



Commercial LED Lighting Program 2012

Program Manual

November 2012

CenterPoint Energy's Commercial LED Lighting Program is implemented by Ecova as an independent contractor. For more information about CenterPoint Energy's energy efficiency incentive programs, please visit www.centerpointefficiency.com.

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I. Program Description

1. Introduction

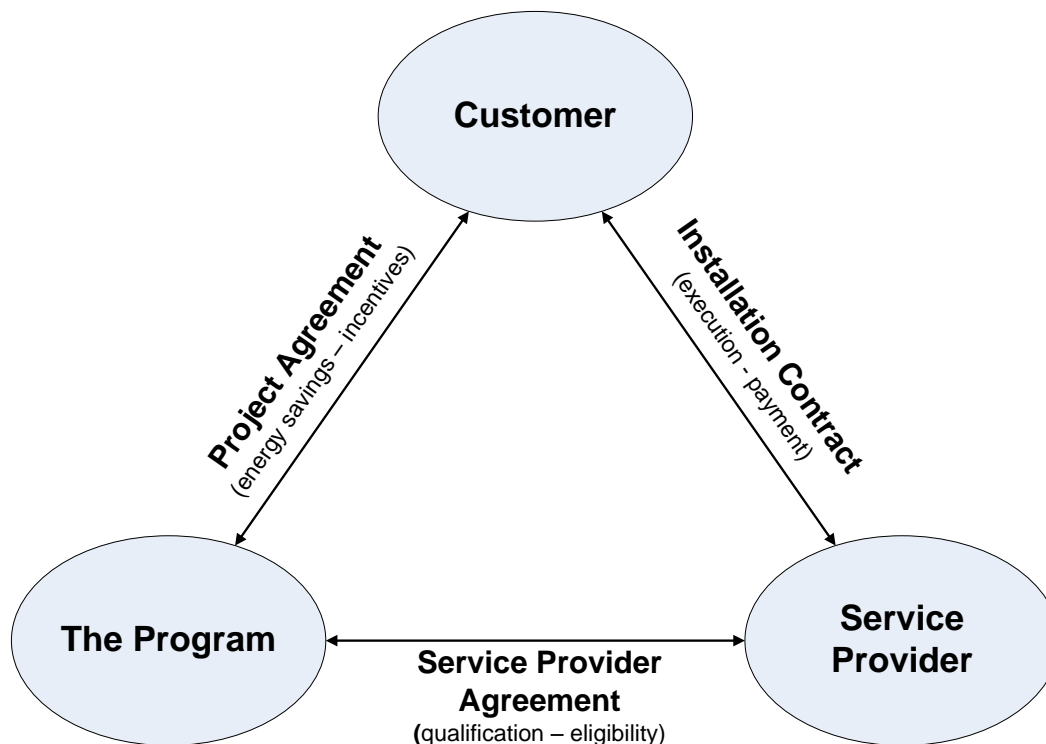
CenterPoint Energy is an electric transmission and distribution utility regulated by the Public Utility Commission of Texas (PUCT) and mandated by the PUCT to offset its demand growth by a certain percentage each year through energy efficiency programs. Therefore, CenterPoint Energy pays incentives or rebates to program participants for the installation of high efficiency equipment that produces measurable and verifiable demand savings.

The 2012 CenterPoint Commercial LED Lighting Program (the “Program”) offers significant performance incentives for commercial, governmental, and not-for-profit customers (“Customers”) to upgrade parking lots, garages, and other eligible outdoor facilities with energy-efficient LED lighting and controls. The incentives are based on verified on-peak demand and annual energy savings resulting from LED installations or retrofits and lighting controls. These incentives allow CenterPoint customers to recoup installation savings in as little as one year, with all future savings and benefits accruing to the property owners. Ecova has been contracted by CenterPoint to implement the Program as an independent contractor. Funding for the Commercial LED Lighting Program is provided by CenterPoint as part of the company’s commitment to reduce energy consumption and demand.

Light-emitting diodes (LEDs) can produce more light per watt than conventional high-intensity discharge lamps (e.g., metal halide and high-pressure sodium) and therefore may require less energy to deliver the same amount of light. LEDs also offer other significant advantages over conventional lamps commonly used in large outdoor/covered areas (e.g., parking lots, garages, and walkways) and other non-conditioned spaces. See Section 1.3 and Appendix F for additional information on LED lighting.

There are two sections in this Program Manual:

- **Section I: Program Description**
Provides a general introduction to the Program, including Program objectives, eligibility requirements, LED information, incentives, project process, and contractual provisions
- **Section II: Program Materials**
Includes all Program contracts, agreements, and forms, with detailed explanations and instructions



To participate in the Program, Service Providers (“Service Providers”) must submit a Service Provider Application for approval by the Program. Names of qualified Service Providers are put on a List of Qualified Service Providers. These Service Providers receive training and assistance from the Program, but each Service Provider is exclusively responsible for the completion and quality of LED installations.

To participate in the Program, Customers select at least one qualified, licensed lighting Service Provider from the Program’s List of Qualified Service Providers to conduct a lighting audit of the existing facility, produce an LED Installation Recommendation and price quote, submit a Project Application to the Program Implementer, and/or provide other consultative services. Upon approval of the Project Application, the Customer enters into a Project Agreement with the Program Implementer specifying the LED lighting and controls to be installed, the estimated energy savings that will result, and the incentives to be paid by CenterPoint following the verified completion of the installation. The contract and payment terms for any products or services (including the LED installation itself) provided by the Service Provider/s is exclusively between the Customer and Service Provider/s.

If Customers already have a Service Provider they wish to work with, that Service Provider may submit a Service Provider Application for approval and training to participate in the Program. Customers who choose to use their own in-house lighting installation team may designate a representative from their team to sign the Service Provider Agreement.

1.1 BACKGROUND

Electricity is a necessity that few can do without. Unfortunately, most resources used to create electricity are finite and come with both financial and environmental costs. Although renewable energy — wind, solar, and geothermal — is becoming cost-competitive compared with fossil fuels, it only accounts for a small percentage of the generation portfolio nationwide.

CenterPoint provides a variety of programs designed to help customers identify areas for energy efficiency improvements, promote the installation of energy efficiency measures by providing financial incentives, and support new energy-efficient technologies within the CenterPoint service area. The Commercial LED Lighting Program is a market-transformation program designed to increase the adoption and growth of LED lighting.

1.2 PROGRAM OBJECTIVES

The primary objective of the 2012 Commercial LED Lighting Program is to provide performance incentives for customers to upgrade parking lots, garages, and other facilities with energy-efficient LED lighting and controls.

Additional program objectives are to:

- Increase awareness of LED lighting technology
- Introduce LED lighting technology into the marketplace
- Develop an infrastructure of trained LED installation and maintenance service providers

1.3 LEDS

Light-emitting diodes (LEDs) can offer significant cost savings and other advantages over conventional lighting commonly used in large outdoor and covered areas, such as parking lots and garages:

- **Energy Savings:** LEDs can produce more light per watt than conventional high-intensity discharge lamps (e.g., metal halide or high-pressure sodium) and may therefore require less energy to deliver the same amount of light.
- **Operational Savings:** LEDs can have very long life spans (50,000+ hours), which reduce the frequency of costly maintenance and replacement service.

Fixture Type	Wattage	Lifespan		Energy Use (24 hrs/day) Annual	Annual Operating Cost (maintenance + electricity) @ \$0.11/kWh	LED Payback Period @ \$0.11/kWh
		Hours	Yrs			
HPS	191 W	24,000	2.7	1,674 kWh	\$195	n/a
LED	78 W	50,000	5.7	683 kWh	\$75	3.9 yrs

SOURCE: "Demonstration Assessment of Light-Emitting Diode (LED) Area Lights for a Commercial Garage"
(U.S. Department of Energy, November 2008)

- **Light Quality:** LEDs produce a very clean, bright light. The superior color, uniformity, and visibility provided by LED lighting can improve user safety and visual comfort while enhancing property values.
- **Future Savings:** LEDs are a rapidly evolving technology with a record of efficiency, performance, and longevity advancements—along with reduced manufacturing costs—every year. Amid increasing public emphasis on energy efficiency, LED lighting can minimize a major component of a facility’s taxable carbon footprint.
-
- **Dimming:** LEDs can be precisely controlled with daylight and occupancy sensors.
- **Durability:** Unlike conventional lighting, LEDs are very tolerant of temperature variations, vibrations, and on/off cycles. LED fixtures can also be tightly sealed, which prevents the interior accumulation of dirt, insects, and moisture and eliminates time-consuming disassembly and cleaning.
- **Environmental:** LEDs contain no mercury or lead.

See Appendix F for more information about LED lighting technology, applications, standards and testing.

1.4 PROGRAM CONTACT INFORMATION

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2. Eligibility

2.1 PROJECT ELIGIBILITY

Non-residential commercial, governmental, and not-for-profit Customers that receive electricity service from CenterPoint and meet the participation requirements are eligible to participate in the Program.

CenterPoint Customers that have previously participated in a energy efficiency program are eligible to participate in the Program. However, incentives for energy savings resulting from an LED upgrade cannot be claimed under more than one CenterPoint energy efficiency program.

A Project (“Project”) is defined by a set of proposed and installed LED measures and estimated on-peak demand or annual energy savings resulting from the installation of said measures at an eligible site (“Site”). An eligible Site can be new construction or the retrofit of an existing facility and is defined as a parking garage, parking lot, outdoor walkway, or facility exterior. Street lighting and traffic signal lighting projects are not eligible under this Program.

All Projects must meet the following requirements:

- Commercial, governmental, not-for-profit, and other non-residential customers receiving service from CenterPoint are eligible to participate in this incentive program.
- Customers must receive distribution service voltages (≤ 34.5 kV), with the exception of educational, not-for-profit, and governmental facilities receiving transmission service voltage (≥ 69 kV).
- Residential customers are not eligible
- A single Project must produce at least 20,000 kWh annual energy savings or 2 kW peak-demand reduction.
- A Project is defined as the installation of LED measures at one Site. For example, the installations of LED measures at three parking garages owned by one parking garage management company would constitute three Projects.
 - The Program may work with Service Providers to group Projects when a single Customer has ten or more Sites and all Projects involve replacing a common set of identical or similar lighting measures. Such grouped Projects require a customized measurement-and-verification approach that must be pre-approved and developed in consultation with the Program. See section 4.2.5.2 for information regarding verification and incentive adjustments for grouped Projects.
- The Project must meet all applicable local, state, and federal regulations and permit requirements.
- General illumination lighting resulting from the Project must meet relevant IESNA luminance standards (<http://www.iesna.org>).

2.2 PROJECT COMPLETION DEADLINE

The completion deadline for 2012 projects is November 30, 2012. *A Project Application is not complete until it includes all required forms and supplementary materials.* Project completions that occur after the deadline are not guaranteed to be reviewed for the 2012 Program year.

2.3 SERVICE PROVIDER ELIGIBILITY

Service Providers include lighting contractors, consultants, manufacturers, and distributors. Customers select one or more qualified Service Providers to conduct the audit, recommend and install LED measures, and/or provide other Project-related services.

To participate in the Program and be included on the List of Qualified Service Providers, Service Providers must submit a Service Provider Application (see Section II), sign the Service Provider Agreement, and receive training. If a Customer has a preferred Service Provider, that Service Provider may submit a Service Provider Application for approval and training. Customers who choose to use their own in-house lighting installation team may designate a representative from their team to sign and submit the Service Provider Agreement for approval and training.

There are two categories of Service Providers, each with different authorized roles and eligibility requirements:

- **Installation Service Providers** may perform all Project-related services, including installation. *All Projects must register a qualified Installation Service Provider.*
- **Consultation Service Providers** may provide limited Project-related services—excluding installation—such as recommending lighting measures, designing installations, etc. *Customers choose to engage a Consultation Service Provider at their own discretion.*

Eligibility requirements for both categories of Service Providers are outlined below.

SERVICE PROVIDER ELIGIBILITY REQUIREMENTS

1. Installation Service Providers

- Service Provider must hold an Electrical Contractor business license through the Texas Department of Licensing and Regulation (TDLR) and/or the relevant municipal license for the project Site.
- Service Provider must either be a TDLR-licensed Master Electrician or employ one.
- Any Service Provider employee performing electrical work under the Program must be a licensed Electrician (apprentice / journeyman / master) under the TDLR. Electrical work means any labor or material used in installing, maintaining, or extending an electrical wiring system and the appurtenances, apparatus, or equipment used in connection with the use of electrical energy in, on, outside, or

attached to a building, residence, structure, property, or premises. The term includes service entrance conductors as defined by the National Electrical Code.

- Service Provider must show proof of financial responsibility, for example:
 - Annual Reports and 10-Ks for the two most recent years if a publicly traded company
 - Copies of financial statements for the two most recent years or a Dun & Bradstreet Report if a privately held company
 - State-authorized Certificate of Good Standing
- Service Provider must follow U.S. Department of Labor's Occupational Safety & Health Administration (OSHA) electrical standards and safety regulations as outlined at <http://www.osha.gov/SLTC/electrical/standards.html>.
- Service Provider must have Workers' Compensation insurance, Employer's Liability insurance, Commercial General Liability and Automobile Liability (specifics available in Appendix B: Installation Service Provider Insurance Requirements).

2. Consultation Service Providers

- Service Provider must show proof of financial responsibility, for example:
 - Annual Reports and 10-Ks for the two most recent years if a publicly traded company
 - Copies of financial statements for the two most recent years or a Dun & Bradstreet Report if a privately held company
 - State-authorized Certificate of Good Standing
- Service Provider must provide proof of General Liability insurance coverage of at least \$500,000.
- LED lighting product manufacturers and distributors that apply to become Program-qualified Consultation Service Providers must provide evidence that at least one of their products is on the DesignLights Consortium's Qualified Products List or has been previously approved for incentives by a Texas utility. (see Measure Eligibility section below)

2.4 MEASURE ELIGIBILITY

2.4.1 Measure Eligibility Criteria

Eligible LED lighting products¹ meet the requirements of one of the following qualifying programs:

- **ENERGY STAR[®]**: http://www.energystar.gov/index.cfm?c=ssl.pr_commercial
- **DesignLights Consortium[™]**:
http://designlights.org/solidstate.about.QualifiedProductsList_Publicv2.php
- LED products that have been previously approved for incentives by a Texas electric utility are likely also qualified for incentives under this program.

The Program may also evaluate and qualify proposed LED lighting products on a project-by-project basis in a market-neutral, non-discriminatory manner. Proposed LED products will be evaluated using the applicable ENERGY STAR[®] or DesignLights Consortium criteria, standards and testing requirements in effect at the time of Project approval:

- ENERGY STAR[®]: http://www.energystar.gov/index.cfm?c=ssl_res.pt_ssl
- DesignLights Consortium:
<http://designlights.org/solidstate.manufacturer.requirements.php>

Additional requirements include:

- Products for outdoor/uncovered applications must utilize a control measure that automatically prevents operation during daylight hours.
- Products must meet applicable Underwriters Laboratory safety standards.
- Product manufacturers must support the Solid-State Lighting (SSL) Quality Advocates program (<http://www1.eere.energy.gov/buildings/ssl/advocates.html>) and take the Lighting Facts Pledge (www.lightingfacts.com) to accurately report and disclose LED product performance based on industry standardized testing.
- Product warranty must cover the repair or replacement of defective electrical parts for a minimum of five (5) years from the date of purchase.
- The following tests must have been performed on all proposed products:
 - IESNA LM-79-08 photometric test measuring the photometric properties of SSL devices, allowing calculation of luminaire efficacy. Testing laboratory must hold NVLAP accreditation for the LM-79-08 test procedure or must be qualified, verified, and recognized through the DOE's CALiPER program.
 - In-Situ Temperature Measurement Test (ISTMT). Testing laboratory must be approved by OSHA as a Nationally Recognized Testing Lab (NRTL), must be qualified, verified, and recognized through DOE's CALiPER program, or must be recognized through UL's Data Acceptance Program.
 - IESNA LM-80-08 lumen maintenance test allowing calculation of measure lifetime, provided by LED package, array, or module manufacturer.

¹ LED replacement lamps are not eligible for incentives under this program.

2.4.2 Measure Qualification

LED products listed by ENERGY STAR[®] or the DesignLights Consortium require no further qualification.

For LED products that are not listed by ENERGY STAR[®] or the DesignLights Consortium:

Once an eligible Project has been identified, Service Providers and measure/device manufacturers may be required to provide detailed measure data and test reports in order for the Program to evaluate and qualify proposed LED measures against the criteria indicated above.

A summary of the required documentation is below, though the Program may require additional measure data in some cases. Refer to the ENERGY STAR[®] Manufacturer's Guide for Qualifying SSL Luminaires (http://www.energystar.gov/index.cfm?c=ssl_res.pt_ssl) for additional information on required testing and documentation (note: the ENERGY STAR[®] submittal process does not apply to this Program).

DOCUMENTS REQUIRED TO EVALUATE PROPOSED LED MEASURES

- a. IESNA LM-79-08 Photometric (Goniophotometry) Test Report (formatted to LM-63-03)
- b. IESNA LM-79-08 Integrating Sphere Output Report
- c. For Lumen Maintenance, use either:
 - Option 1 – Component Performance
 - LED Package Manufacturer LM-80 Test Report with results showing relative light output over time
 - In situ temperature measurement test (ISTMT) showing measured TMP_{LED}
 - Diagram or photograph of the Temperature Measurement Points for the package, array or module
 - Option 2 – Luminaire Performance
 - IESNA LM-79-08 Test Report at time = 0 and 6,000 hours respectively.
- d. For Power Supply (the ISTMT typically includes these results)
 - In situ temperature measurement test showing measured TMP_{PS}
 - Diagram or photograph of the Temperature Measurement Point for the power source
- e. Warranty (a written or electronic copy of the complete terms and conditions)
- f. A written statement indicating the forward drive current (in milliamps, mA) applied to the LEDs in the luminaire, Product Part Number of the luminaire (clarify the version or generation if it is not specified in the part number), and a description/part number of the LED Chip(s)/package(s) in the luminaire.

3. Incentives

3.1 INCENTIVE STRUCTURE

CenterPoint provides performance incentives to the Customer based on the Project’s estimated on-peak demand and annual energy savings resulting from the installation of LED measures. The 2012 Program’s incentive rates are **\$230/kW for on-peak demand reduction** and **\$0.14/kWh for annual energy savings**. Incentives are available for approved Projects on a first-come, first-served basis.

For the retrofit of existing Sites, savings are defined as the difference between on-peak demand and annual energy used before and after the LED measures installation. These savings are calculated from a baseline established by the pre-installation Field Audit Form and from the specifications and ratings of installed LED measures. Customers may also choose to conduct pre- and post-installation metering to establish savings. For new construction Projects, the baseline is calculated as a function of the code-allowed lighting power density (IECC 2009) for the Site.

Table 3.1: Equation for Estimated On-Peak kW Savings

<p>Estimated On-Peak Demand Savings (kW) = Baseline On-Peak Demand – Calculated On-Peak Demand After Installation</p>
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Table 3.2: Equation for Estimated Annual kWh Savings

<p>Estimated Annual Energy Savings (kWh) = Baseline Annual Energy Usage – Calculated Annual Energy Usage After Installation</p>
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3.2 LIMITATIONS

Approved Measures: Project incentives will be paid only for energy and demand savings directly related to approved measures that are specified in the Project Application and installed by a qualified Service Provider.

Minimum Project Size: Projects must produce at least 20,000 kWh annual energy savings or 2 kW peak-demand reduction.

Customer Annual Incentive Cap: Incentives available for any single Customer’s project/s during a Program year are limited to 30% of that year’s original annual incentive budget.

Project Incentive Cap: Incentives will be limited to 80% of the final installed cost (labor and materials) for any single LED lighting Project.

Project Payback Limitation: For Projects that would result in less than a one-year Customer payback period² for Customers, incentives will be adjusted to limit payback to at least one year.

² The payback period is defined as the amount of time required for the operational and energy-cost savings resulting from a Project to equal the installed cost of a Project after incentives.

3.3 PAYMENTS

Once the Program Implementer has verified installation completion and quality, the Program will issue the Project incentive payment to the Customer in one installment. Under no circumstances will CenterPoint make a total incentive payment that is more than 100% of the total estimated incentive payment specified in the Project Agreement.

4. Program Process

This section provides information for Customers and Service Providers on participation in the Program and on the roles, responsibilities, and processes for each Project.

4.1 SERVICE PROVIDER QUALIFICATION

Once a Service Provider has submitted a Service Provider Application and has been approved by the Program Implementer, the Service Provider will receive Program training. The schedule of trainings is available from the Field Coordinator. Online or in-person trainings will be conducted throughout the 2012 Program year in the CenterPoint service area. Upon completion of LED training and approval of the Service Provider Application, the Service Provider will be added to the List of Qualified Service Providers, which will be available on the CenterPoint Web site.

NOTE: The Program's approval of a Service Provider Application to participate in the Commercial LED Lighting Program does not represent endorsement by CenterPoint or the Program of any Service Provider's products or services.

Service Provider qualification for participation in the Program must be renewed after 12 months. Service Providers will be notified at least one month before the qualification expiration date. If the content of their Service Provider Application has not changed since the original submission, Service Providers may submit a Service Provider Qualification Renewal Agreement. Otherwise, Service Providers must submit a new Service Provider Application in order to continue participating in the Program.

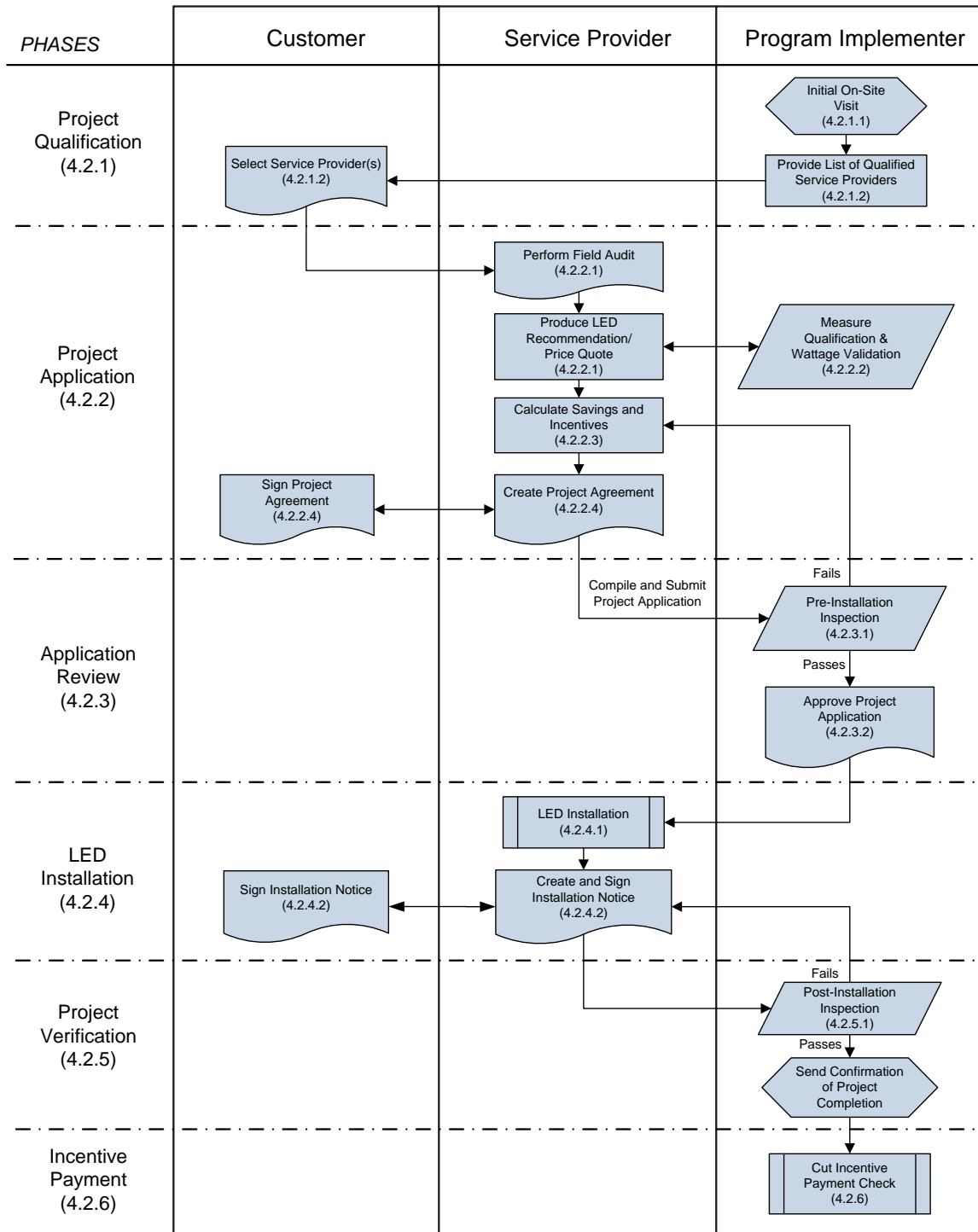
A Service Provider's qualification will be revoked if the Service Provider's Field Audits or installations fail three pre- or post-installation inspections (see sections 4.2.3.1 and 4.2.5).

4.2 PROJECT PHASES

There are six phases for each Project:

1. Project Qualification
2. Project Application
3. Application Review
4. LED Installation
5. Project Verification
6. Incentive Payment

Figure 4.2 illustrates the process flow for a typical Project.

Figure 4.2: Typical Project Process Flow


4.2.1 Project Qualification

4.2.1.1 Initial On-Site Visit

Once a Customer has expressed interest in the Program, the Program Implementer will meet with a Customer representative to discuss the Program and visit the Site to determine its eligibility under the Program. At this time, the Program Implementer will document current lighting with notes and photographs, and collect the Site's ESI-ID number. *Any Service Provider that may participate in this Initial On-Site Visit, whether by invitation of the Customer or otherwise, shall not be construed by any party as receiving endorsement of any type by the Program.*

4.2.1.2 Schedule Field Audit

Once the Program has confirmed the Customer and Project eligibility, the Customer will receive the List of Qualified Service Providers. The Customer may select one or more Service Providers from this list, or a Customer's preferred Service Provider or in-house installation team can submit a Service Provider Application for approval to participate in the Program. The Customer's preferred Service Provider must meet the criteria for the Program and be approved before performing the installation.

NOTE: *The Customer will select a Service Provider (based on the installation recommendation, price quotation, and/or other considerations) and enter into a legal contract, including payment terms, with the Service Provider for the LED installation. Neither CenterPoint nor the Program Implementer will be party to this contract between the Customer and the Service Provider.*

4.2.2 Project Application

4.2.2.1 Field Audit and Installation Recommendation/Quote

The Service Provider selected by the Customer will conduct a Field Audit (outlined in more detail below) and produce an LED Installation Recommendation and price quote. Please note that this Installation Recommendation and price quote constitute the Service Provider's bid and estimate. Customers may choose to have more than one Service Provider conduct the Field Audit and Installation Recommendation/price quote and then select from the most competitive bid. The Customer is exclusively responsible for any costs that may be incurred for performance of these services by the Service Provider.

The Field Audit identifies existing lighting in the structure in need of retrofitting. The Service Provider will also provide the Program with at least two digital photos of each existing fixture type documented on the Field Audit Form: 1) a clear photo showing the existing fixture type installed in its application, and 2) a clear and easily legible photo of the ballast part number (or the lamp part number or the lamp itself if the fixture is not ballasted). Additional details about the Field Audit are in Section II (2.2) of this Manual.

Following the Field Audit, the Service Provider will produce a customized LED Installation Recommendation, including specification of proposed measures, a complete price quote for the proposed installation (including all labor and materials), and an installation timeline with the projected start date, key milestones, and completion date.

4.2.2.2 Measure Qualification & Wattage Verification

See section 2.4.2 (Measure Qualification) for information regarding the test reports and other documentation required by the Program to evaluate and qualify proposed measures and to verify the measure wattages used to calculate Project savings. Project Applications will not be approved until all proposed LED measures are qualified.

4.2.2.3 Calculate Project Savings

The Service Provider will enter data from the Field Audit Form and the Installation Recommendation into the Program's Savings Calculator to estimate the energy savings resulting from the proposed LED installation. In most cases, these savings estimates are the basis for the incentives available for the Project. Customers may also choose to conduct pre- and post-installation metering to determine Project savings and incentives. See Appendix C for more information on using the Savings Calculator and developing and proposing project-specific measurement and verification plans.

4.2.2.4 Project Application Signature and Submission

The Service Provider will prepare and submit a Project Application describing the Site, proposed measures to be installed, estimated demand and energy savings, and the estimated incentive payments for the proposed installation.

The Project Application includes the following (items in **bold** are forms provided by the Program):

- **Application Cover Page:** Contact and other information about the Customer, Project, and Service Provider.
- **Field Audit Form:** Detailed information (including photos) about the existing lighting to be upgraded at the Site.
- Service Provider's proposed LED Installation Recommendation and quote for the total cost to the Customer, including all labor and materials. This must also include an estimated project execution timeline.
- **Savings Calculator:** Combines details from the Field Audit Form and proposed LED Installation Recommendation to estimate demand and energy savings resulting from the proposed Project.
- Measure qualification data for all proposed LED fixtures (see section 2.4.2)
- **Project Agreement:** This signed document calculates the Project incentives (based on results of the Savings Calculator) and contains the terms of the legal agreement between the Customer and the Program Implementer.
- **Incentive Recipient's W-9 Form**

The Service Provider or Customer will submit hard copies (via mail, fax, or scan/email) of all Project Application documents (with signatures, where applicable) to the Program Implementer as a single packet, as well as electronic versions of the Project Application workbook and Savings Calculator files.

More information about these forms is available in Section II of this Program Manual.

4.2.2.5 Project Queue

The date and time that a *complete* Project Application is submitted becomes its official application date, which defines the Project's placement in the Project Queue for review and for the reservation of incentive funds (assuming that the Project Application is approved and sufficient incentive funds are available). *A Project Application is not complete until it includes all required forms and supplementary materials.*

If a Project Application indicates that the Project would require more incentive funds than are currently available for the Program year, the Customer and Service Provider will be informed of the following:

- The Project Application will not be formally reviewed during the current Program year unless additional incentive funds become available.
 - *A Customer may re-submit the Project Agreement with reduced incentives in order to have the Application reviewed for the current Program year.*
- If additional incentive funds do become available during the current Program year, the Project Application would maintain its original application date and placement in the Project Queue.
- If additional incentive funds do not become available during the current Program year, the Customer and Service Provider will have until January 31 of the following year to re-submit a new application *for the same project*—with the new Program year's incentive levels—without losing their original Application Date.

4.2.3 Application Review

4.2.3.1 Pre-Installation Inspection

The Program will conduct a pre-installation inspection of all Project Sites as part of the application review process. The purpose of this inspection is to verify the baseline conditions documented in the Field Audit Form and Savings Calculator and to determine the feasibility of the proposed installation. The Program will contact the Customer and Service Provider to schedule the pre-installation inspection. The pre-installation inspection should include at least one Customer representative and one Service Provider representative so that all parties can identify any discrepancies simultaneously. *These representatives must be able to safely facilitate access to the fixtures themselves and to any components and labeling within the fixture housings.*

The inspection will verify the following information:

- The accuracy of the measures in the Field Audit Form and savings calculator
- That installation of new measures has not already begun

If a Project Site fails the inspection, the Program Implementer may reject the Project Application or, at its discretion, work with the Service Provider to make necessary corrections. If installation has begun before the pre-installation inspection — so that the baseline conditions cannot be verified — CenterPoint and/or the Program Implementer may reject the Project Application. If a Service Provider fails three pre- or post-installation inspections, the Service Provider will no longer be eligible to participate in the Program. (See Section 4.1 for more details.)

4.2.3.2 Project Approval

The Program will review the Project Application to confirm the feasibility and eligibility of the proposed Project and measures, the accuracy of the savings estimates, and the Project timeline. This review may take up to 30 days to complete. CenterPoint or the Program Implementer may request clarification or more information about any item in the Project Application. The Customer and/or Service Provider will have 10 working days to respond to such requests. If clarification or additional information is requested, the review completion date will be pushed back 10 days for each request.

Upon approval of the Project Application, the Program Implementer signs the Project Agreement (Appendix D), reserves incentive funds for the Project, and notifies the Service Provider and Customer that the Project has been approved. The Customer is responsible for executing a contract (including payment terms) with the Service Provider for the specified installation, and the installation must be completed within four months of application approval. *Neither CenterPoint nor the Program Implementer will be party to the contract between the Customer and the Service Provider.*

The Project Agreement is terminable by the Program Implementer and/or CenterPoint at will. The Project Agreement does not in any way guarantee incentive funds the Customer.

4.2.4 LED Installation

4.2.4.1 LED Installation

The Service Provider will perform the installation of the LED measures according to the timeline attached to the approved Project Application. The Program Implementer will monitor the installation and ensure that it is progressing as scheduled. The Service Provider must inform the Program Implementer of any changes to the Project timeline or measures proposed in the Project Application.

4.2.4.2 Installation Notice

Upon completion of the LED installation, the Service Provider will prepare, sign, and submit an Installation Notice to the Program Implementer. The Installation Notice includes a consolidated invoice indicating the total installed price due from the Customer and updated project savings (if necessary). The Customer must also sign the Installation Notice prior to submission.

In cases where post-installation fixtures will not be easily accessible during the post-installation inspection, the Service Provider will either make arrangements so that the Program Implementer will have ready access to the fixtures during the post-installation inspection, or provide the Program Implementer with at least three digital photos of each potentially inaccessible post-installation fixture type: 1) a clear photo showing the post-installation fixture type installed in its application, 2) a clear and easily legible photo of the fixture part number, and 3) a clear close-up photo showing the led board(s)/array(s) within the fixture.

4.2.5 Project Verification

4.2.5.1 Post-Installation Inspection

After receiving an Installation Notice, the Program Implementer will contact the Customer and Service Provider to schedule a post-installation inspection of the Project. The post-installation inspection requires the presence of at least one Customer representative and one Service Provider representative who are familiar with the Project and the Site and able to safely facilitate access to the fixtures themselves and to any components and labeling within the fixture housings. The inspection will verify the calculated savings and that the installed LED measures match those proposed in the Project Application, have been installed properly, and are functioning at optimal levels so that maximum energy savings can be achieved.

Upon the successful verification of the LED installation, the Program Implementer will notify the Customer that incentive checks are being processed.

If a Project fails an inspection, the Program Implementer and/or CenterPoint will inform the Customer and Service Provider of all issues that need to be addressed. The Program Implementer will conduct follow-up inspections until all issues have been corrected. If problems or discrepancies between the proposed measures or installation described in the Project Agreement and the actual measures installed cannot be rectified, the Program Implementer and/or CenterPoint reserve the right to adjust or cancel the Project Agreement. If a Service Provider fails three pre- or post-installation inspections, the Service Provider will no longer be eligible to participate in the Program. (See Section 4.1 for more details.)

4.2.5.2 Verification and Incentive Adjustment Factors for Grouped Projects

The Program may work with Service Providers to group Projects when a single Customer has 10 or more Sites and all Projects involve replacing a common set of identical or similar lighting measures. In such cases, the Program may choose to perform post-installation inspections on a random sample of a statistically representative number of Project Sites to confirm the number of LED measures installed and that they are functioning properly.

After these inspections are completed, all installations will be evaluated on a measure-by-measure basis to calculate an adjustment factor for energy savings, demand reductions and incentives. This adjustment factor will consider the ratio of incentives of the LED measures that pass the inspection to the total incentives associated with the LED measures inspected. The adjustment factor will then be applied to the total estimated incentive amount for payment. The formula for calculating the adjustment factor is described below:

$$\text{Incentive Adjustment Factor} = \frac{\text{Total incentives for measures that pass inspection}}{\text{Total incentives inspected}}$$

In the event the Customer or Service Provider disagrees with the incentive adjustment, the Service Provider may request that all information be reviewed again after additional clarifying information is provided by the Service Provider. However, final payment adjustments will be at the sole discretion of the Program.

4.2.6 Incentive Payment

An incentive check will be processed and delivered to the Customer within four to six weeks following the successful verification of the LED installation.

5. Contractual Provisions

5.1 ACKNOWLEDGMENT OF PROGRAM REQUIREMENTS

By executing the Project Agreement, the Customer and Service Provider warrant and represent that they are aware of and comply with all the agreement documents. The Customer and Service Provider warrant and represent that the Project meets all applicable federal, state, and local laws and regulatory requirements, including:

1. The Project does not achieve demand reduction by eliminating an existing function or shutting down a facility or operation, or result in building vacancies or the relocation of existing operations to locations outside the CenterPoint service area.
2. LED measures pursuant to the Project would not have been installed if not for the Project incentives.
3. The Project does not result in negative environmental or health effects, including effects that result from improper disposal of equipment and materials.

The Customer and Service Provider acknowledge that they have received or downloaded from the Internet and reviewed a copy of this Program Manual prior to submission of the Project Agreement. The Customer and Service Provider warrant and represent that their participation in the Program has at all times been in material compliance with the procedures and conditions set forth in this Program Manual, and that any failure to comply therewith may be treated as a breach of the Project Agreement notwithstanding the fact that such failure occurred prior to the execution of the Project Agreement. The Customer and Service Provider also acknowledge that they meet or exceed all the qualifications required to participate in the Program as described in this Program Manual and that material failure to meet the qualifications therein may be treated as a breach of the Project Agreement.

5.2 AUDITS AND RECORDS

The Customer and Service Provider will provide all records and documentation relating to each Project to the Program Implementer. The Program Implementer shall keep and maintain all documents for a period of not less than three (3) years after the incentive payment for the applicable Project. During the retention period, such records shall be made available, upon reasonable notice, for inspection during normal business hours by the Customer, Service Provider, CenterPoint, or any governmental agency having jurisdiction over the Program or any portion of the Project.

5.3 INSURANCE

The Service Provider shall not utilize occupational accident or health insurance policies, or the equivalent, in lieu of workers' compensation insurance or otherwise attempt to opt out of the statutory workers' compensation system. Installation Service Providers further represent and agree that it will carry and will cause all of its subcontractors to carry all insurance required by the Insurance Requirements (Appendix B). Prior to commencement of installation of any measures pursuant to any Project, the Installation Service Provider shall furnish to the Program Implementer a certificate or certificates of insurance showing compliance with the requirements of this paragraph and stating that the insurance described

therein shall not be canceled or terminated except on thirty (30) days' written notice to CenterPoint, or in the case of nonpayment of premium, 10 days' written notice to the Program Implementer.

5.4 AMENDMENT

No amendment or modification of any Agreement document shall be binding on either party unless it is in writing and signed by all parties.

5.5 FORCE MAJEURE

The term "Force Majeure" as used in this Program Manual will mean acts of God (except as excluded herein), strikes, lockouts or other industrial disturbances, acts of public enemies, terrorists, wars, blockages, insurrections, riots, epidemics, earthquakes, fires, priority allocations of materials or orders, restraints or prohibitions by any court, board, department, commission or agency of the United States or of any state, any arrests and restraints, civil disturbances, explosions, and inability despite reasonable diligence to obtain materials essential to the Project. Rain, snow, ice, or other adverse weather conditions will not be considered events of Force Majeure.

The term "Force Majeure" does not include events or circumstances that affect the costs of installing the measures but do not prevent performance, including, but not limited to, requirements, actions or failures to act on the part of governmental authorities (including the adoption or change in any rule or regulation or bodies); changes in market conditions; and events or conditions attributable to normal wear and tear or flaws randomly experienced in materials and equipment and their assembly and operation, unless such events and conditions are caused by an occurrence that would fit the definition of Force Majeure.

In no event will any Force Majeure extend the Project Agreement beyond its stated term.

5.6 INDEPENDENT CONTRACTOR

The Service Provider will act as and be deemed an independent contractor. The Service Provider will not act as, nor be deemed to be, an agent or employee of CenterPoint. The Customer will have the sole right to control and directly supervise the method, manner, and details of the Project, providing they are in accordance with the contract documents.

5.7 MISCELLANEOUS

The Program Implementer, Customer, or Service Provider will not assign, transfer, or otherwise dispose of any of its obligations or duties without the prior written approval of CenterPoint. Any assignment or transfer made without the express written approval of CenterPoint will be null and void.

The agreement documents constitute the entire agreement between the parties with respect to the subject matter hereof, and there are no express or implied warranties or representations upon which any party may rely beyond those set forth therein.

In the event any provision of the agreement documents is held to be void, unlawful, or otherwise unenforceable, that provision will be severed from the remainder of the agreement and replaced automatically by a provision containing terms as nearly like the void, unlawful, or unenforceable provision as possible; and the agreement documents, as so modified, will continue to be in full force and effect.



The agreement documents will be governed by, construed, and enforced in accordance with the laws of the State of Texas. The parties agree that the proper venue and jurisdiction for any cause of action not within the jurisdiction of the Public Utility Commission of Texas relating to the agreement is Harris County, Texas.

The Program Implementer, Customer, and Service Provider shall not use CenterPoint's corporate name, trademark, trade name, logo, identity, or any affiliation to solicitation for participation in the Project, without CenterPoint's prior written consent.

6. Additional Information

6.1 CONFIDENTIALITY

The Program is subject to oversight by the Public Utility Commission of Texas (PUCT). The PUCT may request a copy of any Program materials that the Program Implementer or CenterPoint receives. Sensitive company and Project information submitted by the Customer and Service Provider, such as financial statements, will be treated confidentially to the fullest extent possible, and will not be provided directly to outside parties other than the PUCT. CenterPoint and the Program Implementer will have no liability to any Customer and Service Provider or other Party as a result of public disclosure of any information submitted by the Customer and Service Provider.

6.2 PARTICIPATION COSTS

CenterPoint will not reimburse any Customer or Service Provider for any costs incurred by participating in the Program, including any costs related to preparing, submitting, or reviewing any Program documents.

6.3 SUBMISSION OF FALSE INFORMATION

CenterPoint reserves the right to discontinue its evaluation of all submittals from the Customer and Service Provider that submit false, misleading, or incorrect information.

6.4 PROGRAM WEB SITE

The program Web site is: www.centerpointefficiency.com

under "Business Energy Efficiency Programs," select "Advanced Lighting Program - Commercial"; or go directly to the page at: <http://www.centerpointenergy.com/services/electricity/business/energyefficiencyprograms/advancedlightingprogram-commercial/>

The Web site will serve as the primary source for all updated program information and materials.

6.5 PROGRAM PROMOTION AND OUTREACH

The Program Implementer will meet with interested Customers and/or Service Providers and may conduct informational public meetings to explain the Program parameters, rules. Contact the Program Manager for a schedule:

Butler Nooner
214-500-3714
bnooner@ecova.com

II. Program Materials

1. Service Provider Application

Lighting/electrical maintenance companies, contractors, manufacturers, distributors, and lighting consultants that are interested in participating in the Program must submit a Service Provider Application and signed Service Provider Agreement (Appendix A), which includes the terms and conditions of the Service Provider Agreement. Customers who choose to use their own in-house lighting installation team may designate a representative from their team to sign the Service Provider Agreement.

The first page of the Service Provider Application asks for the Service Provider's contact information, and tax ID number, as well as its Texas Department of Licensing and Regulation (TDLR) license number or relevant municipal license. Please provide a primary contact person ("Application Information") along with his/her contact information.

The Service Provider must provide the name of each employee who will potentially work on a Project, along with his/her relevant experience and his/her TDLR license number. Any Service Provider employee performing electrical work under the Program must be a licensed Electrician (apprentice / journeyman / master) under the TDLR. Electrical work means any labor or material used in installing, maintaining, or extending an electrical wiring system and the appurtenances, apparatus, or equipment used in connection with the use of electrical energy in, on, outside, or attached to a building, residence, structure, property, or premises. The term includes service-entrance conductors as defined by the National Electrical Code.

CenterPoint supports minority- or women-owned businesses. Page 3 asks that the Service Provider check if it is a certified minority- or women-owned business. To obtain this designation, the Service Provider must be 51% owned or controlled by a minority(s) or woman/women.

To ensure quality and professionalism, the Service Provider is required to provide its company history, along with two references. Installation Service Providers must also supply proof of financial responsibility by submitting financial statements for the two most recent year, annual reports or 10-Ks if a publicly traded company, or a Dun & Bradstreet Report if a privately held company. Consultation Service Providers must provide state-authorized Certificates of Good Standing or equivalent evidence that their corporation or LLC is in existence and is authorized to transact business in the United States and that the company is in compliance with state-required formalities.

Installation Service Providers must meet the insurance requirements outlined in Appendix B. Consultation Service Providers must provide evidence of liability insurance. All certificates of insurance must be included with the Service Provider Application.

SUBMISSION INSTRUCTIONS: The Service Provider will mail, fax, or scan/email a signed hard copy of the Service Provider Application and all supplementary materials to:

Sergio Sanchez
Ecova – Project Lead
CenterPoint Commercial LED Lighting Program
Ssanchez@ecova.com
210-488-6644
FAX: 866-651-5201

The Service Provider must also submit an electronic copy of the Service Provider Application workbook to Ssanchez@ecova.com.

It is the responsibility of the Service Provider to ensure that the Program receives all the required Service Provider Application materials.

Once the Service Provider has submitted the Service Provider Application, the Program will review the application and supplementary materials. If approved, the Service Provider will be invited to attend a Service Provider Training session. Upon completion of this training, the Service Provider will receive a Service Provider Participation Letter and will be added to the List of Qualified Service Providers on Commercial LED Lighting Program page of CenterPoint's Web site:

<http://www.centerpointenergy.com/services/electricity/business/energyefficiencyprograms/advancedlightingprogram-commercial/>.

2. Project Application

The Service Provider will prepare, compile, and submit the completed Project Application, which includes several components (described in more detail below):

- **Application Cover Page***
- **Field Audit Form***
- LED installation recommendation, price quote, and timeline
- Savings Calculator
- Technical documents for proposed LED fixtures
- **Project Agreement** (signed)*
- **W-9 Form** (completed and signed by Customer)

** These items are part of a single Microsoft Excel workbook provided by the Program. This workbook also includes the Installation Notice, which is submitted following the LED installation.*

The Savings Calculator is a separate Excel workbook provided by the Program. The LED Installation Recommendation and price quote is produced by the Service Provider.

2.1 PROJECT APPLICATION COVER PAGE

The Project Application Cover Page (Appendix F) collects contact information for the Customer, Project, and Service Provider, and includes space to indicate the primary contact person for the Project.

2.2 FIELD AUDIT FORM

The Customer will select one or more Service Providers from the List of Qualified Service Providers to perform a Field Audit. If the Customer requests to use one of its preferred Service Providers, that Service Provider must submit a completed Service Provider Application and receive training to participate in the Program.

The Service Provider will complete the Field Audit Form to capture detailed information on the existing lighting measures at the Site. The Service Provider is responsible for documenting all the information as outlined in the form. This includes the description of each space at a Site (square footage, area description, hours of operation, etc.) and a detailed description of the existing lighting measures (lamps/fixtures) in each space at a Site.

In addition to the required written documentation, the Service Provider will also provide the Program with at least two digital photos of each existing fixture type documented on the Field Audit Form: 1) a clear photo showing the existing fixture type installed in its application, and 2) a clear and easily legible photo of the ballast part number (or the lamp part number or the lamp itself if the fixture is not ballasted). Please ensure that the submitted photos are:

- Clear and legible. If a particular ballast label is illegible, Service Providers should make their best attempt to locate a ballast label that is legible. If this is simply not feasible, provide some close-up shots of the fixture, the fixture part number, and the lamp(s).
- Please name the digital photo files intuitively, so that they can be easily paired with the associated existing fixture type documented on the Field Audit Form (i.e. "Line1FieldAuditForm.jpg" or "MH400-1.jpg")

2.3 LED INSTALLATION RECOMMENDATION AND PRICE QUOTE

The Service Provider will produce a customized installation recommendation for the Site, which will include details of the proposed LED measures to be installed, a complete quote for the proposed installation (including all labor and materials), and a timeline for installation (start, milestones, and completion date). Please note that the Installation Recommendation and price quote constitutes the Service Provider's bid and estimate.

***NOTE:** The Customer will select a Service Provider based on the Installation Recommendation and price quote and will enter into a legal contract, including payment terms, with the Service Provider for the LED installation. Neither CenterPoint nor the Program Implementer will be party to this contract.*

2.4 SAVINGS CALCULATOR

Using results from the Field Audit Form and the LED installation recommendation, the Service Provider will use the Savings Calculator to determine the estimated energy and demand savings resulting from the Project. Detailed instructions for completing the Savings Calculator are available in Appendix C.

2.5 TECHNICAL DOCUMENTATION FOR PROPOSED LED MEASURES

See section 2.4.2 (Measure Qualification) for information regarding the test reports and other documentation required by the Program to evaluate and qualify proposed measures and to verify the measure wattages used to calculate Project savings.

2.6 PROJECT AGREEMENT

The Project Agreement (Appendix D) summarizes and calculates incentives for the Project (based on the estimated demand and energy savings from the Savings Calculator). It includes the terms of the legal agreement between the Customer and the Program Implementer. It must be signed by the Customer before submission of the Project Application.

2.7 INCENTIVE RECIPIENT'S W-9

A completed and signed W-9 form must be submitted as part of the Project Application packet. This is used for tax purposes related to the incentive payments. By default, the incentive payment will be sent directly to the Customer. The Customer may complete an Incentive Transfer Document if the incentive is to be paid directly to another party.

2.8 SUBMITTAL INSTRUCTIONS

Hard copies of the completed, signed Project Application forms and supporting materials must be submitted via mail, fax, or scan/email to:

Sergio Sanchez
Ecova – Project Lead
CenterPoint Commercial LED Lighting Program
Ssanchez@ecova.com
210-488-6644
FAX: 866-651-5201

Electronic copies of the Savings Calculator workbook and the workbook containing the Application Cover Page and Project Agreement must be submitted to Ssanchez@ecova.com.

3. Installation Guidelines

The Installation Guidelines summarizes the guidelines and requirements for Service Providers installing LED measures and controls under this Program.

4. Installation Notice

Upon completion of the LED lighting installation, the Service Provider will submit the Installation Notice to the Program Implementer. The Installation Notice has four components:

1. **Installation Summary Report:** Service Provider will produce and attach an updated status and summary report of the completed LED Project.
2. **Project Savings:** Service Provider indicates whether the number and type of measures installed have changed since submission of the Project Application. *If so, the Service Provider must attach a revised Savings Calculator and Project Agreement (signed by the Customer) reflecting the Project's new calculated savings and incentive*
3. **Installation Cost:** Service Provider must indicate the Project's total installed cost and attach consolidated invoices covering all costs, including all materials and labor, due from the Customer.
4. **LED Fixture Documentation:** Submit copies of physical documentation indicating the quantities and specific part numbers of the LED fixtures purchased and installed. Acceptable documentation includes invoice/s (okay to black out prices), shipping document/s, etc.
5. **Certifications:** Both Customer and Service Provider sign the Installation Notice to certify that all information contained therein is true and accurate.

III. Appendices

Appendix A: Service Provider Participation Agreement

Appendix B: Installation Service Provider Insurance Requirements

Appendix C: Savings Calculation Guidelines

I. OVERVIEW

Demand and energy savings resulting from a Project are determined through calculated savings estimates or pre- and post- installation metering. Calculated savings refer to a savings estimation approach that does not require short-term testing or long-term metering. Instead, demand and energy savings are determined based on engineering calculations using typical equipment characteristics and operating schedules developed for particular applications. This method can reduce the need for certain types of field monitoring by using stipulated values for data such as operating hours, equipment efficiencies, etc. Stipulated Savings guidelines have been developed for the following types of retrofits:

- **Lighting Efficiency Retrofit Projects** (Section II)
- **Lighting Efficiency with Controls Retrofit Projects** (Section III)

New construction Projects follow the same stipulated demand and energy savings calculation guidelines developed for lighting efficiency retrofit projects (see Section II below), with the exception that the baseline load is established as the product of the maximum code-allowed lighting power density for the type of building (per IECC 2006) and the illuminated floor area. Service Providers should contact the Program for more information regarding savings calculations for new construction Projects.

For both retrofits and new construction Projects, the Customer/Service Providers may choose to propose and, upon approval, implement a project-specific measurement and verification (M&V) plan involving pre- and/or post-installation metering (for a minimum of two weeks each) to calculate and verify project savings. Any proposed M&V plan must be pre-approved by the Program Implementer. Customers will be responsible for any costs incurred for metering and other related activities. For more details on designing and proposing project-specific M&V plans, see Section IV below.

Inspections

All lighting installations will be subject to pre- and post-inspections. Service Providers are required to complete and submit the Field Audit Form and Savings Calculator as part of the Project Application.

- **Pre-Installation Inspection:** Once the Project Application has been submitted, the Program Implementer will conduct a pre-installation inspection of the Site to verify the Field Audit Form and associated savings/incentive calculations in the Savings Calculator. The Program Implementer will notify the Service Provider that the Project Application is approved and that the Project is cleared for installation or that the Site failed the pre-inspection. Should the Project Site fail the pre-installation inspection, the Service Provider will correct the Field Audit Form, Savings Calculator, and Project Agreement and re-submit the Project Application.

- Post-Installation Inspection:** Following completion of the LED installation, the Program Implementer will conduct a post-installation inspection to verify that the installed LED measures match those used to calculate savings and incentives in the Savings Calculator and Project Agreement. If a Project fails an inspection, the Program Implementer and/or CenterPoint will inform the Customer and Service Provider of all issues that need to be addressed. The Program Implementer will conduct follow-up inspections until all issues have been corrected. If problems or discrepancies between the proposed measures or installation described in the Project Agreement and the actual measures installed cannot be rectified, the Program Implementer and/or CenterPoint reserve the right to adjust or cancel the Project Agreement.

Steps in calculating and verifying savings:

#	ACTIVITY	TOOLS USED	PERFORMED BY
1	Conduct pre-installation field audit of existing lighting fixtures and control measures at Project Site	Field Audit Form	Service Provider
2	Provide detailed measure data and test reports in order for the Program to evaluate proposed LED measures against measure eligibility criteria.	See section 2.4.2 for details on measure qualification	Service Provider & device manufacturer
3	Complete "Pre-Retrofit Equipment" section of the Lighting Inventory worksheet, reflecting the field audit	Savings Calculator	Service Provider
4	Complete "Post-Retrofit Equipment" section of the Lighting Inventory worksheet with data from proposed LED lighting installation	Savings Calculator	Service Provider
5	Enter stipulated operating hours and power adjustment factors into the Lighting Hours and Savings worksheet to reflect area usage and controls	Savings Calculator	Service Provider
6	Complete Lighting Hours and Savings worksheet to determine demand and energy savings and associated incentives	Savings Calculator	Service Provider
7	Conduct pre-installation inspection to verify Service Provider's field audit, savings and incentive calculations	<ul style="list-style-type: none"> Field Audit Form Savings Calculator LED install. rec. 	Program Implementer
<i>LED INSTALLATION COMPLETED</i>			
8	Conduct post-installation inspection to verify "Post-Retrofit Equipment" section of the Lighting Inventory worksheet and incentive calculations	Savings Calculator	Program Implementer

Wattage Table

The CenterPoint Electric Delivery Lighting Table, which is included with the Savings Calculator, contains wattages for hundreds of existing and LED fixture types.

II. STIPULATED SAVINGS GUIDELINES FOR LIGHTING EFFICIENCY RETROFIT PROJECTS

This Stipulated Savings procedure is appropriate for retrofit Projects that involve the replacement of existing fixtures, lamps, and/or ballasts with a similar number of new energy-efficient fixtures, lamps, and/or ballasts. This procedure can also be used for Projects involving de-lamping with or without the use of reflectors. This stipulated hours method requires the use of the appropriate values listed in Table 2.1 below.

Building Type	Stipulated Annual Operating Hours	Coincidence Factor with On-Peak Demand Period ¹	Interactive HVAC Demand Savings	Interactive HVAC Energy Savings
Parking Structure ²	7,884	100%	0%	0%
Outdoor Areas ³ (canopy lighting, walkways, lots, roofs, etc.)	3,996	0%	0%	0%

¹ The on-peak demand period is defined as the hours from 1 p.m. to 7 p.m., Monday through Friday, June through September, excluding federal holidays.

² Light fixtures along the perimeter of an open-walled parking garage that are controlled (ON/OFF) by daylight photo-sensors use the Stipulated Annual Operating Hours and Coincidence Factor of the "Outdoor Areas" building type.

³ The "Outdoor Areas" building type assumes photo-sensor control measures and so must use a Power Adjustment Factor (PAF) of 1.0.

Field Audit

As part of a Project Application, the Service Provider performs a field audit of all pre-installation lighting equipment using the Field Audit Form. This audit should provide the following information about all the fixtures involved in the lighting retrofit: room location, fixture, lamp, and ballast types; lighting controls; area designations; counts of operating and non-operating fixtures; and type of control devices.

The number of non-operating fixtures allowed before demand reductions are calculated will be limited to 10% of the total fixture count per facility. For projects where the number of non-operating fixtures exceeds 10% of the total, the baseline wattage consumption will be reduced by the percentage of non-operating fixtures above the 10% limit. For example, a project with a 12% non-operating count will have the total baseline wattage reduced by 2%.

The Service Provider will also provide the Program with at least two digital photos of each existing fixture type documented on the Field Audit Form: 1) a clear photo showing the existing fixture type installed in its application, and 2) a clear and easily legible photo of the ballast part number (or the lamp part number or the lamp itself if the fixture is not ballasted). Additional details about the Field Audit are in Section II (2.2) of this Manual.

Calculation of Demand and Energy Savings

The peak demand savings and energy savings are calculated according to Equations (a) through (c) below. Demand savings are only allowed for lighting fixtures that will be in operation on weekdays between the hours of 1 p.m. and 7 p.m. during the months of June through September, excluding federal holidays. Total demand savings are calculated using a coincidence factor to account for the average number of lights on during the on-peak demand period.

PEAK DEMAND SAVINGS

Equation (a)

Lighting Demand Savings [kW] = Pre Lighting Demand [kW] – Post Lighting Demand [kW]

Equation (b)

Peak Demand Savings [kW] = Lighting Demand Savings [kW] * Peak Coincidence Factor

ENERGY SAVINGS

Equation (c)

Lighting Energy Savings [kWh] = Lighting Demand Savings [kW] * Stipulated Annual Hours of Operation [hrs]

III. STIPULATED SAVINGS GUIDELINES FOR LIGHTING EFFICIENCY WITH CONTROL MEASURES RETROFIT PROJECTS

This Stipulated Savings procedure is appropriate for retrofit Projects that involve lighting efficiency measures in combination with lighting control measures. Lighting efficiency measures may include the replacement of existing fixtures, lamps, and/or ballasts with a similar number of new energy-efficient fixtures, lamps, and/or ballasts. This procedure can also be used for Projects involving de-lamping with or without the use of reflectors. Control measures may be occupancy sensors or daylight controls.

This method requires the use of the appropriate stipulated hours from Table 3.1 and a Power Adjustment Factor (PAF) from Table 3.2. If values from these tables do not accurately characterize the building type and operation, please contact the Program.

TABLE 3.1: Stipulated Annual Operating Hours and Interactive Savings				
Building Type	Stipulated Annual Operating Hours	Coincidence Factor with On-Peak Demand Period¹	Interactive HVAC Demand Savings	Interactive HVAC Energy Savings
Parking Structure ²	7,884	100%	0%	0%
Outdoor Areas ³ (canopy lighting, walkways, lots, roofs, etc.)	3,996	0%	0%	0%

¹ The on-peak demand period is defined as the hours from 1 p.m. to 7 p.m., Monday through Friday, June through September, excluding federal holidays.

² Light fixtures along the perimeter of an open-walled parking garage that are controlled (ON/OFF) by daylight photo-sensors use the Stipulated Annual Operating Hours and Coincidence Factor of the "Outdoor Areas" building type.

² The "Outdoor Areas" building type assumes photo-sensor control measures and so must use a Power Adjustment Factor (PAF) of 1.0.

Field Audit

As part of a Project Application, the Service Provider performs a field audit of all pre-installation lighting equipment using the Field Audit Form. This audit should provide the following information about all the fixtures involved in the lighting retrofit: room location, fixture, lamp, and ballast types; lighting controls; area designations; counts of operating and non-operating fixtures; and type of control devices.

The number of non-operating fixtures allowed before demand reductions are calculated will be limited to 10% of the total fixture count per facility. For projects where the number of non-operating fixtures exceeds 10% of the total, the baseline wattage consumption will be reduced by the percentage of non-operating fixtures above the 10% limit. For example, a project with a 12% non-operating count will have the total baseline wattage reduced by 2%.

The Service Provider will also provide the Program with at least two digital photos of each existing fixture type documented on the Field Audit Form: 1) a clear photo showing the existing fixture type installed in its application, and 2) a clear and easily legible photo of the

ballast part number (or the lamp part number or the lamp itself if the fixture is not ballasted). Additional details about the Field Audit are in Section II (2.2) of this Manual.

Power Adjustment Factors

The Power Adjustment Factor (PAF) is input for each usage group in the post-retrofit system in the PAF column of the Savings Calculator’s “Lighting Hours and Savings” tab. The stipulated PAF factors in the Power Adjustment Factors Table 3.2 are for use only with a stipulated savings approach.

The PAF can be thought of as the ratio of post-installation annual operating hours to pre-installation annual operating hours. Example cases:

- If the Project involves no control measures before or after, the PAF equals 1.0.
- If there are no controls pre-installation and Occupancy Sensor (OS) post-installation, the PAF would be 0.7.
- For ON/OFF Daylight Controls (DC) before installation and Occupancy Sensor with Daylight Controls (OS w/DC) with multiple-step dimming after installation, the PAF would be calculated by dividing the post-installation PAF (0.65) by the pre-installation PAF (0.9), yielding a final PAF of 0.72.

TABLE 3.2: Power Adjustment Factors* (PAFs)

Control Type	Power Adjustment Factor (PAF)
No control measures	1.0
Daylight Controls (DC) – continuous dimming	0.7
DC – multiple-step dimming	0.8
DC – ON/OFF	0.9
Occupancy Sensor (OS)	0.7
OS w/DC – continuous dimming	0.6
OS w/DC – multiple-step dimming	0.65
OS w/DC – ON/OFF	0.65

** Power Adjustment Factors are adapted from ASHRAE Standard 90.1-1989, Table 6-3*

In a project-specific M&V approach where pre- and post-installation metering will be conducted, the PAF will be calculated for each usage group by dividing the post-install hours by the pre-install hours (6,000 metered pre-install hours and 4,000 metered post-install hours would yield a PAF of 4,000/6,000 or 0.67).

Calculation of Demand and Energy Savings

The peak demand savings and energy savings are calculated according to Equations (a) through (c) below. Demand savings are only allowed for lighting fixtures that will be in operation on weekdays between the hours of 1 p.m. and 7 p.m. during the months of June through September, excluding federal holidays. Total demand savings are calculated using a coincidence factor to account for the average number of lights on during the on-peak demand period. No demand savings are credited to the controls.

PEAK DEMAND SAVINGS

Equation (a)

Lighting Demand Savings [kW] = Pre Lighting Demand [kW] – Post Lighting Demand [kW]

Equation (b)

Peak Demand Savings [kW] = Lighting Demand Savings [kW] * Peak Coincidence Factor

ENERGY SAVINGS

Equation (c)

Lighting Energy Savings [kWh] = {Pre Lighting Demand [kW] – (Post Lighting Demand [kW] * Power Adjustment Factor [%])} * Stipulated Annual Hours of Operation [hrs]

IV. PROJECT-SPECIFIC MEASUREMENT AND VERIFICATION PLANS

Customers/Service Providers may choose to propose and, upon approval, implement a project-specific measurement and verification (M&V) plan involving pre- and post-installation metering (for a minimum of two weeks each) to calculate and verify project savings. Any proposed M&V plan must be pre-approved by the Program Implementer. Customers will be responsible for any costs incurred for metering and other related activities.

Developing Project-Specific M&V Plans

This section defines the general guidelines for designing a Project-specific M&V plan. Further information on issues, guidelines, and requirements specific to each plan is available upon request.

The Service Provider should work with the Program Implementer to identify an M&V methodology and develop an M&V plan that is appropriate for each Project. The proposed M&V plan must be submitted with the Project Application, and must be reviewed and approved by the Program Implementer.

A Project-specific M&V plan shall demonstrate that any proposed metering and analysis will be done in a consistent and logical manner and with a level of accuracy acceptable to all parties. An M&V plan should be prepared and defined in a contract agreement.

All Project-specific M&V plans must meet, at a minimum, all applicable standards under the latest International Performance Measurement and Verification Protocol (IPMVP, more information available here: <http://www.evo-world.org>) and must include the following:

1. Describe the Project site and the Project; include information on how the Project saves energy and what key variables affect the realization of savings.
2. Describe the M&V method to be used.
3. Indicate who will conduct the M&V activities and prepare the M&V analyses and documentation.
4. Define the details of how calculations will be made. For instance: "List analysis tools, such as DOE-2 computer simulations, and/or show the equations to be used." A complete "path" should be defined indicating how collected survey and metering/monitoring data will be used to calculate savings. All equations should be shown.
5. Specify what metering equipment will be used, who will provide the equipment, its accuracy and calibration procedures. Include a metering schedule describing metering duration and when it will occur, and how data from the metering will be validated and reported. Include data formats. Electronic, formatted data read directly from a meter or data logger are recommended for any short- or long-term metering.

6. Define what key assumptions will be made about significant variables or unknowns. Describe any stipulations that will be made and the source of data for the stipulations.
7. Define how any baseline adjustments will be made.
8. Describe any sampling that will be used, why it is included, sample sizes, documentation on how sample sizes were selected, and information on how random sample points will be selected.
9. Define the level of accuracy which should be achieved—if not for the entire analysis, at least for key components. For instance: “lighting operating hours will be measured with a 80% confidence level and 20% precision.”
10. Indicate how quality assurance will be maintained and replication confirmed. For instance: “The data being collected will be checked every month,” or “to ensure sufficient accuracy, results will be subjected to third-party review by the ABC company.”

Appendix D: Project Agreement

Appendix E: Installation Guidelines

1. Service Provider must perform its services in accordance with applicable professional standards and must abide by the specified implementation requirements while performing work for the Project
2. Service Provider must ensure that all work is performed in compliance with reasonable safety and work practices and applicable federal, state, and local laws, rules, and regulations, including but not limited to "Occupational Safety and Health Standards" promulgated by the U.S. Secretary of Labor and the State of Texas.
3. Service Provider must follow all state and local laws, rules, regulations, and procedures to obtain applicable permitting for all projects.
4. Service Provider must follow all applicable manufacturers' instructions for installation in accordance with NEC, NEMA, and local codes, and must not install any product that does not possess an Underwriters product certification.
5. Service Provider must follow all applicable guidelines set forth by ASHRAE 90.1-1999/2001 IECC (or equivalent current applicable standard) to determine lighting, control, and lighting power density requirements, and the IESNA Lighting Handbook 9th Edition for best practices and compliance to codes that pertain to light levels.
6. In disposing of lighting fixtures, lamps and ballasts, Service Providers must comply with the Texas Commission on Environmental Quality Regulatory Guidance #377: "Universal Waste Regulations for Hazardous Lamps and Mercury-Containing Equipment in Texas" (see Appendix G).
7. The 2012 CenterPoint Commercial LED Lighting Program accepts no responsibility nor implies any warranty for any product or installation of any product and assumes no responsibility, physically or financially, for any damage that may result from any product or from that product's installation.

Appendix F: LED Information & Resources

ENERGY STAR[®] Commercial LED Lighting

http://www.energystar.gov/index.cfm?c=ssl.pr_commercial

Designed to help consumers learn more about ENERGY STAR qualified solid-state lighting (SSL) luminaires and filled with graphics, pictures, and simple-to-understand explanations of SSL technology, the site offers a Commercial Purchasing Guide to help consumers find the best LED lighting products for their particular needs. For partners, the pages house many of the tools and resources of the program including the criteria, Manufacturer's Guide for Qualifying SSL products, and soon a Partner's Resource Guide. The pages also include a qualified products list that is sure to grow in the coming months.

CALiPER Program

<http://www.ssl.energy.gov/caliper.html>

Solid-state lighting (SSL) technologies today are undergoing rapid change and improvements, and products arriving on the market exhibit a wide range of performance. There is a need for reliable, unbiased product performance information to foster the developing market for high-performance SSL products. The US Department of Energy (DOE) Commercially Available LED Product Evaluation and Reporting (CALiPER) program supports testing of a wide array of SSL products available for general illumination. DOE allows its test results to be distributed in the public interest for noncommercial, educational purposes only. Detailed test reports are provided to users who provide their name, affiliation, and confirmation of agreement to abide by DOE's No Commercial Use Policy.

GATEWAY Demonstrations

<http://www.ssl.energy.gov/gatewaydemos.html>

DOE's GATEWAY Demonstrations showcase high-performance LED products for general illumination in a variety of commercial and residential applications. Demonstration results provide real-life experience and data on state-of-the-art solid-state lighting (SSL) product performance and cost effectiveness. These results connect DOE technology procurement efforts with large-volume purchasers and provide buyers with reliable data on product performance.

Selected Reports:

- LED Street Lighting: Lija Loop, Portland
- LED Freezer Case Lighting: Albertsons Grocery
- LED Parking Lot Lighting: Raley's Supermarket
- LED Street Lighting: City of San Francisco
- LED Roadway Lighting: I-35W Bridge
- LED Residential Downlights and Undercabinet Lights: 2008 Eugene Tour of Homes
- LED Parking Garage Lighting: Providence Portland Medical Center
- LED Walkway Lighting: Federal Aviation Administration Technical Center
- LED Street Lighting: City of Oakland

U.S. Department of Energy Solid-State Lighting Fact Sheets

<http://www1.eere.energy.gov/buildings/ssl/factsheets.html>

These fact sheets describe solid-state lighting, its characteristics, applications, and issues relating to its successful introduction into the marketplace. A selection of these fact sheets are included in the following pages.

**Appendix G: Texas Commission on Environmental Quality Regulatory
Guidance**

RG-377 – Revised January 2007

**“Universal Waste Regulations for Hazardous Lamps and Mercury-
Containing Equipment in Texas”**