garage.	
46	SO	21	67	1	0.1	0.027	1	Yes	None	5		
47	SR	7	15	12	0.060	0.014	12	Yes	not known	no comment	no comment	none
48	OTHER	10	79	5	0.05	0.023	5	Yes	Lots of T12s that were not retrofitted, lots of opportunity to save.	4	Lower prices	
49	SR	14	80	10	0.075	0.014	10	Yes	2 replaced with CFLS	5	good deal, happy to use them	
49	SR	21	67	1	0.100	0.027	1	Yes	none			
50	SO	12	14	4	0.24	0.056	4	Yes				
50	SO	12	2	4	0.24	0.08	4	Yes				
50	SO	12	2	1	0.06	0.02	1	Yes				
50	SO	12	2	1	0.06	0.02	1	Yes				
50	SO	12	2	1	0.06	0.02	1	Yes				
50	SO	4	2	2	0.15	0.04	2	Yes				
50	SO	4	4	2	0.15	0.04	2	Yes				
50	SO	23	24	1	0.1	0.02	1	Yes				
51	CS	15	3	28	0.065	0.016	28	Yes	no	5	seeing savings of \$100s per month, very satisfied	none
51	CS	31	6	6	0.096	0.052	6	Yes	no			
52	SO	29	5	51	0.176	0.059	51	Yes	none	no comment	no comment	no comment
53	SO	15	45	5	0.065	0.014	5	Yes	none	5	like free lightbulbs, professional	none
53	SO	52	1	4	0.085	0.019	4	Yes	none			
54	OTHER	53	81	2	0.038	0.018	2	Yes	none	no comment	no comment	no comment
55	OTHER	54	82	24	0.075	0.01738	24	22	8 have burned out and been replaced, 2 currently out not yet replaced TCP			
55	OTHER	54	81	3	0.100	0.018	3	3	none			
55	OTHER	17	83	10	0.088	0.059	10	10	none			
55	OTHER	54	81	3	0.075	0.018	3	3	none			
55	OTHER	54	84	4	0.075	0.018	4	4	none			

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55	OTHER	55	85	2	0.375	-0.022	2	2	none			
55	OTHER	54	81	3	0.100	0.018	3	3	none			
55	OTHER	54	86	4	0.075	-0.002	4	4	none			
55	OTHER	29	5	3	0.288	0.03233	3	3	none			
55	OTHER	29	87	11	0.288	0.079	12	12	none			
55	OTHER	29	87	11	0.288	0.079	12	12	none			
55	OTHER	29	87	11	0.288	0.079	12	12	none			
55	OTHER	29	87	10	0.288	0.079	1	1	none			
55	OTHER	17	22	11	0.088	0.059	11	11	none			
55	OTHER	29	87	20	0.288	0.079	20	20	none			
55	OTHER	29	87	10	0.288	0.079	10	10	none			
55	OTHER	29	88	27	0.288	0.059	27	27	none			
55	OTHER	54	81	5	0.075	0.018	5	5	none			
55	OTHER	17	22	6	0.088	0.059	6	6	none			
55	OTHER	54	89	4	0.075	-0.009	4	4	none			
55	OTHER	14	16	6	0.075	0.02	6	6	none			
55	OTHER	14	16	2	0.075	0.02	2	2	none			
55	OTHER	15	90	3	0.065	0.011	3	3	none			
55	OTHER	14	16	1	0.075	0.02	1	1	none			
55	OTHER	17	56	2	0.088	0.019	2	2	none			
55	OTHER	17	56	6	0.103	0.04567	6	6	none			
55	OTHER	29	91	1	0.288	-0.021	1	1	none			
55	OTHER	54	84	4	0.075	0.018	4	4	none			
55	OTHER	17	22	3	0.088	0.059	3	3	none			
55	OTHER	15	92	1	0.065	0.018	1	1	none			
55	OTHER	17	22	6	0.088	0.059	6	6	none			
55	OTHER	17	83	4	0.088	0.059	4	4	none			
55	OTHER	14	16	2	0.075	0.02	2	2	none			
55	OTHER	54	84	31	0.075	0.018	31	31	none			
55	OTHER	31	22	2	0.096	0.059	2	2	none			
55	OTHER	14	8	6	0.075	0.014	6	6	none			
55	OTHER	54	84	12	0.075	0.018	12	12	none			
55	OTHER	17	22	4	0.088	0.059	4	4	none			
55	OTHER	17	83	4	0.088	0.059	4	4	none			
55	OTHER	54	84	2	0.075	0.018	2	2	none			
55	OTHER	17	22	1	0.088	0.059	1	1	none			
55	OTHER	17	22	3	0.088	0.059	3	3	none			
55	OTHER	54	92	7	0.075	0.018	7	7	none			
55	OTHER	18	93	5	0.030	0.004	5	5	none			
55	OTHER	14	16	3	0.075	0.02	3	3	none			
55	OTHER	50	94	2	0.300	0.042	2	2	none			
55	OTHER	17	22	2	0.088	0.059	2	2	none			
56	SR	56	95	3	0.09	0.023	3	Yes	None		Could not find anyone who knew about the program...it's a record store....	
57	ENT	7	96	2	0.060	0.014	2	Yes	none	5	happy with the lights, trying to get a replacement	none
57	ENT	43	97	4	0.075	0.019	4	1	1 replaced with old, trying to get new TCP			
58	ENT	7	15	2	0.060	0.014	2	1 out	2 burned out TCP	5	energy savings, happy to use them	doesn't think the spirals look safe, need to be covered

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59	SR	7	15	1	0.060	0.014	1	Yes	none	5	Likes the new lights in his fan, he used to have burnouts frequently but hasn't had a problem with the new lights	none
59	SR	14	16	4	0.075	0.02	4	Yes	none			
59	SR	21	67	4	0.100	0.027	4	Yes	none			
60	SR	50	98	2	0.450	0.1	2	Yes	none	5	no replacements, very professional installation, thoroughly explained and work was done quickly and with safety in mind which was important to the store.	none
60	SR	57	#N/A	2	0.500	0.165	2	Yes	none			
60	SR	14	16	4	0.075	0.02	4	Yes	none			
60	SR	37	78	14	0.168	0.059	14	Yes	none			
60	SR	17	6	1	0.088	0.052	1	Yes	none			
61	MAN	21	67	5	0.1	0.027	1	Yes	Only one of the five lights is still operable (the one in the bathroom). The others were used in pulldown lights and broke during use. TCP but not burn out issue		Need to also offer industrial strength bulbs - the cfls provided excellent light but weren't sturdy enough for use where the auditor had recommended.	
62	SR	58	75	6	0.06	0.011	5	Yes,	Two have been removed - one burned out and one broke (both rather recently) TCP		very easy.	
63	SO	7	8	7	0.060	0.014	7	6	1 burned out, TCP	5	Great deal, helpful, pleased	none
63	SO	15	45	4	0.065	0.014	4	3	1 burned out, TCP			
63	SO	14	16	1	0.075	0.02	1	1	none			
63	SO	7	8	38	0.060	0.014	38	34	none			
63	SO	15	100	7	0.065	0.015	7	7	none			
64	SR	15	17	3	0.065	0.014	3	2	1 burned out, TCP	no comment	did a good job	none
64	SR	37	101	25	0.168	0.059	25	Yes	none			
64	SR	37	101	25	0.168	0.059	25	Yes	none			
65	SR	12	14	2	0.06	0.014	7	Yes	None	4	Wished program had not been so expensive so that they would have been able to change all the t12 fixtures.	