

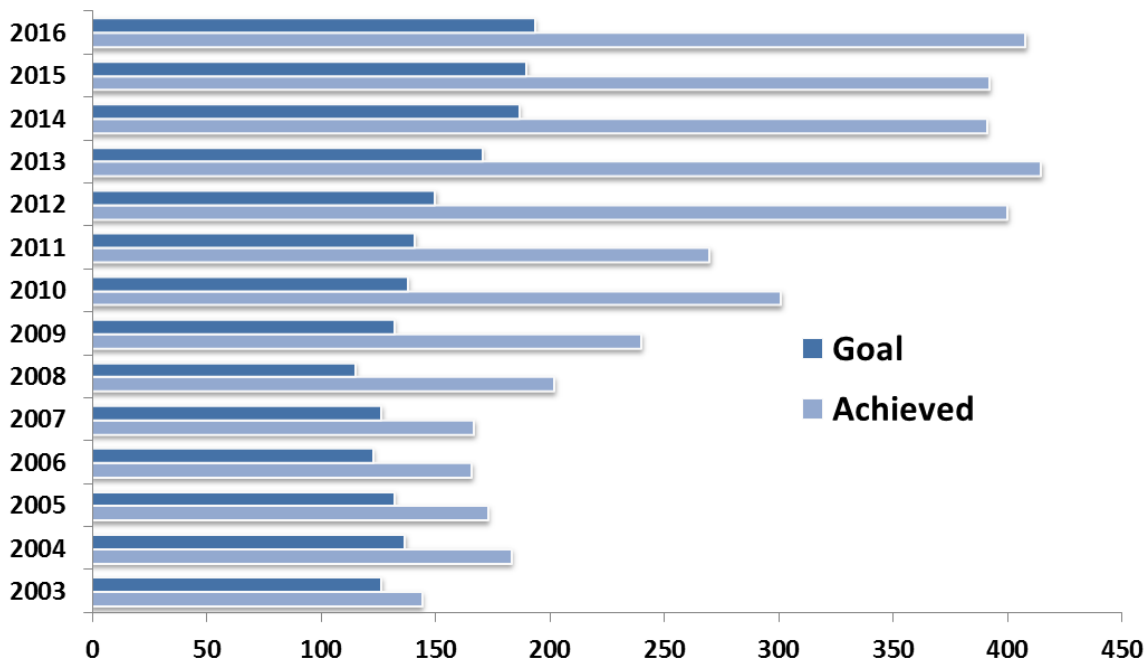
# Energy Efficiency Accomplishments of Texas Investor-Owned Utilities Calendar Year 2016

Frontier Associates LLC

## 1 Accomplishments

In 2016, the majority of the Texas investor-owned utilities (IOUs) exceeded their statewide energy efficiency goals. The utilities achieved 595 gigawatt hours (GWh) of energy savings and 408 megawatts (MW) of peak demand reduction. In the past decade, the U.S. Environmental Protection Agency (EPA) has recognized many of the utilities for their ENERGY STAR® programs, including being recognized for their Sustained Excellence and being named as Partners of the Year. Figure 1 illustrates the annual savings from 2003-2016.

Figure 1. Demand Reduction by IOUs, 2003-2016



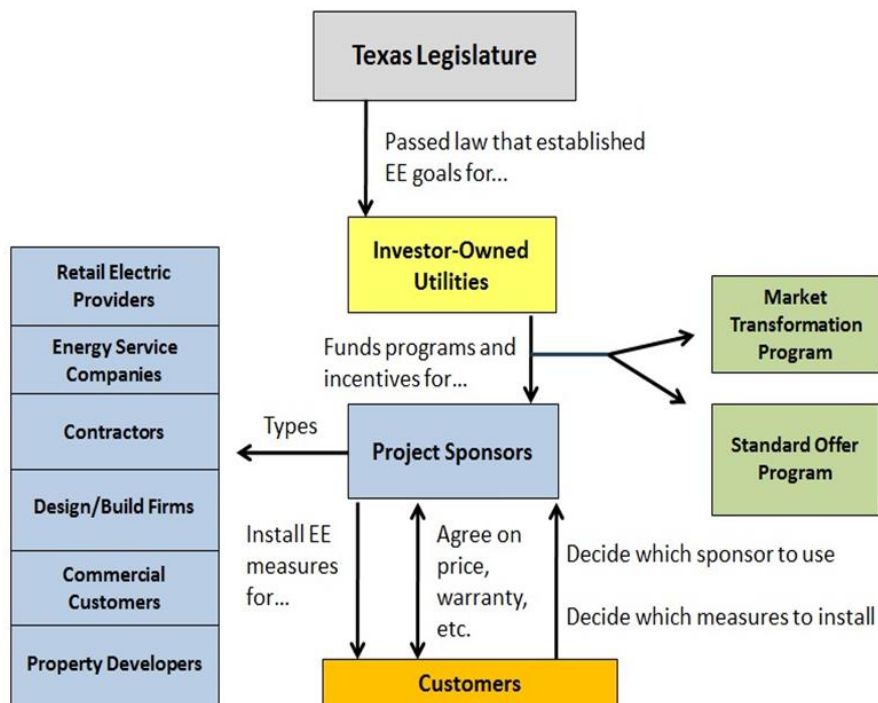
Most of the utilities' programs involve financial incentives which are paid to project sponsors to offset the costs of a variety of energy efficiency improvements. Combined, the IOUs spent approximately \$126 million on energy efficiency programs in 2016 (including administrative expenses).

## 2 Energy Efficiency Program Overview

The 75<sup>th</sup> Texas Legislature passed a law requiring IOUs to meet certain energy efficiency goals. To comply with this law, the IOUs contract with energy efficiency service providers (EESPs) to install energy efficiency measures that result in peak demand reduction and energy savings.

Both national and local EESPs contact consumers (residential and commercial) about performing work to save energy and reduce their electric bills. Customers select the EESP, decide what equipment will be installed, and choose what work the contractor will do. Price, warranty, financing, and other purchasing matters are entirely between the contractor and customer. Figure 2 depicts an overview of the Texas Energy Efficiency Process. Table 1 lists the Texas IOUs and respective acronyms used throughout this report.

**Figure 2. Overview of Texas Energy Efficiency Process**



**Table 1: Texas Investor Owned Utilities**

Utility Name	Utility Acronym
Southwestern Electric Power Company	SWEPCO
American Electric Power-Texas Central Company	AEP-TCC
American Electric Power-Texas North Company	AEP-TNC
CenterPoint Energy Houston Electric LLC	CNP
El Paso Electric Company	EPE
Energy Texas, Inc.	ETI
Texas-New Mexico Power Company	TNMP
Sharyland Utilities	Sharyland
Oncor Electric Delivery Company, LLC	Oncor
Xcel Energy Company	Xcel

## 2.1 Legislative Background

In 1999 the Texas Legislature passed Senate Bill 7 (S.B. 7) which mandated that at least 10% of an IOU's annual growth in electricity demand be met through energy efficiency programs each year. Eight years later, the Legislature passed House Bill 3693 (H.B. 3693) which raised the goals for energy efficiency to 20% of each utility's annual growth in demand by 2009, superseding the goals set by S.B. 7. The Public Utility Commission of Texas (PUCT) Substantive Rule §25.181 ("energy efficiency rule" or "rule") was created to establish procedures for meeting this legislative mandate. In 2010 the PUCT approved a new rule, effective December 1, 2010, that ensured the continuation of energy efficiency programs and increased the goal to 30% reduction in demand growth by 2013.

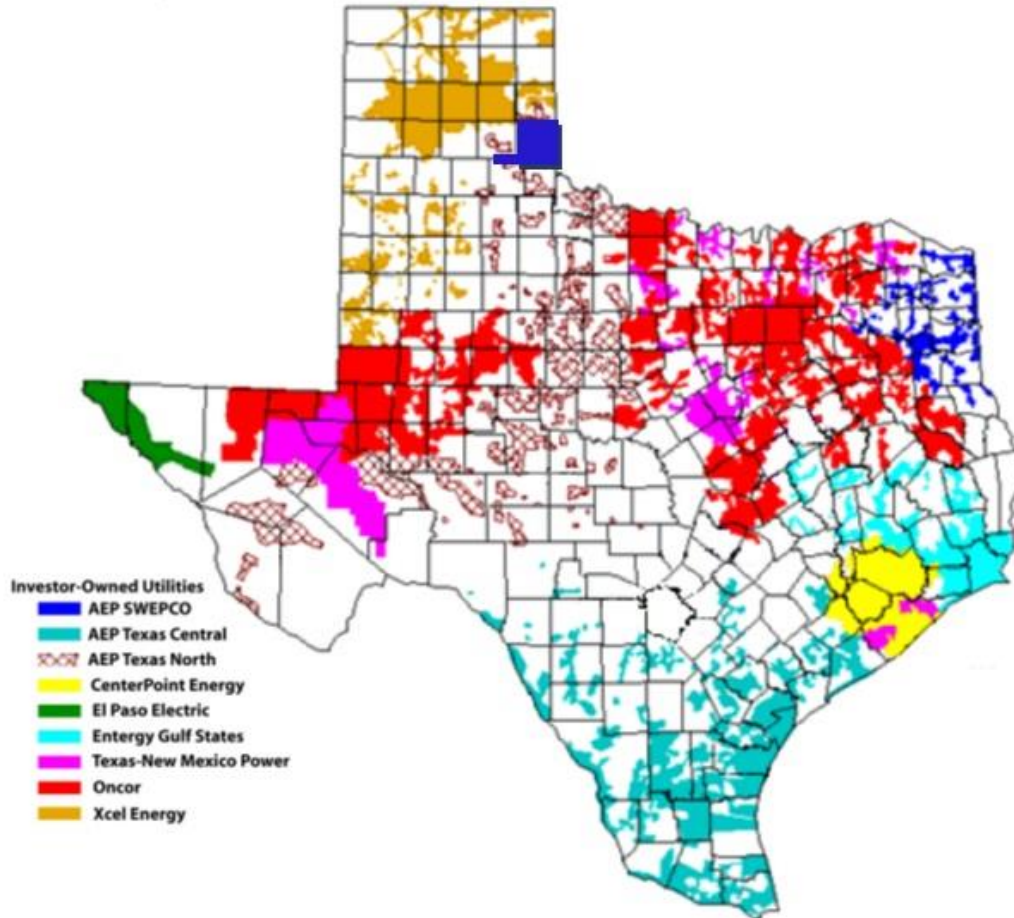
During the 82<sup>nd</sup> Legislative Session, Texas passed S.B. 1125, codifying the goals established by the PUCT in 2010, and S.B. 1434 which mandated specific funding levels for low-income weatherization programs. As a result, the PUCT opened a rulemaking proceeding to amend the energy efficiency rules in August 2011 (Project No. 39674). During this rule making, the energy efficiency goals were modified such that the goal metric changed from a % of load growth to 0.4% of peak load after 2013, assuming established circumstances had been met. The new rule was approved in late 2012 and became effective January 1, 2013.

Utilities are required to administer energy savings incentive programs, which are implemented through EESPs. All programs are designed to reduce system peak demand, energy consumption, or energy costs. Utilities must achieve their energy efficiency goals through either standard offer programs (SOPs), market transformation programs (MTPs), or direct to customer rebates. Programs are made available to all customers, giving each consumer a choice of a variety of energy efficiency alternatives. A full list of programs offered each year is provided in each utility's Energy Efficiency Plan and Report (EEPR), submitted on or before April 1 each

year. The calendar year 2016 reports can be found on the PUCT interchange under docket number 46907.

Figure 3 is a map of Texas outlining the individual IOU service areas.

**Figure 3. Texas Investor Owned Utility Service Area Map<sup>1</sup>**



<sup>1</sup> The map in Figure 3 does not display the territories served by Sharyland Utilities. A map of Sharyland Utilities' service territory can be accessed at: [http://www.su-power.com/docs/SU\\_ServiceMap.pdf](http://www.su-power.com/docs/SU_ServiceMap.pdf).

Table 3 lists each utility’s 2016 program savings and expenditures as reported to the PUCT.

**Table 3: Program Expenditures and Reported/Verified Savings for 2016<sup>2</sup>**

Utility	Funds Expended (\$)	Demand Reduction (kW)	Energy Savings (kWh)
SWEPSCO	4,156,520	11,939	20,648,106
AEP-TCC	13,622,060	39,300	67,713,791
AEP-TNC	2,697,090	6,381	10,817,333
CNP	33,110,909	167,600	190,856,800
ETI	7,029,000	19,750	45,044,000
EPE	3,608,882	12,790	22,912,000
Oncor	53,025,163	128,828	198,742,871
Sharyland	645,430	610	2,213,000
TNMP	4,959,073	12,252	21,717,000
Xcel	3,310,000	8,180	14,453,000
<b>Total</b>	<b>126,164,127</b>	<b>407,630</b>	<b>595,117,901</b>

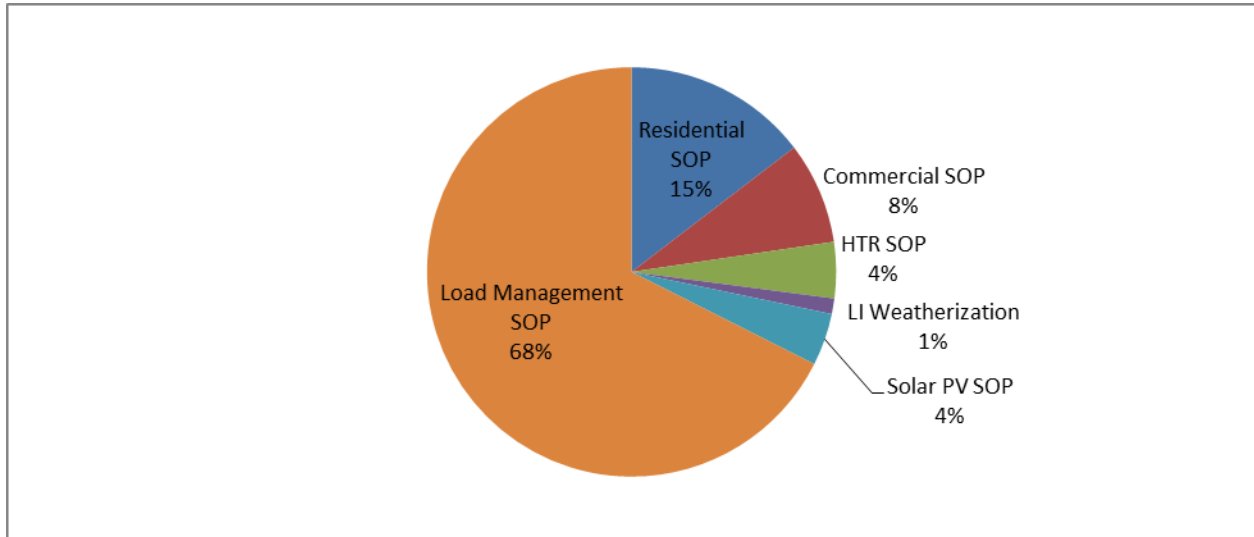
### 3 Standard Offer Programs

An SOP is a type of energy efficiency program where parties enter into a contract with standard terms and conditions. Utilities offer standard incentives for a wide range of measures that are bundled together as a project. Incentive rates are set for each kW of demand reduction and each kWh of energy savings produced and is based on prescribed avoided costs. Payment is based on the measures installed and deemed savings values for each measure with random inspections to verify proper installation. The following sections describe the different types of SOPs offered by Texas IOUs. It is important to note that some utilities offer variations of “standard” SOPs.

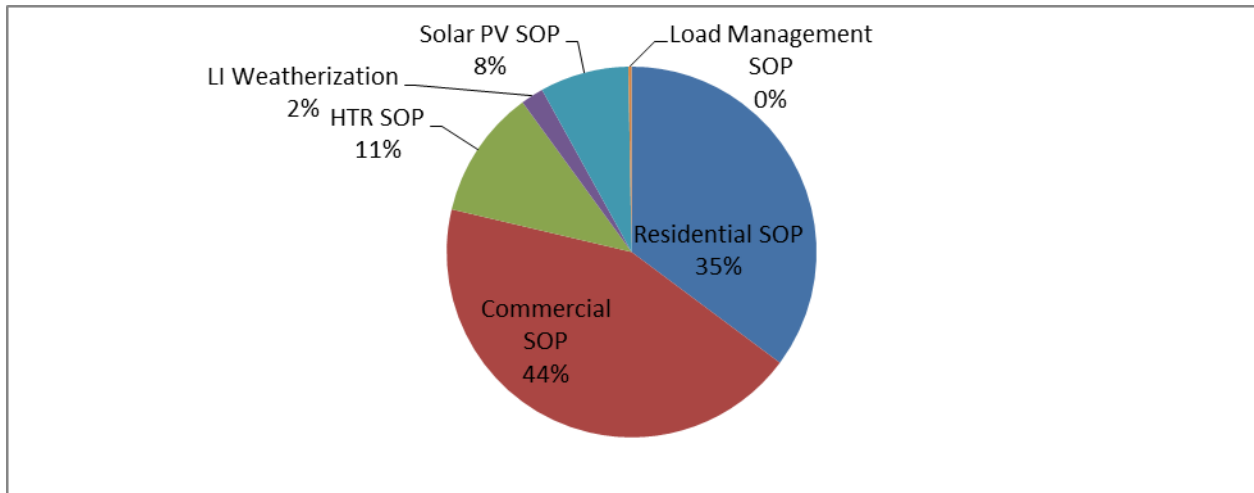
Figure 4 illustrates the breakdown of demand reduction attributed to each SOP, while Figure 5 shows the breakdown of energy savings.

<sup>2</sup> As provided in each utility’s Energy Efficiency Plan & Report (EEPR) for calendar year 2016; all savings are reported at the meter. Savings and spending may not total the exact amount as seen in the EEPRs due to rounding.

**Figure 4. Demand Reduction by Standard Offer Programs in 2016**



**Figure 5. Energy Savings by Standard Offer Programs in 2016**



### 3.1 Commercial & Qualifying Industrial<sup>3</sup>

The Commercial and Qualifying Industrial (C&I) program targets large commercial and industrial customers with a minimum demand requirement (this varies by utility). Utilities pay incentives to project sponsors for certain measures installed in new or retrofit applications that provide verifiable demand and energy savings. Typical projects include the replacement of existing chillers and lighting equipment with more efficient chillers and lighting, and industrial process retrofits.

### 3.2 Residential & Small Commercial

The Residential and Small Commercial program targets residential and small commercial customers including multi-family, single-family, and mobile homes. The program provides incentives for the installation of a wide range of measures that reduce system peak demand, energy consumption and energy costs. Retrofits and efficient new construction of low-income housing may also be undertaken.

Utilities pay incentives to EESPs. These incentives are based on deemed savings when available. (Deemed savings estimates are predetermined, validated estimates of energy and peak demand savings attributable to an energy efficiency measure.) Otherwise, the EESPs set incentives based off actual peak demand reduction and energy savings as verified using the International Performance Measurement and Verification Protocol.

The primary objective of the Residential and Small Commercial SOP is to achieve cost-effective reduction in energy consumption during peak summer demand. There are five additional objectives of the program: (1) to encourage private sector delivery of energy efficiency products and services; (2) to achieve customer energy and cost savings; (3) to significantly reduce barriers to participation by streamlining program procedures and measurement and verification (M&V) requirements; (4) to encourage participation by a wide range of EESPs; and (5) to produce demand, energy, and bill savings in new single-family affordable housing projects and in new multifamily projects.

### 3.3 Hard-to-Reach

The Hard-to-Reach program encourages energy efficiency improvements in households with annual incomes at or below 200% of the federal poverty guideline. It is designed to be a comprehensive program by emphasizing building shell improvements and end uses. It is a retrofit program that targets multi-family, single-family, and mobile homes.

Incentives are paid to project sponsors for eligible measures that provide verifiable demand and energy savings. Special measures include the replacement of incandescent light bulbs with compact fluorescent lighting and water savers.

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<sup>3</sup> Generally, industrial facilities served at transmission voltage are not eligible to participate in the programs described here. However, exceptions may be made for non-profit facilities or other situations dictated by regulatory orders.

### 3.4 Load Management

Load Management programs encourage electric load control or shifting of electric loads in C&I facilities. Participating project sponsors provide on-call, voluntary curtailment of electric consumption during peak demand periods in return for incentive payments. The program is designed to assist businesses to reduce their on-peak energy demand and help meet the state's energy efficiency goals. Targeting a mix of industrial, office, and hospital facilities, program requirements differ on a utility-by-utility basis.

### 3.5 Low Income Weatherization

Low Income Weatherization programs are designed to reduce the energy consumption and energy costs for low-income residential customers in a cost-effective manner. Program implementers provide eligible weatherization and energy efficiency measures to residential customers who meet the current Department of Energy (DOE) income eligibility guidelines. Program cost-effectiveness is evaluated based on a whole-house audit utilizing the DOE-approved Savings-to-Investment Ratio (SIR). Implementation of this Senate Bill 712 Weatherization Program also provides targeted eligible residential customers with basic on-site energy education to satisfy the requirements of Substantive Rule 25.181(p).<sup>4</sup>

## 4 *Market Transformation Programs*<sup>5</sup>

A MTP is a strategic effort to make lasting changes in the market that result in increased adoption of energy efficient technologies, services, and practices. MTPs are designed to overcome specific market barriers that prevent energy efficient technologies from being accepted.

Figures 6 and 7 show the demand reduction and energy savings, respectively, which result from MTPs as reported to the PUCT. The most common MTPs offered by the IOUs are described below.

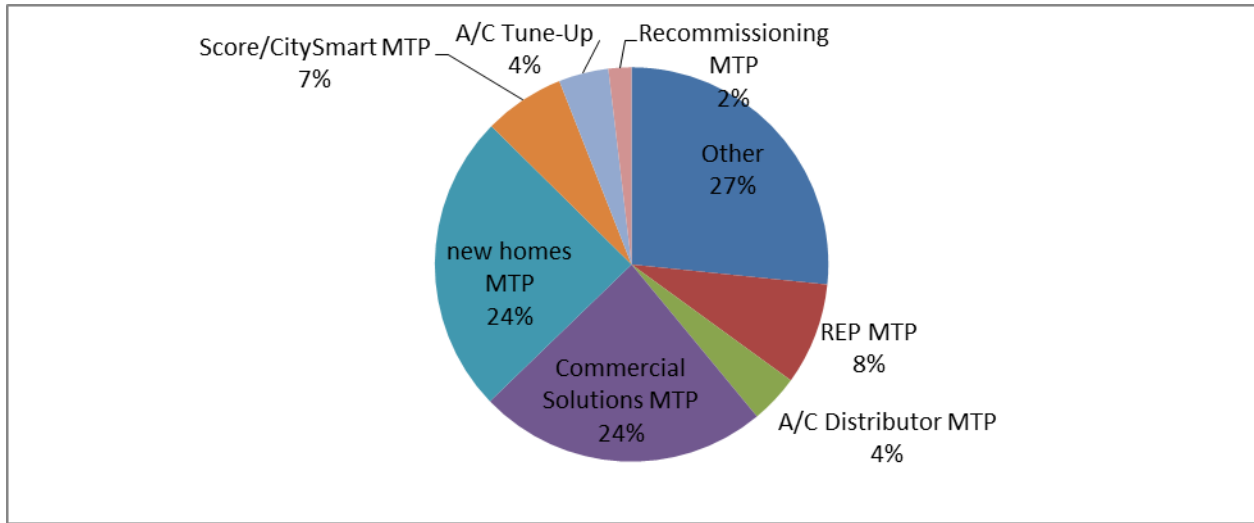
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<sup>4</sup> Low Income values include CenterPoint's Agencies in Action Low Income Weatherization Program, which is technically considered a Market Transformation Program.

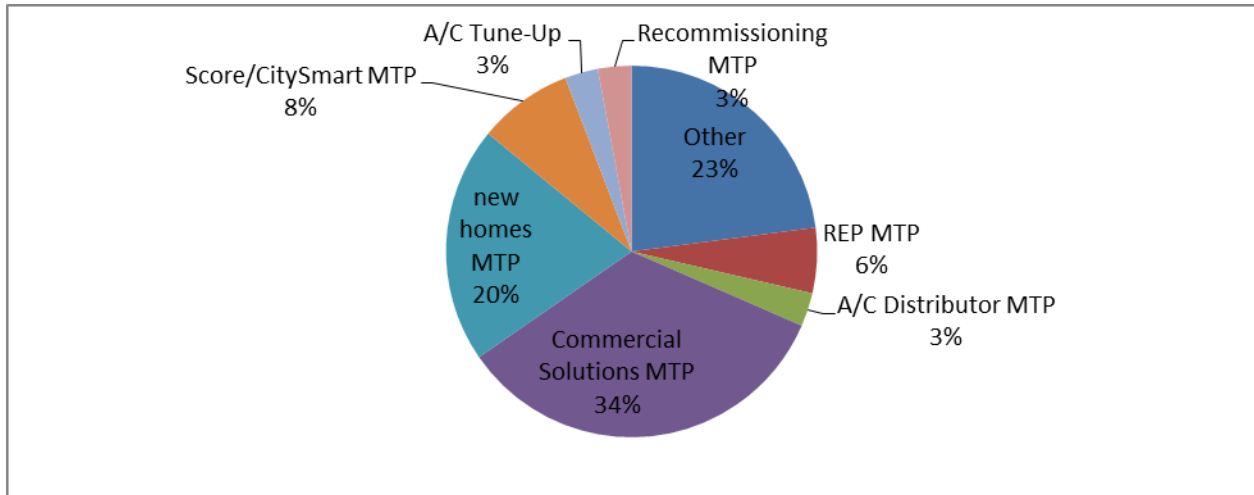
<sup>5</sup> Not all programs are covered by the six labeled programs in the charts. The programs making up the "other" section can be found within the EEPs of each of the utilities; these can be accessed at [www.TexasEfficiency.com](http://www.TexasEfficiency.com).



**Figure 6. Demand Reduction by Market Transformation Programs in 2016**



**Figure 7. Energy Savings by Market Transformation Programs in 2016**



#### 4.1 ENERGY STAR® New Homes Construction

The ENERGY STAR® New Homes Construction program targets residential new construction. It promotes the construction of energy efficient ENERGY STAR® new homes. To qualify, homes must be 15% more efficient than the energy requirements of the locally adopted International Energy Conservation Code. The program provides education and technical assistance to builders and subcontractors. In addition, the program is supported by training, education, and advertising components.

## 4.2 Retro-Commissioning

The Retro-Commissioning program helps energy end users reduce their peak demand and energy usage. The program provides expert analysis and systematic evaluation of building systems. By implementing low-cost and no-cost measures that improve system operation, customers reduce energy and peak demand while maintaining or improving customer comfort.

## 4.3 Texas Schools Conserving Resources (SCORE)/CitySmart

The Texas SCORE Program promotes a structured process to K-12 school districts to identify opportunities and implement energy efficiency measures. Incentives to school districts encourage these installations. Non-cash incentives promote best business practices. The Texas CitySmart Program promotes a similar program to a targeted audience of local and state government entities and municipalities.

## 4.4 Large Commercial & Industrial (C&I) Solutions<sup>6</sup>

The Large C&I Solutions program offers customers both cash and non-cash incentives. The cash incentives are at a lower \$/kW than SOPs, with the difference used to provide non-cash incentives that include technical assistance, education on financing energy efficiency projects, and communications services. The Solutions program helps companies 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.

## 4.5 Residential and Small Commercial Solutions

The Residential and Small Commercial Solutions Pilot MTP offers customers both cash and non-cash incentives. The cash incentives are at a lower \$/kW than the SOPs, with the difference used to provide non-cash incentives for technical assistance, education on financing energy efficiency projects, and communications services. The program focuses on improving the efficiency and installation practices of products and services that residential consumers purchase and that local contractors install. In addition to capturing kW reductions, the implementer helps residential and small commercial contractors improve their ability to identify, evaluate, and sell efficiency improvements to home and small business owners and assist consumers in evaluating energy efficiency proposals from vendors.

## 4.6 Hard-to-Reach Solutions

This program mirrors the Residential and Small Commercial Solutions Pilot MTPs described above.

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<sup>6</sup> Generally, industrial facilities served at transmission voltage are not eligible to participate in the programs described here. However, exceptions may be made for non-profit facilities or other situations dictated by regulatory orders.

## 4.7 LivingWise Education

The LivingWise Program uses a school-based method that builds student knowledge, provides high efficiency devices to families, and serves as an effective community outreach program. The Program identifies and enrolls students and teachers within a utility's service territory. The enrolled participants receive educational materials designed to build participant knowledge and demonstrate simple ways to save energy by not only changing habits but also changing devices.

## 4.8 Small Distributed Renewable Generation Pilot

The Small Distributed Renewable Generation (Solar Photovoltaic (PV)) Pilot Program is designed to help customers meet a portion of their energy needs with solar electric systems. Through market development and financial incentives, the program will increase the number of installations of photovoltaic systems among utility customers, while also creating a foundation for a self-sustaining market.

## 4.9 Premium Lighting Program

The Premium Lighting Program is designed to promote the installation of higher efficiency compact fluorescent bulbs (<13 watts) and LED lights. Through incentives to large lighting manufacturers, costs to large retailers are reduced and those reduced costs are passed on to consumers.

# 5 *Research & Development*

Research and Development (R&D) activities are undertaken by Texas utilities in order to study new technologies, analyze the potential for new programs, and increase efficiencies in the administration of current programs. The energy efficiency rule does not require utilities to conduct R&D; however, the PUCT does limit spending on such activities to 10% of a utility's total program costs.<sup>7</sup> Details on these projects can be found in the utility EEPRs under PUCT docket number 46907.

# 6 *Greenhouse Gas Emissions Reductions*

Table 4 shows the emissions reductions of all Texas IOUs implementing SOPs and MTPs as part of the Texas Energy Efficiency Program. Specifically, the table lists the carbon dioxide (CO<sub>2</sub>) emissions avoided as a result of the energy efficiency programs in 2016.

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<sup>7</sup> PUCT Substantive Rule 25.181(i) states that the cost of administration shall not exceed 15% of a utility's total program costs. The cost of R&D shall not exceed 10% of a utility's total program costs. The cumulative cost of administration and R&D shall not exceed 20% of a utility's total program costs.

**Table 4: Annual Emission Reductions by Utility for Activities Completed in 2016<sup>8</sup>**

Utility	Energy Savings (MWh)	CO <sub>2</sub> (lb/MWh)	CO <sub>2</sub> (lb)
SWEPCO	20,648	1,476	30,476,604
AEP-TCC	67,714	1,143	77,396,863
AEP-TNC	10,817	1,143	12,364,212
CNP	190,857	1,143	218,149,322
ETI	45,044	1,022	46,034,968
EPE	22,912	876	20,070,912
Oncor	198,743	1,143	227,163,102
Sharyland	2,213	1,143	2,529,459
TNMP	21,717	1,143	24,822,531
Xcel	14,453	1,476	21,332,628
<b>Total</b>	<b>595,118</b>		<b>680,340,601</b>

## **7 Summary & Conclusion**

The majority of the ten Texas investor-owned utilities exceeded the legislature’s statewide goals for energy efficiency. The utilities achieved 408 MW of demand reduction and 595 GWh of energy savings in 2016, effectively reducing CO<sub>2</sub> emissions by 680 million pounds for the year.

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<sup>8</sup> Emission rates are based on the EPA’s eGRID2014 database Version 2.0. Annual non-baseload output emission rates for each eGrid subregion (ERCOT, SPP South, WECC Southwest, and SERC Mississippi Valley) were used for each utility as appropriate. For more details, see the Annual Output Emission Rates here: [https://www.epa.gov/sites/production/files/2017-02/documents/egrid2014\\_summarytables\\_v2.pdf](https://www.epa.gov/sites/production/files/2017-02/documents/egrid2014_summarytables_v2.pdf).

## 8 *Appendices*

### 8.1 Acronyms & Abbreviations

A/C	Air Conditioning
C&I	Commercial & Industrial
DOE	Department of Energy
EESP	Energy Efficiency Service Provider
EPA	Environmental Protection Agency
GW	Gigawatt=one billion watts
GWh	Gigawatt-hour
IOU	Investor-Owned Utility
kW	Kilowatt = one thousand watts
kWh	Kilowatt-hour
LED	Light emitting diode
MTP	Market Transformation Program
M&V	Measurement & Verification
MW	Megawatt = one million watts
MWh	Megawatt-hour
NO <sub>x</sub>	Nitrogen Oxides
PUCT	Public Utility Commission of Texas
SEER	Seasonal Energy Efficiency Ratio
SOP	Standard Offer Program
TDHCA	Texas Department of Housing and Community Affairs

## 8.2 Key Terms

**Deemed savings estimate:** a predetermined, validated estimate of energy and peak demand savings attributable to an energy efficiency measure. Deemed savings estimates may be used instead of determining energy and peak demand savings by measurement and verification activities.

**Energy efficiency measure:** systems, pieces of equipment, or materials that result in either reduced electric energy consumption, reduced peak demand, or both.

**Nitrogen oxides:** gases consisting of one molecule of nitrogen and one or more molecules of oxygen. Power plants and gasoline-powered vehicles typically emit NO<sub>x</sub>. When NO<sub>x</sub> molecules reach the atmosphere, they often contribute to the formation of smog. NO<sub>x</sub> are thus considered pollutants and are recognized as such by the EPA.

**Market transformation program:** strategic efforts to induce lasting structural or behavioral changes in the market that result in increased adoption of energy efficient technologies, services, and practices.

**Measurement & verification:** all necessary equipment surveys, metering and monitoring, statistical estimation and analysis, and reporting used to quantify the energy savings and demand reduction resulting from the installation of energy efficiency measures.

**Standard offer program:** a type of energy efficiency program where parties enter into a contract with standard terms and conditions, and utilities offer standard incentives for a wide range of installed energy efficient measures bundled together as a project.