
Southwestern Electric Power Company
2012 Energy Efficiency Plan and Report
Substantive Rules § 25.181 and § 25.183

March 30, 2012

Project No. 40194



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INTRODUCTION

Southwestern Electric Power Company (SWEPCO or Company) presents this Energy Efficiency Plan and Report (EEPR) to comply with Public Utility Commission of Texas (PUCT or Commission) Substantive Rules 25.181 and 25.183 (EE Rule), which implement Public Utility Regulatory Act (PURA) § 39.905. As mandated by this section of PURA § 39.905, the EE Rule requires that each investor owned electric utility achieve the following demand reduction goals through market-based standard offer programs (SOPs) and limited, targeted, market transformation programs (MTPs):

- at least 20% of the electric utility's annual growth in demand of residential and commercial customers by December 31, 2011.
- at least 25% of the electric utility's annual growth in demand of residential and commercial customers by December 31, 2012.
- at least 30% of the electric utility's annual growth in demand of residential and commercial customers by December 31, 2013.

The EE Rule includes specific requirements related to the implementation of SOPs and MTPs that control the manner in which electric utilities must administer their portfolio of energy efficiency programs in order to achieve their mandated annual demand reduction goals. SWEPCO's plan enables it to meet its statutory goals through implementation of energy efficiency programs in a manner that complies with PURA §39.905 and the EE Rule. This EEPR covers the periods of time as required in Substantive Rule 25.181. The following section describes the information that is contained in each of the subsequent sections and appendices.

EEPR ORGANIZATION

This EEPR consists of an Executive Summary, fourteen sections, a list of acronyms, a glossary and four appendices.

Executive Summary

- The Executive Summary summarizes SWEPCO's plans for achieving its goals and projected energy efficiency savings for program years 2012 and 2013 and highlights SWEPCO's achievements for program year 2011.

Energy Efficiency Plan

- Section I describes SWEPCO's program portfolio. It details how each program will be implemented, presents related informational and outreach activities, and provides an introduction to any programs not included in SWEPCO's 2011 EEPR.
- Section II explains SWEPCO's targeted customer classes and describes the estimated size of each class and the method used in determining those class sizes.

- Section III presents SWEPCO's projected energy and demand goals and savings for the prescribed planning period detailed by program for each customer class.
- Section IV describes SWEPCO's proposed energy efficiency budgets for the prescribed planning period detailed by program for each customer class.

Energy Efficiency Report

- Section V documents SWEPCO's demand reduction goal for each of the previous five years (2007-2011) based on its weather-adjusted peak demand and actual savings achieved for those years.
- Section VI compares SWEPCO's projected energy and demand savings to its reported and verified savings by program for calendar years 2010 and 2011.
- Section VII details SWEPCO's incentive and administration expenditures for each of the previous five years (2007-2011) detailed by program for each customer class.
- Section VIII compares SWEPCO's actual 2011 expenditures with its 2011 budget by program for each customer class. It identifies funds committed but not expended and funds remaining and not committed. It also explains any cost deviations of more than 10% from SWEPCO's overall program budget.
- Section IX describes the results from SWEPCO's MTPs.
- Section X describes Research and Development.
- Section XI documents SWEPCO's most recent Energy Efficiency Cost Recovery Factor (EECRF).
- Section XII documents SWEPCO's Underserved Counties.
- Section XIII describes SWEPCO's Performance Bonus calculation for program year 2011.

Potential Impacts of Project 39674

- Section XIV describes the potential impacts of Project No. 39674, rulemaking proceeding to amend energy efficiency rules.

Acronyms

- A list of abbreviations for common terms used within this document.

Glossary

- A list of definitions for common terms used within this document.

Appendices

- Appendix A – Reported and Verified Demand and Energy Reduction by County for each program.
- Appendix B – Program Templates for any new or modified programs and programs not included in SWEPCO's previous EEPR.
- Appendix C – SWEPCO's existing energy efficiency contracts and obligations.
- Appendix D - Data, explanations, or documents supporting other sections of the EEPR.

EXECUTIVE SUMMARY - ENERGY EFFICIENCY PLAN (PLAN)

SWEPCO plans to achieve savings of at least a 25% reduction in its annual growth in demand of residential and commercial customers by December 31, 2012, and at least a 30% reduction in its annual growth in demand of residential and commercial customers by December 31, 2013. SWEPCO's Plan addresses achieving the corresponding calculated energy savings goal, which is derived from its demand savings goal each year using a 20% capacity factor [Substantive Rule 25.181(e)(4)]. The goals, budgets, and implementation procedures that are included in this Plan are consistent with the requirements of the EE Rule, using lessons learned from past experience and customer participation in the various historical energy efficiency programs. A summary of SWEPCO's projected annual goals and budgets is presented in Table 1.

Table 1: Summary of Goals, Projected Savings (at the Meter)¹ and Budgets

Calendar Year	Average Growth in Demand (MW)	Growth In Demand Reduction	Demand Goal (MW)*	Energy Goal ² (MWh)	Projected Savings ³ (MW)	Projected Savings ^{2 3} (MWh)	Projected Budget (000's)
2012	-18.04	25%	5.60	9,811	13.76	19,139	\$4,565
2013	-18.04	30%	5.60	9,811	15.11	21,473	\$5,200 ⁴

* Substantive Rule 25.181(e)(3)(B) – Beginning in 2009 a utility's demand reduction goal in megawatts for any year shall not be less than the previous year's goal.

EXECUTIVE SUMMARY – ENERGY EFFICIENCY REPORT (REPORT)

This report demonstrates that in 2011 SWEPCO cost-effectively implemented SOPs and MTPs as provided for by PURA § 39.905. SWEPCO exceeded its demand reduction goal to be achieved by December 31, 2011 by procuring 15,034 kW of peak demand savings at a total cost of \$4,888,597. Programs in 2011 included the Commercial Solutions Pilot MTP, Commercial SOP, CoolSaver[®] A/C Tune-Up Pilot MTP, Hard-to-Reach SOP, HomeSavers, LED Lighting Pilot MTP, Load Management SOP, On-Line Home Energy Checkup, Residential SOP, Schools Conserving Resources MTP, Small Business Direct Install Pilot MTP, SMART SourceSM Solar PV Pilot MTP, and the SWEPCO CARE\$ Energy Efficiency for Not-for Profit Agencies.

¹ Average Growth in Demand figures are from Table 4; Projected Savings from Table 5; Projected Budgets from Table 6. All kW/MW and kWh/MWh figures in this Table and throughout this EEPR are given “at the Meter.”

² Calculated using a 20% capacity factor.

³ Projected savings are based upon the portfolio of programs and budgets identified in Tables 5 and 6.

⁴ Additional costs will likely be incurred and reported in SWEPCO's EECRF filing pending Commission action in Project No. 39674 as discussed in Section XIV.

ENERGY EFFICIENCY PLAN

I. 2012 PROGRAMS

A. 2012 Program Portfolio

SWEPSCO has implemented a variety of programs in 2012 to enable the Company to meet its goals in a manner that complies with PURA § 39.905 and the EE Rule. These programs target broad market segments and specific market sub-segments with significant opportunities for cost-effective energy savings.

Table 2 below summarizes SWEPSCO's programs and targeted customer class markets for 2012. The programs are described in further detail in Subsections B and C. SWEPSCO maintains a web site containing all of the requirements for energy efficiency service provider (EESP) participation, forms required for project submission, and currently available funding at www.AEPefficiency.com. This site is the primary method of communication to provide program updates and information to customers, potential EESPs and other interested parties.

Table 2: 2012 Energy Efficiency Program Portfolio

Program	Target Market	Application
Commercial Solutions Market Transformation Program	Commercial	Retrofit New Construction
Commercial Standard Offer Program	Commercial	Retrofit New Construction
CoolSaver [®] A/C Tune-Up Pilot Market Transformation Program	Residential	Retrofit
Hard-to-Reach Standard Offer Program	Hard-to-Reach Residential	Retrofit
Home\$avers	Low Income Residential	Retrofit
Load Management Standard Offer Program	Commercial	Retrofit
On-Line Home Energy Checkup	Residential	Education
Residential Standard Offer Program	Residential	Retrofit
Schools Conserving Resources Market Transformation Program	Commercial	Retrofit New Construction
Small Business Direct Install Pilot Market Transformation Program	Commercial	Retrofit
SMART Source SM Solar PV Pilot Market Transformation Program	Residential	Retrofit New Construction
SWEPSCO CARE\$ Energy Efficiency for Not-for-Profit Agencies Program	Commercial	Retrofit New Construction

B. Existing Programs

Commercial Solutions Market Transformation Program (CS MTP)

Program design

SWEPSCO began implementing the CS MTP in the fourth quarter of 2008 as a pilot program. SWEPSCO issued a Request for Proposals (RFP) in 2011 to select an implementer to begin fully implementing the program in 2012. SWEPSCO's CS MTP targets commercial customers (other than public schools) that do not have the in-house capacity or expertise to: 1) identify, evaluate, and undertake efficiency improvements; 2) properly evaluate energy efficiency proposals from vendors; and/or 3) understand how to leverage their energy savings to finance projects. Incentives are paid to customers served by SWEPSCO for certain eligible energy efficiency measures that are installed in new or retrofit applications that result in verifiable demand and energy savings.

Implementation process

Under this program, SWEPSCO is targeting a number of commercial customers meeting the program participation parameters. The CS MTP facilitates the identification of demand and energy savings opportunities, general operating characteristics, long-range energy efficiency planning, and overall measure and program acceptance by the targeted customer participants.

Outreach activities

SWEPSCO markets the availability of its programs in the following manner:

- Contracts with a third-party implementer to conduct outreach and planning activities;
- Targets a number of customer participants during the program;
- Conducts workshops as necessary to explain elements of the program, such as responsibilities of the participants, project requirements, incentive information, and the application and reporting process;
- Utilizes working relationships between Customer Account Managers and customers to promote the program;
- Participates in regional outreach activities as may be necessary; and
- Participates in appropriate industry-related meetings to generate awareness and interest.

Commercial Standard Offer Program (CSOP)

Program design

The CSOP targets commercial customers of all sizes. Incentives are paid to project sponsors for certain eligible measures installed in new or retrofit applications, based upon verified demand and energy savings.

Implementation process

Any eligible project sponsor may submit an application for a project that meets minimum requirements. The program information on SWEPCO's web site is updated frequently to reflect participating project sponsors and the remaining available incentive budget.

Outreach activities

SWEPCO markets the availability of its programs in the following manner:

- Utilizes mass electronic mail (e-mail) notifications to keep potential project sponsors interested and informed;
- Utilizes working relationships between Customer Account Managers and customers to promote the program;
- Maintains an internet web site with detailed project eligibility, end-use measures, incentives, procedures and application forms;
- Participates in appropriate industry-related meetings to generate awareness and interest;
- Participates in state-wide outreach activities as may be available; and
- Conducts workshops as necessary to explain elements such as responsibilities of the project sponsor, project requirements, incentive information, and the application and reporting process.

CoolSaver[®] A/C Tune-Up Pilot Market Transformation Program (CoolSaver[®] MTP)

Program design

SWEPCO began implementing the CoolSaver[®] MTP in 2010 as a pilot program. This program is designed to overcome market barriers that prevent residential customers from receiving high performance air conditioning (A/C) system tune-ups. The program works with local A/C contractor networks to offer key program components, including:

- Training and certifying A/C technicians on the tune-up and air flow correction services and protocols;
- Paying incentives to A/C contractors for the successful implementation of air conditioning tune-up and air flow correction services; and
- Paying incentives to the customers in the form of coupons to be applied toward the completion of recommended work leading to optimum unit efficiency.

SWEPCO will continue to implement this pilot program in 2012. After review of the program findings, SWEPCO may transition this program to a full program for the 2013 implementation year, or consider other approaches to promote A/C tune-ups in its service territory.

Implementation process

A third-party implementer is contracted to design, implement, and market the CoolSaver[®] MTP as well as provide specialized training to the A/C technicians. Contractors that wish to participate enter into a contractor partnering agreement that specifies the program requirements. Contractors are

trained on the A/C tune-up process and are provided incentives and discounts on the cost of field equipment designed to diagnose and quantify energy savings opportunities. Energy savings are captured through the correction of A/C system inefficiencies identified during the tune-up activities. Participating customers are eligible to receive a coupon for use toward A/C and heat pump efficiency services performed as a result of the program's tune-up analysis. At this time, only residential customers of SWEPCO are eligible to participate in this program.

Outreach activities

SWEPCO markets the CoolSaver[®] MTP in the following manner:

- Contracts with a third-party implementer to conduct outreach and planning activities;
- Targets residential A/C contractors who service customers served by SWEPCO;
- Conducts training workshops with contractor staff on the specific tune-up and airflow correction services promoted by the program, as well as the measurement and verification process to document savings;
- Conducts workshops as necessary to explain elements of the program, such as responsibilities of the contractors, project requirements, incentive information, and the application and reporting process; and
- Participates in appropriate industry-related meetings to generate awareness and interest.

Hard-to-Reach Standard Offer Program (HTR SOP)

Program design

The HTR SOP targets residential customers in existing homes with total annual household incomes at or below 200% of current federal poverty guidelines. Incentives are paid to project sponsors for a variety of eligible measures installed in retrofit applications, which result in verifiable demand and energy savings. Incentives are higher for work performed in historically underserved counties and for certain identified underserved measures to encourage activity. Project comprehensiveness is encouraged and customer education regarding energy conservation behavior is administered by materials distributed by project sponsors. PUCT-approved Deemed Savings values are accepted as measured and verified savings for projects submitted for approval in this program.

Implementation process

Any eligible project sponsor may submit an application for work that will meet the minimum requirements. The program information on SWEPCO's web site is updated frequently to reflect participating project sponsors and available incentive budget.

Outreach activities

SWEPCO markets the availability of its programs in the following manner:

- Utilizes mass e-mail notifications to enroll and keep potential project sponsors interested and informed;
- Maintains an internet web site with detailed project eligibility, end-use measures, incentives, procedures and application forms;
- Educates internal employees about the program to help increase the customers' awareness of the programs;
- Participates in appropriate industry-related meetings to generate awareness and interest;
- Participates in state-wide outreach activities as may be available; and
- Conducts workshops as necessary to explain elements such as responsibilities of the project sponsor, project requirements, incentive information, and the application and reporting process.

Home\$avers (Low-Income Weatherization Program)

Program design

The Home\$avers program is designed to cost-effectively reduce the energy consumption and energy costs for SWEPCO's lowest-income customers. Program implementers provide eligible weatherization and energy efficiency measures for residential customers who meet the Department of Energy income-eligibility guidelines, currently 125% of federal poverty guidelines.

Implementation process

The program implementer signs agreements with not-for-profit (NFP) Agencies that will verify customer eligibility and conduct an energy use assessment of eligible customers' homes. The agencies install measures based on the savings-to-investment ratio (SIR), which evaluates cost-effectiveness. PUCT-approved Deemed Savings values are used to determine demand and energy savings.

Outreach activities

The program implementer conducts outreach by targeting existing weatherization service providers and other NFP and governmental agencies in SWEPCO's service territory. These service providers identify potential Home\$avers applicants from their client lists or conduct outreach into the surrounding community and to other low-income assistance agencies.

Load Management Standard Offer Program (LM SOP)

Program design

The LM SOP targets commercial customers with a peak electric demand of 500 kW or more. Incentives are paid to project sponsors to reduce peak electric load on 1-hour-ahead notice for load reduction periods of 2 to 4 hours duration. Incentive payments are based upon the metered peak demand reduction as called for by SWEPCO.

Implementation process

Any eligible project sponsor in the area identified by SWEPCO may submit an application for a project meeting the minimum requirements. The program information on SWEPCO's web site is updated frequently to reflect remaining available budget amounts.

Outreach activities

SWEPCO markets the LM SOP in the following manner:

- Utilizes mass e-mail notifications to enroll and keep potential project sponsors interested and informed;
- Utilizes working relationships between Customer Account Managers and customers to promote the program;
- Maintains an internet web site with detailed project eligibility, end-use measures, incentives, procedures and application forms;
- Participates in appropriate industry-related meetings to generate awareness and interest;
- Participates in state-wide outreach activities as may be available; and
- Conducts workshops as necessary to explain elements such as responsibilities of the project sponsor, project requirements, incentive information, and the application and reporting process.

On-Line Home Energy Checkup

Program design

The On-Line Home Energy Checkup is designed to provide a web-based, do-it-yourself home energy audit that equips residential customers with valuable information to help them manage their energy use and cost. The program is available for all SWEPCO Texas customers that have access to the internet. The tool provides functionality that produces a printer-friendly report that:

- Factors in weather and local electricity prices;
- Uses the customer's actual historic energy usage in savings calculations;
- Estimates monthly and annual energy usages and costs;
- Provides customized energy saving recommendations and potential savings for implemented measures; and
- Integrates and displays SWEPCO programs and incentives.

Included in the tool are energy calculators (appliance, lighting, heating/cooling systems), an extensive home energy library, Fundamentals of Electricity information, and Kids Korner Reference Libraries.

Implementation process

The tool is a web-based tool with entry point prominently located on SWEPCO's customer website at <https://www.swepco.com/save/calculate/Default.aspx>. This tool is available to all SWEPCO Texas customers. The only requirement is for customers to sign in to the tool using their SWEPCO account number.

Outreach activities

SWEPCO markets the availability of its program in the following manner:

- Maintains internet web site with detailed information and instructions on the use of the tool;
- Provides informational bill messages in customers' bills describing the location, availability and functionality of the tool; and
- Educates internal employees about the availability of the tool to better respond to customer inquiries.

Residential Standard Offer Program (RSOP)

Program design

The RSOP targets residential customers in existing homes that are over two years old. Incentives are paid to project sponsors for certain eligible measures installed in retrofit applications that result in verified demand and energy savings. Program incentives are higher for work performed in historically underserved counties to encourage activity in these areas. Higher incentives are also paid for certain measures that have been installed less frequently than other measures. Project comprehensiveness is encouraged. PUCT-approved Deemed Savings values are accepted as measured and verified savings for projects submitted for approval in this program.

Implementation process

Eligible project sponsors submit applications and are approved for participation in the program. The program information on SWEPCO's web site is updated frequently to reflect participating project sponsors. Project sponsors are able to view the remaining available incentive amounts on the program database that is used to track progress of the program.

Outreach activities

SWEPCO markets the availability of its programs in the following manner:

- Utilizes mass e-mail notifications to inform and update potential project sponsors such as EESPs and national and local companies that provide energy-related services;
- Provides additional outreach using direct mail as necessary to attract more participants;

- Educates internal employees about the program to help increase the customers' awareness of the programs;
- Maintains an internet web site with detailed project eligibility, end-use measures, incentives, procedures and application forms;
- Participates in appropriate industry-related meetings to generate awareness and interest;
- Sends informational brochures to customers concerned about utility bills;
- Participates in state-wide outreach activities as may be available; and
- Conducts workshops as necessary to explain elements such as responsibilities of the project sponsor, project requirements, incentive information, and the application and reporting process.

Schools Conserving Resources Market Transformation Program (SCORE MTP)

Program design

The SCORE MTP provides energy efficiency and demand reduction solutions for public schools. This program is designed to help educate and assist these customers in lowering their energy use by facilitating the integration of energy efficiency into their short- and long-term planning, budgeting and operational practices. Incentives are paid to participating customers for eligible energy efficiency measures that are installed in new or retrofit applications that provide verifiable demand and energy savings.

Implementation process

Within this program, SWEPCO offers participation to public school districts in its service territory. The program facilitates the identification of potential demand and energy savings opportunities, general electric energy operating characteristics, long-range energy efficiency planning, and overall measure and program acceptance by the targeted customer participants.

Outreach activities

SWEPCO markets the availability of its program in the following manner:

- Contracts with a third party to implement outreach and planning activities;
- Identifies customer participants;
- Utilizes working relationships between Customer Account Managers and customers to promote the program;
- Conducts workshops as necessary to explain elements of the program, such as responsibilities of the participants, project requirements, incentive information, and the application and reporting process;
- Participates in regional outreach activities as may be necessary; and
- Participates in appropriate industry-related meetings to generate awareness and interest.

Small Business Direct Install Pilot Market Transformation Program (SBDI)

Program design

The SBDI program has been developed as a pilot program to offer energy efficiency services to small commercial customers with peak demands less than 50 kW. Currently, this customer group is the segment least served by SWEPCO's current program portfolio.

Implementation process

This program is designed to overcome barriers unique to small commercial customers that prevent them from participating in energy efficiency programs proven to be successful for larger business owners. These barriers include:

- Minimal technical knowledge among small business owners;
- Concerns about performance uncertainty and hidden costs;
- Owner/tenant challenges;
- Lack of capital, expertise, and staff; and
- Information or search costs.

To overcome these barriers, the program will offer a "turnkey" approach in which marketing, energy education, site-specific energy analysis, financial incentives, equipment procurement, and installation can be provided. Installation work will be performed by local/area contractors, thus benefiting the local economy and educating local service industries on energy efficiency benefits and capabilities.

Outreach activities

SWEPCO markets the availability of its program in the following manner:

- Maintains internet web site with detailed project eligibility, end-use measures, incentives, procedures and application forms;
- Educates internal employees about the program to help increase the customers' awareness of the programs; and
- Conducts workshops as necessary to explain elements such as responsibilities of the project sponsor, project requirements, incentive information, and the application and reporting process.

SMART SourceSM Solar PV Pilot Market Transformation Program (Solar PV Pilot MTP)

Program design

The Solar PV Pilot MTP was implemented by SWEPCO in late 2009. In addition to demand and energy savings achieved from the installations, the program also aims to transform the market by increasing the number of qualified companies offering installation services and by decreasing the average installed cost of systems by creating greater market economies of scale.

Implementation process

The pilot program primarily targets solar PV installation companies in SWEPCO's service territory, but also promotes program awareness to solar PV manufacturers and SWEPCO customers. Solar PV installers complete a solar certification process to become eligible for participation in the program and then submit project applications to be eligible to receive incentive amounts based on program guidelines.

Outreach activities

SWEPCO markets the availability of its program in the following manner:

- Makes available clear and concise material that describes the program incentive offer;
- Maintains an internet web site and program guidebook to be used as referral tools;
- Uses bill inserts and e-mail notifications;
- Conducts workshops and training for installers and local code enforcement officials to explain project requirements and incentive information; and
- Facilitates earned media opportunities, spotlighting successful projects and interesting stories when possible.

SWEPCO CARE\$ Energy Efficiency for Not-for-Profit Agencies Program (SWEPCO CARE\$)

Program design

This program targets commercial NFP agencies that provide services to low-income customers in the SWEPCO service territory. Incentives are paid to participating agencies for certain eligible energy efficiency improvements made to their administrative facilities that result in verified demand and energy savings. These improvements reduce the agency's operating costs by making the administrative facility more energy efficient, resulting in greater resources being made available to the HTR clients served.

Implementation process

The SWEPCO CARE\$ program is implemented by annually issuing notice of the program rollout date and incentive budget to a wide range of NFP organizations. Project proposals include information about the organization, planned energy efficiency improvements and specific installation costs. Proposals are reviewed and evaluated on a first-come, first-served basis until the annual program budget is fully reserved.

Outreach activities

SWEPCO markets the availability of its programs in the following manner:

- Conducts a direct mail campaign targeting possible qualifying organizations;
- Utilizes mass e-mail notifications to enroll and inform potential applicants; and
- Presents program information at agency functions and meetings, as available.

C. New Programs for 2012

There are no new programs currently scheduled to be introduced in 2012.

D. Existing DSM Contracts or Obligations

SWEPCO has no existing DSM contracts or obligations.

II. CUSTOMER CLASSES

SWEPCO's energy efficiency programs target residential and commercial customer classes. SWEPCO's energy efficiency programs also target certain customer subclasses, including Residential – HTR and Low-Income; and Commercial – Public Schools and NFP Agencies. The annual projected savings targets are allocated among these customer classes and subclasses by examining historical program results, evaluating certain economic trends, and compliance with Substantive Rule 25.181(3).

Table 3 summarizes the number of active customers in each eligible customer class at SWEPCO in the month of January 2012. These numbers were used to determine goal and budget allocations for each customer class and each program. It should be noted, however, that the actual distribution of the annual goal to be achieved and budget required to achieve the goal must remain flexible based upon the conditions of the marketplace, the potential interest a customer class may have in a specific program and the overriding objective of meeting SWEPCO's mandated demand reduction goal in total. SWEPCO offers a varied portfolio of SOPs and MTPs such that all eligible customer classes have access to energy efficiency alternatives.

Table 3: Summary of Customer Classes

Customer Class	Number of Customers
Commercial	34,311
Residential	146,784
Hard-to-Reach ⁵	48,439*

* Hard-to-Reach is a subset of the Residential customer class.

III. ENERGY EFFICIENCY GOALS AND PROJECTED SAVINGS

As prescribed by Substantive Rule 25.181, SWEPCO's annual demand reduction goal is specified as a percent of its historical, weather-normalized, five-year average growth in demand. SWEPCO's 2012 goal is based upon the average annual growth in peak demand for the years 2007 through 2011, inclusive (the most recent historical load growth data available). The 2012 Program Year demand reduction goal to be achieved is to be at least 25% of this calculated annual growth in demand of residential and commercial customers by December 31, 2012. The 2013 Program Year demand reduction goal to be achieved is to be at least 30% of this calculated annual growth in demand of residential and commercial customers by December 31, 2013. The corresponding annual energy savings goals are determined by applying a 20% capacity factor to the applicable demand reduction goal for each of these years (2012 and 2013). A utility's demand reduction goal in megawatts for any year cannot be less than the previous year's goal.

Table 4 presents the actual historical annual growth in demand for the previous five years used to calculate SWEPCO's goals. Table 5 presents the projected demand reduction and energy savings, by program, for each customer class for each of the years 2012 and 2013. Projected savings reflect the estimated demand and energy savings that SWEPCO's programs are expected to achieve.

⁵ According to the U.S. Census Bureau's 2009 Current Population Survey, 33% of Texas families fall below 200% of the poverty threshold. Applying that percentage to SWEPCO's residential customer base of 146,784, the number of HTR customers is estimated at 48,439.

Table 4: Annual Growth in Demand and Energy Consumption (at the Meter)

Calendar Year	Peak Demand (MW)				Energy Consumption (GWh)				Growth (MW)	Average Growth (MW) ⁶
	Total System		Residential & Commercial		Total System		Residential & Commercial			
	Actual	Actual Weather Adjusted	Actual	Actual Weather Adjusted	Actual	Actual Weather Adjusted	Actual	Actual Weather Adjusted	Actual Weather Adjusted	Actual Weather Adjusted
2006	1,602	1,588	1,463	1,450	7,254	7,222	6,123	6,091	NAP	NAP
2007	1,603	1,624	1,485	1,507	7,358	7,394	6,344	6,380	57	NAP
2008	1,611	1,629	1,465	1,483	7,393	7,480	6,415	6,503	(23)	NAP
2009	1,289	1,353	1,222	1,286	6,553	6,685	5,826	5,958	(197)	NAP
2010	1,452	1,432	1,357	1,336	7,394	7,141	6,434	6,182	50	NAP
2011	1,639	1,566	1,534	1,462	7,544	7,335	6,585	6,376	23	NAP
2012	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP	(18.04)
2013	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP	(18.04)

⁶ Average historical growth in demand over the prior five years for residential and commercial customers adjusted for weather fluctuations.

**Table 5: Projected Demand and Energy Savings by Program for Each Customer Class
(at the Meter)**

Customer Class and Program	2012		2013	
	Projected Savings		Projected Savings	
	kW	kWh	kW	kWh
Commercial				
Commercial Solutions Pilot MTP	364	741,186	590	2,161,756
Commercial SOP	1,261	5,266,313	1,208	5,044,318
Load Management SOP	7,960	219,640	8,734	241,017
SCORE MTP	482	1,213,381	646	1,619,135
Small Business Direct Install Pilot MTP	367	1,467,161	550	2,200,742
SMART Source SM Solar PV Pilot MTP	0	0	100	192,000
SWEPCO CARE\$	13	36,828	13	36,828
Residential				
CoolSaver [®] A/C Tune-Up Pilot MTP	273	614,495	284	692,280
On-Line Home Energy Checkup	0	0	0	0
Residential SOP	1,556	5,203,741	1,523	5,093,452
Residential Pilot Under Development	NA	NA	250	645,106
SMART Source SM Solar PV Pilot MTP	64	123,424	50	96,000
Hard-to-Reach				
Hard-to-Reach SOP	1,292	3,918,628	1,028	3,116,493
Home\$avers	129	333,674	129	333,674
Total Annual Projected Savings	13,761	19,138,471	15,105	21,472,801

IV. PROGRAM BUDGETS

Table 6 presents total projected budget allocations required to meet SWEPCO's projected demand and energy savings to be achieved for the years 2012 and 2013. The budget allocations are defined by the overall projected demand and energy savings, the avoided costs of capacity and energy specified in Substantive Rule 25.181, allocation of demand goals among customer classes, and the incentive levels by customer class. The Table 6 budget allocations are detailed by customer class, by program, and by budget categories: incentive payments, administration, and research and development (R&D).

Table 6: Projected Annual Budget by Program for Each Customer Class

2012	Incentives	Admin	R&D	Total
Commercial				
Commercial Solutions Pilot MTP	\$200,450	\$10,550		\$211,000
Commercial SOP	\$483,215	\$53,690		\$536,905
Load Management SOP	\$245,000	\$12,995		\$257,995
SCORE MTP	\$256,500	\$13,500		\$270,000
Small Business Direct Install Pilot MTP	\$330,000	\$17,368		\$347,368
SWEPCO CARE\$	\$90,000	\$10,000		\$100,000
Residential				
CoolSaver [®] A/C Tune-Up Pilot MTP	\$228,009	\$25,334		\$253,343
On-Line Home Energy Checkup	\$8,505	\$1,501		\$10,006
Residential SOP	\$885,000	\$120,682		\$1,005,682
SMART Source SM Solar PV Pilot MTP	\$135,000	\$15,000		\$150,000
Hard-to-Reach Residential				
Hard-to-Reach SOP	\$900,000	\$122,727		\$1,022,727
Home\$avers	\$373,630	\$26,370		\$400,000
Research & Development			0	0
Total Budget	\$4,135,309	\$429,717	\$0	\$4,565,026

Table 6: (Continued)

2013	Incentives	Admin	R&D	Total
Commercial				
Commercial Solutions MTP	\$324,900	\$36,100		\$361,000
Commercial SOP	\$462,846	\$51,427		\$514,273
Load Management SOP	\$268,845	\$14,150		\$282,995
SCORE MTP	\$355,500	\$39,500		\$395,000
Small Business Direct Install Pilot MTP	\$470,250	\$24,750		\$495,000
SMART Source SM Solar PV MTP	\$180,000	\$20,000		\$200,000
SWEPCO CARE\$	\$90,000	\$10,000		\$100,000
Residential				
CoolSaver [®] A/C Tune-Up MTP	\$220,408	\$32,935		\$253,343
On-Line Home Energy Checkup	\$8,705	\$1,301		\$10,006
Residential SOP	\$866,243	\$129,439		\$995,682
Residential Program Under Development	\$174,000	\$26,000		\$200,000
SMART Source SM Solar PV MTP	\$90,000	\$10,000		\$100,000
Hard-to-Reach Residential				
Hard-to-Reach SOP	\$715,772	\$106,955		\$822,727
Home\$avers	\$373,630	\$26,370		\$400,000
Research & Development			\$70,000	\$70,000
Total Budget	\$4,601,099	\$528,927	\$70,000	\$5,200,026⁷

⁷ Additional costs will likely be incurred and reported in SWEPCO's EECRF filing pending Commission action in Project No. 39674 as discussed in Section XIV.

ENERGY EFFICIENCY REPORT

V. HISTORICAL DEMAND AND ENERGY SAVINGS GOALS FOR THE PREVIOUS FIVE YEARS

Table 7 documents SWEPCO's actual demand and energy goals for the previous five years (2007-2011) calculated in accordance with Substantive Rule 25.181 and actual savings achieved.

Table 7: Historical Demand and Energy Goals (at the Meter)

Calendar Year	Actual Weather Adjusted Demand Goal (MW)	Achieved Demand Savings (MW)	Actual Weather Adjusted Energy Goal (MWh)	Achieved Energy Savings (MWh)
2011 ⁸	5.60	15.03	9,811	22,582
2010 ⁹	5.60	14.75	9,811	18,478
2009 ¹⁰	5.60	9.56	9,811	17,880
2008 ¹¹	5.60	6.26	NAP	14,875
2007 ¹²	4.44	1.61	NAP	5,497

⁸ Actual weather-adjusted MW and MWh Goals as reported in SWEPCO's EEPR filed April 2011 under Project No. 39105.

⁹ Actual weather-adjusted numbers from EEPR, Project No. 37982.

¹⁰ Actual weather-adjusted numbers from EEPR, Project No. 36689.

¹¹ Actual weather-adjusted numbers from EEPR, Project No. 35440.

¹² Actual weather-adjusted numbers from EER, Project No. 33884.

VI. PROJECTED, REPORTED AND VERIFIED DEMAND AND ENERGY SAVINGS

**Table 8: Projected versus Reported and Verified Savings for 2011 and 2010
(at the Meter)**

2011 Customer Class and Program	Projected Savings ¹³		Reported and Verified Savings	
	kW	kWh	kW	kWh
Commercial				
Commercial Solutions Pilot MTP	750	1,449,758	812	3,835,382
Commercial SOP	1,480	7,496,724	1,658	6,921,640
CoolSaver® A/C Tune-Up Pilot MTP	252	1,080,712	153	290,742
LED Lighting Pilot MTP	40	761,120	0	86,936
Load Management SOP	7,829	132,849	8,674	239,063
SCORE MTP	750	1,451,184	776	1,993,312
Small Business Direct Install Pilot MTP	102	407,545	15	60,175
SMART Source SM Solar PV Pilot MTP	54	104,136	62	154,794
SWEPCO Care\$	9	29,553	10	27,646
Residential				
CoolSaver® AC Tune-Up Pilot MTP	272	815,273	68	153,172
Residential SOP	1,506	4,100,854	1,422	4,756,479
SMART Source SM Solar PV Pilot MTP	54	104,136	37	35,704
Hard-to-Reach Residential				
Hard-to-Reach SOP	1,070	3,589,183	1,218	3,694,079
Home\$avers	174	497,712	129	333,148
R&D				
Total Annual Savings	14,342	22,020,739	15,034	22,582,272

¹³ Projected savings from EEPR filed April 2011, Project No. 39105.

2010 ¹⁴	Projected Savings		Reported and Verified Savings	
Customer Class and Program	kW	kWh	kW	kWh
Commercial				
Commercial Solutions Pilot MTP	1,059	2,047,059	630	2,307,809
Commercial SOP	2,330	16,216,406	904	4,551,035
CoolSaver [®] A/C Tune-Up Pilot MTP	146	401,785	4	8,231
Load Management SOP	5,600	90,246	9,297	157,541
SCORE MTP	480	928,758	1,120	3,412,786
SMART Source SM Solar PV Pilot MTP	30	40,400	84	161,520
SWEPCO Care\$	23	74,071	10	29,626
Residential				
CoolSaver [®] A/C Tune-Up Pilot MTP	165	304,462	9	18,078
Residential SOP	1,308	3,775,174	1,636	4,453,468
SMART Source SM Solar PV Pilot MTP	30	44,000	26	50,784
Hard-to-Reach Residential				
Hard-to-Reach SOP	693	2,747,730	792	2,656,619
Home\$avers	36	326,582	235	670,440
R&D	50	292,000	0	0
Total Annual Savings	11,950	27,288,673	14,748	18,477,937

¹⁴ Projected and Reported/Verified Savings from EEPR filed April 2010, Project No. 37982.

VII. HISTORICAL PROGRAM EXPENDITURES

This section documents SWEPCO's incentive and administration expenditures for the previous five years (2007-2011) detailed by program for each customer class.

Table 9: Historical Program Incentive and Administrative Expenditures for 2007 through 2011 (000's)¹⁵

	2011		2010		2009		2008		2007	
	Incent	Admin	Incent	Admin	Incent	Admin	Incent	Admin	Incent	Admin
Commercial										
Commercial Solutions Pilot MTP	\$458.7	\$45.1	\$270.2	\$25.6	\$255.9	\$16.4	\$75.0	\$2.8	NAP	NAP
Commercial SOP	\$635.1	\$101.7	\$345.1	\$54.0	\$466.3	\$47.8	\$558.7	\$48.5	\$231.7	\$21.7
CoolSaver® A/C Tune-Up Pilot MTP	\$132.6	\$11.0	\$20.0	\$1.8	NAP	NAP	NAP	NAP	NAP	NAP
LED Lighting Pilot MTP	\$33.9	\$5.8	\$21.4	\$6.9	NAP	NAP	NAP	NAP	NAP	NAP
Load Management SOP	\$267.0	\$35.0	\$290.9	\$32.7	\$169.5	\$21.1	\$85.4	\$7.5	NAP	NAP
SCORE MTP	\$278.7	\$30.2	\$336.1	\$27.1	\$201.3	\$19.7	\$124.1	\$10.3	\$166.9	\$13.9
Small Business Direct Install Pilot MTP	\$67.8	\$12.5	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP
SMART Source SM Solar PV Pilot MTP	\$204.3	\$14.3	\$141.8	\$9.3	\$0.0	\$0.0	NAP	NAP	NAP	NAP
SWEPCO Care\$	\$67.6	\$6.9	\$98.7	\$11.6	\$84.9	\$7.1	\$90.0	\$9.2	\$79.0	\$3.3
Residential										
Appliance Recycling Pilot MTP	NAP	NAP	NAP	NAP	\$30.0	\$3.0	NAP	NAP	NAP	NAP
CoolSaver® A/C Tune-Up Pilot MTP	\$56.8	\$4.7	\$105.3	\$9.7	NAP	NAP	NAP	NAP	NAP	NAP
On-Line Home Energy Checkup	\$0.0	\$5.3	NAP	NAP	NAP	NAP	NAP	NAP	NAP	NAP
Residential SOP	\$808.9	\$110.5	\$888.8	\$98.1	\$419.3	\$48.8	\$358.5	\$47.1	\$216.8	\$20.8
SMART Source SM Solar PV Pilot MTP	\$52.7	\$3.7	\$87.1	\$5.7	\$35.8	\$6.5	NAP	NAP	NAP	NAP
TX Statewide Energy Star Residential CFL MTP	NAP	NAP	\$2.7	\$0.0	\$29.4	\$11.0	\$37.1	\$8.7	NAP	NAP
Hard-to-Reach Residential										
Hard-to-Reach SOP	\$848.5	\$116.2	\$599.1	\$69.4	\$745.9	\$68.2	\$582.6	\$42.0	\$61.5	\$13.5
HomeSavers	\$373.0	\$25.9	\$503.3	\$33.5	\$246.4	\$26.7	\$278.5	\$25.3	\$371.5	\$14.8
Research and Development (R&D)	\$0.0	\$74.2	\$0.0	\$185.5	\$7.3	\$136.9	\$27.1	\$27.9	\$14.9	\$3.9
Total Expenditures	\$4,285.6	\$603.0	\$3,710.5	\$570.9	\$2,692.0	\$413.2	\$2,217.0	\$229.3	\$1,142.3	\$91.9

¹⁵ 2011 expenditures taken from Table 10 in the current EEPR; 2010 expenditures from EEPR, Project No. 39105; 2009 expenditures from EEPR, Project No. 37982; 2008 expenditures from EER, Project No. 36689; 2007 expenditures from EER, Project No. 35440.

VIII. PROGRAM FUNDING FOR CALENDAR YEAR 2011

As shown in Table 10, the total projected budget for 2011 was \$5,200,076. Total funds expended for 2011 were \$4,888,597, an overall total program expenditure 6% below the amount budgeted. Not all programs, experienced expenditures below their 2011 budgets.

The residential component of the SMART Source Solar PV MTP did not perform as expected and came in under budget. The commercial component of the SMART Source Solar PV MTP program exceeded its budgeted amount due to commercial customers being able to combine SWEPCO incentives with government funds.

In 2011, the Outdoor LED Lighting MTP fell below its proposed budget due to the higher cost of LED technology versus standard fixtures.

Implementation of the Small Business Direct Install Pilot MTP commenced later than originally expected and therefore the full amount budgeted was not totally expended.

The anticipated budget for the On-Line Home Energy Checkup was not completely spent due to a later than expected implementation date, resulting in a partial year of operation.

SWEPCO CARE\$ did not allocate all of its funding for several reasons. NFP Agencies' expenditures typically relate to air conditioning or lighting upgrades. They typically do not have the expertise to determine other valuable energy efficiency projects.

Other programs exceeded their projected budgets were the Commercial SOP, the Commercial Solutions MTP, and the Load Management SOP due to higher participation.

Table 10: Program Funding for Calendar Year 2011

2011	Total Projected Budget	Number of Customers Participating	Actual funds Expended (Incentives)	Actual Funds Expended (Admin)	Research and Development (R&D)	Total funds Expended	Funds Committed (Not Expended)	Funds Remaining (Not Committed)
Commercial	\$2,454,605		\$2,145,655	\$262,551		\$2,408,204		
Commercial Solutions Pilot MTP	\$458,913	28	\$458,703	\$45,081		\$503,784		
Commercial SOP	\$631,000	11	\$635,103	\$101,701		\$736,803		
CoolSaver [®] A/C Tune-Up Pilot MTP	\$145,160	21	\$132,614	\$10,964		\$143,578		\$1,582
LED Lighting Pilot MTP	\$215,000	0	\$33,888	\$5,801		\$39,689	\$10,026	\$165,285
Load Management SOP	\$257,895	7	\$266,988	\$35,019		\$302,006		
SCORE MTP	\$313,304	16	\$278,717	\$30,236		\$308,953		\$4,351
Small Business Direct Install Pilot MTP	\$183,333	2	\$67,748	\$12,470		\$80,218		\$103,115
SMART Source SM Solar PV Pilot MTP	\$150,000	8	\$204,333	\$14,342		\$218,675		
SWEPCO Care\$	\$100,000	6	\$67,561	\$6,937		\$74,498		\$25,502
Residential	\$1,260,412		\$918,494	\$124,181		\$1,042,676		
CoolSaver [®] A/C Tune-Up Pilot MTP	\$170,406	173	\$56,835	\$4,699		\$61,534		\$108,872
On-Line Home Energy Checkup	\$10,006	37		\$5,281		\$5,281		\$4,725
Residential SOP	\$930,000	1465	\$808,938	\$110,501		\$919,440		\$10,560
SMART Source SM Solar PV Pilot MTP	\$150,000	4	\$52,721	\$3,700		\$56,421		\$93,579
Hard-to-Reach Residential	\$1,369,059		\$1,221,458	\$142,014		\$1,363,472		
Hard-to-Reach SOP	\$969,059	1241	\$848,418	\$116,148		\$964,566		\$4,493
Home\$avers	\$400,000	112	\$373,040	\$25,866		\$398,906	\$1,098	
Research & Development	\$116,000		\$0	\$0	\$74,245	\$74,245		
Total Expenditures	\$5, 200,076	3131	\$4,285,607	\$528,746	\$74,245	\$4,888,597	NA	NA

IX. MARKET TRANSFORMATION PROGRAM RESULTS

Commercial Solutions Pilot MTP (CS MTP)

SWEPSCO implemented the CS MTP as a pilot program in the fourth quarter of 2008 by targeting customers in the SWEPSCO service territory that met the program participation parameters. The program provided non-cash incentives, such as technical assistance and communication support provided by the program implementer as well as cash incentives for the installation of documented energy efficiency measures that reduce peak demand and energy use. SWEPSCO issued a competitive solicitation RFP for a Commercial Facility Program in 2011 to select an implementer to fully implement the Program in 2012. SWEPSCO contracted with a third-party program implementer to provide services, education, and support to assist businesses in identifying critical needs and promoting best practices.

For 2011, SWEPSCO projected to acquire 750 kW demand savings from this program. SWEPSCO's verified and reported results are 751 kW in demand savings. This included participation by 28 customers in eight different counties.

Pursuant to Substantive Rule 25.181, as part of the 2011 Commercial Solutions Pilot MTP, SWEPSCO completed a baseline study of the commercial market. The primary objective of this study was to document the current status of customer awareness, attitudes, and knowledge regarding energy efficiency within commercial facilities in SWEPSCO's service territory. The study showed that most businesses are encountering financial constraints and lack of energy efficiency education and technical assistance.

CoolSaver® A/C Tune-Up Pilot MTP (CoolSaver MTP)

SWEPSCO began implementing the CoolSaver® MTP in 2010 as a pilot program. The program goal was to acquire 524 kW demand savings in 2011. A total of 221 kW was actually achieved. Nine area A/C contractors purchased the diagnostic equipment and 19 technicians were trained to offer a more thorough diagnosis of a unit's performance. These technicians performed 460 tune-ups at 203 different residential and commercial locations in 11 different counties.

While the program experienced better performance than the previous program year, it still did not reach its demand and energy savings goals. The program was on track to reach its commercial goal, but the cooling season ended before that could be achieved. The residential program still experienced many of the challenges that were experienced in 2010, as well as some new challenges that were identified, which include:

- Several trained technicians left the approved contractor's employment, taking with them the knowledge and experience to perform CoolSaver[®] tune-ups.
- Customers were unwilling to spend additional dollars for anything other than necessary work to their units, which led to poor upselling opportunities for participating contractors.
- A/C dealers with large volumes of service contracts dedicated their resources to those existing contracts during the summer cooling season.

The commercial component has been eliminated from the program for 2012.

LED Lighting Pilot MTP

SWEPCO began implementing the LED Lighting Pilot MTP in July, 2010, by marketing to customers in the SWEPCO service territory that met the program eligibility parameters. The program provided non-cash value to SWEPCO customers such as technical education and project financial calculations, both of which were provided by the program implementer. SWEPCO contracted with a third-party implementation to provide services, education, and support to assist customers with identifying LED lighting installation opportunities.

In 2011, the program achieved 86,936 kWh in energy savings. Uncertainty about the economy and LED technology impeded customers' interest in capital investments and limited the number of projects closed in 2011. At the end of 2011, SWEPCO decided to discontinue the program due to its higher costs versus other programs and the need to meet cost caps as required by Substantive Rule 25.181.

SCORE MTP

SWEPCO implemented this energy-smart schools MTP in pilot form in 2005. The program targeted several schools in the SWEPCO service area. SWEPCO issued a RFP in 2008 to select a consultant to fully implement the program in 2009, and continued the program in 2010 and 2011. The program is designed to overcome obstacles to energy efficiency projects such as the institutional disconnect between finance and facilities departments, the lack of first-hand experience with efficiency measures, limited budgets, and the lack of management decision-making processes necessary for identifying, prioritizing, and completing projects that will improve energy performance and reduce operating costs for public school and government facilities.

The 2011 SCORE MTP provided non-cash incentives such as building energy analysis (benchmarking), energy master-planning seminars, technical assistance, communications support, and monetary incentives for the installation of documented energy efficiency measures that reduce peak demand and energy use.

For 2011, SWEPCO projected to acquire 750 kW demand savings from this program. SWEPCO has verified reported savings of 755 kW. This included participation by 16 customers in seven counties.

SMART SourceSM Solar PV Pilot MTP (Solar PV Pilot MTP)

The Solar PV Pilot MTP program experienced a small increase in residential participation in 2011, and a decrease in commercial customer participation during the same period, resulting in a 7% overall decrease in installed kW of approximately 7% when compared with Program Year 2010. The 2011 program saw the majority of program activity in the commercial sector. Demand savings were projected to be 108 kW; verified savings are reported at 99 kW. At the end of 2011, approximately 91% of SWEPCO's incentive funds were expended on projects.

The Commercial component of the Solar PV Pilot MTP has been eliminated for 2012 due to cost caps, but the residential component will be continued in 2012.

X. RESEARCH AND DEVELOPMENT

R&D activities and projects accounted for 1.5% of SWEPCO's 2011 program expenses. R&D activities are intended to help SWEPCO meet future energy efficiency goals by researching new technologies and program options as well as developing better and more efficient ways to administer current programs. The following is a summary of R&D efforts for 2011.

Center for Commercialization of Electric Technologies (CCET)

SWEPCO is a member of CCET, whose purpose is "to enhance the safety, reliability, security, and efficiency of the Texas electric transmission and distribution system through research, development and commercialization of emerging technologies." Since CCET benefits primarily the ERCOT companies, a mid-year decision was made to discontinue SWEPCO participation.

Electric Power Research Institute (EPRI) "Hyper-Efficient" Appliance R&D Project

EPRI selected SWEPCO as a host site for the "Hyper-Efficient" Appliance project. The goal of the project is to test, evaluate, demonstrate, and accelerate adoption of high efficiency refrigerators and washing machines. The refrigerators have inverter-driven compressors to adjust power output to deliver the required cooling, microprocessors to monitor temperature, and an anticipated energy reduction of approximately 20%. The washing machines exceed ENERGY STAR standards by using less energy and water while removing more water during the spin cycle to reduce drying requirements.

The customers' existing appliances were metered for 60 days to establish a baseline. After the 60-day period, the new appliances were installed. The appliances were monitored via internet to determine energy consumption, water consumption, water temperature, relative humidity, temperature in residence, and the number of times the refrigerator door was opened.

Appliances were installed and monitoring began in 2011. The appliances will be monitored until March, 2012, at which time EPRI will process the data and publish the results.

LED Lighting for Broiler Houses R&D Project

This R&D project was initiated in the summer of 2010 and was designed to measure and verify the electrical demand and energy savings of LED lamps against control houses containing incandescent lamps, verify the life of the LED lamps, and evaluate the performance of the LED lamps with different dimmer technologies compared to the existing silicon controlled rectifier (SCR) dimmers.

The project was conducted on two almost identical broiler farms owned by the same grower. Each farm consists of six houses. The grower replaced 60-watt incandescent feeder lamps with 10-watt LED lamps in the six houses on one of the broiler farms. The lighting circuits of three houses on the LED farm and three houses on the incandescent farm were sub-metered to provide energy consumption data. The SCR dimmers on the LED farm were replaced with new, more efficient dimmers. Data for this project has been collected through the end of 2011 and will ultimately include an evaluation of the LED bulbs to determine bulb life. Through eight flocks of birds, the LED lights have reduced the demand and energy consumed in LED houses by an average of 7.3 kW and 26,482 kWh, respectively, as compared to the incandescent bulbs in the control houses. To date there have been no known failures of the LED bulbs. The grower has indicated that the birds in the test houses are less active, which could possibly be due to the color temperature (4,500 Kelvin) of the specific LED lights installed. In some of the flocks, lower bird mortality and higher final bird weights have been reported when compared to the incandescent houses; however, the impact of these specific LED lights on the various bird metrics is inconclusive. Both photopic and scotopic lighting measurements have been mapped in the LED and control houses on at least two occasions, which could ultimately allow for an analysis of the lamp lumen depreciation on both a photopic and scotopic basis.

This R&D project verified that there were significant energy and demand savings associated with the replacement of the incandescent bulbs with LED bulbs; however, the impact of these specific LED lights on the various bird metrics (mortality, feed conversion, final grow-out weight, etc.) is

inconclusive. There is a large cost differential between LED bulbs and incandescent bulbs, but due to incandescent phase-out associated with the Energy Independence and Securitization Act of 2007, SWEPCO asserts that lighting technology utilized in poultry broiler houses will ultimately transform itself without the development of specific energy efficiency lighting program for the poultry industry. As LED bulbs for this type of application become ENERGY STAR qualified or listed by the Design Lights Consortium, they will be incented through SWEPCO's other approved non-residential EE Programs where appropriate. Therefore, SWEPCO will not be continuing this R&D Project in 2012.

LED Outdoor Parking Lot Lighting R&D Project

SWEPCO partnered with a major retailer to jointly sponsor a commercial LED Outdoor Lighting R&D project in Longview. The primary objectives of the project were to understand the potential energy savings achievable with comparable perceived illumination, evaluate the reliability of LED lighting electronics' ability to survive real-world electrical disturbances, and to provide a forum to evaluate public acceptance, durability, light performance, and weather resistance.

The existing 1000-watt metal halide fixtures in a parking lot were replaced with LED fixtures. A sample of the lighting circuits was sub-metered with the existing metal halide fixtures and after the installation of the LED fixtures to determine energy consumption. Photometric evaluation will also be prepared on a pre- and post-basis and at the approximate 6000-hour burn time to evaluate the quality of the LED lighting system. SWEPCO is splitting the R&D costs 50/50 with the retailer. The connected lighting load was reduced by 36 kW but since outdoor lighting is off-peak, minimal peak demand savings are anticipated. Except for a direct lightning strike, there have been no failures of the LED fixtures, and customers have not seemed to notice the difference in the lighting source. SWEPCO is continuing to work on the final light readings and will send two of the LED lighting fixtures to a test lab to determine the lamp lumen depreciation and the estimated remaining life of the LED fixtures.

Program Research and Development

Other R&D activities included:

- SWEPCO has continued to refine and enhance data collection and management systems for current programs.
- A critical programming and design change was caused by the need to begin recording program expenses and savings for the commercial customer class by individual rate codes.
- SWEPCO Program Managers attended a national Association of Energy Services Professionals (AESP) Conference to develop additional knowledge regarding program ideas and how to best implement SWEPCO's energy efficiency programs.

- Program Managers also attended the following training sessions: Certified Measurement and Verification Professionals (AEE); Overview of Demand-Side Management (AESP); DSM Program Planning, Design & Implementation (AESP); Air Infiltration Testing & Duct Leakage (TX A&M); and Performance Testing Requirements in Code (TX A&M).

XI. CURRENT ENERGY EFFICIENCY COST RECOVERY FACTOR

In Docket No. 39359, SWEPCO requested an EECRF to recover \$4,565,026, the cost of SWEPCO's energy efficiency program projected for 2012, to meet its energy efficiency objectives under PURA §39.905, and a performance bonus of \$856,409. Also requested was a return to the customers of \$239,829 in revenue that was over-collected during 2010. SWEPCO's request was granted by the PUCT on December 15, 2011. The EECRF was made effective on December 30, 2011, the beginning of SWEPCO's January 2012 billing month, and is calculated to recover \$5,181,606 in energy efficiency costs.

Table 11: EECRF

Customer Class	EECRF
Residential	\$0.001247 per kWh
Commercial	\$0.000540 per kWh
Industrial	\$0.000176 per kWh
Lighting	(\$0.000660) per kWh

Revenue Collected

SWEPCO collected \$5,521,277 during 2011 through its 2011 EECRF for energy efficiency costs. This total included \$676,534, the amount approved as SWEPCO's performance bonus for exceeding its 2009 energy efficiency goal. Therefore, SWEPCO collected \$4,844,743 related to its 2011 energy efficiency program.

Program Costs Expended

SWEPCO expended a total of \$4,888,597 for its 2011 energy efficiency programs. The 2011 budget was \$5,200,076, for program offerings. SWEPCO's actual program costs were \$311,479 less than its budget in 2011.

Over- or Under-recovery

The final order in Docket No. 38210 authorized SWEPCO to recover \$5,200,076 in energy efficiency program costs through its 2011 EECRF. SWEPCO spent \$311,479 less on energy efficiency programs than the projected budget for 2011. SWEPCO collected \$4,844,743 of its program costs through its 2011 EECRF resulting in an over-recovery of \$324,214, which will be applied to the 2013 EECRF.

XII. UNDERSERVED COUNTIES

The underserved counties in the SWEPCO service territory per Substantive Rule 25.181 are Childress, Collingsworth, Donley, Hall, Rusk and Wheeler. Underserved counties have been defined by SWEPCO as any county for which SWEPCO did not report demand or energy savings through any of its 2011 SOPs or MTPs.

XIII. PERFORMANCE BONUS

SWEPCO achieved a 15,034 kW reduction in peak demand from its energy efficiency programs offered in 2011. SWEPCO's demand reduction goal for 2011 was 5,600 kW. This achievement represents 267% of its 2011 goal, qualifying it for a performance bonus. Per Substantive Rule 25.181(h), SWEPCO is eligible for a Performance Bonus of \$977,719 which it will request within its May 1, 2012 EECRF filing for implementation in 2013.

Table 12: Energy Efficiency Performance Bonus Calculation for 2011

	kW	kWh	From Table
2011 Goals	5,600	9,811,200	7
2011 Savings			
<i>Reported/Verified Total</i>	15,034	22,852,272	8
<i>Reported/Verified Hard-to-Reach</i>	1,347		8
2011 Program Costs		\$4,888,597	10
2011 Performance Bonus		\$977,719	

Performance Bonus Calculation

268.46%	Percentage of Demand Reduction Goal Met (Reported kW/Goal kW)
230.17%	Percentage of Energy Reduction Goal Met (Reported kWh/Goal kWh)
TRUE	Met Requirements for Performance Bonus?
\$14,818,886	Total Avoided Cost (Reported kW * PV (Avoided Capacity Cost) + Reported kWh * PV (Avoided Energy Cost))
\$4,888,597	Total Program Costs
\$9,930,289	Net Benefits (Total Avoided Cost – Total Expenses)

Bonus Calculation

\$8,364,478	Calculated Bonus ((Achieved Demand Reduction/Demand Goal – 100%) / 2) * Net Benefits
\$977,719	Maximum Bonus Allowed (20% of Program Costs)
\$977,719	Bonus (Minimum of Calculated Bonus and Bonus Limit)

XIV. POTENTIAL FINANCIAL IMPACTS OF PROJECT NO. 36974, RULEMAKING PROCEEDING TO AMEND ENERGY EFFICIENCY RULES

Under the current PUCT rule-making Project No. 39674, several proposed changes to Substantive Rule § 25.181 will likely increase the current proposed budget estimate outlined in this report and are referenced below:

- Evaluation, Measurement and Verification (EM&V) costs;
- Rate case expenses;
- Reimbursement for the governing body of a municipality pursuant to PURA § 33.023(b); and
- Other potential items ultimately adopted in the final rulemaking.

While these costs have not been calculated due to the ongoing rulemaking proceeding, a forecast of the cost breakdown of the above-referenced services or expenses will be incorporated into the EECRF filing in 2012 or when the new rule is adopted.

ACRONYMS

A/C	Air conditioning
AEE	Association of Energy Engineers
AESP	Association of Energy Services Professionals
CCET	Center for the Commercialization of Electric Technologies
CoolSaver® MTP	CoolSaver® AC Tune-Up Pilot Market Transformation Program
CS MTP	Commercial Solutions Pilot Market Transformation Program
CSOP	Commercial Standard Offer Program
DOE	Department of Energy
EE Rule	Energy Efficiency Rule, PUC Substantive Rules 25.181 and 25.183
EECRF	Energy Efficiency Cost Recovery Factor
EEP	Energy Efficiency Plan
EEPR	Energy Efficiency Plan and Report
EER	Energy Efficiency Report, which was filed as a separate document prior to April 2008
EESP	Energy efficiency service provider
EPRI	Electric Power Research Institute
HTR SOP	Hard-to-Reach Standard Offer Program
HTR	Hard-To-Reach
LED	Light-emitting diode
LED MTP	LED Lighting Pilot Transformation Program
LM SOP	Load Management Standard Offer Program
M&V	Measurement and Verification
MTP	Market Transformation Program
NAP	Not Applicable

ACRONYMS (Continued)

NFP	Not for Profit
PLAN	Energy Efficiency Plan, which was filed as a separate document prior to April 2008
PUCT	Public Utility Commission of Texas
PURA	Public Utility Regulatory Act
PV	Photovoltaic
R&D	Research and Development
REPORT	Energy Efficiency Report
RFP	Request for Proposal
RSOP	Residential Standard Offer Program
SBDI	Small Business Direct Install
SCORE MTP	Schools Conserving Resources Market Transformation Program
SOLAR PV PILOT MTP	SMART Source SM Solar PV Pilot Market Transformation Program
SCR	Silicon controlled rectifier
SWEPCO CARE\$	SWEPCO CARE\$ Energy Efficiency for Not-for-Profit Agencies Program
SWEPCO	Southwestern Electric Power Company

GLOSSARY

Actual Weather Adjusted -- Actual Weather Adjusted peak demand and energy consumption is the historical peak demand and energy consumption adjusted for weather fluctuations using weather data for the most recent ten years.

At meter – Demand (kW/MW) and Energy (kWh/MWh) figures reported throughout the EEPR are reflective of impacts at the customer meter. This is the original format of the measured and deemed impacts, which the utilities collect for their energy efficiency programs. Goals are necessarily calculated “at source” (generator) using utility system peak data at the transmission level. In order to accurately compare program impacts, goals and projected savings have been adjusted for the line losses (7%) that one would expect going from the source to the meter.

Average growth -- Average historical growth in demand (kW) over the prior five years for residential and commercial customers adjusted for weather fluctuations.

Capacity factor – The ratio of the annual energy savings goal, in kWh, to the peak demand goal for the year, measured in kW, multiplied by the number of hours in the year; or the ratio of the actual annual energy savings, in kWh, to the actual peak demand reduction for the year, measured in kW, multiplied by the number of hours in the year.

Commercial customer -- A non-residential customer taking service at a metered point of delivery at a distribution voltage under an electric utility’s tariff during the prior calendar year and a non-profit customer or government entity, including an educational institution. Each metered point of delivery is considered a separate customer.

Deemed Savings -- A pre-determined, validated estimate of energy and peak demand savings attributable to an energy efficiency measure in a particular type of application that an electric utility may use instead of energy and peak demand savings determined through measurement and verification activities.

Demand -- The rate at which electric energy is used at a given instant, or averaged over a designated period, usually expressed in kilowatts (kW) or megawatts (MW).

Demand savings -- A quantifiable reduction in demand.

Energy efficiency -- Improvements in the use of electricity that are achieved through facility or equipment improvements, devices, or processes that produce reductions in demand or energy consumption with the same or higher level of end-use service and that do not materially degrade existing levels of comfort, convenience, and productivity.

Energy efficiency measures -- Equipment, materials, and practices at a customer’s site that result in a reduction in electric energy consumption, measured in kilowatt-hours (kWhs), or peak demand, measured in kilowatts (kW), or both. These measures may include thermal energy storage and removal of an inefficient appliance so long as the customer need satisfied by the appliance is still met.

Energy efficiency program -- The aggregate of the energy efficiency activities carried out by an electric utility or a set of energy efficiency projects carried out by an electric utility under the same name and operating rules.

Energy Efficiency Rule (EE Rule) -- Sections 25.181 and 25.183 of the Public Utility Commission of Texas’ Substantive Rules implementing Public Utility Regulatory Act (PURA) § 39.905.

Energy savings -- A quantifiable reduction in a customer's consumption of energy that is attributable to energy efficiency measures.

Glossary (continued)

Growth in demand -- The annual increase in demand in the Texas portion of an electric utility's service area at time of peak demand, as measured in accordance with the Energy Efficiency Rule.

Hard-to-reach (HTR) customers -- Residential customers with an annual household income at or below 200% of the federal poverty guidelines.

Incentive payment -- Payment made by a utility to an energy efficiency service provider under an energy-efficiency program.

Inspection -- Examination of a project to verify that an energy efficiency measure has been installed, is capable of performing its intended function, and is producing energy savings or demand reduction.

Load management -- Load control activities that result in a reduction in peak demand on an electric utility system or a shifting of energy usage from a peak to an off-peak period or from high-price periods to lower-price periods.

Market transformation program (MTP) -- Strategic programs to induce lasting structural or behavioral changes in the market that result in increased adoption of energy efficient technologies, services, and practices.

Measurement and verification (M&V) -- Activities intended to determine the actual energy and demand savings resulting from energy efficiency projects.

Peak demand -- Electrical demand at the times of highest annual demand on the utility's system.

Peak demand reduction -- Reduction in demand on the utility system throughout the utility system's peak period.

Peak period -- The hours from one p.m. to seven p.m., during the months of June, July, August, and September, excluding weekends and federal holidays.

Photopic Lumens - A type of light measured in lumens that is generally detected by common light meters and accounts for part of the human eye's perception of brightness.

Program year -- The period of time between January 1 and December 31 of the same year.

Projected demand and energy savings -- Peak demand reduction and energy savings Company projects to achieve by implementing the portfolio of programs outlined in this EEPR. These projected savings reflect Company's goals required by the Energy Efficiency Rule.

Project sponsor -- An energy efficiency service provider or customer who installs energy efficiency measures or performs other energy efficiency services under the Energy Efficiency Rule. An energy efficiency service provider may be a retail electric provider or commercial customer, provided that the commercial customer has a peak load equal to or greater than 50 kW.

Renewable demand side management (DSM) technologies -- Equipment that uses a renewable energy resource (renewable resource), as defined in PUC Substantive Rule 25.173(c) (relating to Goal for Renewable Energy) that, when installed at a customer site, reduces the customer's net purchases of energy, demand, or both.

Standard offer program (SOP) -- A program under which a utility administers standard offer contracts between the utility and energy efficiency service providers.

Scotopic Lumens - A type of light that is not generally detected by common light meters but which accounts for part of the human eye's perception of brightness.

Glossary (continued)

Underserved county-- A county that did not report any demand or energy savings through a prior year's SOP or MTP.

Underserved measure – A measure not commonly installed in a prior year's SOP or MTP.

APPENDIX A:

**REPORTED AND VERIFIED DEMAND
AND ENERGY REDUCTION BY COUNTY**

Appendix A: Reported and Verified Demand and Energy Reduction by County

Program		Bowie	Camp	Cass	Childress	Collingsworth	Donley	Franklin	Gregg	Hall	Harrison	Hopkins	Marion	Morris	Panola	Rains	Red River	Rusk	Shelby	Smith	Titus	Upshur	VanZandt	Wheeler	Wood
Commercial Solutions	kW	229.88		3.55					540.91		27.00										3.70	2.89	4.33		
	kWh	705.469		15,896					2,999,690		66,956										14,950	12,977	19,444		
Commercial SOP	kW	819.22						114.40	75.11		300.48				144.73							203.59			
	kWh	2,275.992						989,248	366,670		1,700,734				774,625							814,372			
CoolSaver A/C Tune-Up	kW	0.19	0.84	1.82				0.60	58.97		3.15		0.32	7.14	115.70			0.87			28.25	1.31			2.27
	kWh	382	1,743	3,723				948	130,910		5,968		412	17,674	220,394			2,378			50,185	2,715			6,482
Hard-to-Reach SOP	kW	349.62	27.07	59.79					309.39		153.63		2.26		83.24			21.12	5.44	0.98	165.44	5.41	5.40		29.19
	kWh	859,412	46,632	219,499					819,494		500,132		3,131		400,112			59,043	27,238	6,114	566,913	29,645	14,970		141,744
HomeSavers	kW	53.89	5.29	10.83				2.42	23.29		1.80	0.04	6.72	14.66	3.31			0.87			5.56				
	kWh	126,234	13,672	47,348				6,783	53,331		3,912	259	15,264	34,738	7,774			2,595			21,238				
Outdoor LED	kW																								
	kWh								86,936																
Load Management	kW	3.346							3,957		220							1,151							
	kWh	120,450							69,246		7,927							41,440							
Residential SOP	kW	488.08	8.83	31.98				7.50	438.30		41.09	1.77	2.14	7.12	139.87			28.16			208.09	6.73	2.00		10.31
	kWh	1,287,684	52,603	104,418				47,965	1,080,380		131,137	12,269	9,129	37,663	527,668			97,746			1,274,767	24,778	9,021		59,251
SCORE	kW	42.98		74.60					463.83		49.07				7.00				135.73						2.60
	kWh	98,202		169,420					1,231,450		110,060				19,239				360,499						4,442
Small Business Direct Install	kW	15.01																							
	kWh	60,175																							
SMART Source	kW	6.81		18.30					33.86		6.30			4.48			3.40	7.74	17.93						
	kWh	13,120		35,280					65,274		12,144			8,640			6,560	14,920	34,560						
SWEPCO CARES	kW	1.80							5.10		1.96							1.25							
	kWh	4,016							14,351		5,466							3,813							
Totals per County	kW	5,338.47	42.03	200.87	0	0	0	124.92	5,905.76	0	804.48	1.81	11.44	33.40	493.85	0	3.40	1,211.01	159.10	0.98	411.04	219.93	11.73	0	44.37
	kWh	5,490,961	114,650	595,584	0	0	0	1,044,944	6,917,732	0	2,544,436	12,528	27,936	98,715	1,949,812	0	6,560	221,935	422,297	6,114	1,928,053	884,487	43,435	0	211,919

The following counties had no installations: Childress, Collingsworth, Donley, Hall, Rains, Wheeler

APPENDIX B:

PROGRAM TEMPLATES

SWEPCO does not have any program templates to report this year.

APPENDIX C:

EXISTING CONTRACTS OR OBLIGATIONS

SWEPCO does not have any Existing Contracts or Obligations documentation to provide.

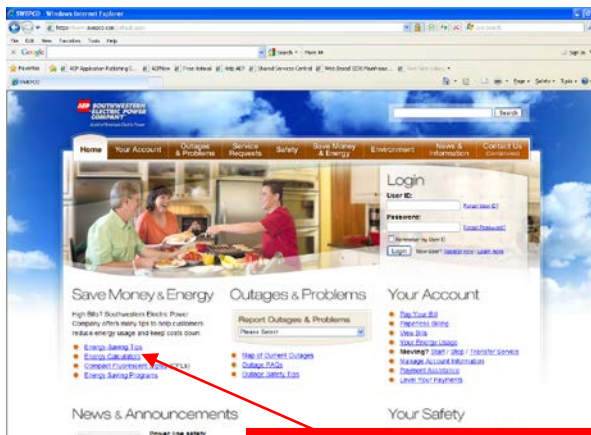
APPENDIX D:

OPTIONAL SUPPORTING DOCUMENTATION

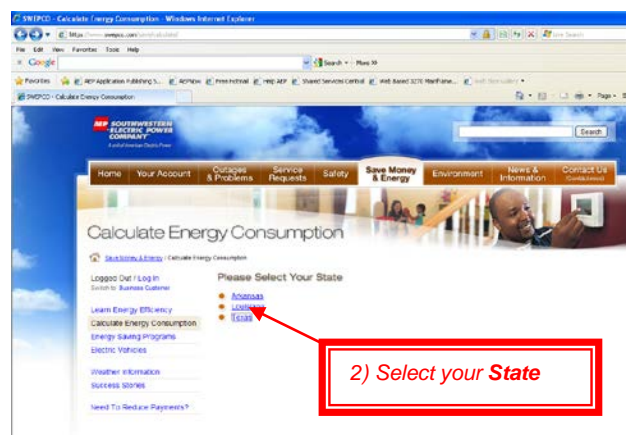
SWEPCO provides the following Optional Supporting Documentation.

Program: On-Line Home Energy Checkup

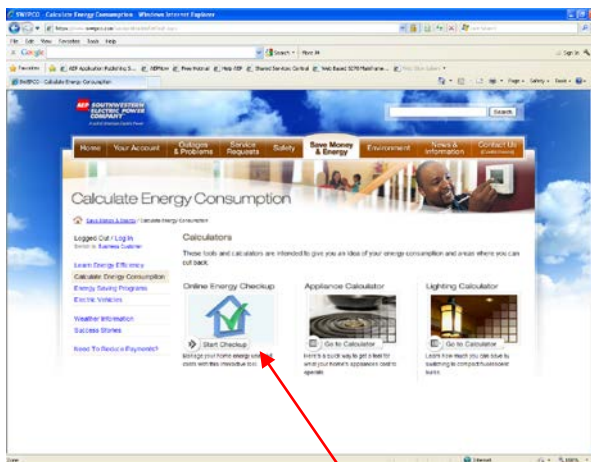
SWEPCO has the Online Home Energy Checkup tool available to all of our Texas customers. The site is accessed from www.swepeco.com.



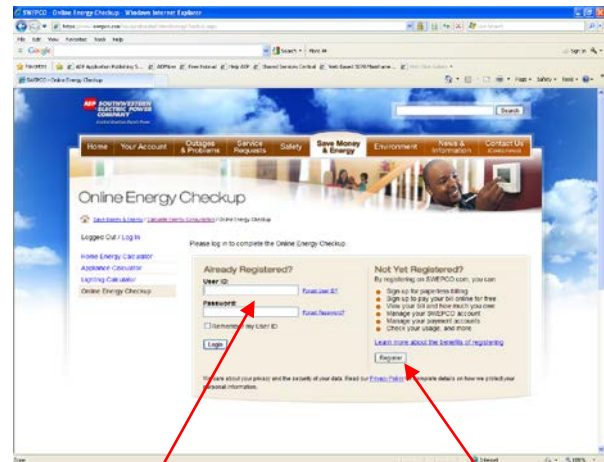
1) Select 'Energy Calculators'



2) Select your State



3) Select 'Online Energy Checkup'



5) Login

4) First-time users register

News from AEP



Monday, September 26, 2011 at 12:00 AM ET | Written by: [Kenneth M Drenten](#)

Energy Efficiency, Consumer Programs prove invaluable during heat wave

Energy Efficiency and Consumer Programs in western AEP operating companies proved invaluable during this summer's heat wave

Customers helped out when called upon to curtail load during heat wave

Dramatic increase in interest in energy efficiency found among customers due to heat

Related Topics: [AEP Texas](#), [PSO](#), [SWEPCO](#), [Energy Efficiency](#)



The 550-MW natural gas J. Lamar Stall Unit at Arsenal Hill Plant in Shreveport was among the generating units called upon to keep the electricity flowing during times of peak demand during this summer's heat wave. Customers helped by reducing load when called upon in AEP Texas, PSO and SWEPCO.

Energy Efficiency and Consumer Programs in AEP Texas, Public Service Company of Oklahoma (PSO) and Southwestern Electric Power Company (SWEPCO) proved invaluable during this summer's heat wave in those operating companies.

For much of the summer the three operating companies sweltered under extreme heat, including many days when temperatures were in triple digits. From August 1-7, temperatures exceeded 110 degrees in many areas.

Even before that, customers had been sweating it out all summer. Oklahoma's July temperatures were historically hot -- breaking the record for the hottest monthly temperatures for any state in the country. In July, Oklahoma had an average statewide daily temperature of 88.9 degrees, according to the National Oceanic and Atmospheric Association (NOAA).

On Sept. 12, Grandfield, Okla., marked 100 days of temperatures of 100 degrees or above. Wichita Falls, Texas, has surpassed the 100 days/100 degrees mark as well. Shreveport, La., had 62 days of 100 degrees or above, and numerous towns and cities in the region have broken local records for the number of 100-degree days endured this summer.

When the heat was on and AEP asked for help reducing load due to extreme demand, customers were willing to cooperate. Overall, a dramatic increase was found in interest and awareness about energy efficiency programs among customers due to the effects of the extreme heat and the stress on the electric grid during the peak demand times.

The heat was on this summer

During the first week of August, PSO and SWEPCO customers used record amounts of energy at peak load times, as did customers served by AEP Texas. AEP's Emergency Operating Plan was invoked in the Southwest Power Pool during the the week of July 31-Aug. 6.

PSO established a new all-time peak demand of 4,430 megawatts on Aug. 3. PSO exceeded the previous all-time peak demand record on five different days.

SWEPCO set a new all-time peak demand of 5,543 MW on Aug. 3. SWEPCO exceeded the previous all-time peak demand record on eight different days.

The Southwest Power Pool (SPP) set a new regional electricity demand record of 54,949 MW on Aug. 2, and exceeded the previous all-time peak demand record on seven different days.

The Electric Reliability Council of Texas (ERCOT) set a new electricity demand record of 68,294 MW on Aug. 3.

Customers in all three operating companies were asked to curtail load and/or conserve electricity during peak demand periods. Conservation measures ranged from reducing power to some large industrial customers with temporary interruptible load agreements to public appeals to residential customers to conserve energy by avoiding unnecessary use of electric appliances.

"The AEP central support organization provides the operating companies with projected load and temperature information on a daily basis, sometimes twice a day, to allow them to make an informed decision on when a load curtailment event should be called," said Don Nichols, Energy Efficiency and Consumer Programs manager. "Once the operating company makes that decision, my team initiates the load curtailment event through one or more of the demand response software platforms we manage."

AEP Texas, PSO and SWEPCO successful in reducing demand

Energy Efficiency and Consumer Programs managers and coordinators at each of the three operating companies said that a variety of energy efficiency programs offered to all three classes of customers (residential, commercial and industrial) had a beneficial effect of reducing demand during these critical times.

"Many of the participants and customers really want to help and feel like they are contributing," said Phil Watkins, Energy Efficiency and Consumer Programs manager for SWEPCO.

SWEPCO has nine customers participating in its 2011 Load Management Standard Offer Program (SOP). Customers in the program may be curtailed a total of 48 hours from June 1-Sept. 30, or a maximum of 12 hours per month. This summer, SWEPCO issued nine curtailment calls in Arkansas -- two in June, three each in July and August, and one to date in September. Preliminary results showed an average demand reduction of 7.8 megawatts, according to Greg Perkins, Energy Efficiency and Consumer Programs coordinator for SWEPCO in Arkansas.

In Texas, SWEPCO has eight Load Management SOP customers, with an average demand reduction of 8.5 MW from nine curtailment calls during June to September to date, according to Paul Pratt, Energy Efficiency and Consumer Programs coordinator for SWEPCO in Texas.

AEP Texas North Company (TNC) has three customers participating in the Load Management SOP representing 2 MW. TNC to date has issued a total of 12 curtailment calls this summer. AEP Texas Central Company (TCC) has a total of nine customers in its program, representing 12.2 MW, and TCC issued 10 curtailment calls this summer.

Not every customer was called upon to curtail for each of these events, as each customer selected a different participation option, according to Gary Throckmorton, principal Energy Efficiency and Demand Response coordinator, AEP TNC.

"AEP TNC and AEP TCC were, through their respective Load Management SOPs, able to help ERCOT reduce energy usage on the transmission and distribution system and minimize any potential adverse effects during this time of extreme heat and high energy usage," said Russell Bego, principal Energy Efficiency and Demand Response coordinator, AEP TCC.

PSO has both residential and commercial/industrial load reduction programs. PSO had 13 C/I customers responding to load curtailment events this summer with a demand reduction of approximately 28.55 MW. "Our commercial and industrial customers have proven that they are ready and able to respond when we need them, and they offer us stability and flexibility in managing our peak demands," said Kathy Champion, Energy Efficiency and Consumer Programs manager for PSO.



Residential programs include Cool Rewards cycling discount

This was the first year for PSO to offer a residential curtailment program. PSO's Cool Rewards program was more than fully subscribed this year with nearly 2,900 customers participating, with a load reduction of almost 3 MW. "What we heard from customers was that they appreciated the opportunity to participate, and to do their share to help conserve when needed," said Mary Jackson, Energy Efficiency and Consumer Programs coordinator for PSO.

AEP offers wide variety of Energy Efficiency, Demand Reduction programs

Other programs offered by PSO, AEP Texas and SWEPCO differ due to varying regulatory requirements, but commercial and industrial customer energy efficiency programs include Smart Solutions programs, commercial lighting and controls programs, commercial Cooler Saver AC Tune-up program, C&I load control, large C&I custom solutions, SMART Source Solar, Commercial Solutions, SCORE/CitySmart, and the Business Energy Solutions Toolbox (BEST) program.

Residential customers may be offered home energy assessments, equipment rebates and discounts, equipment recycling rewards, low income weatherization programs, cycling discounts (Cool Rewards), SMART Source Solar, and residential Cool Saver AC Tune-up programs.

"Demand response programs have grown significantly over the past few years," Nichols said. "A few years ago we managed one demand response platform. Now we manage five. In addition to PSO, AEP Texas and SWEPCO, demand response programs are also currently operational in AEP Ohio and Indiana Michigan Power. Within the next few weeks, a new residential program will launch in Kentucky Power. And Appalachian Power has contracts in place with some of its largest industrial customers to shave demand during peak periods."

More information about energy efficiency and consumer programs is located on the operating companies' websites under "Energy Savings Programs."

Breath of Air

HIGH-SPEED TURBO BLOWERS PLAY A CENTRAL ROLE IN A TEXAS TREATMENT PLANT'S ENERGY EFFICIENCY UPGRADE PROJECT

By Pete Litterski

Operators at the Grace Creek Wastewater Treatment Plant in Longview, Texas, expect significant savings from an energy efficiency project that includes replacement of two of five older aeration blowers with high-speed, high-efficiency units.

The project is part of a \$1,045,625 project that also includes a cogeneration power plant with a 65 kW microturbine that operates on digester methane. The projects were funded in part by a \$781,900 Energy Efficiency and Conservation Block Grant from the U.S. Department of Energy, according to Shawn Raney, chairman of the city's Energy Management Committee. The grant was supplemented by money from the city Water Utilities Fund.

Scott Baggett, plant manager at Grace Creek, says the aeration blower project designed by KSA Engineers will offer many benefits. The new APG-Neuros NX 150 turbo blowers — a 125 hp unit and a 150 hp unit — operate on air bearings, making them energy efficient, low maintenance, and quiet. The blowers are now the primary units in the aeration system. The 150 hp blower can be routed to either of the two pairs of aeration basins at the plant. The 125 hp blower is routed to a pair of square basins next to the blower room.

SUPERIOR CONTROL

"The biggest thing they do is give us more control over our dissolved oxygen," says Baggett. "We're going to be able to keep the bugs happy."

Although the blowers are more energy efficient than the old ones, "The real savings will come because we're not pushing 7 or 8 mg/l DO when we only need 2 to 4," Baggett says. The greater control comes from the flexibility of the new blowers and the use of real-time monitoring. Controller units that constantly track the dissolved oxygen levels in the four aeration basins and then control the new pneumatic actuated K-Tork butterfly valves installed in the blower room and at the basins.

The aerator project included the upgrades of two controllers from Hach SC-100 to Hach SC-1000 units. Each of the

Scott Baggett, plant manager at Longview's Grace Creek Wastewater Treatment Plant, looks at one of the new pneumatic actuated K-Tork butterfly valves that help operators maintain the proper airflow in the plant's four aeration basins. (Photos by Pete Litterski)



Before and After: Three of the old blowers at Longview's Grace Creek Wastewater Treatment Plant will remain available as backup units to the two new APG-Neuros NX 150 aerator blowers installed in part with a federal grant.



What's Your Story?

TPO welcomes news about environmental improvements at your facility for future articles in the Greening the Plant column. Send your ideas to editor@tpomag.com or call 877/953-3301.

controllers is linked to a pair of basins and connected to probes that track dissolved oxygen, pH and MLSS levels.

Once optimal dissolved oxygen levels are programmed into the system, Baggett says, the controllers can determine how far to open the valves. Each of the new blowers, which have variable-frequency drives, can modulate according to what the valve is allowing. "As the DO goes up, the valve closes down, and the pump responds to the lower demand," says Baggett.

With the new system, the controller can make real-time decisions that in the past would have required an operator's undivided attention.

TRACKING THE SAVINGS

The energy savings are expected to be significant. The city contracted with the local electric utility, AEP-SWEPCO, to have the CLEAResult energy optimization company audit the aerator system before the two old units were taken offline. With that baseline in hand, the company will come back after the new blowers are fully operational and perform another audit. "Some of this is in uncharted waters," Baggett says. "But now that we have a baseline, we'll be able to show how much we reduced."

The three older blowers still online have been relegated to backup status and will be used only during peak demand or when one of the new blowers has to be taken down for repairs or maintenance. If the funding can be found for another project, Baggett would like to replace the rest of the older blowers with the new models.

“The biggest thing the blowers do is give us more control over our dissolved oxygen. The real savings will come because we’re not pushing 7 or 8 mg/l DO when we only need 2 to 4.”

SCOTT BAGGETT

HEATING AND POWER

The cogeneration system will deliver still more energy savings. Just a few feet from the stack where the plant once flared excess methane from four anaerobic digesters, the gas now makes a left turn to the turbine. Power from the system runs the biosolids press, but since the press only runs four days per week, the city sells surplus power to AEP-SWEPCO.

Raney says the city sells the excess power for about 50 percent more than it pays for electricity. “We pay 4.01 cents per kWh, but we sell the power at 6.1 to 6.2 cents,” he says.

The methane is routed to the facility’s digester control building, where a gas pressure transmitter and flowmeter track gas production. Raw methane is routed to the digester heaters as needed, and the rest is piped to an underground vault about 50 yards from the digester building.

At the vault, gas lines were reconfigured, giving operators the option of routing methane to the cogeneration system or, if necessary, to the flare stack. Since the cogeneration unit came online, the plant has not flared any gas. The cogeneration system is expected to reduce the plant’s greenhouse gas emissions by more than 700,000 pounds per year.

CONDITIONED GAS

The engineer/project manager for the cogeneration system was Willard Jordan, P.E., of Longview-based Electrical Expertise. The installation contractor was James D. White Electric of White Oak, Texas. The skid-mounted cogeneration unit includes a gas conditioning system from Unison Solutions that filters, dries and compresses the raw gas.

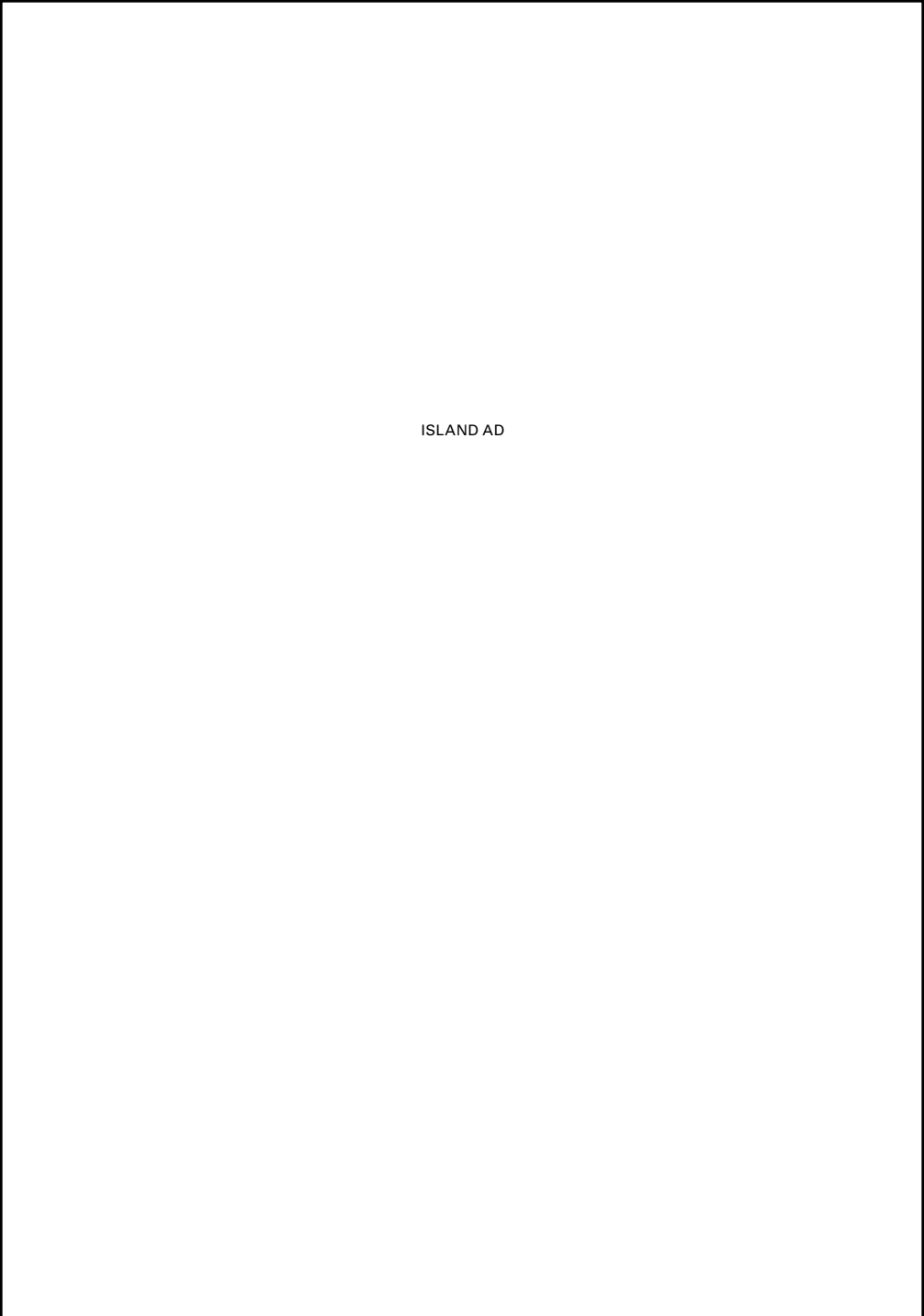
The treated gas feeds a Capstone C65 microtur-

bine generator that operates at 96,000 rpm. Near the generating unit, a concrete pad holds a programmable logic controller and a pair of chillers that deliver cooling water.

All the licensed operators at Grace Creek received training on the cogeneration system and can be called on to check its status and make necessary adjustments. The system also can be accessed remotely by support personnel at Unison Solutions and at Pumps & Services, a New Mexico company that provided the training on the cogeneration system. **tpo**



Unit 3 in the blower room at Longview’s Grace Creek Wastewater Treatment Plant is a new APG-Neuros NX 150 aerator blower that can be used to supply air to any of the four aeration basins at the facility.



ISLAND AD



AEP SWEPCO

Energy Efficiency Programs Bulletin

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ABOUT THE PROGRAMS

SCORESM is a no-cost program offered to school and institutional customers to improve energy efficiency and reduce monthly utility costs. The program is designed to minimize the impact of volatile energy costs, ease budget pressures, and provide infrastructure improvements.

For more information about the SCORE Program, contact Paul Pratt, Program Manager, at (318) 673-3542 or pepratt@aep.com.

Commercial Solutions is a no-cost program offered to commercial and industrial customers. Similar to SCORE, the program provides technical and financial support to help organizations identify and implement energy efficiency upgrade projects.

For more information about the Commercial Solutions Program, contact Paul Pratt, Program Manager, at (318) 673-3542 or pepratt@aep.com.

The programs are sponsored by AEP SWEPCO and administered by CLEARresult.

You can reach CLEARresult at (512) 327-9200 or bcrandall@CLEARresult.com.

New Construction, New Savings!

Pleasant Grove Independent School District knows the value of energy efficiency and has implemented many efficiency measures since enrolling in the AEP SWEPCO SCORE Program in 2008. In fact, it was one of the busiest partners of 2010 – completing construction of two new facilities and making much-needed improvements to schools throughout the district.

Pleasant Grove Intermediate School saved 42.91 kW through new lighting and air conditioning systems. The high school campus increased energy efficiency by upgrading the air conditioning system for a savings of 56.3 kW. Additionally, Pleasant Grove ISD kept efficiency at the forefront during construction of its new athletic facility. The indoor practice stadium provides an air-conditioned field for athletes during the scorching summer months and features high efficiency lighting and air conditioning systems that are 63 kW more efficient than standard equipment.

Altogether, Pleasant Grove ISD earned a total incentive of \$24,342 for saving 162.28 kW. Keep up the good work!



City of Carthage Commended for Project Completion

The City of Carthage made big strides toward energy efficiency after deciding to take advantage of the national Energy Efficiency and Conservation Block Grant (EECBG) funds available to finance upgrades to buildings throughout the town. The city replaced the air conditioning system in its Country Music Museum and upgraded the lighting technology in its City Hall, Police and Fire Station and Community Center. The lighting upgrades alone will save approximately 31,250 kWh of electricity, equivalent to eliminating the carbon dioxide emissions of more than 2,500 gallons of gasoline.

In addition to improving the efficiency of existing city buildings, Carthage completed the construction of a new Civic Center that was also built with energy efficiency in mind. The city incorporated high efficiency lighting and air conditioning systems, two 117-ton air-cooled chillers and occupancy sensors in low traffic areas of the building into the newly-completed project.

The five energy conservation measures the city completed saved 70 kW and earned a \$10,500 incentive check from SWEPCO.

PARTNER SUCCESS

The following partners completed projects over the past few months and were awarded incentives:

Ace Hardware	\$710
Alcatel Lucent	\$1,844
Baptist Sunday School Committee	\$5,112
Candlewood Suites	\$1,354
City of Beckville	\$240
City of Carthage	\$10,505
City of Gilmer	\$249
Courthouse Athletics	\$1,779
Eastern Fuels	\$1,921
Energy WeldFab	\$960
Fay J Packaging	\$9,135
First Baptist Church of Texarkana	\$2,943
Halliburton	\$1,930
General Dynamics	\$917
Gillespie Coatings	\$1,094
Jarvis Christian College	\$912
Museum Systems	\$1,119
Perry Reed LFP Offices	\$843
Price Hardware	\$840
Red River Credit Union	\$940
Robbins Toyota	\$3,168
Texarkana College	\$1,386
Wadley Health System	\$1,980
Gilmer ISD	\$225
Hughes Springs ISD	\$525
Longview ISD	\$7,522

**Congratulations,
Partners!**

It's Okay to Look Before You Leap

Last year, Alcatel-Lucent implemented a lighting retrofit through SWEPCO's Commercial Solutions program. The Opportunity Assessment compiled for the company provided the motivation to start the project.

"The Opportunity Assessment explained exactly how we could expect the upgrades to benefit our company," said James Goodwin, Site Services Agent II at Alcatel-Lucent. "Because of Commercial Solutions resources, we were able to push the project through to upper



management. They hold a lot of responsibility for such projects."

The incentive amount, energy savings and simple payback period helped convince employees company-wide that energy efficiency was the right choice for the company. Another factor behind Alcatel-Lucent's decision was the ability to test the high efficiency fixtures in its own facility, ensuring that the lighting quality standards were met. A local contractor, Cheyenne Electric, replaced the original 400-Watt metal halide lighting with high-output 32-Watt T8 lights.

The four-lamp, high-output T8 bulbs saved an estimated 75 kW of peak electric demand and 518,600 kilowatt-hours (kWh) of annual energy use, equivalent to eliminating the carbon dioxide emissions from the energy use of about 31 homes for one year. Their energy savings earned the company an incentive of \$11,250.

Truck Stop Owner Hauls in Savings

Dr. JT Roberts of Eastern Fuels LLC owns several truck stops in east Texas. Hearing consistent buzz about being green and reducing carbon footprints, Roberts wanted to incorporate energy efficiency into his business model.

"I knew that energy efficiency provided both long- and short-term benefits," said Roberts. "I wanted to make upgrades, but was unsure where to start."

Before partnering with SWEPCO's Commercial Solutions Program, Roberts had considered installing solar panels on canopies over gas pumps. However, after consulting with his Commercial Solutions representative, he decided to instead invest in an energy efficient air conditioning upgrade. In addition to offering a greater return on investment, the project earned Roberts an incentive check of \$1,971 from SWEPCO.

Benchmark Your Way to Savings in 2011

Benchmarking is a starting point to establishing clear goals and defining your energy management strategy. The benchmarking process compares your buildings' energy performance against buildings in similar climates across the country. The results help identify which of your facilities offer the greatest opportunity for energy and cost savings. This benchmarking process is a highly useful tool in implementing energy efficiency opportunities and better management practices.

Benchmarking can benefit your organization by:

- Helping focus energy efficiency investments in a cost-effective manner
- Helping organizations gather, analyze and understand the importance of tracking

energy usage data

- Identifying Key Performance Indicators for future reporting
- Determining if facilities qualify for energy efficiency awards and certifications
- Creating marketing value by providing proof of efficiency to donors, investors, tenants, or the community
- Supporting investment grade audits on lower-performing buildings

Benchmarking is a free service. For more information about benchmarking your facilities, please contact Ben Crandall at (512) 327-9200 or bcrandall@clearesult.com

Energy-Efficient Residential Appliances



EPRI is measuring the energy performance of high-efficiency refrigerators, washers, and dryers as part of the Hyper-Efficient Residential Appliances Demonstration.

EPRI has targeted several important "white goods"—refrigerators, clothes washers, and electric clothes dryers—for an energy-efficiency demonstration and performance-measurement project.

Together, these appliances use about 15% of the residential electricity consumed in the U.S., according to the Energy Information Administration. Refrigerators account for about 8% of an average household's electricity use, washers about 1% (this excludes water-heating use), and dryers 5.8%.

Manufacturers have improved the energy efficiency of these products in recent decades, spurred by federal energy-efficiency standards, rating and labeling programs, and financial incentives from utilities and others. For example, refrigerators manufactured today for the U.S. market use only about a third as much electricity as their counterparts of 30 years ago.

Potential for Energy Efficiency

Manufacturers of white goods have boosted efficiency primarily by combining or integrating more efficient components or materials rather than using radically different technologies. The design options that have improved the efficiency of residential appliances vary by equipment type, but include advanced electronic sensors and controls, more efficient motors, improved materials and insulation, and enhanced configuration and design integration.

For the Hyper-Efficient Residential Appliances Demonstration, appliances were selected not strictly based on high efficiency ratings. EPRI is also measuring equipment that has advanced components or designs for which little field data are available, such as refrigerators with inverter-driven compressors and dryers with advanced termination controls.

Clothes Washers: As much as 90% of the energy used for washers is for heating water. Thus, the major change that most affects the energy use of clothes washers is the emergence of models that use significantly less water. These are typically front-loading designs, which have no agitator but instead tumble clothes through a small amount of water.

Another major feature is higher spin speeds, which can be up to three times faster than conventional models, removing more moisture and thus cutting the amount of energy needed to evaporate moisture in the dryer.

Clothes Dryers: Water extraction in the washer spin cycle has been the primary means of reducing dryer energy use in the U.S. market. In the past, energy use of U.S. dryers has not varied much, which is why there are no ENERGY STAR-rated clothes dryers and no yellow Energy Guide label is required.

However, the sensitivity of moisture sensors and the software used in clothes dryers for automated termination to prevent over-drying can make a difference in energy use, which EPRI intends to measure in the Demonstration.

The other major technical advancement in the efficiency of clothes dryers is the heat-pump clothes dryer, which uses about half as much electricity as a conventional dryer. However, this high-efficiency dryer is not yet available in the U.S. market. Therefore, EPRI did not include these appliances in the field measurements.

Refrigerators: Design options to increase the energy efficiency of refrigerators include variable-speed compressors, adaptive defrost technologies, improved insulation, better-sealing doors and gaskets, and alternative refrigerants.

Models being demonstrated have a combination of more efficient evaporators and compressors and other elements to achieve high efficiency. A variable-speed compressor is an advanced component of one of the refrigerator models in the Demonstration. Most compressors operate at a single speed—the compressor is either ON or OFF. However, variable-speed compressors can operate at multiple speeds. As a result, the compressor can better match the load.

Demonstration Objectives and Metrics

The objective of the EPRI Hyper-Efficient Residential Appliances Demonstration is to compare the energy performance and load profiles of conventional refrigerators, clothes washers, and electric clothes dryers to that of high-efficiency (also called *hyper-efficient*) appliances. Instruments are installed on the appliances in households to measure energy use and operation. In “treatment” sites, home occupants receive a new appliance. In “control” sites, an existing appliance is metered. In some cases, these two sites are combined, with existing appliances measured for a period of time, followed by measurement of new, high-efficiency replacement appliances.

In treatment and control cases, the appliance is instrumented with a data-acquisition system and sensors to collect values such as power consumption, how often the door is opened and closed (refrigerators/freezers), and water usage and water temperature (clothes washers). Data is sent to EPRI servers via the Internet or cell phone. Surveys of occupants are also being conducted to obtain information on behaviors such as preferred temperature settings.

Concurrent with the field demonstrations, appliances are being tested in the EPRI laboratory in Knoxville, Tennessee, in controlled conditions to establish baseline data that can be compared to data collected from the field.

Barriers

The appliances with the highest efficiency are generally more expensive than standard appliances. Often, the more advanced components cost more. For example, for a clothes washer, the higher spin speed may require a more expensive suspension system. Or the inverter-driven compressor in the refrigerator costs more than a single-speed unit. As a result, manufacturers often incorporate energy efficiency into their higher-end models with premium features.

For the Demonstration, overcoming the barrier of higher cost is not the intent of the project; rather, EPRI and its host utilities are looking to increase understanding of technologies and performance, collecting data that will help inform program planning and forecasting.

Nevertheless, energy-efficient units may be available that are less expensive than standard-efficiency models, and EPRI anticipates that the efficiency of less-expensive models will increase as new federal standards take effect.

Applications and Results

More than 200 individual appliances have been monitored in participating households for the demonstration and measurement project. Roughly 40% of the appliances are control (existing) models, and about 60% are the new high-efficiency units. Installations began in 2009 and continued through 2010. Monitoring equipment will be in place for up to two years.

Wisconsin Public Service (WPS), American Electric Power (AEP), Kansas City Power and Light (KCPL), and FirstEnergy are the host utilities of the Demonstration.

For More Information

For more information, contact the EPRI Customer Assistance Center at 800.313.3774 (askepri@epri.com).

Contact

Karen George, Project Manager, Energy Efficiency and Demand Response Program, kgeorge@epri.com, 303.449.1113.



COMMERCIAL SOLUTIONS BASELINE STUDY FINAL

Prepared for:

**AEP TX CENTRAL, AEP TX NORTH, AEP SWEPCO,
EL PASO ELECTRIC, TX-NM POWER, ENTERGY-TX**

Prepared by:

OPINION DYNAMICS CORPORATION
1999 Harrison St. Suite 1420
Oakland, CA 94612
(510) 444-5050
www.opiniondynamics.com

Tom Fisher
tfisher@opiniondynamics.com

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1. EXECUTIVE SUMMARY

This report presents the findings from Opinion Dynamics' study of Texas commercial customers in six commercial sectors (July to August 2011). The research was conducted to serve as a baseline for the Commercial Solutions program. The purpose of this report is to enable the six utilities to assess changes in the market over time as a result of the Commercial Solutions program, while also providing insights to help future program efforts. Our study focused on the following six sectors: offices, health care facilities, warehouses and distributors, manufacturers, small retailers, and churches and religious organizations.

Energy savings opportunities exist in the two major equipment types; lighting and HVAC. Some of our key findings across multiple sectors include the following:

- Nearly half of all customers (49%) reported that they still have T-12 linear fluorescent lighting at their facility, while just over a quarter (27%) have T-8 lighting and less than one in ten (8%) have T-5 lighting at their facility.
- Energy saving opportunities exist in five out of six sectors (with the exception of warehouses) with HVAC. Nearly one-third (32%) of their HVAC equipment is over 7 years in age; prime candidates for early retirement.

Regarding attitudes and awareness our results show:

- Respondents recognize there is room for energy efficiency improvements at their facilities as they rated the energy efficiency of their facility a mean of 5.9 (on a scale of 1 to 10).
- The six sectors cited cost as the main reason, and often the only reason, that they would not purchase energy efficient equipment. This demonstrates the need for utility incentives or access to financing as an option to encourage customers to take action.
- Additionally, many organizations are unable to recognize energy saving opportunities on their own; 29% believe they are very knowledgeable about energy saving opportunities in HVAC, 40% with lighting and 33% with other equipment opportunities.
- As such, a large percentage of customers in most sectors expressed a need for technical assistance. With the exception of the manufacturing sector, approximately 70% expressed at least some interest (and approximately 40% are very interested) in receiving technical assistance to help choose the right energy efficiency improvements.

The marketplace demonstrates a need for technical training, and education in the commercial trades (architects, contractors, interior designers, etc.), regarding how they specify equipment and assist customers in making energy efficient decisions.

Our research shows a need for utility incentives and financing to encourage energy efficient equipment replacement, but that incentives alone are not likely to transform the market. Technical assistance and other program elements can help move over 70% of the market.

This study presents detailed findings and opportunities by sector (with comparisons between sectors) as well as data on the presence of energy efficient and non-efficient equipment.

2. INTRODUCTION AND METHODOLOGY

This report presents the findings from Opinion Dynamics' study of Texas commercial customers. This study was designed to provide a baseline for the Commercial Solutions program. The Commercial Solutions program includes outreach and technical assistance to help commercial customers install and pay for measures (through utility incentives and assistance in finding additional funding assistance), as well as to identify opportunities for savings of which they might not be aware. CLEAResult is implementing the program on behalf of six Texas utilities: AEP Texas Central, AEP Texas North, AEP SWEPCO, Entergy Texas, Texas-New Mexico Power, and El Paso Electric.

The primary objective of this research effort is to measure customer awareness, attitudes, and knowledge regarding energy efficiency. This report also provides baseline metrics for major equipment types in use at commercial facilities in these six territories. Our baseline study targeted six sectors: offices, health care facilities, warehouses, manufacturers, small retailers, and churches and religious organizations. We selected these sectors based on two factors: (1) the potential for growth in participation in the Commercial Solutions program, and (2) the potential for energy savings through the program. Appendix A presents our detailed rationale for choosing each of the sectors studied.

We conducted our baseline study in four phases: a program database review; a technical review of key equipment (lighting, HVAC, and roofing) in place nationwide for the studied sectors; phone interviews with lighting, HVAC, and roofing contractors to explore the installation activity of energy consuming equipment in the six utilities marketplace; and a telephone survey of commercial customers to learn about the specific equipment in place as well as the potential for energy efficiency upgrades. This report primarily presents the findings from the commercial customer phone survey and contractor interviews, supplementing these results with key findings from the database review and technical review, where relevant.

2.1 Customer Survey Methodology

Opinion Dynamics made nearly 22,000 telephone calls to complete 364 total interviews with randomly selected customers in the six studied commercial sectors. We classified interviewed customers into the six sectors in the sample based on their primary Standard Industrial Classification (SIC) code from public records, and confirmed their sectors in the survey based on their self-identification.

Table A-2 in Appendix A presents the SIC codes used to identify each sector. Note that these six sectors are not intended to be representative of the entire commercial populations in these utility territories.

Opinion Dynamics conducted the customer phone interviews from July 6 to August 4, 2011, with an initial goal to complete up to 70 interviews per sector. We completed 364 interviews,

with an overall response rate of 7%¹, and an average interview length of just over 20 minutes.

Across all sectors, Opinion Dynamics also designed a proportional sample by utility. We used these proportions only in creating the sample, and not in weighting the final results. Table 1 lists the proportions of the population and final completed interviews.

Table 1. Distribution of Population and Interview Sample by Utility

Utility	% of total population	% of interviews (n=364)	Number of completed interviews
AEP Texas Central	34%	26%	97
El Paso Electric	19%	14%	52
Entergy Texas	13%	23%	82
TNMP	12%	9%	34
AEP Texas North	11%	10%	36
SWEPCO Texas	10%	17%	63

Our survey instrument had two overarching modules: the equipment module and the non-equipment module. The equipment module asked respondents to describe the current lighting, cooling equipment, roofing, and refrigeration equipment in their businesses. The non-equipment module included questions on the business's awareness, knowledge, and attitudes concerning energy efficiency, as well as planned energy efficiency purchases and overall equipment decision-making processes.

We present the equipment findings across all sectors to highlight each sector's individual equipment differences.

We present the non-equipment findings separately by sector, with arrows indicating areas where the sector is significantly different from all other sectors with a margin of error of +/- 10% at the 90% confidence level. A green arrow pointing "up" means that figure is significantly higher than some of the other sectors, a red arrow pointing "down" means it is significantly lower.

Sections with asterisks next to the heading (Knowledge and Attitudes, Program Awareness, Energy Efficiency Barriers and Importance in Equipment Purchases), are areas with baseline metrics developed through this research, that over time can be influenced by the commercial program and should be measured again in the future to determine if any change has occurred.

2.2 Contractor Interview Methodology

Opinion Dynamics conducted in-depth interviews with fourteen trade allies with specialties in lighting, HVAC systems, and/or roofing technology in June and July 2011. These trade allies included both rebate administrators and local contractors. Of these third parties, eleven perform lighting work, three perform HVAC work, and three perform roofing work. Six of the

¹ AAPOR Response Rate 4.

interviewed trade allies were rebate agents² while eight were local contractors who carry out lighting, HVAC, or roofing work.

The trade allies interviewed cover the territories of all six utilities that participated in the baseline study. The lighting and HVAC contractors provide service to all six building sectors, but the roofing contractors we interviewed only served five building types, with no work done by roofing contractors on health care facilities.

The purpose of these interviews was to investigate the presence of energy efficiency in the three key equipment types in the six utility territories, as well as to explore barriers to adoption of energy efficient technology in the Texas marketplace. These interviews mostly asked about equipment practices overall but went into detail on differences between sectors when possible. Because these findings mostly relate to equipment in place, we present them in the Findings by Equipment Type section.

2.3 Study Limitations

While the primary purpose of this research effort was to measure customer awareness, attitudes, and knowledge regarding energy efficiency, we also obtained data regarding the energy consuming equipment that currently exists in the six commercial sectors. However, because we obtained this equipment data through customer telephone interviews rather than through on site visits, our equipment analysis relies on customer self-report rather than onsite verification. We found in our interviews that customers were able to identify the presence of equipment in their facilities more easily than they could describe the amount of equipment in use. Therefore, our study focuses on the penetration (presence) of equipment, rather than saturation. We did not conduct site visits due to budget limitations. In addition, because data are self reported they may not be fully representative of actual field conditions or of future actions that will be taken by customers.

² Rebate agents are energy consultants who provide a variety of activities for their clients including utility rebate administration.

3. KEY FINDINGS

We present our key findings from the customer phone baseline study below, supplemented with our findings from our database review, technical review, and contractor interviews where relevant. We first present our findings by sector for our non-equipment module.

3.1 Findings by Sector

Here we present portraits of the six sectors studied in our baseline research: offices, health care facilities, warehouses and distributors, manufacturers, small retailers, and churches. The portraits list key findings from our research; we also present dashboards which graphically summarize detailed findings from our phone survey to highlight both baseline measurements and program opportunities. These dashboards also call out any areas where each sector differs significantly from the other five (e.g., offices compared with non-offices, retailers compared with non-retailers) at the 90% confidence level.

3.1.1 Offices

The office sector includes a broad spectrum of business types, including most service industries such as law offices, banks, real estate offices, and nonprofit organizations. Because offices cover such a broad range of business types, office buildings also represent the largest percentage of the commercial population in the six utility territories (34%).

Based on our review of the Standard Offer and Commercial Solutions program databases,³ we found that offices encompass approximately 20% of the Commercial Solutions program participants and 3% of the Standard Offer program. Savings from offices are among the highest of the Commercial Solutions program by sector, with offices comprising 16% of reported program kW savings and 20% of reported kWh savings. Top Commercial Solutions projects in the office sector were lighting (60%), roofing (24%), and HVAC (16%). Our key findings from our customer phone survey include the following:

- Our survey found that many offices still have T-12s installed (42%), though the percentage is not significantly higher than non-offices. Our technical review found that lighting accounts for the largest percentage of office energy usage (29%), indicating that offices provide a significant potential for savings in lighting programs, especially through replacing inefficient T-12 lighting.
 - Offices may need some outreach in improving their awareness of the lighting in use at their facility: A moderately high percentage of offices (31%) said that they do not know whether they have T-12s installed at their businesses at all.
 - Our technical review⁴ found that 0.2% of offices used lighting controls; respondents from our telephone study reported a much higher presence of

³ See our “Baseline Segment Proposal and Database Review Results” memo, dated June 3, 2011.

⁴ Note, however, that our technical review was based on the Energy Information Administration (EIA) Commercial Building Energy Consumption Survey (CBECS), which was most recently conducted in 2003 and thus is likely to be out of date on newer technological developments such as lighting controls.

- lighting controls overall (39% have any lighting controls).⁵ Offices' usage of lighting controls is moderate compared to the other sectors, but they still have a low percentage of indoor occupancy sensors (13%) and a significantly lower percentage of daylighting sensors (1%) compared to other sectors. A moderate percentage of offices (22%) use lighting timers compared with non-offices.
- HVAC is also a particular need for the office sector: 82% of offices have conditioned space on average, which is significantly higher than the remaining sectors. Offices have a relatively high presence of rooftop packaged AC units: 43%, which is significantly higher than the other sectors. Two-thirds of offices have programmable thermostats.
 - Offices also have a lower percentage of new HVAC units compared with other sectors, with 26% having HVAC equipment less than four years old, a significantly lower percentage than non-offices.

Barriers in Offices

- Key barriers in the office sector include less involvement with or knowledge of their energy usage: 8% of offices say they do not pay their own utility bills, which is significantly higher than in the other sectors. Furthermore, 15% say that they rent their facility and cannot make changes to its equipment.
 - Participants in the office sector state that they are the least likely to buy any energy efficient equipment in the next two years (14%). Office sector participants are also significantly less likely than other sectors to give the highest rating (10 out of 10) to the importance of energy efficiency in their most recent equipment purchase (17%).
 - Offices also report a moderately high number of participants who felt that they did not have enough information about energy efficiency (49%) compared with other sectors. Furthermore, about one in four offices (25%) said that they did not know what information they would need before buying energy efficient equipment, indicating that the owners and managers of offices may need to learn more about the energy efficient technologies that are available.

Opportunities in Offices

- One of the key opportunities in the office sector is that offices have few decision-makers: 70% of offices said that only one person is responsible for decisions on capital investments, which is a significantly higher percentage than found in non-offices. The mean number of decision makers is 1.7, which is significantly lower than in the other sectors we studied. This indicates that the program should encounter less bureaucracy in the decision-making process to move the business toward energy efficiency improvements.

⁵ "Lighting controls" are defined as indoor occupancy sensors, indoor day lighting sensors, outdoor motion sensors, outdoor photocells, and lighting timers. See Table 5.

- Furthermore, offices were moderately aware of energy efficiency incentive programs (28%), but were significantly more likely than non-offices to be aware of tax breaks for efficiency upgrades (8%). This may present an opportunity for the program to help offices leverage tax incentives when finding opportunities most relevant to them.



Offices

Company Size
 85% Small ↑
 13% Medium
 3% Large

↓ 3,611 Avg. Sq. Ft. 94% <50 Employees
 ↓ 92% Pay Util. Bills 53 Avg. Hours/Wk
 61% Own Building ↑ 82% Avg. Cond. Sq.
 34 yr. Avg. Bldg Age 10% >1 TX Facility

Needs in Marketplace

New EE equip in last 2 years 26%
 Received any incentives 1%
 Buying EE equip in next 2 years 14% ↓
 % with T-12s installed 42%
 % w/programmable thermostats 67%
 % with AC units < 4 years old 26% ↓

Interest in Program Offerings

Incentives 53% 28% 19%
 Technical asst 38% 31% 32%
 Financing asst 29% 32% 39%
 Budget/mgmt asst 26% 36% 38%
 ■ Very (8-10) ■ Somewhat (4-7) ■ Not (1-3)

Opportunities

Roofing 8% 1%
 HVAC 10% 10%
 Lighting 11% 1% 10%
 Other 7% 4% 1%
 0% 10% 20% 30%
 ■ Maybe buying ■ Buying not EE ■ Buying EE

Had an energy audit 15%
 Lighting contractor often/sometimes discusses EE w/ business 12%
 HVAC contractor often/sometimes discusses EE w/ business 10% ↓
 Have enviro. policy on EE 4%

*Knowledge & Attitudes (Mean, 0-10)

Buys most EE equip possible 7.4
 Knowledge of lighting savings 6.3
 Efficiency of facility 5.9
 Knowledge of HVAC savings 5.8
 Knowledge of other savings 5.8
 Top measure mentioned: building envelope

*Program Awareness

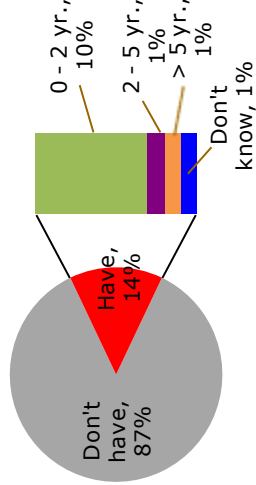
Any non-federal programs (unaided) 18%
 Incentives (aided) 28%
 Technical assistance (aided) 18%
 Financing assistance (aided) 11%
 Budget/mgmt assistance (aided) 10%
 Federal programs 18%

*Energy Efficiency Barriers

Cost 51%
 Don't have enough info on EE 49%
 Could not describe additional energy savings opportunities when prompted 34%
 Rent/lease and can't make changes to EE equipment 15%

↑ indicate significant differences between offices and non-offices at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
 *Indicates baseline data.

Payback Period



*Importance in Equipment Purchases

Initial cost 77% 14% 9%
 Operation cost 72% 22% 6%
 Energy efficiency 52% 33% 14%
 Payback period 52% 32% 17%
 ■ Very (8-10) ■ Somewhat (4-7) ■ Not (1-3)

Decision-Making Process

40% 23% 70%
 3%
 ■ Bureaucratic
 ■ Committee of depts
 ■ Group or team
 ■ One person

Mean # involved in equip. decisions: 1.7

3.1.2 Health Care Facilities

The health care sector includes businesses that conduct medical care, including hospitals, doctors' offices, dentists' offices, and outpatient facilities (including nursing homes and long-term care facilities). Health care facilities comprise 9% of the commercial facilities in the population of the six utility territories.

Based on our previous database review, we found that health care facilities comprised approximately 7% of the Commercial Solutions program participants. Savings through the health care sector are moderate (ranked fourth out of the twelve sectors provided in the program database we initially evaluated by savings per project), with health care facilities comprising 10% of reported program kW savings and 9% of reported kWh savings. Top Commercial Solutions projects in the health care sector were lighting (69%), HVAC (21%), and roofing (10%). Our key findings from our customer phone survey include the following:

- Nearly all health care facilities (98%) report having linear fluorescent lighting – a significantly higher percentage than non-health care facilities.
 - Our survey found that close to half (47%) of health care facilities have T-12s, which is similar to the other sectors studied. There are multiple types of bulbs in many healthcare facilities as 38% have T-8s, the highest penetration of all the studied sectors.
 - Health care facilities reported a significantly higher penetration of indoor LED lighting (11%) than offices, warehouses, and small retailers.
- Our technical review found that HVAC equipment accounts for 23% of energy usage in the health care sector⁶. HVAC is a particular need for the health care sector: health care facilities have a mean of 97% air-conditioned space, which is significantly higher than non-health care facilities.
 - Penetration of programmable thermostats (not including EMS) is high (83%) compared to other sectors included in this study - significantly higher than non-health care facilities.
 - Health care facilities have a high presence of rooftop packaged AC units: 46%, which is significantly higher than non-health care facilities overall. Health care facilities also reported a relatively high presence of chillers (10%, significantly higher than non-health care facilities).
 - HVAC units in health care facilities are beginning to age, with significantly more units in health care facilities (25%) than non-health care facilities that are seven to twelve years old. Furthermore, health care facilities were more likely than all other sectors to say that they did not know how old their HVAC equipment was (15%).

⁶ 2003 CBECS database.

Barriers in Health Care

- One key barrier to program participation in the health care sector is the lack of awareness about their equipment.
 - Forty percent of participants from health care facilities reported that they did not have enough information about energy efficiency.
 - Health care facilities generally rated their knowledge about equipment low for equipment other than lighting, with a significantly lower mean knowledge rating about HVAC (4.8 mean using a 1 to 10 scale) than found in non-health care facilities.
 - Health care facilities are particularly unlikely to be familiar with their roofing needs: health care facilities are more likely than non-health care facilities to say they do not know their roofing type (35%), its color (30%), or when they had their most recent roofing upgrade (25%). Our technical review found that health care roofing was metal surfaced 59% of the time, and built-up roofing (BUR) or asphalt shingle roofing 21% of the time. We found that 17% of buildings have multiple, unspecified types of roofing.
- Another possible barrier for health care facilities is that some do not have the authority to make changes at their facilities. Slightly more than half of health care facilities (55%) said that they rent their facilities, which is significantly higher than non-health care facilities. Furthermore, health care facilities who gave low ratings to their interest in one or more Commercial Solutions program offerings, did so primarily because they do not have the authority to decide to participate (38%), which is higher than the other sectors we studied.

Opportunities in Health Care

- While personnel in health care facilities report more efficient lighting than other sectors, they also lack the knowledge to identify potential additional energy savings, with 54% unable to describe energy savings opportunities other than lighting and HVAC when asked. Additionally, only 17% have received an energy audit.
 - It is important to note that of all the equipment this sector is likely to purchase in the next two years, HVAC equipment was most likely, with 18% of health care organizations planning to purchase it.
 - Based on previous studies, we have found that health care facilities can present opportunities for refrigeration upgrades due to use of refrigeration for both food service and laboratories. Our phone survey found that 11% of the health care sector had walk-in coolers and freezers, which is significantly higher than in the other sectors.
- While opportunities exist in health care, there needs to be additional outreach for this sector, as their unaided awareness of energy efficiency programs (6%) was significantly lower than discovered in the other sectors. However, the equipment that health care facilities report having is often more efficient than that of other sectors. For example, health care facilities have significantly higher penetration of T-8 lighting

than non-health care facilities. This indicates that health care facilities may be performing more efficient upgrades than other sectors that are not already part of the program. Health care facilities have started taking first steps on their own but, as indicated by the high percentage of health care facilities unable to name additional savings opportunities at their facilities (54%), may be most in need of program assistance to encourage additional energy saving actions.

Health Care



Company Size

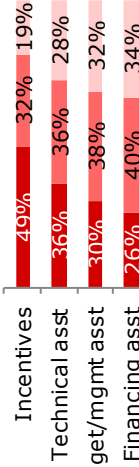
71% Small
16% Medium
13% Large

23,014 Avg. Sq. Ft. ↓ 71% <50 Employees
94% Pay Util. Bills ↑ 76 Avg. Hours/Wk
↓ 45% Own Building ↑ 97% Avg. Cond. Sq.
↓ 27 yr. Avg. Bldg Age 15% >1 TX Facility

Needs in Marketplace

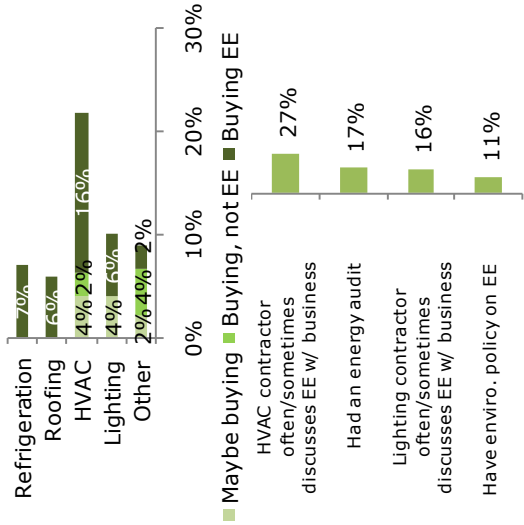
New EE equip in last 2 years ↓ 15%
Received any incentives 0%
Buying EE equip in next 2 years 19%
% with T-12s installed 47%
% with occupancy sensors 6%
% with AC units 7+ years old 33%

Interest in Program Offerings



Very (8-10) Somewhat (4-7) Not (1-3)

Opportunities



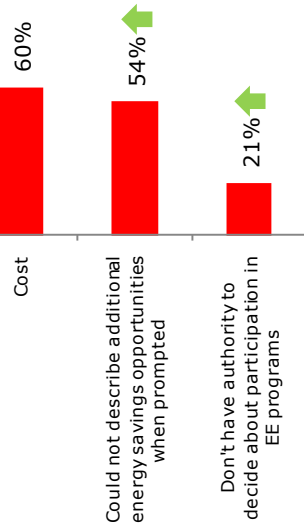
*Knowledge & Attitudes (Mean, 0-10)

Buys most EE equip possible 7.3
Knowledge of lighting savings 5.7
Efficiency of facility 5.6
Knowledge of other savings 5.4
Knowledge of HVAC savings 4.8 ↓

*Program Awareness

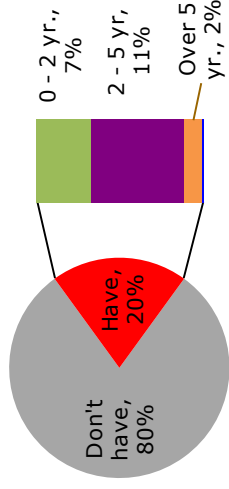
Any non-federal programs (unaided) ↓ 6%
Incentive (aided) 19%
Technical assistance (aided) 9%
Budget/mgmt assistance (aided) 6%
Financing assistance (aided) 6%
Federal programs 13%

*Energy Efficiency Barriers

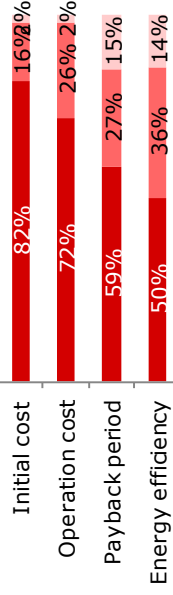


↓ indicate significant differences between health care facilities and non-health care facilities at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
*Indicates baseline data.

Payback Period



*Importance in Equipment Purchases



Very (8-10) Somewhat (4-7) Not (1-3)

Decision-Making Process



Mean # involved in equip. decisions: 3.5

3.1.3 Warehouses

The warehouse sector includes facilities that primarily store goods, including warehouses, storage facilities, distribution facilities, and wholesalers. Warehouses are a moderate percentage of the overall population (7%).

Based on our previous database review, we found that warehouses comprised approximately 4% of the Commercial Solutions program participants, which represents a small portion of the warehouse population. Warehouses have the second-highest savings per project by sector, and account for 6% of reported program kW savings and 6% of reported kWh savings. Nearly all Commercial Solutions projects in the warehouse sector were lighting (94%), followed by “other” projects (6%).

- Most warehouses (91%) report having some type of linear fluorescent lighting, with 54% of warehouses still using T-12 fixtures. Thirty percent also report having lighting other than linear fluorescents, which is moderate compared to non-warehouses. Our technical review found that lighting accounts for more than two-thirds of warehouse energy usage (68%), indicating that warehouses provide a significant potential for savings in lighting programs, especially through the replacement of inefficient T-12 lighting.
 - Warehouses’ usage of lighting controls is moderate compared to the other sectors (43% using any efficient lighting controls⁷), but warehouses have a low percentage of indoor occupancy sensors (8%) and a significantly lower percentage of day lighting sensors (2%) compared to other sectors. Warehouses also use lighting timers (26%) on a level similar to non-warehouses.
- HVAC is a lower priority for the warehouse sector than for other sectors. Warehouses have a mean of 47% air-conditioned space, which is the lowest of all studied sectors and is significantly lower than in the other sectors. This is, however, higher than our technical review, which found (nationwide) that only about 15% of the square footage at warehouses is air-conditioned. Warehouses are more likely to have newer HVAC equipment than other facility types, reporting that 47% of their HVAC equipment is less than four years old, a significantly higher percentage than non-warehouses. The penetration of programmable thermostats is moderate compared with non-warehouses (70%).
- Warehouses are also significantly more likely than non-warehouses to say that they have metal or metallic-surfaced roofing (62%). This is consistent with our technical review, which found that 72% of warehouses had metal roofing. Most of this roofing is not cool roofing; our phone survey found that only 16% of warehouses said they had bright white (cool) roofing, indicating that there are many opportunities in this sector to improve the efficiency of its metal roofing.
- Fewer warehouses reported purchasing energy efficient equipment in the last two years than non-warehouses (17%).

⁷ Efficient lighting controls identified as occupancy or daylighting sensors, timers, and EMS controls.

- Forty percent of Warehouse participants reported that they did not have enough information on energy efficiency.
- Sixty-eight percent of warehouses said that only one person is responsible for decisions on capital investments, with the mean number of decision makers being 2.5, which is significantly lower than some of the other industries we investigated. This indicates that the program has to sway fewer people at a warehouse to move the business toward energy efficiency improvements.

Opportunities in Warehouses

- The program also has several opportunities to intervene and help improve warehouse equipment and knowledge: About one in four warehouses (26%) said that they did not know what information they would need before buying energy efficient equipment, indicating that warehouses may need to learn more about the energy efficient technologies that are available to make educated, informed decisions. Furthermore, because so few warehouses have upgraded their equipment in the last two years, they may have more upcoming opportunities as older equipment needs to be replaced, most likely in lighting where 21% intend to upgrade in the next two years.
- Warehouses gave a moderately high rating to the importance of energy efficiency in their most recent equipment purchase (mean of 7.2), and gave significantly higher ratings than non-warehouses to the importance of the payback period (7.8 mean rating, 70% rating “very important”) in their last purchase.

Warehouses



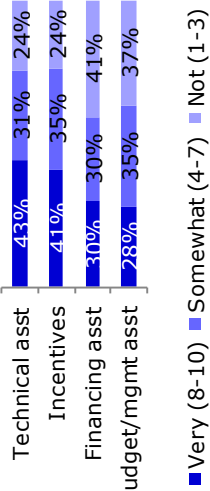
Company Size
 66% Small
 28% Medium
 6% Large

13,371 Avg. Sq. Ft. 94% <50 Employees
 100% Pay Util. Bills 51 Avg. Hours/Wk
 59% Own Building 47% Avg. Cond. Sq.
 29 yr. Avg. Bldg Age 16% >1 TX Facility

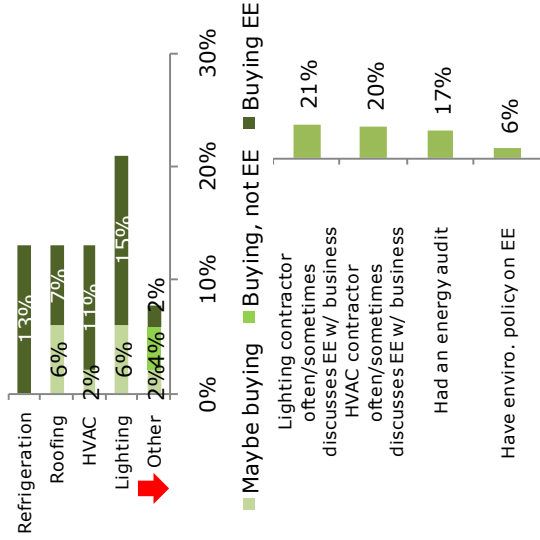
Needs in Marketplace

New EE equip in last 2 years 17% ↓
 Received any incentives 0%
 Buying EE equip in next 2 years 22%
 % with T-12s installed 54%
 % with indoor occupancy sensors 8%
 % with cool roofing 16%

Interest in Program Offerings



Opportunities



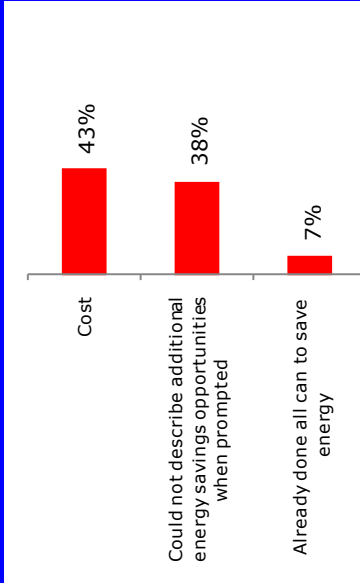
*Knowledge & Attitudes (Mean, 0-10)

Buys most EE equip possible 7.5
 Knowledge of lighting savings 6.8
 Knowledge of other savings 6.5
 Top measure mentioned: Building envelope
 Knowledge of HVAC savings 6.0
 Efficiency of facility 6.0

*Program Awareness

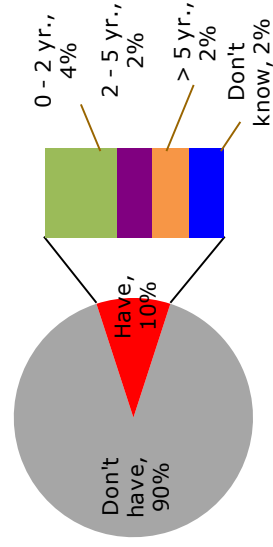
Any non-federal programs (unaided) 22%
 Incentives (aided) 28%
 Budget/mgmt assistance (aided) 13%
 Technical assistance (aided) 20%
 Financing assistance (aided) 13%
 Federal programs 13%

*Energy Efficiency Barriers

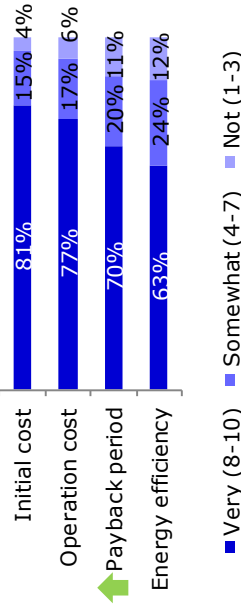


↓ indicate significant differences between warehouses and non-warehouses at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
 *Indicates baseline data.

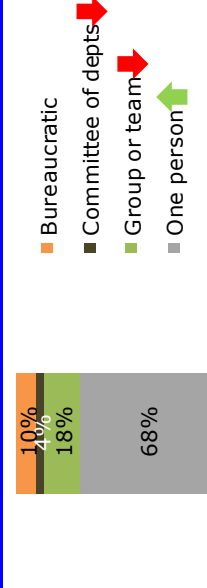
Payback Period



*Importance in Equipment Purchases



Decision-Making Process



Mean # involved in equip. decisions: 2.4 ↓



3.1.4 Manufacturers

Our study mostly focused on small manufacturers, who comprised about 80% of the manufacturers we contacted. Manufacturers are a moderate percentage of the overall facility population (6%).

Based on our previous database review, we found that manufacturers comprised approximately 13% of the Commercial Solutions program participants. Manufacturers have the highest savings per project by sector, and account for the largest portion of Commercial Solutions program savings: 23% of reported program kW savings and 29% of reported kWh savings. Most Commercial Solutions projects for the manufacturing sector are lighting projects (74%), followed by HVAC (17%), roofing (7%), and “other” projects (2%).

- Most warehouse lighting is some type of linear fluorescent: 84% report having linear fluorescents, fewer than in non-manufacturing facilities. Forty-three percent also report having lighting other than linear fluorescents.
- Our survey found that penetration of T-12s is high in manufacturing facilities (53%), though not significantly higher than in other facility types. Penetration of T-5s, however, is low (4%), and approximately one-third (31%) said that they do not know whether they have T-5s in their businesses at all.
 - Manufacturers’ usage of lighting controls overall is significantly lower than non-manufacturers (33%), and manufacturers have a low percentage of indoor occupancy sensors (9%) and day lighting sensors (5%). Manufacturers also report a significantly lower presence of timers (9%) than non-manufacturers. Our trade ally interviews revealed that safety concerns may be an especially strong barrier to lighting controls in this sector, as discussed in the Lighting Controls section.
- HVAC is a lower priority for the manufacturing sector than for other sectors: Manufacturers have a mean of 60% air-conditioned space, which is significantly lower than non-manufacturers. Manufacturers are more likely to have newer HVAC equipment, reporting that 54% of their HVAC equipment is less than four years old – the highest of all six sectors and significantly higher than non-manufacturers. A significantly higher percentage of manufacturers (11%) than non-manufacturers said that they have no air conditioning at their facility.
 - Of the space that is air-conditioned, however, there is an opportunity to move manufacturers toward installing programmable thermostats. Penetration of programmable thermostats is significantly lower for manufacturers than for non-manufacturers (51%).

Opportunities in Manufacturing

- Manufacturers are also significantly more likely than other facility types to say they have metal roofing (70%). This is consistent with our technical review, which found that 80% of manufacturers have metal roofing. Manufacturers are significantly more likely than non-manufacturers to say that their roof was last upgraded more than 15 years ago (30%).
- Furthermore, as we found in our database review, manufacturing facilities produce the highest amount of Commercial Solutions program savings both in terms of overall savings and savings per project, potentially there are opportunities for a deep level of savings moving forward.

Barriers in Manufacturing

- The key barrier in the manufacturing sector is that energy efficiency is not a priority in their businesses. Manufacturers gave themselves the lowest mean rating (6.3) on buying the most efficient equipment possible, and also gave a significantly lower mean rating than other sectors to the importance of energy efficiency in their most recent equipment purchase (6.3).
 - The primary reasons manufacturers said they would not buy efficient equipment is because of concerns about its availability, performance, and effect on production (12%). Furthermore, 14% of manufacturers who said they were not interested in one or more Commercial Solutions program offerings said that their business is too small to change.
- The barriers that manufacturers cited (unavailability of equipment, their business being too small to change) indicates they may not be aware of specific savings opportunities for the equipment they have. Manufacturers appear to be the most knowledgeable about their equipment compared to the other sectors we studied, with few manufacturing respondents said that they did not know the attributes of their equipment types. Furthermore, significantly more manufacturers than non-manufacturers said that they have enough information on ways to save energy (67%); this is most likely due to the fact that their profession is “blue collar” compared to most of the other sectors we studied which are more “white collar”. Additionally, this sector appears to interact with market actors who are pushing energy efficiency more than some of the other sectors we studied. Manufacturers are more likely to identify ways to save energy, yet upfront cost is a large barrier for this segment, expressing the need for utility incentives.
- The strongest opportunities with manufacturers lie in the lighting sector. Manufacturing is the least likely to have outdoor sensors than any other sector (9%). Manufacturers have the highest penetration of T-12s (63%) and incandescent bulbs (38%).
 - A significantly higher percentage of manufacturing facilities (30%) reported that their roofing is old (last upgraded more than 15 years ago) and will likely need replacement soon.



Manufacturing

Company Size
80% Small
17% Medium
2% Large

10,850 Avg. Sq. Ft. 87% <50 Employees
98% Pay Util. Bills 49 Avg. Hours/Wk
71% Own Building ↓60% Avg. Cond. Sq.
31 yr. Avg. Bldg Age 0% >1 TX Facility

Needs in Marketplace

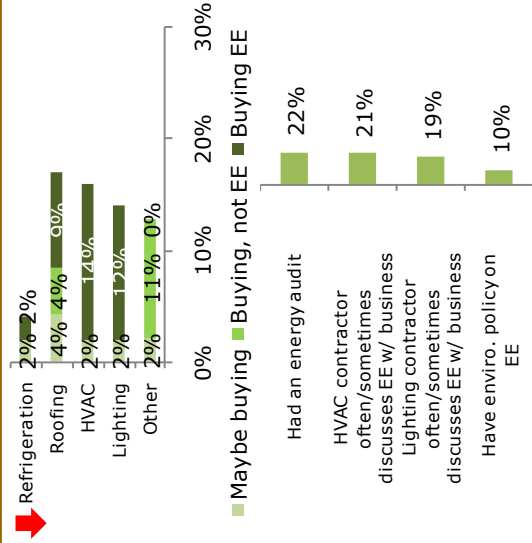
New EE equip in last 2 years 23%
Received any incentives 2%
Buying EE equip in next 2 years 25%
% with T-12s installed 53%
% w/programmable thermostats 51% ↓
% with roofing 15+ years old 30% ↓

Interest in Program Offerings

Financing asst 27% 24% 49%
Budget/mgmt asst 27% 33% 45%
Technical asst 27% 35% 39%
Incentives 41% 31% 29%

■ Very (8-10) ■ Somewhat (4-7) ■ Not (1-3)

Opportunities



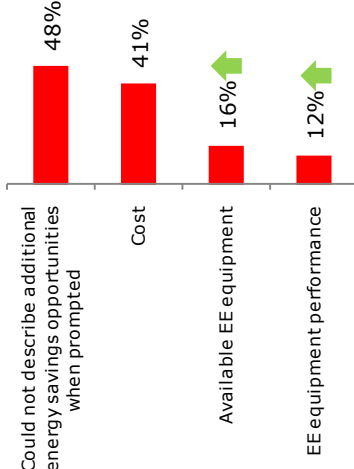
*Knowledge & Attitudes (Mean, 0-10)

Knowledge of other savings 6.4
Top measure mentioned: renewables
Knowledge of lighting savings 6.3
Buys most EE equip possible 6.3 ↓
Efficiency of facility 5.9
Knowledge of HVAC savings 5.4

*Program Awareness

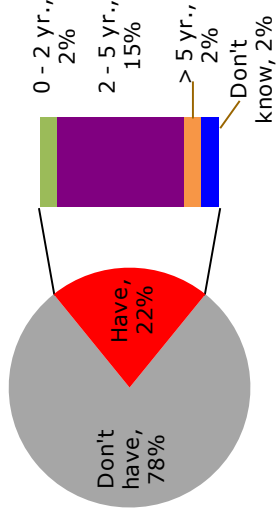
Any non-federal programs (unaided) 16%
Technical assistance (aided) 18%
Financing assistance (aided) 18% ↑
Incentives (aided) 18%
Budget/mgmt assistance (aided) 12%
Federal programs 18%

*Energy Efficiency Barriers

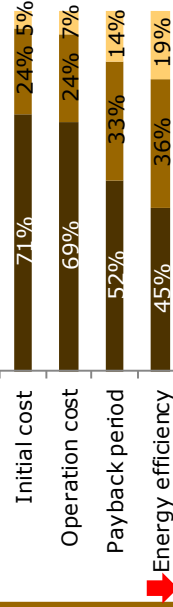


↑ indicate significant differences between manufacturers and non-manufacturers at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
*Indicates baseline data.

Payback Period



*Importance in Equipment Purchases



■ Very (8-10) ■ Somewhat (4-7) ■ Not (1-3)

Decision-Making Process



Mean # involved in equip. decisions: 2.6



3.1.5 Small Retailers

Small retailers include businesses involved in the sales of goods to the general public. Our sampling specifically targeted retailers we classified as “small,” defined as a retailer with revenues of less than \$5 million per year (based on public records). Of the respondents we interviewed, 81% classified themselves as small and only one respondent classified itself as large. We found that retailers comprise about 17% of the total commercial population. Our count of the overall retail population does not calculate the percentage of small retailers alone.

Based on our previous database review, we found that retailers comprise approximately 4% of the Commercial Solutions program participants and account for a high percentage of program savings, 22% of reported program kW savings and 19% of reported kWh savings. Most Commercial Solutions projects for the retail sector are lighting projects (58%), followed by HVAC (29%), roofing (8%), and “other” projects (5%).

Opportunities

- The opportunities for lighting energy savings in the small retail sector are mostly in upgrading linear fluorescent lighting, which has a 50% penetration rate of T-12s among small retailers. Penetration of lighting other than linear fluorescent (21%) and outdoor lighting (36%) is significantly lower in small retailers than non-retailers. Our technical review found that lighting accounts for 34% of retailer energy use, indicating that small retailers provide a significant potential for savings in lighting programs, especially through replacing inefficient T-12 lighting.
 - Small retailers are among the most knowledgeable of all sectors about their lighting, with only 13% unable to name any lighting type, and only 19% (significantly lower than non-retailers) unsure whether they had T-12s at their facility.
 - Small retailers’ usage of lighting controls is moderate (40%) compared to the other sectors, but small retailers still have a low percentage of indoor occupancy sensors (6%) and day lighting sensors⁸ (6%). Small retailers report a similar percentage of lighting timers (25%) to non-retailers.
- Small retailers report a mean of 70% air-conditioned space, and our technical review found (nationwide) that air conditioning only accounted for about 18% of small retailers’ energy usage.
 - Small retailers, however, reported having the oldest HVAC systems: 20% of small retailers, significantly more than non-retailers, reported that their HVAC system is more than 12 years old.
 - Penetration of programmable thermostats is also significantly lower for small retailers than for non-retailers (55%).

⁸ Many retailers may not be likely to use occupancy sensors; however, daylighting may be an opportunity.

- The opportunities in the roofing sector are lower for the small retail sector than other sectors. Twenty-two percent of small retailers said that their roof is bright white, and half (50%) said that they had upgraded their roof in the last five years.

Barriers in Small Retail

- A key barrier in the small retail sector is that many may not be able to implement major equipment changes. Seventeen percent of small retailers, a significantly larger percentage than non-retailers, said they rent their facility and cannot make changes to their equipment. Furthermore, more than one in five (21%) small retailers who were not interested in the program offerings said that they did not have the authority to decide whether to participate.
 - Small retailers may be unlikely to have already investigated energy efficiency. Only 7% of small retailers, significantly fewer than non-retailers, said they had ever gotten an energy audit at their facility. Small retailers also reported fewer instances of their lighting contractors (4%) or HVAC contractors (9%) talking to them about energy efficiency.
- Small retailers were significantly more likely than the remaining sectors to give the highest rating (10 out of 10) to the importance of energy efficiency in their last equipment purchase (34%). Additionally, while small retailers may not be aware of energy efficiency opportunities, they are not against being energy efficient. More small retailers than non-retailers said that there were no barriers to being energy efficient (22%).
 - Furthermore, small retailers are already among the more knowledgeable sectors about the equipment at their facility, with few respondents unable to answer questions about the equipment types that they had in use.



Small Retail

Company Size
 81% Small
 17% Med.
 1% Large

4,461 Avg. Sq. Ft. ↑ 97% <50 Employees
 97% Pay Util. Bills 51 Avg. Hours/Wk
 58% Own Building ↓ 70% Avg. Cond. Sq.
 37 yr. Avg. Bldg Age 6% > 1 TX facility

Needs in Marketplace

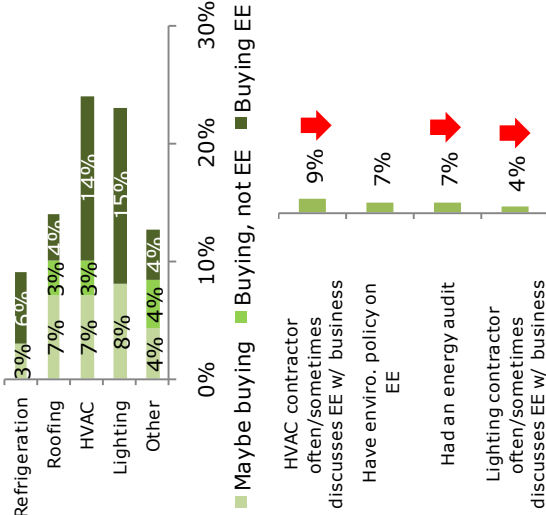
New EE equip in last 2 years 21%
 Received any incentives 0%
 Buying EE equip in next 2 years 31%
 % with T-12s installed 50%
 % w/programmable thermostats 55% ↓
 % AC systems 12+ years old 20% ↑

Interest in Program Offerings

Incentives	50%	28%	21%
Technical asst	42%	25%	32%
Financing asst	36%	18%	46%
Budget/mgmt asst	29%	33%	38%

Very (8-10) Somewhat (4-7) Not (1-3)

Opportunities



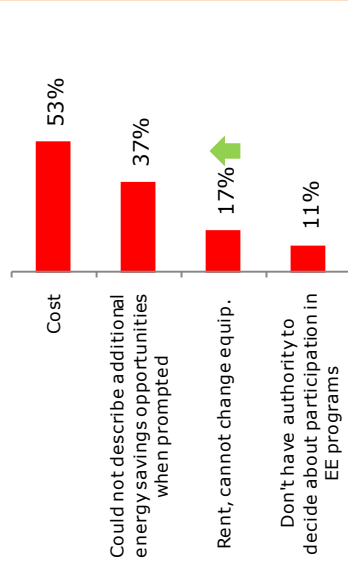
*Knowledge & Attitudes (Mean, 0-10)

Buys most EE equip possible 7.3
 Knowledge of lighting savings 6.3
 Knowledge of other savings 5.8
 Top measure mentioned: renewables ↑
 Efficiency of facility 5.8
 Knowledge of HVAC savings 5.4

*Program Awareness

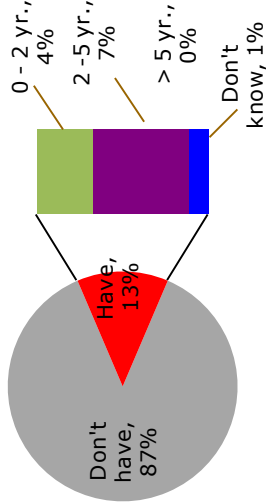
Any non-federal programs (unaided) 15%
 Incentives (aided) 14% ↓
 Technical assistance (aided) 10%
 Budget/mgmt assistance (aided) 4% ↓
 Financing assistance (aided) 0%
 Federal programs 1.2%

*Energy Efficiency Barriers

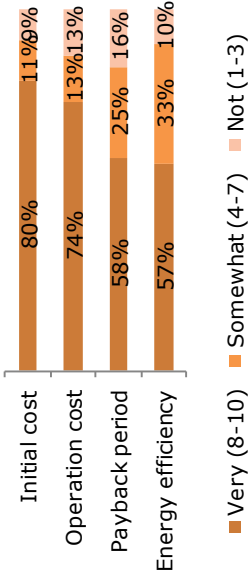


↓ indicate significant differences between small retailers and non-retailers at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
 *Indicates baseline data.

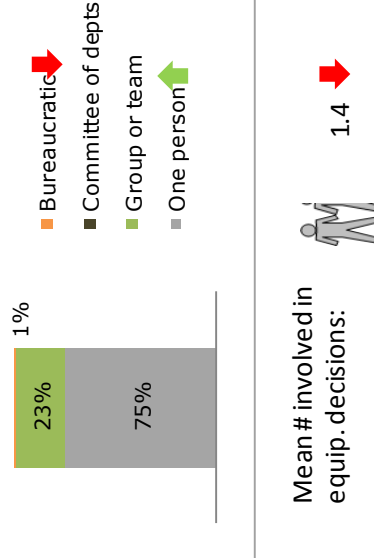
Payback Period



*Importance in Equipment Purchases



Decision-Making Process



3.1.6 Churches and Religious Organizations

The church and religious organization sector includes any building primarily used by a religious group, excluding any religiously affiliated schools or colleges. Religious organizations comprise about 3% of the total commercial population in the six utilities' territories.

Based on our previous database review, we found that religious organizations comprised approximately 11% of the Commercial Solutions program participants. This represents a larger portion of the religious organization population than other sectors, but a relatively smaller percentage of Commercial Solutions program savings, 6% kW savings and 5% kWh savings. Most Commercial Solutions projects for the religious organization sector are lighting projects (59%), followed by HVAC (34%) and roofing (6%).

Opportunities in Religious Organizations

- Religious organizations present an opportunity for savings through lighting upgrades: Religious organizations have by far the largest reported use of non-fluorescent lighting in their facilities (74%), and also have significantly higher penetration of incandescent lighting (60%) than non-religious organizations. However, churches also have the highest penetration of CFLs (44%), indicating that many churches likely have both incandescent and CFL lighting installed.
 - Religious organizations have a high level of inefficient lighting. More than six in ten religious organizations have incandescent lighting (60%), and half (50%) have T-12 lighting. These organizations especially need assistance in identifying opportunities to upgrade their linear fluorescent lighting – significantly more religious organizations than non-religious organizations said that did not know the type of any of the linear fluorescent lighting at their facility (29%), so there potentially could be a larger amount of T-12s.
 - Most religious organizations said that they had outdoor lighting at their facility (89%), which is significantly higher than non-religious organizations. Despite the high penetration of outdoor lighting, religious organizations had low levels of knowledge about their outdoor lighting compared to other sectors. Significantly more religious organizations than non-religious organizations said they were unable to identify their specific outdoor lighting equipment (10%), indicating that more outreach may be useful to this sector in identifying outdoor lighting savings opportunities.
 - Religious organizations report significantly higher usage of efficient lighting controls than non-religious organizations overall (77%), but their usage of indoor occupancy sensors is significantly lower than non-religious organizations (1%). Religious organizations are significantly more likely than non-religious organizations, however, to use outdoor motion sensors (39%) and indoor or outdoor lighting timers (47%).
- HVAC presents large opportunities for savings in the religious organization sector. Our survey found that 96% of the square footage in religious organizations is air

conditioned, significantly higher than non-religious organizations. Furthermore, our technical review found that cooling accounts for 33% of religious organizations' energy usage, compared with only 18% of energy used for lighting⁹. This is the only sector included in this study where cooling accounts for more energy use than lighting. Nearly half of religious organizations report having a residential-style split AC system (47%),

- However, knowledge about their equipment is also an issue in the religious organization sector for HVAC equipment: significantly more religious organizations than non-religious organizations said that they did not know their system type (16%).
- Penetration of programmable thermostats is significantly higher for religious organizations than for non-religious organizations (85%).
- Religious organizations are also significantly more likely than non-religious organizations to say that they have built-up roofing (BUR (43%) and wood shingle or shake roofing (13%). Our technical review¹⁰ found a similar percentage of wood shingle or shake roofing nationwide (14%), but a much higher percentage of metal roofing (77%) than we found in our phone study (37%).
 - The religious organizations included in our study have some potential for roofing upgrades, as significantly more religious organizations than non-religious organizations said that they had brown or wood-colored roofs (35%), and few religious organizations said that they had bright white roofing (4%). Non-white, cool roofing products do exist, and churches with concerns about their roof's appearance can still be encouraged to install more energy efficient roofing options.
- Though religious organizations indicated lower levels of knowledge about their lighting and HVAC in the equipment sections, their interest in energy efficiency was higher than that of the other five sectors studied, indicating that the program has the potential to serve this sector very well.
 - Religious organizations indicate that they value energy efficiency in their equipment purchases. Forty-one percent said that they had purchased energy efficient equipment in the last two years, and religious organizations gave significantly higher mean ratings than non-religious organizations to selecting the most efficient equipment possible (8.0) and the importance of energy efficiency in their most recent equipment purchase (8.1).
 - The vast majority of religious organizations (89%) said that they own their facility, significantly higher than non-religious organizations, and only 3% of religious organizations said that they were renters who could not change their equipment (3%).

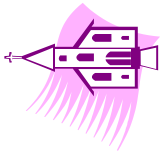
⁹ Technical review of CBECS database, 2003.

¹⁰ The technical review of CBECS data looked at three states, not just Texas, and had a very small religious sample from data collected in 2003.

Barriers in Religious Organizations

- One of the main barriers to energy efficiency is that religious organizations have a more complex decision-making process than the other five sectors studied. Few religious organizations said they only had one decision-maker on equipment purchases (9%), and they had the highest mean number of people (10.5) involved in making equipment decisions. However, because religious organizations rate their interest in energy efficiency so highly, tend to own their facilities, and have already taken energy efficiency actions, these barriers may be easier to overcome for this sector.

Churches



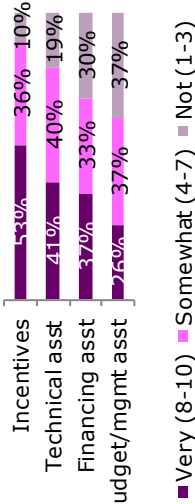
Company Size
 51% Small
 40% Medium
 9% Large

14,061 Avg. Sq. Ft. ↑ 99% <50 Employees
 100% \$ Util. Bills ↓ 45 Avg. Hours/Wk
↑ 89% Own Bldg ↑ 96% Avg. Cond. Sq.
↑ 41 yr. Avg. Bldg Age 16% >1 TX Facility

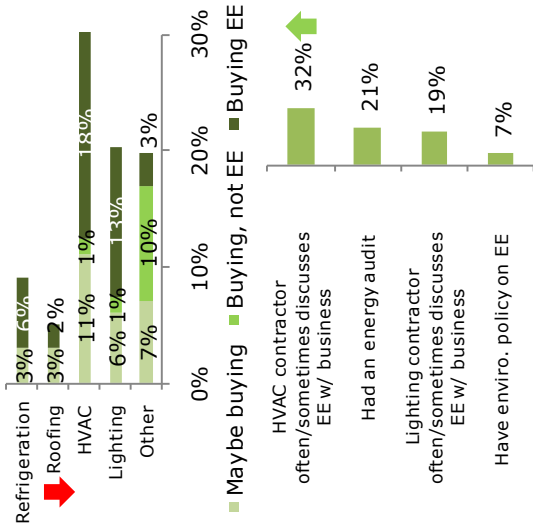
Needs in Marketplace

New EE equip in last 2 years ↑ 41%
 Received any incentives 0%
 Buying EE equip in next 2 years 30%
 % with incandescents/T-12s ↑ 60%/51%
 % of HVAC 7+ years old 33%
 % with refrigeration ↑ 30%

Interest in Program Offerings



Opportunities



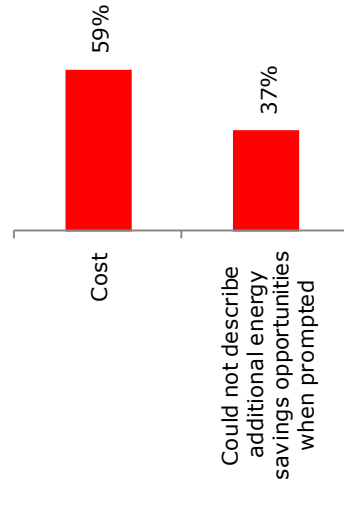
*Knowledge & Attitudes (Mean, 0-10)

Buys most EE equip possible 8.0 ↑
 Knowledge of lighting savings 6.3
 Knowledge of other savings 5.9
 Top measure mentioned: Building envelope
 Efficiency of facility 5.9
 Knowledge of HVAC savings 5.3

*Program Awareness

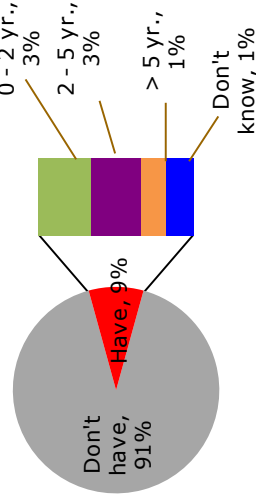
Any non-federal programs (unaided) 11%
 Incentives (aided) 17%
 Technical assistance (aided) 10%
 Budget/mgmt assistance (aided) 9%
 Financing assistance (aided) 7%
 Federal programs 14%

*Energy Efficiency Barriers

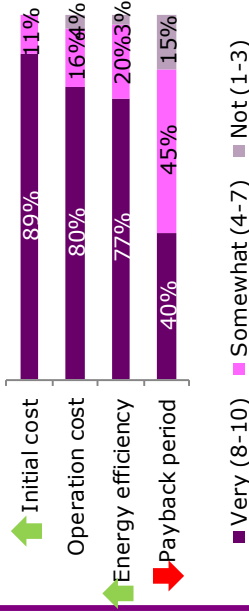


↓ indicate significant differences between religious organizations and non-religious organizations at 90% confidence. Note that some percentages may not add up to 100% due to rounding.
 *Indicates baseline data.

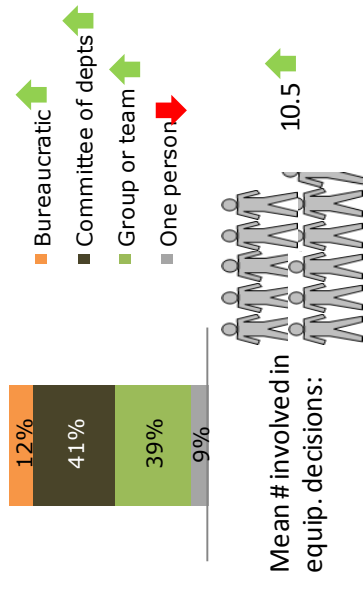
Payback Period



*Importance in Equipment Purchases



Decision-Making Process



3.2 Findings by Equipment Type

In this section, we present our findings from the equipment module of our phone baseline study. We present our findings by sector, comparing each sector both to all other sectors combined and to all other sectors individually. We also supplement these with findings from our trade ally interviews, which offer high-level insights on the types of equipment in use in the marketplace.

3.2.1 Lighting

Our phone survey found that T-12s still have the highest overall level of penetration in the sectors studied, with 49% of all interviewed businesses reporting that they have T-12s installed. We present our lighting findings overall and by sector in Table 2 through Table 4, which provide the following information:

- **Penetration of lighting types:** The percentage of respondents who reported having each lighting type for linear fluorescent lights, indoor lighting other than linear fluorescent, and outdoor lights. Because respondents may have multiple types of lights, these percentages may add up to more than 100%. For context, we also report the percentage of respondents who said they did not know what types of lighting they had.

Interior Lighting Technology

While trade allies indicated that T-12 lighting is no longer installed in new fixtures or in retrofits or replacement of existing fixtures, trade allies do find a significant amount of T-12 lighting still in use in the existing facilities they serve. Trade allies report that they find T-12s in “most,” “almost all,” or “all” buildings more than ten years old, or they find it in 70% of offices and 80-90% of the other facilities they serve. This existing T-12 lighting is estimated to be at least ten years old, and is found mainly in manufacturing, and warehouse spaces. Our phone survey also found that T-12 penetration was higher than any other lighting type, with 49% of businesses reporting that they have T-12s in use (note that an additional 23% of respondents said they did not know if they had T-12s or not).

All trade allies said that their standard replacement for T-12 lighting was T-8 lighting with electronic ballasts. Trade allies reported installing T-8 fixtures with 32-watt lamps over 80% of the time. They use 28-watt lamps just 17% of the time, and 25-watt lamps only 1% of the time. One contractor mentioned that the 25-watt lamps are more expensive, and have lower returns on investment over time due to the higher costs of regular lamp replacement. This information demonstrates the need for training, education and help specifying lighting equipment.

Some trade allies also report seeing significant amounts of incandescent lighting in the facilities they retrofit. Two say they see incandescent lighting in many churches, where light quality and the ability to dim the lights are important. Incandescent lighting in churches can be harder to replace, but one lighting trade ally reports using LED fixtures as a replacement. Incandescent lighting is also reportedly found in 75 to 80% of task lights that use screw-in bulbs, and at least half the can or spot lighting used in retail facilities use incandescent or

halogen lighting. Screw-in fixtures and can lights are routinely replaced with twist CFLs or specialty CFL flood lights.

Table 2 shows the reported penetration of indoor lighting types from our customer phone survey. In these tables, we highlight percentages per sector that are significantly higher than all other sectors (e.g., churches compared to non-churches) in green, and those that are significantly lower than all other sectors in red. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

Table 2. Penetration of Indoor Lighting Types by Sector



Lighting Type	Offices (n=72) (a)	Health Care (n=47) (b)	Ware-house (n=54) (c)	Manuf (n=49) (d)	Sm. Retail (n=72) (e)	Church (n=70) (f)	All 6 Sectors (not weighted) (n=364)
Indoor Linear Fluorescents	89%	98% ^{ad}	91%	84%	94% ^d	93%	91%
T-12	42%	47%	54%	53%	50%	51%	49%
T-8	22%	38% ^{oade}	30%	18%	33% ^{od}	21%	27%
T-5	6%	6%	11%	4%	8%	10%	8%
Don't know any linear fluorescent types	15%	19%	15%	10%	13%	29% ^{oacde}	17%
Non-Linear Fluorescent Indoor Lighting	28%	38% ^e	30%	43% ^{ae}	21%	74% ^{oabcde}	39%
CFL	10%	19% ^{oc}	7%	22% ^{oac}	13%	44% ^{oabcde}	20%
Incandescent	19%	26% ^{oe}	20%	16%	11%	60% ^{oabcde}	20%
Halogen	7%	9%	4%	14% ^c	10% ^c	23% ^{oabce}	11%
LED	1%	11% ^{oace}	2%	4%	3%	14% ^{oacde}	6%
Other indoor lighting	4%	4%	0%	4%	4%	7%	4%
Don't know any non-linear fluorescent types	0%	0%	0%	0%	0%	1%	<1%
Don't know any facility lighting types	3%	0%	2%	8%	1%	3%	3%

Colored boxes indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.
Base: All respondents.

Barriers and Energy Efficiency Standards

Opinion Dynamics interviewed 11 trade allies who conduct work in lighting in the six utility territories. Our trade ally interviews found that the main barrier to participation in utility programs was a lack of money to install the energy efficient products that meet program requirements. This finding is consistent with our phone survey, which found that 51% of all businesses said cost would prevent them from buying energy efficient equipment of any type.

Some trade allies also discussed a concern for the quality of energy efficient lighting as a reason it is not always installed. Two said that some clients did not believe that energy efficient lighting would provide the right ambiance in their facility.

Exterior Lighting Technology

In our interviews, only five of the lighting trade allies reported installing lights in exterior areas, like parking lots or parking garages. Of the five that replace exterior lighting, the fixtures being replaced vary from mercury or high pressure sodium lighting, to metal halide, to T12 fixtures. LED technology for exterior lighting applications is starting to be installed in Texas, with one trade ally reporting that they always install LED lighting in exterior spaces, and another saying they install LEDs 15% of the time. Most of the trade allies replace existing lighting with T5 lighting or metal halide fixtures. This represents an opportunity to educate lighting contractors about the benefits of LED lighting in exterior applications.

Our phone study found that more than half (56%) of all businesses have exterior lighting, and that halogen and mercury vapor are the two most common types reported.

Table 3 shows the reported penetration of outdoor lighting types from our customer phone survey. In these tables, we highlight percentages per sector that are significantly higher than all other sectors (e.g., retailers compared to non-retailers) in green, and those that are significantly lower than all other sectors in red. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

Table 3. Penetration of Outdoor Lighting Types by Sector



Lighting Type	Offices (n=72) (a)	Health Care (n=47) (b)	Ware- house (n=54) (c)	Manuf (n=49) (d)	Sm. Retail (n=72) (e)	Church (n=70) (f)	All 6 Sectors (not weighted) (n=364)
Outdoor lighting	50% e	60% e	52% e	47%	36%	89% ^{abcde}	56%
Halogen	7%	15%	9%	16%	15%	34% ^{abcde}	16%
Metal halide	4%	13% ^{ae}	13% ^{ae}	4%	4%	10%	8%
Mercury vapor	6%	9%	11%	16% ^a	15% ^a	33% ^{abcde}	15%
High-pressure sodium	6%	15% ^{ade}	7%	2%	3%	14% ^{ade}	8%
Low-pressure sodium	1%	4%	0%	2%	1%	3%	2%
LED	6%	11% ^{cd}	2%	2%	8%	7%	6%
Other outdoor lighting	19%	13%	11%	16%	32% ^{abcdf}	14%	18%
Don't know outdoor lighting types	4%	9%	2%	0%	0%	10%	4%

Colored boxes indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.
 Base: All respondents.

LED Lighting Technology

In our interviews, we asked trade allies where they are installing any types of LED lighting. These interviews revealed that trade allies are not necessarily ready to adopt LED lighting in the commercial sector. Two of eleven trade allies report never installing LEDs at all, and three trade allies mentioned concerns about LED lighting, including whether LEDs will last as long as promised, what options exist for replacement when they eventually do wear out, (i.e., replacing bulbs versus replacing entire fixtures), and the belief that they create glare. One trade ally gave a positive assessment of LEDs, saying that LEDs produce crisper, more natural light than many other lighting technologies, and appreciates their ability to be dimmed.

Our phone survey found that LED penetration was low across all sectors, with only 10% of customers reporting having either interior or exterior LED lighting. To increase penetration of LEDs, therefore, the program may need to target trade allies first to educate them and address their concerns, so that trade allies can become stronger promoters of LEDs in the marketplace as this technology matures

Table 4 shows the reported penetration of LED lighting overall from our customer phone survey. In these tables, we highlight percentages per sector that are significantly higher than all other sectors (e.g., retailers compared to non-retailers) in green, and those that are significantly lower than all other sectors in pink. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

Table 4. Overall LED Penetration by Sector

Lighting Type	Offices (n=72) (a)	Health Care (n=47) (b)	Ware- house (n=52) (c)	Manuf (n=49) (d)	Sm. Retail (n=72) (e)	Church (n=70) (f)	All 6 Sectors (not weighted) (n=364)
	% with any LEDs installed	7%	15% _c	4%	6%	10%	20% _{acde}
Indoor LEDs	1%	11% _{ace}	2%	4%	3%	14% _{acde}	6%
Outdoor LEDs	6%	11% _{cd}	2%	2%	8%	7%	6%

Colored boxes indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.
Base: All respondents.



Lighting Controls

We present our lighting controls findings overall and by sector in Table 5, which provide the following information:

- **Penetration of lighting controls:** The percentage of respondents who reported having each of five types of lighting controls: indoor occupancy sensors or day lighting controls (out of those who have indoor lighting), outdoor motion sensors or photocells (out of those who have outdoor lighting), and those who have lighting timers (out of those who have indoor or outdoor lighting).

Our phone study found that nearly half (46%) of businesses overall had at least one type of lighting control. These controls were primarily outdoor lighting controls and timers, with 39% of businesses with outdoor lighting saying that they have outdoor motion sensors. Only 7% of interviewed businesses overall said that they have indoor occupancy sensors. In Texas, occupancy sensors do not have kW demand reduction associated with them.

Our trade ally interviews explored the use of lighting controls and found their use varied by sector, particularly for indoor occupancy sensors. The trade allies we interviewed reported installing occupancy sensors most often in warehouses, with occupancy sensors installed in 80 to 100% of the warehouses they serve. Occupancy sensors are least frequently installed in manufacturing spaces, where they are only used in places where they will not create a safety hazard, i.e., storage areas, offices with occasional use, restrooms, and in some aisles and hallways.

According to these trade allies, they install occupancy sensors in offices about 40% of the time. Two trade allies do not install any occupancy sensors in offices since they do not think typical office use is sporadic enough to make the sensors cost effective. Two say they almost always install occupancy sensors as part of their standard energy efficient upgrades. The remaining contractors say they only install them in spaces where they make sense, such as offices used intermittently, restrooms, break rooms and some stairwells. Occupancy sensors are reportedly never used in retail facilities, though our survey found that a few small retailers (6%) do use occupancy sensors.

The trade allies also do not install daylighting controls very often. Five of the lighting contractors we interviewed never install daylighting, and do not think it is cost effective. The others install it only occasionally in office, warehouse, manufacturing, and retail applications. One trade ally has installed some light tubes along with daylighting sensors in warehouses. Another trade ally says many of his manufacturing clients could not use daylighting at all because they must control the climate of their facilities.

Of the five trade allies who install exterior lighting, all use controls on the lighting they install. This is consistent with our phone survey, which found that outdoor lighting controls were more common than indoor lighting controls. Three trade allies exclusively use photosensors to control exterior lighting, and the other two install both photocells and some timers.

Because of the variation between sectors in their lighting needs and preferences seen in both our trade ally interviews and phone survey, the program may need to pay special attention to customizing lighting control recommendations based on business type.

Table 5 shows the reported penetration of lighting controls from our customer phone survey. In these tables, we highlight percentages per sector that are significantly higher than all other sectors (e.g., retailers compared to non-retailers) in green, and those that are significantly lower than all other sectors in pink. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

Barriers to Lighting Controls

One trade ally said that some clients do not want to use occupancy sensors in their facilities, even in applications where they would be effective. Another, These clients are skeptical of occupancy sensor technology in general, thinking the sensors would turn lights off if people sit still for too long, believing their lights are already properly controlled using standard switches, and seeing no reason to spend extra money on lighting equipment. Another trade ally mentioned distrust in the quality of energy efficient products in general, mentioning that he regularly sees batches of ballasts and fixtures with high malfunction rates.

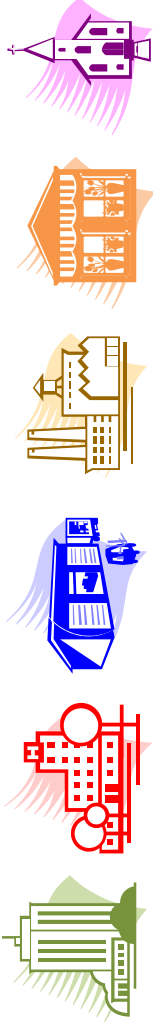
Table 5. Penetration of Lighting Controls by Sector

Lighting Type	Offices (n=72) (a)	Health Care (n=47) (b)	Ware- house (n=52) (c)	Manuf (n=49) (d)	Sm. Retail (n=72) (e)	Church (n=70) (f)	All 6 Sectors (not weighted) (n=364)
Indoor Occupancy Sensors	13% ^f	6%	8%	9% ^f	6%	1%	7%
Less than 25% of lights*	56%	67%	25%	25%	25%	100%	44%
25-49%	22%	0%	25%	25%	0%	0%	16%
50-74%	11%	33%	25%	25%	25%	0%	20%
75-99%	0%	0%	25%	0%	0%	0%	4%
100%	11%	0%	0%	25%	50%	0%	16%
Indoor Daylighting Sensors	1%	6%	2%	5%	6%	12% ^{ac}	5%
Outdoor Motion Sensors	19%	21%	14%	9%	23%	39% ^{abcd}	24%
Less than 25% of lights*	57%	83%	0%	50%	67%	67%	61%
25-49%	14%	0%	25%	0%	17%	25%	18%
50-74%	0%	0%	50%	0%	17%	0%	6%
75-99%	0%	0%	25%	0%	0%	0%	2%
100%	14%	0%	0%	50%	0%	8%	8%
Don't know	14%	17%	0%	0%	0%	0%	4%
Outdoor Photocells	11%	29% ^a	43% ^a	35% ^a	35% ^a	37% ^a	32%
Indoor or Outdoor Lighting Timers	22% ^d	26% ^d	26% ^d	9%	25% ^d	47% ^{abcde}	26%

Colored boxes indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

Note: The outdoor lighting controls penetration rate is based only on those who report having outdoor lighting at their facility. The indoor lighting penetration rate is based only on those who report having indoor lighting at their facility.

*Base: Those with lighting control type above.



3.2.2 HVAC

We interviewed three trade allies who provide HVAC services. These three trade allies varied in the types of services that they provided to their clients.

Regarding HVAC controls, all three trade allies report that they frequently install controls (programmable thermostats or EMS) with HVAC upgrades, and they are pushing businesses towards the use of EMS (reportedly up to 60% to 75% of upgrades they conduct). Our phone survey found that most facilities that control their equipment have programmable thermostats (69%), but very few have EMS (2%).

As to other types of HVAC equipment, most packaged and split systems are set up to use economizer cooling, but this is not effective in many climate regions of Texas. It is often too humid, or temperatures never get cool enough to be effective. The three contractors interviewed usually deactivate the economizer, or change the factory settings to adjust it to the climate. Utilities should evaluate the climate in their region and provide specific recommendations for economizer use to their clients. Instead of deactivating the economizer completely, properly setting it up can allow some energy saving during cooler portions of the year.

Our trade ally interviews also explored the use customers variable frequency drives/variable speed drives (VFDs/VSDs), although we did not ask customers about VFDs/VSDs. Variable speed or variable frequency drives are also not extremely common in the facilities these contractors visit in Texas. One trade ally we interviewed says VFD/VSDs are always installed on new construction projects, but have only been added on four of thirty retrofit projects recently completed in Texas. Another trade ally includes the cost of VFD/VSD upgrades on all his project bids, but these upgrades are not always undertaken due to a lack of up-front funding. The third trade ally has only seen VSDs used in one Texas school. It is important to note that in Texas the focus is on kW rather than kWh savings which prevents utilities from focusing on these measures.

Table 6 shows the penetration of HVAC types and ages by sector. In this table, we highlight percentages per sector that are significantly higher than all other sectors (e.g. health care compared non-healthcare) in green, and those that are significantly lower than all other sectors in red. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

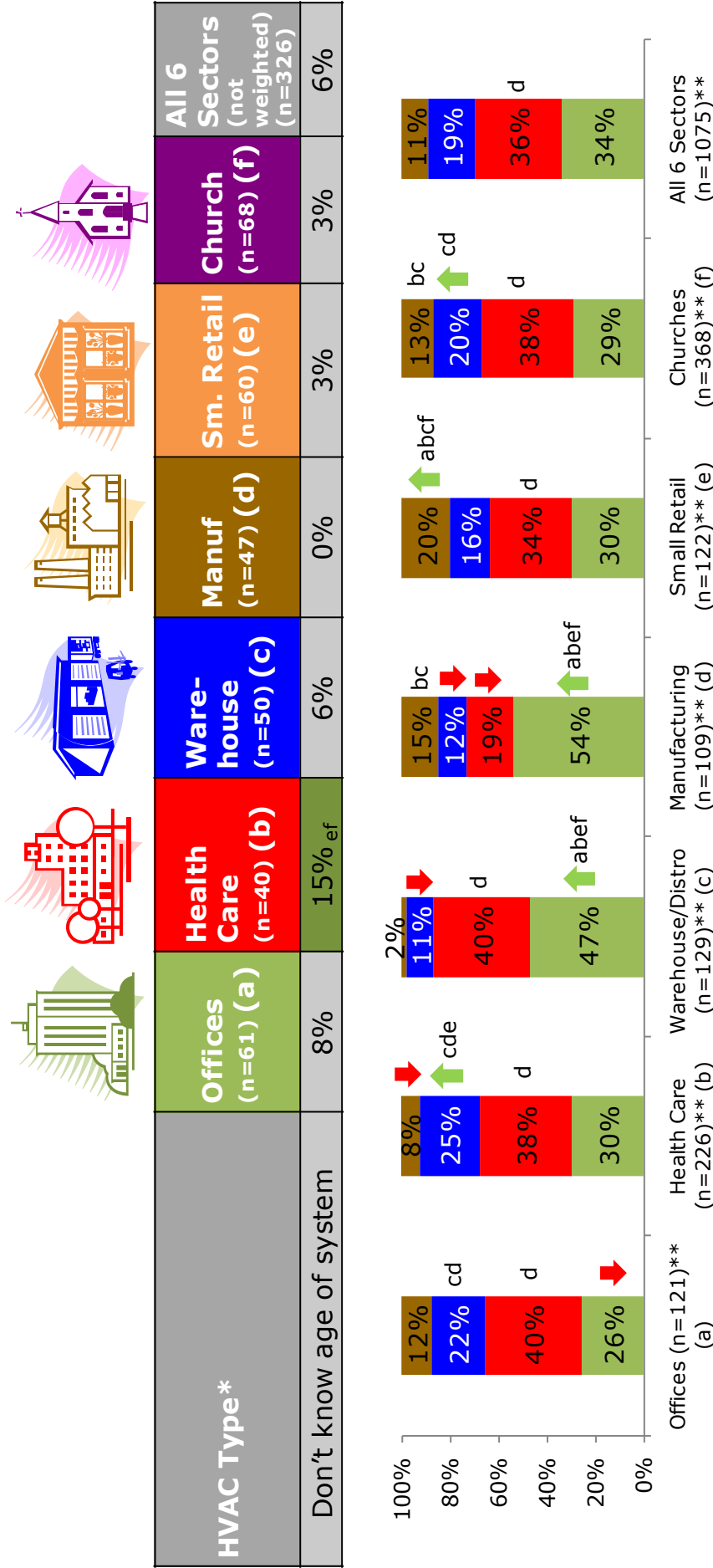
Table 6. Reported Penetration of HVAC Systems by Sector

HVAC Type *	Offices (n=61) (a)	Health Care (n=40) (b)	Ware- house (n=50) (c)	Manuf (n=47) (d)	Sm. Retail (n=60) (e)	Church (n=68) (f)	All 6 Sectors (not weighted) (n=326)
Programmable Thermostat	67%	83% _{de}	70%	51%	55%	85% _{acde}	69%
Energy Management System	3%	8%	4%	2%	2%	0%	2%
HVAC Type (multiple response)							
Split systems	25%	42% _{ac}	26%	40% _a	35%	47% _{ac}	36%
Rooftop AC units or packaged units	43% _{df}	45% _{df}	38% _{df}	11%	33% _{df}	19%	31%
Room air conditioners	7%	8%	12%	15% _e	5%	16% _{ae}	10%
Heat pumps	7%	10%	8%	2%	3%	4%	6%
Evaporative Coolers	3%	0%	10% _f	6%	3%	1%	4%
Chillers	0%	10%	0%	4%	0%	3%	2%
Other	20% _b	8%	10%	21% _b	18% _b	21% _b	17%
None	0%	0%	0%	11%	7%	0%	3%
Don't know system type	3%	8%	10% _e	4%	2%	16% _{ade}	7%

Colored boxes and arrows indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

*Base: Owners and renters able to make changes to the facility equipment. Note that 1.1% of all respondents were renters who cannot change this measure type.

Figure 1. Ages of HVAC Systems by Sector



■ Less than 4 years old ■ 4-7 years old ■ 7-12 years old ■ More than 12 years old

Colored boxes and arrows indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

*Base: Owners and renters able to make changes to the facility equipment. Note that 11% of all respondents were renters who cannot change this measure type.

**Base: Total number of units identified by respondents. Respondents in the "don't know" category could not state how many to tal units they have.

3.2.3 Roofing

We interviewed three trade allies who conduct roofing work. Notably, one of these three trade allies was not aware of utility programs for roofing, and another had never advised their clients about these programs or helped them receive incentives. However, our database review found that a significant percentage of Commercial Solutions projects (10%) during the first two years were for roofing.

According to our trade ally interviews, the main barrier to the implementation of cool roofing is the lack of knowledge about this technology, not just by the building owners and facility managers, but also by energy efficiency professionals and roofers themselves. The one roofing-only contractor we interviewed knew nothing about cool roofing, had never heard of ENERGY STAR® roofing or the Cool Roof Rating Council, and was unable to say whether the products they usually installed were cool or not. This firm gets their business by bidding on requests for proposals, where architects and facility managers have already developed the specifications. The roofer had no control over the specification process, and did not seem curious about the various types of roofing that were specified for different jobs. Neither of the other two contractors was much better informed, but they did at least have awareness of cool roof options and the availability of utility incentives for them.

Despite a lack of awareness, a proportion of roofs being installed in Texas are cool. One contractor reports installing Duro-last¹¹ roofing on roofing upgrades (mainly on retail facilities). A second roofing contractor reports that bright white single-ply roofing is installed on about 30% of their projects.

Other reported roofing installations are probably not cool. The remaining 70% of installations by the second roofing contractor are reportedly modified bitumen roofing (either Styrene Butadiene Styrene or Atactic Polypropylene) or built-up roofing, both with a granulated white surface. It is not clear if these roofs were surfaced with special, cool, bright white granules (with a solar reflectance of 65% or more), or if they were the more typical grayish white granules (with solar reflectance of 25%).

One of the contractors we interviewed reported that most roofs on the warehouses and manufacturing facilities he works with have aluminum coatings. Metallic coatings and bare metal roofs tend to have somewhat higher solar reflectance, but their low thermal emissivity keeps them from being cool.

Because our database review indicates that there may be a special interest in roofing projects through the Commercial Solutions program, the program can increase its participation in the roofing component by focusing on trade ally education about roofing and its effects on energy usage. If roofer knowledge about energy efficiency increases, program participation should increase to even higher levels.

Table 7 and Table 8 show the penetration of roofing types by sector. In these tables, we highlight sector percentages that are significantly higher than all other sectors (e.g., offices compared to non-offices) in green, and those that are significantly lower than all other sectors in red. We also indicate differences between individual sectors (e.g., retailers

¹¹ Duro-last is a cool, bright white, PVC single-ply membrane roof product.

compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

Table 7. Reported Roof Types and Colors by Sector

Roofing Type*	Offices (n=61) (a)	Health Care (n=40) (b)	Ware- house (n=50) (c)	Manuf (n=47) (d)	Sm. Retail (n=60) (e)	Church (n=68) (f)	All 6 Sectors (not weighted) (n=326)
Roof Type (multiple resp.)							
Built-Up Roofing (BUR)	31%	28%	20%	21%	25%	43% ^{cde}	29%
Modified Bitumen	5%	0%	0%	0%	2%	1%	2%
Metal	30% ^b	13%	62% ^{abef}	70% ^{abef}	47% ^{ab}	37% ^{ob}	43%
TPO Single-Ply	0%	3%	0%	0%	2%	3%	1%
EPDM Single-Ply	0%	5%	0%	0%	0%	0%	1%
Slate/Tile	2%	0%	0%	2%	0%	1%	1%
Wood shingle or shake	2%	8%	2%	0%	7%	13% ^{ac}	6%
Other	11% ^d	13% ^d	4%	2%	10%	7%	8%
Don't know	21% ^{ef}	35% ^{cdef}	18%	11%	8%	9%	16%
Roof Color (single resp.)							
Light grey or white	15%	25%	16%	32% ^{acef}	15%	18%	19%
Dark grey or black	23%	15%	16%	13%	20%	14%	17%
Brown or wood	8%	5%	8%	2%	10% ^d	35% ^{abcde}	13%
Metallic	11%	8%	18% ^{of}	15% ^f	15% ^{of}	4%	12%
Bright white	7%	5%	16% ^{bf}	11%	22% ^{abf}	4%	11%
Tan or beige	5%	5%	8%	15% ^a	7%	10%	8%
Other	11% ^{cd}	5%	2%	2%	5%	7%	6%
Don't know	20% ^{ef}	30% ^{def}	16% ^f	11%	7%	6%	14%

Colored boxes and arrows indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

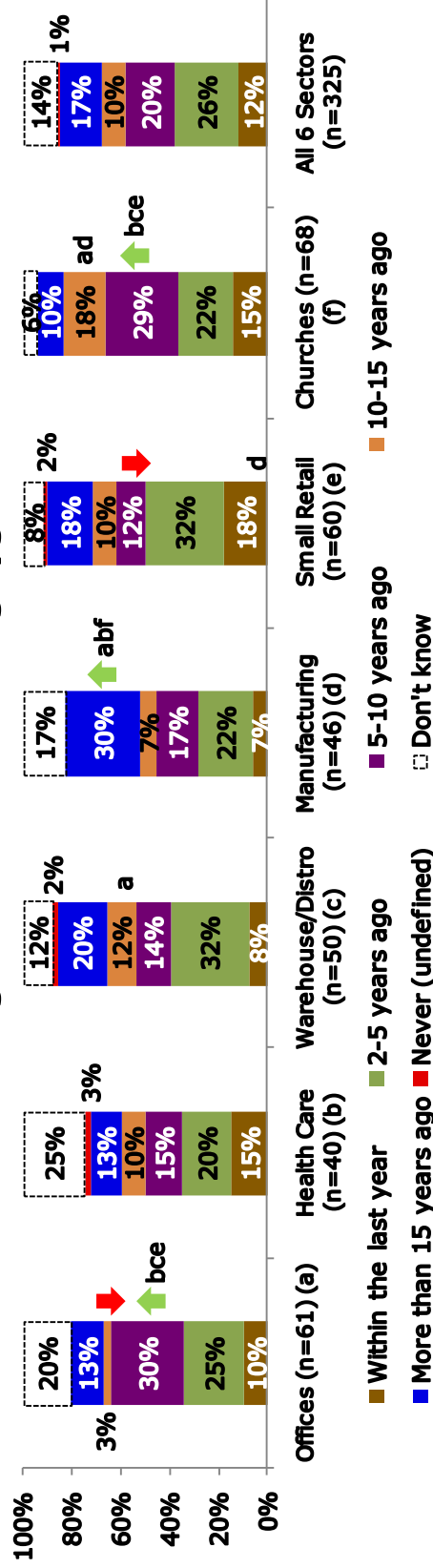
*Base: Owners and renters able to make changes to the facility equipment. Note that 11% of all respondents were renters who cannot change this measure type.

Table 8. Reported Roof Textures and Ages by Sector

Roofing Type*	Offices (n=61) (a)	Health Care (n=40) (b)	Ware-house (n=50) (c)	Manuf (n=47) (d)	Sm. Retail (n=60) (e)	Church (n=68) (f)	All 6 Sectors (not weighted) (n=326)
Roof Texture							
Smooth	31%	30%	52% ^{abf}	49% ^{abf}	43%	31%	39%
Granular	30% ^{cd}	25% ^d	16%	11%	23% ^d	44% ^{abcde}	26%
Ballasted or rocky	8%	9%	10%	9%	8%	7%	9%
Other	7%	5%	10%	15%	15% ^b	13%	11%
Don't know	20% ^f	28% ^{ef}	16% ^f	17% ^f	10%	4%	15%



Timing of Most Recent Roofing Upgrade



*Base: Owners and renters able to make changes to the facility equipment. Note that 11% of all respondents were renters who cannot change this measure type. Colored boxes and arrows indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

3.2.4 Refrigeration





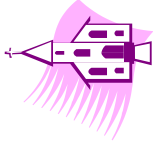
Penetration of refrigeration was low among the sectors we studied: Only 18% of all businesses interviewed said that they had commercial refrigeration at their facility.¹² Our survey also asked customers to describe the amount of refrigerated space for case coolers and walk-in coolers, but too few customers answered these questions to provide data by sector. Overall, customers who had reach-in or case coolers had a mean of approximately 32 linear feet of refrigerated space. Customers who had walk-in coolers or freezers had a reported mean of approximately 870 square feet of refrigerated space.

We did not conduct interviews with any trade allies who specialized in commercial refrigeration.

Table 9 presents our refrigeration penetration findings by sector. In these tables, we highlight sector percentages that are significantly higher than all other sectors (e.g., churches compared to non-churches) in green, and those that are significantly lower than all other sectors in red. We also indicate differences between individual sectors (e.g., retailers compared with offices, retailers compared with health care facilities) with letters indicating that the percentage in one sector is significantly higher at the 90% confidence level than that of the sector(s). The letter next to the percentage identifies each sector and also appears at the top of each column (a-f).

¹² This percentage excludes offices, who were not asked about commercial refrigeration.

Table 9. Penetration of Refrigeration Types by Sector

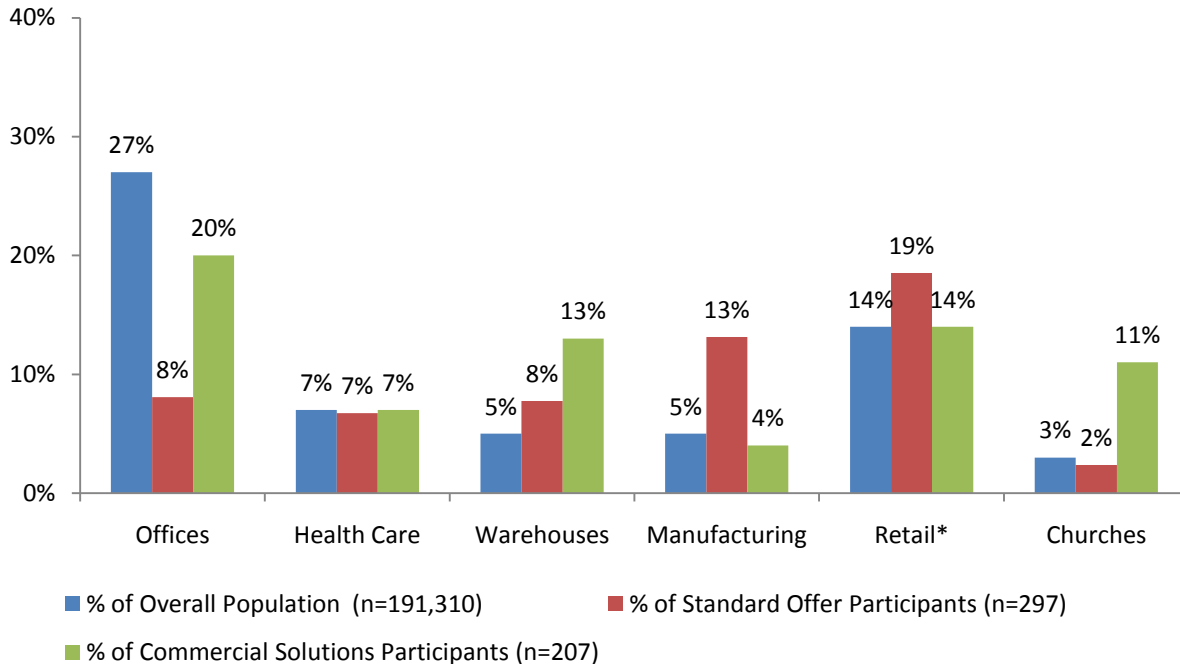
Refrigeration Type	    					All 5 Sectors (not weighted) (n=290)
	Health Care (n=46) (b)	Ware-house (n=54) (c)	Manuf (n=48) (d)	Sm. Retail (n=72) (e)	Church (n=70) (f)	
Facility has refrigeration	15%	13%	10%	17%	30% ^{bpcde}	18%
Refrigerator type						
Reach-in cooler or freezer	4%	6%	0%	4%	22% ^{bpc}	8%
Walk-in cooler or freezer	11% ^{cf}	2%	4%	6%	1%	4%
Case cooler or freezer	0%	0%	0%	3%	0%	1%
Process cooling or freezing	0%	2%	2%	0%	0%	1%
Other	2%	4%	6%	6%	3%	4%
Don't know	0%	0%	0%	0%	2%	1%

Note: Offices did not receive these questions. Base: All respondents for all sectors but offices. Colored boxes indicate significant differences between the sector and all remaining sectors collectively at 90% confidence. Letters indicate significant differences between individual sectors at 90% confidence.

A. APPENDIX: SECTOR DEFINITIONS AND SIC CODES

There were two primary criteria for selecting these six sectors: (1) The sector has low participation rates in the Standard Offer program (relative to their overall population), indicating that the sector may need additional support to participate in energy efficiency programs; (2) The sector has high potential for savings through the Commercial Solutions program (either through large numbers or customers and/or a large number of potential measures that could be installed). Note that we analyzed average savings among those already participating in the Commercial Solutions program to determine this second criterion. Figure 2 below compares program participation to the population from the geography selected in the six sectors we studied.

Figure 2: Participation in Programs compared to Population



Based on our review of the sectors, Opinion Dynamics proposes focusing the baseline efforts on the following six sectors:

- Offices
- Health care providers
- Warehouses
- Manufacturing facilities
- Churches and religious organizations

➤ Small retailers

Table A-1 provides the savings estimates and participation rates for both the Standard Offer program and Commercial Solutions program. The proposed sectors are indicated in boldface.

Table A-2 indicates the SIC codes used in identifying each sector in the general population. Below, we go into more detail on our justifications for the sectors we propose.

Table A-1. Participation and Savings from Commercial Solutions and Standard Offer Programs

Building Type	Percentage of Utilities' Target Population (based on SIC code) (n=126,305)	Standard Offer Program Projects			Commercial Solutions Projects		
		% of total population participating	Mean Peak Savings (kW) Per Project	Mean Total Savings (kWh) Per SOP Project	% of total population participating	Mean Peak Savings (kW) Per CS Project	Mean Total Savings (kWh) Per CS Project
Office	34%	0.10% (low)	4 (40.6)	4 (181,356)	0.21%	3 (21.5)	3 (89,042)
Retail**	17%	1.84%	6 (31.3)	6 (144,095)	0.64%	9 (12.4)	9 (53,673)
Health care or hospital	9%	0.47% (low)	3 (51.7)	3 (267,842)	0.36%	4 (19.1)	4 (85,642)
Government (local, state, or federal; including military) ^a	8%	1.07%	8 (27.6)	5 (148,965)	0.48%	10 (10.9)	10 (35,354)
Restaurant or food service	7%	0.41% (low)	12 (5.3)	12 (17,256)	0.45%	12 (7.7)	11 (32,406)
Warehouse, storage, or distribution	7%	0.42% (low)	2 (84.1)	2 (556,868)	0.19%	2 (31.0)	2 (145,262)
Manufacturing	6%	0.82%	1 (116.0)	1 (748,250)	0.56%	1 (42.0)	1 (271,277)
Grocery store	4%	2.23%	9 (27.0)	7 (138,414)	0.49%	6 (16.0)	6 (70,890)
School or university ^a	3%	8.19%	7 (28.5)	9 (77,664)	0.87%	11 (10.3)	12 (27,122)
Church or religious institution	3%	0.23% (low)	10 (16.7)	10 (60,367)	0.80%	8 (13.9)	8 (55,495)
Lodging	1%	1.59%	5 (33.0)	8 (136,451)	0.64%	7 (16.0)	7 (69,236)
Gym	1%	0.38% (low)	11 (9.1)	11 (22,951)	1.25%	5 (16.5)	5 (70,955)

^a Local governments and schools were the subject of the Opinion Dynamics Texas School and Local Government Energy Efficiency Market Assessment and Baseline Study conducted for CLEARresult in 2009, so they are not eligible for the Commercial Solutions baseline study. They are included only for reference. **Note that our baseline targets only small retailers as described in the text.

Sectors for Study

Offices

The office sector includes both large and small office customers. Offices comprise the largest sector of the utilities' target market population overall (34%), but the Standard Offer program has reached only a small portion of this population (0.10%, which is the lowest participation rate of all the sectors).

Offices also comprise 16% of applications in the Commercial Solutions program (number not shown in table above), indicating that there is a need for additional assistance among this sector. Moreover, the potential for energy savings in the office sector is one of the highest among all potential sectors. Office-sector projects under the Commercial Solutions program had a mean estimated annual 21.5 kW demand reduction and 89,042 kWh total savings. These were the third-highest mean savings estimates, behind only warehouses and manufacturing.

Health Care Providers

The health care sector includes hospitals, doctors' offices, outpatient facilities, nursing homes, and any other businesses that are dedicated to providing medical treatment. While it is the third-largest sector in the target population (9%), this sector's participation rate in the Standard Offer program is among the lowest.

Health care providers also offer moderately high potential for savings, both in terms of peak demand savings and overall usage savings, ranking fourth (behind offices, warehouses, and manufacturing) in terms of average savings for those in the Commercial Solutions program (19.1 kW and 85,642 kWh, respectively).

Warehouses

The warehouse sector includes warehouses, storage facilities, distribution facilities, and wholesalers. Warehouses also have low participation rates in the Standard Offer program, but produced the second-highest savings overall (after manufacturing) among participants in the Commercial Solutions program (31 kWh and 145,262 kWh).

Manufacturing Facilities

The manufacturing sector has the highest potential for savings of all program sectors, ranking number one in terms of average savings in both the Standard Offer and Commercial Solutions program. Manufacturing has had moderate participation across both programs (0.82% in Standard Offer and 0.56% in Commercial Solutions), but is included because it provides the largest energy savings both in peak usage and overall usage. Further, the Standard Offer program tends to attract larger, metropolitan, manufacturing facilities while the Commercial Solutions program tends to attract smaller facilities in remote locations. Given that some manufacturing facilities are choosing to participate in the Commercial Solutions program, some of these groups appear to benefit from the additional support

provided by the Commercial Solutions program.

Churches and Religious Organizations

While churches make up a relatively small portion of the overall target population (3%) and past projects provided moderately low savings (ranked 8 out of 12), this sector falls among the sectors with the lowest participation rates in the Standard Offer program. In addition, it includes a much larger proportion of the population participating in the Commercial Solutions program (0.80%) than in the Standard Offer program (0.23%), indicating that the religious organization sector seems to benefit from the Commercial Solutions program.

Small Retailers

The sixth sector does not meet the same criteria in that retailers are well represented in the Standard Offer program. The retail sector also has only moderately low savings; however, a large number of retailers are choosing to participate in the Commercial Solutions program. The difference, however, is in the types of retailers that are participating.

Based on our review of the program databases, Commercial Solutions retail participants tend to be smaller retailers with single projects that are handled directly by the customer. Standard Offer retail participants tend to be large national chains with bundled projects.

Many Standard Offer projects are handled through rebate administrators or other third parties, who work with large, national chains to help them identify and apply for utility incentive programs. These third parties are overwhelmingly participating in the Standard Offer program rather than the Commercial Solutions program. An analysis of the Standard Offer database revealed that known rebate administrators accounted for 43% of all applications in the retail sector. The Commercial Solutions database did not have any applications from third parties in the retail sector.

Therefore, we propose specifically targeting small retailers for the Commercial Solutions baseline, as these retailers are less likely to partner with a rebate administrator and thus are more likely to be better served by the Commercial Solutions program offerings.

Table A-2. Sector SIC Codes

Sector Name	SIC Code (2 or 4-digit)
Office	60, 61, 62, 63, 64, 65, 67, 7291, 7299, 73, 81, 83, 8611, 8621, 8631, 8641, 8651, 8699, 87
Health Care	80
Warehouse	4214, 4221, 4222, 4225, 4226, 50, 51
Manufacturing	20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39
Church or religious organization	8661
Small Retailers*	52, 53, 55, 56, 57, 59, 7221, 7231, 7241, 7251, 7841

* In this study, we defined "small retailers" as those with less than \$5 million in revenue per year.

Sectors Excluded from Study

Government and Schools

We studied governments and schools in the Opinion Dynamics Texas School and Local Government Energy Efficiency Market Assessment and Baseline Study conducted for CLEAResult in 2009, so they are not eligible for the Commercial Solutions baseline study. Therefore, we did not analyze them for meeting any criteria for inclusion.

Grocery Stores

Participation in the Standard Offer Program has been relatively high (2.23%) with Grocery stores, while participation has been limited in the Commercial Solutions program (0.44% of the population). The average energy savings is typical of a program participant thus far. As such, we have not targeted this sector.

Restaurants

Although restaurants have been moderately unlikely to participate in either program (0.45% of the population in Commercial Solutions and 0.41% in Standard Offer), the potential for savings is lower (lowest for peak savings and second-lowest in overall savings). As such, we did not include restaurants in the top six sectors.

Lodging

Like grocery stores, lodging may be better suited to the Standard Offer program. The Standard Offer program (1.59% of the population) has had stronger participation than the Commercial Solutions program (0.64%) in this sector.

Gyms

Gyms indicate differences between the two programs, with a much higher percentage of the population participating in the Commercial Solutions program (1.25%) than in the Standard Offer program (0.38%). This indicates that gyms may be a target sector for the Commercial Solutions program. Gyms also achieved moderate estimated savings per project (ranked fifth in peak demand reduction and overall savings). Savings per project have been higher for gyms participating in the Commercial Solutions program than in the Standard Offer program; gyms were only one of two sectors (the other being restaurants) where this was the case. However, gyms made up such a small portion of the overall target population (only 1%) that we determined this sector was too small to include in the top six sectors.