



Saving Energy and Money: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Service Areas in the State

Submitted to Texas State Energy Conservation Office

Submitted By:

Nexant, Inc.

1331 Lamar Street, Suite 1575

Houston, Texas 77010

October 31, 2011

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Section 1 Executive Summary

The Texas State Energy Conservation Office (SECO), in partnership with the Texas Public Power Association (TPPA) present this Guide titled "Saving Energy and Money: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State" (the Guide). The Guide was developed by the consulting team consisting of Nexant and The Cadmus Group, Inc. (the Project Team) with funding provided by the U.S. Department of Energy (DOE). Its objective, in part, is to serve as a resource to support SECO's commitment to reach 1 percent annual electricity savings statewide.

Energy efficiency has been long recognized and accepted as a resource that, when balanced with new generation and other supply options, contributes to the country's growing electricity needs. Utilities across the country are utilizing energy efficiency in their resource portfolios by offering programs to help reduce demand. Texas municipally-owned utilities (MOUs) are at the precipice of the efficiency movement. While regulated utilities have had to experiment with alternative program strategies in their efforts to meet increasingly aggressive targets and to coalesce around new market players, MOUs stand to benefit from their lessons learned.

TPPA represents 72 cities that own and operate their own electric utility systems, several electric cooperatives (TPPA associate members), river authorities, and joint action electric agencies in Texas. MOUs provide electric service to over 3 million Texans, or nearly 15 percent of the state's retail electric customers. Only a few of the 72 MOUs in Texas currently offer energy efficiency programs. Thus, MOUs are perfectly positioned to learn from investor-owned utilities' (IOUs') experience and introduce new programs that benefit from measured program success factors.

This Guide is the result of extensive research, interviews, data collection, and analysis and was developed to promote the implementation of energy efficiency programs by Texas' MOUs. This Guide serves as a resource to not only increase the understanding of best practices utilized by successful energy efficiency programs across the country, but also a plan to support MOUs implementing energy efficiency programs that will ultimately result in energy and electric bill savings for their customers.

To support MOUs with the implementation of their own energy efficiency programs, this Guide leverages the lessons learned from energy efficiency programs operating across the country in an effort to:

- Identify energy efficiency best practices and disseminate them among locally owned electric providers so that decision makers can assess, select, and implement the policies and programs that align best with local conditions and constraints.
- Engage MOUs as they expand or refine current energy efficiency programs, implement new energy efficiency programs based on proven best practices, and incorporate successful program initiatives and cost saving measures.

1.1 Research Findings

The best practices outlined in this Guide are gleaned from existing energy efficiency programs identified by the Project Team as "successful." Program success was defined on a number of metrics including cost-effectiveness, market penetration, innovation, and other factors.

This Guide is unique among other best practices studies because the Project Team cross-referenced best practices with the local conditions in MOU service territories. The Project Team conducted extensive outreach to MOUs to understand the local barriers, issues, and needs associated with energy efficiency programs. This cross-referencing ensures that the best practices defined in the Guide are applicable to the communities using this Guide.

The Project Team developed a research plan that consisted of two parallel tracks of research: a stakeholder engagement process that provided insights on MOUs local conditions, and a best practices study.

1.1.1 Best Practices Research

The Team conducted a quantitative screening of 400 identified programs aimed at narrowing the list down to only those that achieved the best performance in several areas. To best accommodate this process, the Project Team selected benchmarking metrics appropriate for each of seven program categories, including:

- Equipment Rebates
- Appliance Recycling
- Audit and/or Direct Install
- Education and Behavior Impact
- New Construction
- Innovative Financing
- Demand Response (DR)

Within each of these categories, the Project Team further broke program types down by target sector and subcategories in order to most effectively compare quantitative metrics and key best practice attributes. As a result of this process, the team identified 58 best practice programs for further investigation.

In the level two analyses, the Project Team conducted a qualitative review to gain insights into how the identified best practice programs achieved exceptional results. The Project Team assessed each program in detail and analyzed individual program attributes to identify best practice characteristics that differentiated the successful programs. This review entailed two evaluations of program best practices:

- ***Cross-cutting program best practices.*** The Project Team looked at each identified best practice program, as well as our accumulated literature review findings to assess best practice program features that are common across all program categories. These cross-cutting program best practices ensure effective program delivery and management, a high level of quality and customer satisfaction, and the achievement of strong participation and cost-effective energy savings results. Through this process, the Project

Team identified cross-cutting program best practices in four categories: (1) program design, (2) program management, (3) program implementation, and (4) evaluation.

- ***Implementation level best practices by program category.*** To facilitate the Program Team's review of the 58 identified best practice programs, the Project Team sought to answer several researchable questions pertinent to meeting qualitative criteria related to: (1) market impacts, (2) customer service and satisfaction, (3) operations and delivery, (4) innovation, (5) transferability and scalability, and (6) overcoming barriers. These factors also helped the Team cross-reference best practice attributes with Texas market conditions and identify those attributes that are transferable to Texas MOUs' Long-Term Energy Efficiency Plan.

1.1.2 Research on Municipally Owned Utilities' Local Conditions

This project attracted participation from a wide range of small to mid-sized MOUs representing considerable variation in conditions that affect energy efficiency program planning. The Project Team used a series of MOU engagement tactics, including a brainstorming session, data request, and structured interviews to gather information about local market conditions for energy efficiency programs in each participating MOU's service territory. Our investigation included factors such as MOUs' existing operational structures, customer behavior and decision-making trends, local delivery capacity, regional codes, technology adoption, energy efficiency potential in MOUs' territories (at the measure level if applicable secondary data were available) and interest in energy efficiency programs. Our investigation found that the MOUs participating in the process represent a wide range of communities, but many have significant commonalities in terms of customer makeup and types of efficiency programs currently offered.

Table 1 summarizes high level findings on commonalities averaged across all participant MOUs.

Table 1. High Level Municipally Owned Utility Research Findings

Category	Research Findings
Customer distribution	84% residential; 14% commercial-industrial
Electricity sales by sector	46% residential; 39% commercial; 15% industrial
Existing Efficiency programs	
Delivery approach	85% deliver programs with in-house staff
Target sector	53% residential; 36% commercial; 11% industrial
Predominant program type *Residential*	wide variety including lighting, heating, ventilation, and air conditioning (HVAC), renewable, weatherization, audits, appliance recycling, etc.
Commercial	30% lighting; 26% renewable; 15% audits, etc.
Industrial	38% lighting; 38% renewable; 13% comprehensive
Budgeting and management	Heavily in-house budgeting and management structures
Efficiency Potential	
Residential	High: cooling, building shell, lighting Moderate: kitchen appliances, renewable energy
Commercial	High: lighting, building shell, HVAC Moderate: controls, operation and maintenance (O&M)
Industrial	Moderate: O&M, lighting, HVAC, controls, motors

Category	Research Findings
Biggest barriers	
Operational	funding, interest among decision makers and community
Customer	equipment cost, split incentives, lack of awareness of value of efficiency measures and of programs
Priorities and goals	high savings at a low cost, reducing peak load, good public relations value, educating community and market transformation, avoiding rate increases

1.2 Energy Efficiency Planning Guide

The Project Team utilized its research to develop an energy efficiency planning guide for MOUs in Texas that leverages best practices gleaned from existing energy efficiency programs deemed successful through our research combined with the Team's extensive outreach to MOUs to understand the local barriers, issues, and needs associated with energy efficiency programs. This cross-referencing ensures that the best practices defined in the Guide are applicable to the communities using this Guide.

The Guide also seeks to engage MOUs to expand, refine, or implement energy efficiency programs in their service areas. This Guide contains a Long Term Energy Efficiency Plan that will make it easy for MOUs to select programs that could be most readily implemented in their territories. The plan includes several programs concepts that define broad parameters for full development and implementation, including:

- Program description and objectives
- Infrastructure and staffing
- Customer targets and eligibility
- Implementation
- Program barriers and mitigation strategies
- Marketing and outreach
- Measures and incentive levels
- Measuring savings
- Best practices and innovations

Finally, the Project Team will assist in the full development and implementation of selected energy efficiency programs for a few of the MOUs. Using the findings from the Guide and the resources in the plan, the Project Team will work with each participating MOU to implement programs in its service territory.

1.3 Acknowledgements

This Guide was developed with extensive support from SECO's staff and the TPPA. The Best Practices Project Team would like to gratefully acknowledge Dub Taylor from SECO, Mark Zion, and Wendell Bell from TPPA and Johanna Zetterberg from DOE for their leadership. The Project Team also thanks the representatives from all of the Texas MOUs who provided the Project Team with valuable insights about their service territories to help direct the results of our work, particularly Vicki Reim and Lisa Lemons. The Project Team is especially indebted to Pam Groce, who worked with us every step of the way, for her generous contributions.

Section 2 Introduction

SECO, in partnership with TPPA are proud to present this Guide titled "Saving Energy and Money: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State" (the Guide). The Guide was developed with funding provided by the DOE. It is the result of extensive research, interviews, data collection, and analysis and was developed to promote the implementation of energy efficiency programs by Texas' MOUs. This Guide serves as a resource to not only understand the best practices utilized by successful energy efficiency programs across the country, but also a plan to support MOUs implementing energy efficiency programs that will ultimately result in energy and electric bill savings for their customers.

Energy efficiency is a resource that can be balanced with new generation and other supply options to help meet Texas' growing electricity needs. IOUs and some of the larger MOUs in Texas and throughout the United States are incorporating energy efficiency by offering programs to help reduce demand, as a part of a diverse resource portfolio.

To help increase the implementation of energy efficiency programs in smaller to mid-sized MOUs in Texas, in January 2011, SECO issued a request for proposals (RFPs) to review, identify, and analyze existing, successful energy efficiency programs at the local level and develop, with guidance from SECO and project stakeholders, a Guide to Best Practices for Energy Efficiency in MOU service areas. SECO stipulated that "this Guide will include existing energy efficiency best practices that are offered by a variety of utility programs, including a thorough discussion of the benefits and barriers of each best practice identified and how the savings are calculated and realized. This Guide will also include implementation strategies, new policies, and detailed implementation programs that align best practices with local conditions and constraints."

Nexant, Inc., along with subcontractor The Cadmus Group, Inc. (the Project Team), was awarded the project in May 2011. The Project Team implemented a strategy to create the Guide that included the following steps:

- Preparing a robust research methodology that:
  - ✓ ensures a technically sound analytical framework,
  - ✓ is consistent with Texas policy objectives,
  - ✓ fosters collaboration among core stakeholders and industry partners,
  - ✓ identifies technical criteria and success factors to guide the selection of program design elements most suitable for Texas MOUs, and
  - ✓ ensures a comprehensive examination of current efficiency program best practices
- Implementing and managing the Guide to address in detail the best programs, and present the results in accessible formats to meet Guide users' needs
- Creating a Long Term Cost-effective Energy Efficiency Plan that includes program concepts appropriate for implementation by MOUs that account for regional policy, climate, and market conditions.

2.1 Literature Review

One of the first tasks the Project Team undertook to develop this Guide was a comprehensive literature review. This literature review helped lay the groundwork for the Project Team to identify successful energy efficiency programs and the factors that made them successful, and also to understand the specific market conditions in Texas. This literature review focused on three areas of research: best practices; energy efficiency programs and projects; and Texas market and utility environment.

The documents for the research came from three main sources:

- Research papers and articles
- Project Team work
- Utility reports and public findings.

Research Papers and Articles

Utilities and other institutions have offered energy efficiency programs for over 30 years. These programs have evolved from classroom education and simple discounts on energy-efficient products to complicated custom savings programs with detailed reporting requirements and savings targets. As these energy efficiency programs have evolved and improved, a number of organizations have completed studies on a wide range of issues surrounding their implementation and delivery. Common areas of research include cost-effectiveness, energy savings, program design, best practices, etc. The Project Team reviewed research papers from some of the following organizations:

- American Council for An Energy-efficient Economy (ACEEE)
- American Public Power Association (APPA)
- California State Public Utility Commissions
- Colorado Governor's Energy Office
- Energy Trust of Oregon
- Local Governments for Sustainability (ICLEI)
- International Energy Agency
- Pew Center on Global Climate Change
- Southwest Energy Efficiency Project
- Texas SECO
- DOE
- U.S. Environmental Protection Agency (EPA)
- U.S. Energy Information Administration (EIA)

Project Team Work

The Project Team has completed work for utilities and governments across the country and has been designing, implementing, and evaluating publicly funded energy efficiency programs for more than 20 years. Project Team staff have led the design and administration of programs within Texas for CenterPoint Energy, CPS Energy, Oncor Electric Delivery, Entergy, and AEP, as well as numerous utilities throughout North America. Our staff has successfully completed several investigations comparable in magnitude and complexity to this study. This extensive experience and accumulated knowledge based on potential studies, implementation manuals, program plans, and evaluation reports guided our research.

Utility Reports and Public Findings

Utilities are often required to submit reports, results, and findings from their energy efficiency programs as part of their regulatory requirements. In Texas, the Public Utility Commission of Texas (PUCT) filed Substantive Rule §25.181 that requires IOUs to file an Energy Efficiency Plan and Report (EEPR) on a yearly basis. The EEPR details the utility's future plans for energy efficiency and reports on the most recent year's actual achievements. Nine medium to large MOUs (500,000 kilowatt hour (kWh) energy consumption annually) have also voluntarily submitted reports on energy efficiency programs they offer in their service territories. The Project Team had a good understanding of and access to these reports and consequently established a good foundation of knowledge of the successful energy efficiency programs in the state.

Detailed references for literature the Project Team reviewed are provided in Appendix G.

2.2 Background

2.2.1 Objectives and Overview of the Project

According to the National Action Plan for Energy Efficiency, "Improving the energy efficiency of our homes, businesses, schools, governments, and industries—that consume more than 70 percent of the natural gas and electricity in the country—is one of the most cost-effective ways to address the following challenges:

- Energy demand continuing to grow despite historically high energy prices
- Concerns over energy security and independence
- Air pollution
- Climate change

Energy efficiency has been long recognized and accepted as a resource that, when balanced with new generation and other supply options, contributes to the country's growing electricity needs. Utilities across the country are utilizing energy efficiency in their resource portfolios by offering programs to help reduce demand. In addition, the institutional setting for energy efficiency programs has moved beyond the domain of regulated utilities and now includes third-party implementers and public agencies. The infusion of federal funding geared toward stimulating energy efficiency along with an increasingly savvy and energy-aware marketplace has resulted in a trend toward innovative program concepts and delivery mechanisms. Yet program designers do not necessarily have the benefits of decades of experience and continued refinements associated with utility program planners and administrators.

Increased market awareness of energy issues and technologies coupled with the use of information technology (IT) to support program deployment are changing the ways programs are implemented and customers respond. IT-based program components such as remote customer/utility information exchange, online incentive applications, and automated rebate processing are increasingly common. Successful outreach is moving toward the use of social media and community networks. Free-market players with innovative business models may complement – or compete with – traditional program delivery strategies. Such trends are introducing both new opportunities and potential pitfalls for utility programs.

Texas MOUs are at the precipice of this innovation movement. While regulated utilities have had to experiment with alternative program strategies in their efforts to meet increasingly aggressive targets and to coalesce around new market players, MOUs stand to benefit from their lessons learned. TPPA represents 72 cities that own and operate their own electric utility systems, several electric cooperatives (TPPA associate members), river authorities, and small, joint action electric agencies in Texas. MOUs provide electric service to over three million Texans, or nearly 15 percent of the state's retail electric customers. Only a few of the 72 MOUs in Texas currently offer energy efficiency programs, while the nine IOUs offer a total of 98 programs. Thus MOUs are perfectly positioned to learn from the IOUs' experience and introduce new programs that benefit from identified program success factors.

To support MOUs with the implementation of their own energy efficiency programs to reach the goal of 1 percent energy savings, this Guide leverages the lessons learned from energy efficiency programs operating across the country in an effort to:

- Identify energy efficiency best practices and disseminate them among locally-owned electric providers so that decision makers can assess, select, and implement the policies and programs that align best with local conditions and constraints.

- Engage MOUs to expand or refine current energy efficiency programs, implement new energy efficiency programs based on proven best practices, and incorporate successful program initiatives and cost-saving measures.

The best practices outlined in this Guide are gleaned from existing energy efficiency programs identified by the Project Team as "successful." Program success was defined based on a number of metrics including cost-effectiveness, market penetration, innovation, and other factors. These metrics are outlined in more detail in Section 4.

This Guide is unique among other best practices studies because the Project Team cross-referenced best practices with local conditions in MOU service territories. The Project Team created and implemented a stakeholder engagement plan that outlined our strategy for working with MOUs to understand barriers, issues and needs in their local communities. This ensures that the identified best practices are applicable to the communities using this Guide.

The Guide seeks to engage MOUs to expand, refine, or implement energy efficiency programs in their service areas. The included Long Term Energy Efficiency Plan is a resource for MOUs to select programs that could be readily implemented in their territories. The Plan includes program concepts that define broad parameters for implementation, including:

- Program description and objectives
- Infrastructure and staffing
- Customer targets and eligibility
- Implementation
- Program barriers and mitigation strategies
- Marketing and outreach
- Measures and incentive levels

- Measuring savings
- Best practices and innovations

Finally, the Project Team will assist in the development and implementation of selected energy efficiency programs for a few MOUs. Using the findings from the Guide and the resources in the Plan, the Project Team will work with the MOUs to implement programs in their service territories.

Key Stakeholders

A few key stakeholders were critical to development of this Guide:

a) DOE

   DOE provided funding for the Guide through a grant to SECO and TPPA. The DOE is hoping to use this Guide as a resource for MOUs across the country to encourage the implementation of energy efficiency programs in MOU service areas.

b) SECO

   SECO provides information and resources to Texas residents and businesses on how to reduce energy costs and maximize energy efficiency. SECO partners with Texas consumers, businesses, educators and local governments to offer these programs across the state. This Guide is one strategy SECO is utilizing to help encourage and promote energy efficiency programs. SECO established a goal of achieving a 1 percent annual electricity savings from its efforts.

c) TPPA

   Formed in 1978, TPPA represents the interests of public power providers in the state of Texas, including MOUs. TPPA provides resources through which members may extend their influence on public policy matters affecting the public power industry. TPPA understands MOUs' issues, barriers, and concerns regarding energy efficiency and plays a key role in ensuring the Guide matches the interests of its members.

Area of Focus

This Guide presents best practices and implementation strategies for small to mid-sized Texas MOUs, or those that have customer bases of less than 100,000 customers. Two MOUs in Texas exceed this size: Austin Energy (AE) and CPS Energy in San Antonio. These two utilities have already developed and implemented a number of energy efficiency programs and are considered ahead of the curve compared to the small and mid-sized MOUs. While this guide can be utilized by AE and CPS Energy, their larger role in this study was to share program lessons that serve as examples of best practices in the state.

2.2.2 Energy Efficiency in a National Context

The energy industry plays a critical role in the economies of Texas, the U.S, and the world. The strength of our economy depends in large part on the availability of affordable and reliable energy. Yet increasing demand for energy from homes and businesses is driving electricity prices higher throughout much of the United States. According to DOE, energy consumption in the

United States is predicted to increase by more than one third by 2025, with electric power increasing 40 percent during that time period. The US EIA reports that the average retail price of electricity for all sectors has increased from 6.74 cents/kWh in 1998 to 9.82 cents/kWh in 2009 (an increase of 46 percent)[1]. This growth threatens to strain not only existing utility infrastructure and domestic supplies needed to provide this energy, but also the pocketbooks of American consumers and businesses. Energy efficiency programs are one set of tools utilities deploy to meet this growing challenge.

Energy efficiency first took hold in the U.S. utility industry after the 1973 oil embargo, when Congress enacted federal policies aimed at efficiency, including the Energy Policy & Conservation Act of 1975 (that first established appliance efficiency standards). While utilities in the past simply met demand growth with increased production, the 1970s and 1980s saw the emergence of demand-side management (DSM) programs and the "least-cost" or integrated resource planning model utilities use today. Utilities' experience with DSM as a cost-effective alternative to generation increased their understanding of the benefits of efficiency, such as:

- Lower energy bills for businesses and households and greater customer satisfaction
- Environmental benefits such as cleaner air
- Utilities' ability to expand capacity at a lower cost compared to building new generation
- Reduced strain on transmission lines
- Modularity and ease of deployment
- Economic development from a growing workforce needed to deliver efficiency programs
- Energy security from protecting domestic supplies and reducing the need for energy imports

In light of these benefits, several states have passed energy efficiency resource standards (EERS) that usually require investor-owned and large utilities to achieve a specific target for reduced energy consumption. According to the DOE, 20 states have EERS (five states have non-mandated goals) as of September 2011[2]. Figure 1 below shows the distribution of states with an EERS or goal.

[1] EIA Website: http://www.eia.gov/cneaf/electricity/epa/epaxlfile7_4.pdf. September 2011.
[2] DSIRE Database website: http://www.dsireusa.org/summarymaps/index.cfm?ee=1&RE=1. September 2011

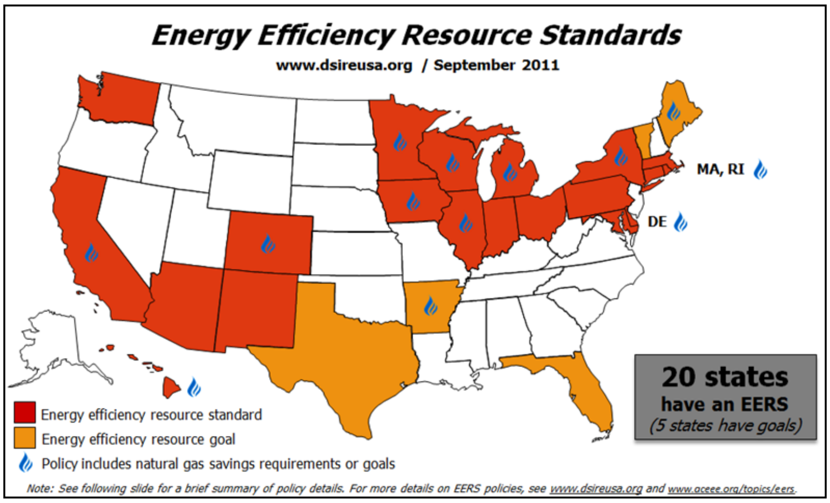

Figure 1. States with Energy Efficiency Resource Standards in the United States

Efficiency activity is not limited to IOUs. Even though few MOUs are subject to EERS, and few have rate mechanisms such as decoupling (which some IOUs have used to break the link between sales and revenue), many still offer DSM programs. APPA reported, in a 2010 survey, that of over 2,000 community-owned utilities serving 45 million Americans, that 68 percent were offering some form of DSM program[3].

Indeed, utilities are finding that efficiency goals are easily attainable. A July 2007 report on DSM program results across the United States found that IOUs not only met, but exceeded, their mandated savings every year from 2003 to 2006 (see Figure 2)[4]. Further, it should be noted that each additional megawatt hours (MWh) of energy saved becomes more difficult to achieve as the baseline improves.

[3] *Effect of Energy efficiency programs on Electric Utility Revenue Requirements.* American Public Power Association. 2009

[4] *Energy Efficiency Accomplishments of Texas Investor Owned Utilities*. Frontier Associates LLC. June 16, 2008.

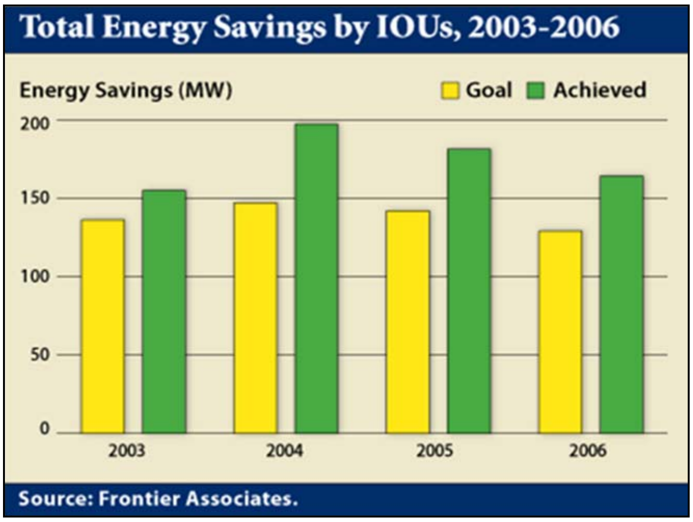

Figure 2. Total Energy Savings by Investor-owned Utilities

Despite this progress, considerable energy efficiency potential remains. The National Action Plan for Energy Efficiency of 2006 noted that available efficiency resources may be able to meet 50 percent or more of expected U.S. load growth through 2025, resulting in $100 billion energy bill savings, $500 billion in net savings, and substantial greenhouse gas (GHG) emissions reductions.

The convergence of increasing energy demand, state mandates, and easy deployment has resulted in dramatically increased spending on efficiency programs in recent years. According to the EIA, between 1998 and 2009, utilities spent about $15 billion on efficiency programs, saving almost 700,000,000 MWh during that time. Thirty years of energy efficiency efforts have had a significant effect on the U.S. economy. According to the 2008 Energy Report by the Texas Comptroller of Public Accounts, "The U.S. economy is significantly more energy-efficient than it was in the mid-1970s. The amount of energy needed to produce one dollar's worth of goods fell by 50 between 1970 and 2003."[5]

2.2.3 Energy Efficiency in Texas

With abundant oil, natural gas, and wind resources, Texas has long been recognized as an energy production state. Today, Texas leads the nation in wind-powered energy generation with 10,135 megawatts (MWs) of installed wind capacity as of 2010 (which represent nearly 25 percent of U.S. capacity)[6]. Texas also has a large population, heavy industrial base, and hot climate, making it also among the nation's largest energy consumers. According to the EIA, Texas leads the nation in total energy consumption and ranks 6th in the nation in total energy consumption per capita, with 456 million BTUs/capita. The EIA also estimated that Texans spent an average of $4,651 on energy in 2009 (which is $1,190 above the national average)[7].

Texas has made great strides in recent years with energy efficiency and has significant potential to do more in the years ahead. Recognizing the need to develop a more energy-efficient economy, Texas was the nation's first state to establish EERS (which does not apply to MOUs).

[5] *The Energy Report.* Texas Comptroller of Public Accounts. May 2008
[6] American Wind Energy Association. http://www.awea.org/. September 2011
[7] U.S. Energy Information Agency. http://www.eia.gov/state/state-energy-profiles.cfm?sid=TX. September 2011

Senate Bill 7 (S.B. 7), set a goal at the time of 10 percent of an electric utility's annual demand growth be met by efficiency programs by 2004. Texas utilities easily reached this goal. In fact, The Energy Report of 2008 by the Texas Comptroller of Public Accounts reported, "Even in the first year of the program (2000), EERS generated reported savings 11 percent above the goal."[8] Recognizing the ease with which these programs could produce tangible savings, the Texas Legislature has twice passed increases to the efficiency standard stipulating that 20 percent (H.B. 3693) and then 30 percent (S.B. 1125) of demand be met by efficiency programs by 2009 and 2013, respectively. While these goals do not directly impact cooperative and municipal utilities, some of the lessons learned and best practices from large IOU programs are can help provide a roadmap for smaller utilities. This is, in part, the goal of this report.

It is important to note that the state law requiring IOUs to offer certain energy efficiency programs also directs the PUC to ensure timely and reasonable cost recovery for utility expenditures made to satisfy the goal. (PURA Sec. 39.905 (b)) Costs for IOU energy efficiency programs are significant. In 2009, for example, expenditures totaled approximately $105.8 million. (Energy Efficiency Accomplishments of Texas Investor Owned Utilities. EUMMOT. 2009)

State law also provides for the establishment of an energy efficiency cost recovery factor (EECRF) to collect the incremental amount of energy efficiency revenue requirement not included in base rates. Thus, IOU customers must pay a state-mandated energy efficiency fee as a line item on their electric bills, plus an additional amount mandatorily included in their base electric rates.

So far, utilities have had great success meeting their targets. According to a 2009 report commissioned by the Electric Utility Marketing Managers of Texas (EUMMOT), "The nine Texas investor-owned utilities exceeded the legislature's statewide goals for the seventh straight year for energy efficiency. The utilities exceeded their 2009 demand reduction goal of 132 MW by 82 percent, achieving 240 MW of demand reduction. Furthermore, 559.8 gigwatt hours (GWh) of energy savings were achieved, effectively reducing nitrogen oxide (NOx) emissions by 827,409 pounds for the year."[9]

Yet more can be done. In 2007, the ACEEE conducted a potentials study for the state of Texas and found that, "In the immediate and long-term future, energy efficiency, DR, and onsite renewable energy resources can meet the growing demand for electricity in Texas."[10] ACEEE found that Texas could significantly and cost-effectively increase its energy resources through efficiency.

As successful as the Texas IOU programs have been overall, geographic coverage is inconsistent, reflecting the availability of energy service providers. A 2006 report to the PUC by Summit Blue Consulting and Quantec noted that this "has resulted in more remote areas having no coverage while metro areas are served multiple times across program years[11]." In recognition of this issue, the PUC requires utilities to include in their Energy Efficiency Plan and Report "a list of any counties that in the prior year were under-served by the energy efficiency program." (PUC

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[8] *The Energy Report.* Texas Comptroller of Public Accounts. May 2008

[9] *Energy Efficiency Accomplishment of Texas Investor Owned Utilities*. EUMMOT. 2009.

[10] *Potential for EE/RE to Meet Texas's Growing Energy Demands*. ACEEE, Report Number E073 March 2007.

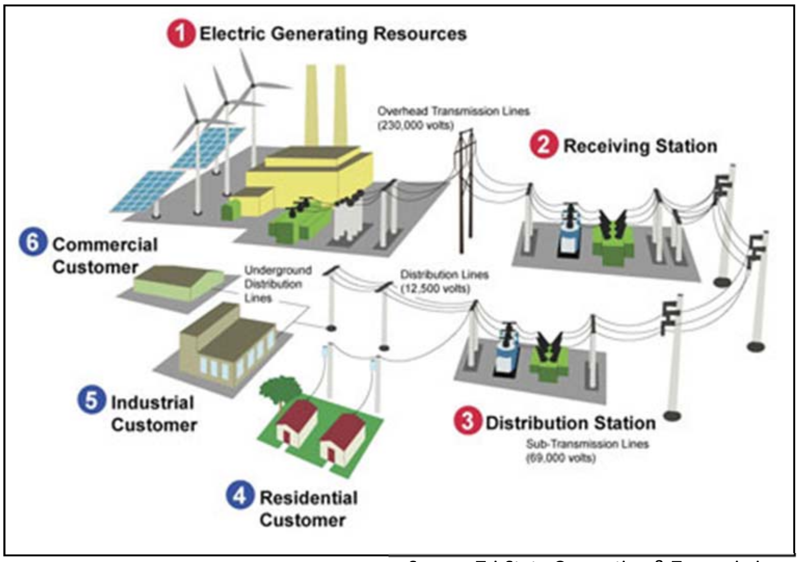
[11] *Summit Blue Consulting et al (2006) Independent Audit of Texas Energy Efficiency Programs in 2003 and 2004 Report Available at http://www.puc.state.tx.us/industry/projects/rules/38578/EEP_Audit_Rpt_03-04.pdf*

Substantive Rule 25.181(m)(2)(T)) In 2011, the Texas Legislature also acknowledged that energy service providers tend to be concentrated in the major urban areas when it added a provision allowing a utility to provide programs directly to customers in a rural area if it can demonstrate that its program requirements cannot be met through competitive energy service providers. (Senate Bill 1125)

2.3 The Energy Industry and Municipally Owned Utilities in Texas

2.3.1 Overview of the Electric Industry in Texas

The structure of the electric supply industry in Texas varies based on geographic location; however, the process of delivering electricity is consistent across the state. Large-scale generating sources such as natural gas plants or wind farms are connected to transformers that increase voltage and then transport the electricity along transmission lines. Substations then decrease the voltage to a level that can be distributed and sold to residential, commercial, and industrial customers. Figure 3 illustrates the flow of energy from generation to end use.



Source: Tri-State Generation & Transmission

Figure 3. Flow of Electricity from Generation to Customer

Several regulatory authorities oversee to the energy industry: the Federal Energy Regulatory Commission (FERC), the North American Electric Reliability Corporation (NERC), the Electric Reliability Council of Texas (ERCOT), and the PUCT, among others. These agencies exist to protect consumers and ensure that energy is being provided in a reliable and affordable manner. Most people are unaware of the complex energy landscape that exists to generate, transmit, and distribute electricity to their homes or businesses.

Electricity in Texas is delivered to end users via one of three types of utilities (also known as retail electric providers): 1) an IOU, 2) a cooperative utility, or 3) an MOU. IOUs are private shareholder-owned companies that must abide by PUCT oversight. Electric cooperatives are private, nonprofit utilities owned by the people they serve, typically in rural areas. MOUs are also publicly owned. River authorities are also common in Texas; they manage water resources and produce electricity from dams, but do not deliver end-use power.

ERCOT manages the flow of electric power to 23 million Texans - representing 85 percent of the state's electric load and 75 percent of the Texas land area. As shown in Figure 4, the majority of Texas MOUs are located within the ERCOT territory.

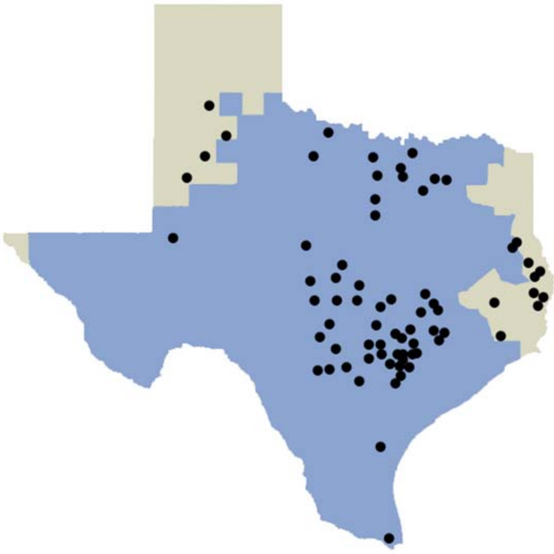


Figure 4. ERCOT Region and Municipally Owned Utility Territory Overlay

In the ERCOT region, IOUs are deregulated, meaning utility functions are "unbundled" into the three segments: wholesale generation, transmission/distribution, and retail, so that different companies provide each service (deregulation does not apply to MOUs). Most IOUs in Texas operate in a retail competition environment. However, outside of the ERCOT region, traditional vertically-integrated utilities provide bundled generation, transmission, and distribution. All MOUs have the option to operate in a vertically-integrated manner, though many purchase power and then distribute it to their customers.

2.3.2 Municipally Owned Utilities in Texas

While municipal utilities can be vertically integrated with generating resources (even in the ERCOT region), typically their primary roles include distributing power to customers, maintaining distribution lines, metering customer energy usage, and billing. Since few MOU activities are regulated by the PUCT, local governing boards within each service territory provide oversight. Governing boards may be city councils or community boards. This structure gives MOUs the unique advantage of being self-governed by their citizens and the responsibility for setting customer rates. Additionally, MOUs are not bound by the same EERS that IOUs must abide by. That is, MOUs are not mandated to meet 30 percent of their forecasted growth in demand from energy efficiency programs.

While IOUs' primary goal is to earn a return for their shareholders, MOUs operate as non-profits. This means that after the MOU covers the cost of providing electric service, additional revenue is reinvested in the community in a variety of ways. With respect to energy efficiency programs, this difference can allow MOUs to create energy savings at a lower cost/kWh.

There are 72 MOUs in Texas that, together, serve 4 million Texans (1.6 million meters), accounting for 15 percent of Texas' retail electric customers. The MOUs are incredibly diverse in terms of the number of customers they serve. CPS Energy in San Antonio, for example, is the largest MOU, serving approximately 700,000 customers. According to EIA, CPS Energy ranks as the 4th largest retail electricity provider (REP) in Texas; on the other end of the spectrum, the City of Goldsmith serves a population of 300. Eight Texas MOUs are among the 100 largest public power utilities in the nation.

2.4 How the Guide is Organized

The Best Practices Guide for Locally Governed Electric Service Areas is presented in two distinct sections. The first, which includes Sections 1 through 4, reports the Project Team's findings regarding best practice programs around the country and best practice attributes that contribute to program success. Additionally, this section presents our research on Texas' market conditions and key considerations for MOUs interested in implementing energy efficiency programs. The second, presented as Section 5, represents the Long-Term Energy Efficiency Plan. It incorporates several recommended programs for consideration by the Texas MOUs, as well as a discussion of key considerations for MOUs embarking on new energy efficiency programs, and cross-cutting best practice attributes that should be common to all energy efficiency program efforts.

To aid MOUs in selecting, designing, developing, and implementing energy efficiency programs, our recommendations include summaries of the critical operating characteristics and design criteria that should be considered in the program development process. In many cases the Project Team has provided alternative design and implementation strategies as well as examples for consideration; however, ultimately MOUs will need to carefully consider their own market needs, opportunities and barriers, delivery capacity, and resources to select the best programs and an implementation path that best meets their needs. Each program recommendation also includes an extensive list of program best practices and innovations. Recognizing that it may be impossible to implement every best practice identified in the course of this study, MOUs should examine these best practices and strive to implement those that are most feasible and appear most advantageous for ensuring program success.

Structure of the Best Practices Guide

The remainder of this guide includes the following key elements to inform Texas MOUs' energy efficiency program development and implementation.

Section 3: Methodology. This section provides a detailed explanation of the research and analysis methodology the Project Team used to identify best practice programs and apply them to MOU conditions in Texas.

Section 4: Analysis and Results. Section 4 outlines the results of the Project Team's research and analysis, including findings from the best practice program screening as well as our research into Texas MOUs' market characteristics. This section offers detailed information on the current state of the art energy efficiency program design and on the identified best practice attributes inherent to seven categories of programs.

Section 5: Energy Efficiency Plan. Section 6 provides recommendations for programs that were identified as candidates for implementation by Texas MOUs. These recommendations were informed by our research findings and include specific best practices to support robust program design. Additionally, the section includes guidelines and information that MOUs should consider as part of their overall energy efficiency program planning process.

Section 6: Conclusions and Final Remarks. Section 6 includes a brief summary of how MOUs can use this Guide as a tool to aid program decision making and next steps.

Section 3 Methodology

The Project Team developed a research plan that consisted of two parallel tracks of research: a stakeholder engagement process that provided insights on MOUs local conditions, and a best practices study.

The stakeholder engagement process solicited involvement from the Texas MOUs most interested in the development and implementation of this Guide. The process was designed to investigate the following factors:

- General information about MOUs' operational structure
- Utility experience with energy efficiency programs and interest in future programs
- Customer behavior and decision-making trends, local delivery capacity (i.e., existence of sufficient equipment dealers, installation contractors, and other program vendors to support program implementation) and local market potential for various technologies in each sector
- Barriers and constraints to implementing energy efficiency programs

The best practices study was guided by a detailed analytical framework that allowed the Project Team to evaluate the vast amount of collected data associated with resource acquisition and energy efficiency programs. The analytical framework, instrumental to the project's success, was developed to serve as a roadmap to identify program performance metrics that ultimately define "best practices" attributes key to successful energy efficiency programs.

The framework had to support the Project Team to make meaningful comparisons of programs and program components. This required a painstaking process of normalizing data based on market segments, program type, design characteristics, administrative approach, and implementation strategy.

To facilitate subsequent inter-program and intra-program analyses of performance, the Project Team developed two tiers of metrics. Quantitative metrics allowed the Team to narrow the field of best practice programs, and qualitative metrics served to identify program features that reflected SECO objectives (e.g., cost-effective energy savings, addressing market barriers, administrative efficiency, etc.). These metrics further facilitated an "apples-to-apples" comparison of data within benchmarking datasets and allowed the Project Team to identify obvious program differences.

The four main steps to the stakeholder engagement process and correlated tasks in the best practices study are outlined in Figure 5 and explained further in Sections 3.1 and 3.2 below.

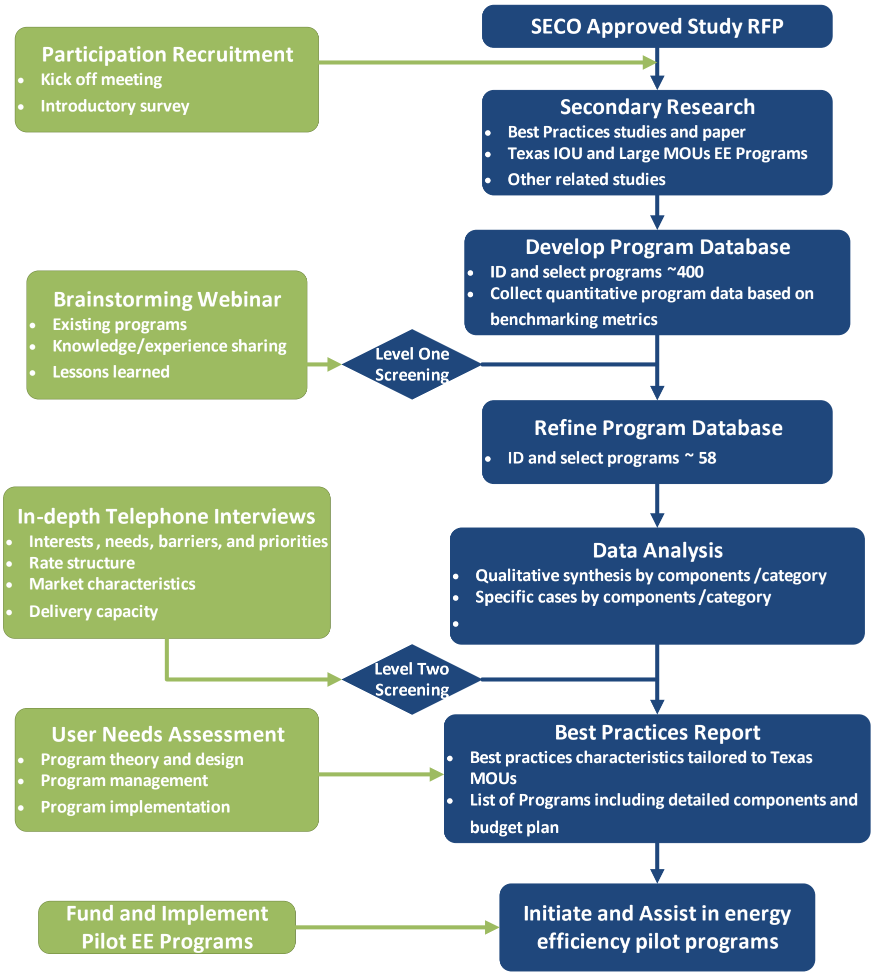


Figure 5. MOU Best Practice Study Parallel Research Tracks

3.1 Stakeholder Engagement Process

3.1.1 Initial Outreach and Participant Recruitment

The initial step in stakeholder engagement was to introduce the project to the Texas MOUs. The Project Team, working with TPPA, drafted an introductory letter (see Appendix A), to serve three main purposes:

- Introduce the Project Team to the MOUs
- Announce the official kick-off of the project and key dates for participation.
- Request the MOUs' participation in the project and set the foundation for future stakeholder engagement.

Initial outreach materials were segmented according to two groups of MOUs, based on their annual electricity sales. The Project Team and TPPA drafted two different letters to introduce the project and describe the objectives of the Guide.

- Small to medium-sized MOUs (less than 500,000 MWh) – The initial letter to the smaller MOUs included a brief survey with answers to frequently asked questions (FAQs) regarding the project. This survey sought to gather a few key pieces of data from as many MOUs as possible to help the Project Team understand the status of energy efficiency programs for the smaller MOUs.
- Medium to large-sized MOUs (more than 500,000 MWh) – Utilities falling in this group are required to report to the State of Texas annually on their local energy efficiency programs, due to new legislation (Senate Bill (SB)-924) enacted in April 2011. The introductory letter to this group requested an updated annual report on existing and planned energy efficiency programs.

The Project Team received 22 completed surveys. Table 2 lists the utilities that participated.

Table 2. List of Utility Respondents

Utility Participants in the Study
Weatherford Municipal Utility
Kerrville Public Utility Board (KPUB)
Floresville Electric Light & Power System (FELPS)
City of San Marcos
Georgetown Utility System (GUS)
Brownsville Public Utilities Board (BPUB)
Garland Power & Light (GP&L)
College Station Utilities
Lubbock Power and Light (LP&L)
New Braunfels Utilities (NBU)
Bryan Texas Utilities (BTU)
Denton Municipal Electric (DME)
City of Moulton
City of Yoakum
City of Seguin
Robstown Utility System
GEUS
City of Bowie
City of Boerne
City of Floydada
Austin Energy (AE)
CPS Energy

3.1.2 Brainstorming Session

Once MOU participants were identified, the Project Team hosted a brainstorming session to launch the study process. The brainstorming session was an opportunity for the Project Team to provide details on the research methodology and project goals, and discuss with the MOU participants the local conditions in their service territories.

This session was offered as a webinar at two different times of the day on June 28th, 2011, to reach as many MOU participants as possible. Figure 6 outlines the webinar objectives.

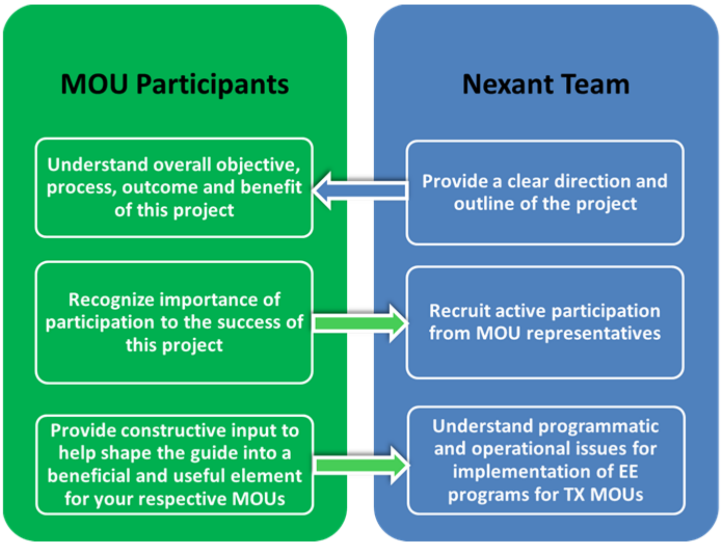


Figure 6. Brainstorming Webinar Objectives

The brainstorming webinar allowed the Project Team to provide a deeper level of project information beyond the introductory letter. It also helped develop the framework for a core group of utilities who would participate in the process.

The Project Team posed a series of questions to participants in the brainstorming session to gather information about the MOUs' service territories. These questions included the following:

- What types of energy efficiency program/offerings have been successful in your territory?
- Who manages or would manage energy efficiency programs in your territory?
- What are the barriers to implementing energy efficiency in your territory?
- What types of customer sectors/segments should we focus on for your territory?
- What types of programs should we focus on for your territory?
- What types of measures should we focus on for your territory?
- Which of the identified cost-effectiveness tests are the most relevant for your utility?

3.1.3 Structured Interviews and Detailed Program Information Collection

In order to gain a higher-level understanding of the individual MOU conditions, the Project Team conducted a data gathering process consisting of written data requests and structured, in-depth, interviews with the MOUs that volunteered to participate.

MOU data collection was implemented in two stages. First, the Project Team submitted written data requests to each participating MOU to gather quantitative information related to customer characteristics, consumption and demand, and existing program offerings. To supplement this data, the Project Team conducted phone interview with representatives from each of the 20 Texas MOUs who volunteered to participate in this research study. The Team used a structured interview instrument based on information obtained during the webinar and initial survey to guide the interviews. The final data request and interview guide are provided in Appendix B.

3.2 Best Practice Program Benchmarking

As discussed previously, the Project Team developed an analytical framework to guide its research on best practice programs around the United States. The analytical research framework to identify and categorize best practices followed the step-by-step approach shown in Figure 5 and described in greater detail below.

The overarching methodology for identifying and categorizing best practices approaches for Texas MOUs followed this step-by-step approach.

- **Step 1** – The Project Team started by identifying approximately 400 programs across North America and categorizing them based on sector and program type. The list included best practice programs identified by ACEEE and other energy organizations and programs that the Project Team has identified as successful through our previous evaluation and planning work.

- **Step 2** – The Project Team identified a range of metrics to compare programs within sectors and categories to determine those that qualify as best practice programs. The metrics best suited for program comparisons varied within and among program categories and sectors. For each metric, the Project Team defined critical analysis data to facilitate an equitable comparison of programs.

- **Step 3** – The Project Team developed a spreadsheet database (see Appendix C) using the identified analysis data to define data entry fields. The database broke down programs into primary categories, such as “audit/direct install” and “equipment rebate,” to facilitate a comparison of like programs determined to be most appropriate for MOUs. The Project Team populated the analysis tool with commonly available program planning and impact evaluation data (e.g., energy and demand savings and cost-effectiveness).

- **Step 4** – Level 1 Screening. The Project Team identified sets of screening criteria appropriate for each applicable program category that allowed us to identify those programs in the database that performed well in specific best practice attributes for each category. The initial screen used collected data to analyze and benchmark programs based on the quantitative performance metrics for each specific program category and allowed the Project Team to narrow the list to those that had achieved a high level of performance.

- **Step 5** – Level 2 Screening. Programs that passed the initial analysis and screening went through a secondary review, based on qualitative metrics. The level 2 screening helped the Project Team identify a list of candidate programs for more detailed study and for cross-referencing against regional conditions. The Project Team reviewed program materials and available process evaluation reports and where necessary, interviewed program managers to determine specific best-practice attributes that contributed to the programs’ success.

Once this data screening process was complete, the Project Team applied specific best practice program attributes to the collected program data. A cross-correlation of the attributes (independent variables) gave the Project Team a better understanding of which attributes have the most influence that may be most appropriate for the Texas MOU marketplace, and how to best group and apply the collected data to useful program recommendations.

Section 4 Analysis and Results

As discussed earlier, in order to determine energy efficiency program best practice attributes most appropriate for replication by the MOUs, the Project Team conducted research to gain a thorough understanding of both best practice energy efficiency programs around the country and the local and regional market conditions among the MOUs. This section includes details on the Project Team's analytical processes and results.

4.1 Overview of Texas' Municipally Owned Utilities

While some best practice attributes may prove highly successful under certain market conditions, they may not necessarily apply to Texas' MOU environment. Different MOUs in Texas have different energy efficiency programs and needs. The state's two largest MOUs offer mature efficiency programs, while some mid-sized Texas MOUs are looking to expand or refine existing energy efficiency programs, and other mid-sized and smaller MOUs are just getting started. As part of the stakeholder engagement process, the Project Team collected data and conducted interviews with a subset of Texas MOUs and analyzed the results to discern market characteristics and important considerations for energy efficiency programs.

4.1.1 Large Municipally Owned Utilities

The two largest MOUs in Texas, AE in Austin and CPS Energy in San Antonio, both have robust energy efficiency programs and staff to manage them, and therefore served as a program model rather than the target population for the Guide.

4.1.1.1 Austin Energy

Austin Energy (AE) serves 400,000 customers in Austin and the surrounding areas. AE initiated energy efficiency programs in 1982 and its DSM portfolio remains among the most comprehensive in the nation today. With the help of these energy efficiency programs, AE has saved more electricity than the annual output of a 500 megawatt power plant.

AE's Power Saver and Green Building programs help maximize energy resources by creating opportunities for customers to lower their electric bills while increasing comfort and satisfaction. Higher efficiency lowers costs to AE and its customers while reducing power plant emissions and promoting economic development in the Austin area. Investment in high efficiency equipment and services provide economic benefits through increased employment in the local energy efficiency industry. Energy bill savings augment customers' disposable incomes, which in turn, increases spending in the local economy.

AE's diverse mix of residential efficiency, commercial energy management, and green building programs also have achieved substantial reductions in peak electric demand, leading to all-time record reductions in both energy usage and power plant emissions. From October 2007 through September 2008, AE achieved 64.1 MW of demand reduction and a 132,000 MWh energy reduction. Table 3 through Table 5 show AE's participation, demand savings, and energy savings achieved through energy efficiency in 2008.

Table 3. Austin Energy 2008 Residential Program Results

Program	# of Projects	Energy Savings (kWh)	Peak Demand Savings (kW)
Appliance Efficiency Program	3,093	3,782,000	2,930
Home Performance Energy Star – Rebate	2,223	421,000	4,020
Home Performance Energy Star – Loan	213	4,390,000	380
Free Weatherization	505	552,000	480
Multifamily Program	21,814	23,847,000	4,610
Clothes Washer Rebate	813	234,000	40
Duct Leaks Sealing/Diagnosis	231		
Refrigerator Recycling	4,114	3,235,000	1,210
Power Partner	9,934	97,000	9,800
Cycle Saver	1,237	7,000	800
Compact Fluorescent Lamps (CFLs)	0	6,244,000	990
Residential Subtotal	**44,177**	**42,810,000**	**253,000**

Table 4. Austin Energy 2008 Commercial Program Results

Program	# of Projects	Energy Savings (kWh)	Peak Demand Savings (kW)
Commercial Rebate	351	42,783,000	12,800
Commercial AEP	0	0	0
Small Business	264	2,414,000	1,100
Municipal	129	383,000	130
Municipal Power Partner	0	14,000	1,430
Commercial Power Partner	1,331	19,000	1,250
Load Coop	29	492,000	2,160
Engineering Support	3	0	70
Commercial Smart Vendor	420	0	730
Muni. Vend & Monitor Misers	0	1,238,000	0
Discontinued Programs	0	0	19,700
Subtotal Commercial	**2,527**	**47,343,000**	12,800

Table 5. Austin Energy 2008 Green Building Programs Results

Program	# of Projects	Energy Savings (kWh)	Peak Demand Savings (kW)
Residential Ratings	1,021	1,529,000	850
Residential Energy Code	2,941	7,914,000	4,860
Multifamily Energy Code	4,805	4,627,000	2,170
Multifamily Ton Reduction	0	0	1,300
Commercial Ratings	0	13,377,000	4,770
Commercial Energy Code	0	14,590,000	5,210
Subtotal Green Building	**8,767**	**42,039,000**	**19,200**

4.1.1.2 CPS Energy

CPS Energy of San Antonio, Texas, is the nation's largest municipally-owned energy company to provide both natural gas and electrical services. In 2008, the CPS Energy Board of Trustees adopted a portfolio of energy efficiency programs known as "Save for Tomorrow Energy Plan" (STEP). The goal of these programs is to save 771 MW between 2009 and 2020 with an allocated budget of approximately $849 million. STEP offers a wide variety of incentive programs to its 1.2 million electric and gas customers. The programs are broken into three main categories: residential energy efficiency programs, nonresidential energy efficiency programs, and DR programs.

The 2010 net energy and demand savings along with the number of projects per program are shown in Table 6 below for the residential program offerings. The largest savings, for both energy and demand, were achieved through the Residential HVAC Program.

Table 6. CPS Energy 2010 Residential Program Results

Program	# of Projects	Energy Savings (kWh)	Peak Demand Savings (kW)
CFL	452,693	9,969,578	993
Home Efficiency	2,923	2,321,792	944
Air Flow Performance	366	505,483	281
Residential HVAC	12,647	12,437,505	3,634
Solar Photovoltaic (PV) & Water Heater	197	1,729,383	1,090
New Homes Construction	677	4,406,780	745
Refrigerator Recycling	1,380	859,811	91
Wash Right	8,620	1,145,856	478
Residential Subtotal	**479,503**	**33,376,189**	**8,257**

Table 7 shows non-residential program results for 2010. The Large Commercial Lighting Program achieved the highest savings of the nonresidential programs.

Table 7. CPS Energy 2010 Nonresidential Program Results

Program	# of Projects	Energy Savings (kWh)	Peak Demand Savings (kW)
Large Commercial Lighting	137	16,421,243	3,203
Small Commercial Lighting	14	99,640	20
Com. HVAC	130	6,142,509	2,537
Motors	10	179,793	62
Roof Coating	27	181,405	123
Window Film	2	144,700	42
Restaurant Equipment	13	19,969	2
Lean Clean Energy	4	595,441	68
New Construction	1	58,636	42
Custom	7	823,731	115
Non-Residential Subtotal	**345**	**24,667,067**	**6,215**

Table 8 lists CPS Energy's 2010 results for its DR Programs.

Table 8. CPS Energy 2010 DR Program Results

Program	# of Customers	Energy Savings (kWh)	Peak Demand Savings (kW)
Peak Saver	43,174	460,676	17,785
Commercial and Industrial (C&I) DR	51	1,283,346	45,028
DR Subtotal	**43,225**	**1,744,022**	**62,813**

4.1.2 Small and Mid-sized Municipally Owned Utilities

This project attracted participation from a wide range of MOUs representing considerable variation in conditions that affect energy efficiency program planning. Our investigation included factors such as MOUs' existing operational structures, customer behavior and decision-making trends, local delivery capacity, regional codes, technology adoption, energy efficiency potential in MOUs' territories (at the measure level, if applicable secondary data were available) and interest in energy efficiency programs. Our investigation found that the MOUs participating in the process represent a wide range of communities, but many have significant commonalities in terms of customer makeup and types of efficiency programs currently offered.

4.1.2.1 Operating and Market Conditions

Initial phone interview questions were designed to gain an understanding of Texas MOUs' basic operating structure, size, and electric usage trends in the past 5 years. Our findings indicated that the residential sector dominates MOU customer bases, with approximately 84 percent residential customers and 16 percent nonresidential customers. The majority of MOUs have seen their populations increase over the past 5 years, which has translated into increased electric demand requirements for most. However, despite increasing demand requirements, few MOUs have faced problems meeting peak demand. Finally, while 55 percent of MOUs have increased their electricity rates in the past 5 years, 5 percent have reduced rates, and among the remaining 40 percent, rates have remained flat. Table 9, Figure 7 and Figure 8 provide information on MOUs' operating and market characteristics.

Table 9. Texas Municipally Owned Utility Operational and Market Characteristics

Customer Size	1,100-100,000 total	84% Res	16% Com/Ind
MOU Staff Size	Total employees range from 5 - 300	1-3 employees dedicated to energy efficiency (includes both FTE and part-time employees (PTEs))	
Program Delivery Approach	85% in house	5% 3rd party	10% both
Population Trends	70% w/ increasing trend	30% w/ flat trend	
Electric Demand Trends	70% w/ increasing trend	30% w/ flat trend	
Utility Rate Trends	55% w/ increasing trend	5% w/ decreasing trend	40% w/ no change
Power Supply Sources	20% own	75% purchase	5% both
Marketing Efforts	Methods to reach community members include bill stuffers, media events, social/public events, newspapers advertisements. No MOUs reported problems reaching their communities.		

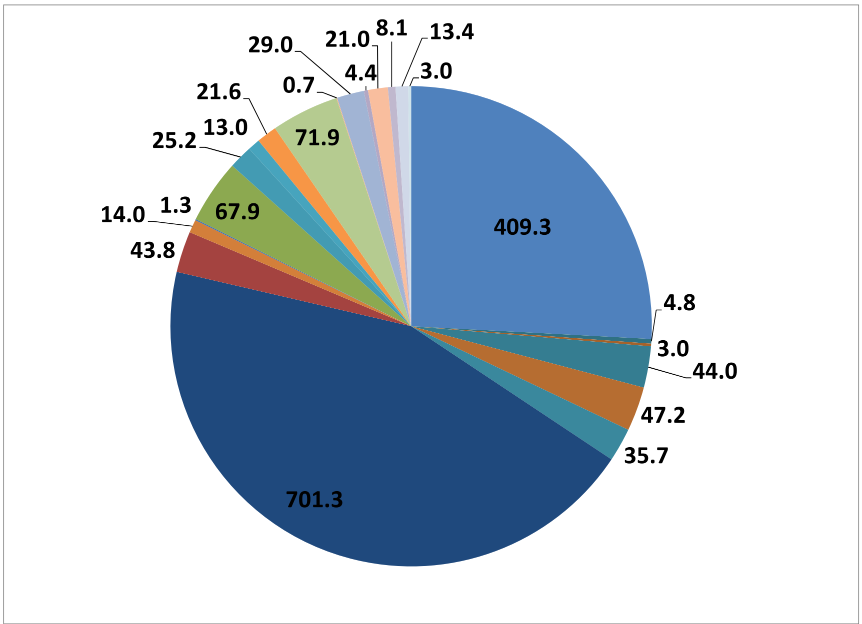


Figure 7. Participating Municipally Owned Utilities by Customer Base (in thousands)

Although small to mid-sized Texas MOUs predominantly serve residential customers (in terms of number of customers), electricity sales are more evenly distributed among customer sectors. Nearly half of MOUs' total electricity sales (46 percent) are to residential sector customers followed by commercial customers (39 percent). MOUs in Texas generally have few industrial customers and their sales to that sector represent only about 15 percent of total electricity sales. Due to the smaller industrial customer base, this sector may not offer significant energy saving opportunities for most MOUs.

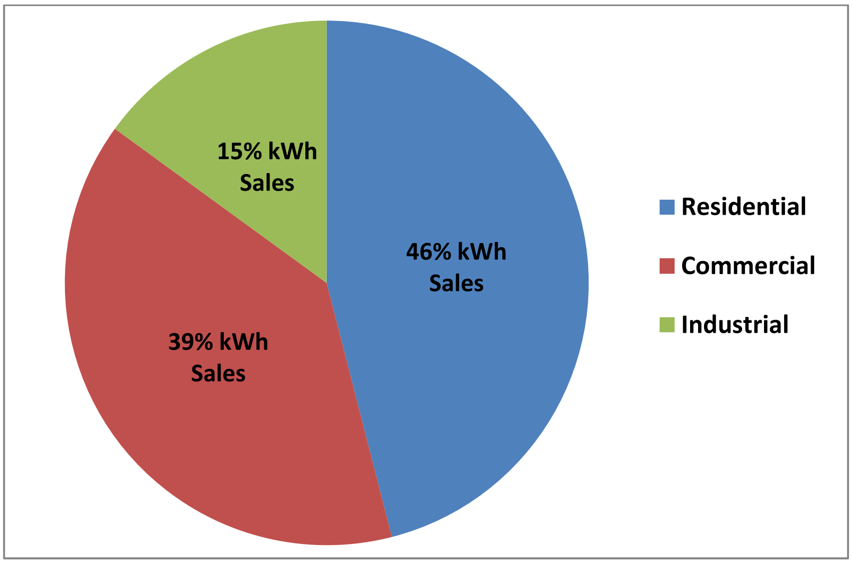


Figure 8. Distribution of Total Electricity Sold (kWh) by Market Sector

These findings were consistent with the results of our brainstorming discussion with MOUs that indicated they were most interested in residential type programs.

4.1.2.2 Local Market Conditions and Efficiency Program Background

Overall, the 22 participating MOUs indicated they currently offer a total of 129 energy efficiency programs. The programs ranged from energy audits to rebates for energy efficiency equipment.

Figure 9 through Figure 12 summarize the energy efficiency programs currently being offered by Texas MOUs. Key program components including market sector focus, measure qualification, program budgets, and implementation strategies are summarized below. The comprehensive programs offered in each sector include those that offer incentives for a wide range of measures including lighting, HVAC, insulation, building shell, solar systems, thermostats, motor replacement, etc.

Existing Energy Efficiency Programs by Market Sector

Among existing MOU energy efficiency programs, some offer services or incentives to customers in multiple market sectors. For the purposes of this study, the Project Team categorized these as individual programs for each customer sector targeted.

Figure 9 shows a breakdown of current energy efficiency programs by customer sector. Nearly 53 percent of MOUs' programs are residential/residential low income whereas 36 percent are commercial and 11 percent are industrial.

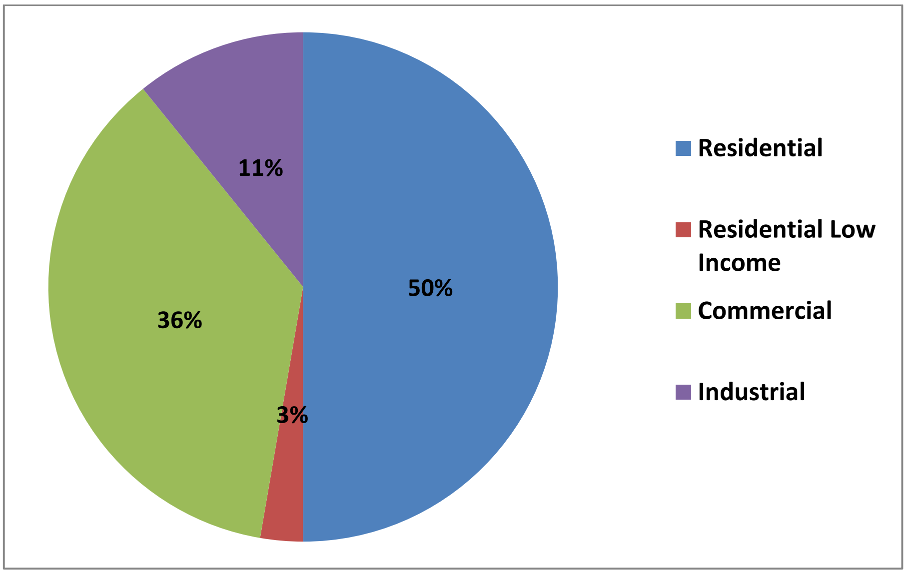


Figure 9. Existing Energy Efficiency Programs by Market Sector

The Project Team's analysis of the most common types of energy efficiency programs indicated a healthy mix of residential programs currently offered by Texas MOUs. Figure 10 shows the mix of residential sector programs. Of 39 programs offered, the majority are geared towards energy-efficient lighting and HVAC, followed by renewable energy and weatherization. It is worth noting that a significant number of MOUs provide incentive programs to promote renewable energy technologies, which are not generally considered a cost-effective resource when compared to energy efficiency.

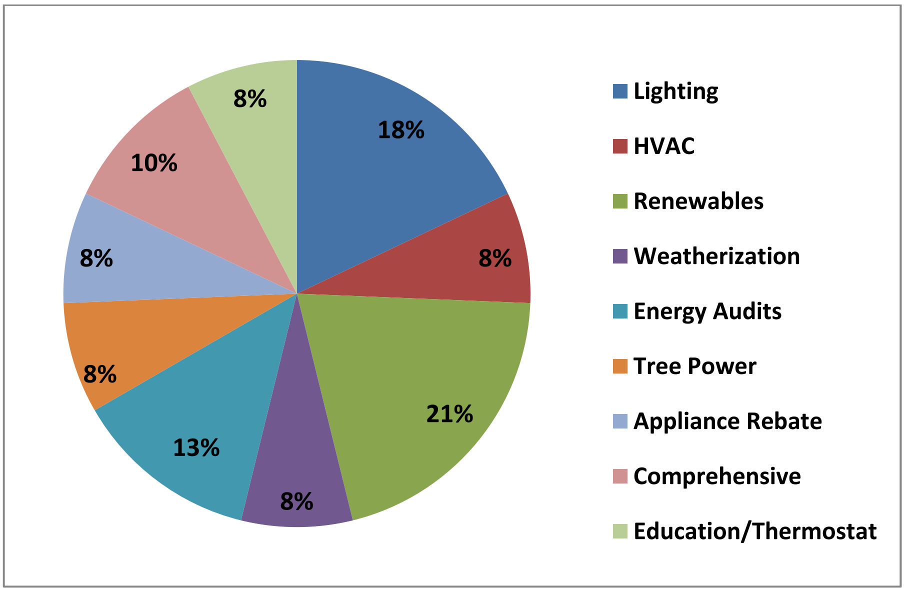


Figure 10. Existing Municipally Owned Utility Residential Programs by Program Type

MOUs currently offer a total of 27 programs in the commercial sector. As shown in Figure 11, most target energy-efficient lighting and renewable energy technologies. A smaller proportion offer energy audits and education. The “other” category includes low-interest financing, reflective roof, and tree giveaway programs.

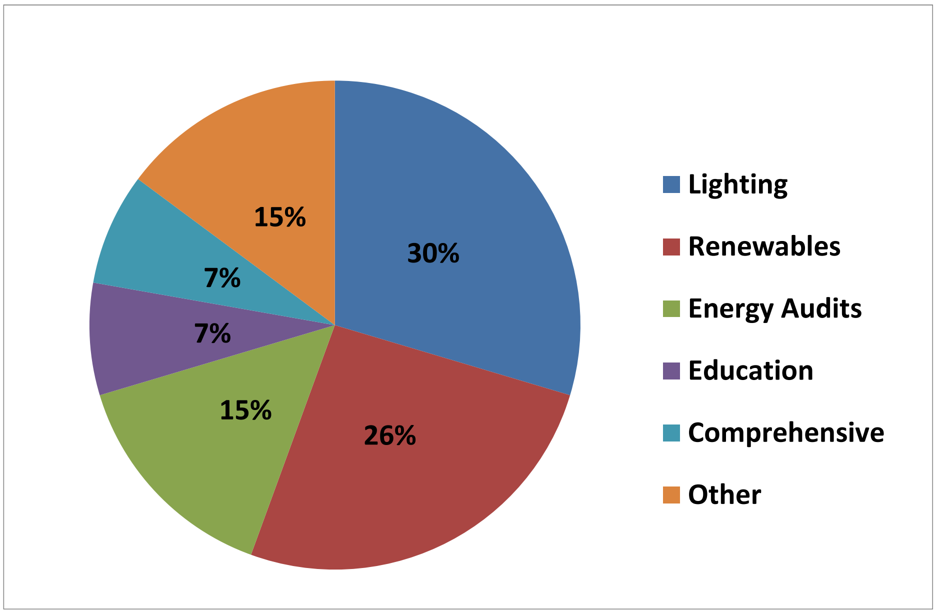


Figure 11. Existing Municipally Owned Utility Commercial and Industrial Programs

Of the MOUs’ total eight industrial sector programs, the majority promote energy-efficient lighting and renewable energy. Reflective roof coating is represented in the “other” program category. The analysis suggests very few MOUs offer energy efficiency programs for the industrial sector since most MOUs have few or no industrial customers.

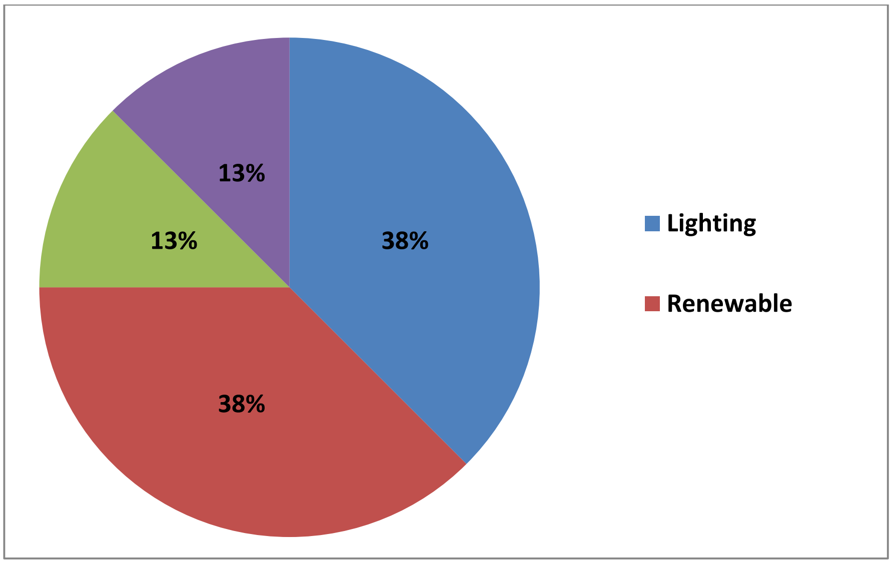


Figure 12. Existing Industrial Sector Energy Efficiency Programs by Program Type

4.1.2.3 Energy Efficiency Program Budgeting and Management Structure

The Project Team found that, in most cases, a designated utility board or City Council reviews and approves energy efficiency programs recommended by staff. Few MOUs establish savings goals for their energy efficiency programs or measure energy savings; those that do typically rely on random field inspections and billing analysis to estimate savings. Most MOUs manually document program data rather than using information tracking systems, and most do not calculate the cost-effectiveness of their energy efficiency programs.

The MOUs that participated in phone interviews indicated their current energy efficiency programs are well-received by community members and their Board/City Council governing bodies. However, they also indicated a general lack of interest in increasing electric rates to fund future energy efficiency programs.

Figure 13 shows the MOUs' typical budgeting and management structure governing energy efficiency programs. Ninety-eight percent of the MOUs interviewed fund their programs with internal budgets and manage their programs with in-house staff rather than hiring third-party consultants or contractors.

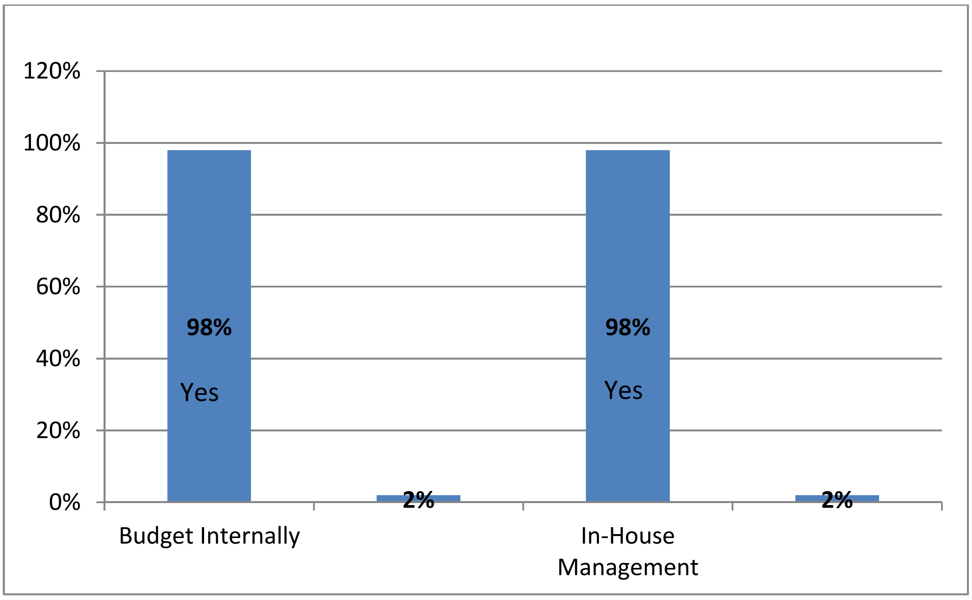


Figure 13. Program Budgeting and Program Management Structure

4.1.2.4 Efficiency Potential

The Project Team asked a series of interview questions aimed at identifying the Texas MOUs' perceived savings potentials in each market segment, including residential, small C&I/large commercial. Participants were asked to rate the savings potentials of a list of common utility program electric efficiency measures or technologies from low to significant, where "low opportunity" equaled a score of 1, "moderate opportunity" scored a 2, and "significant opportunity" was given a score of 3.

Analysis results based on the ratings are shown in the bar charts below. The charts display different energy efficiency technologies on the horizontal axis, the scale on the left hand side shows the number of MOUs whose responses were recorded for this analysis, and the scale on the right displays the average score each technology achieved. Three bar colors differentiate “low opportunity” (green), “moderate opportunity” (red) and “significant opportunity” (blue), respectively. The total average score is indicated next to each technology.

The Project Team’s analysis used an average score of 2.0 as the cutoff to indicate sufficient potential to justify a concerted effort in energy efficiency program strategies. Technologies that scored a 2.0 or less were considered to offer a relatively low opportunity for energy savings.

As shown in Figure 14, most MOUs rate the following measures as having moderate to significant energy savings potential in the residential sector:

- Cooling
- Building shell
- Lighting
- Low income weatherization
- Kitchen appliances

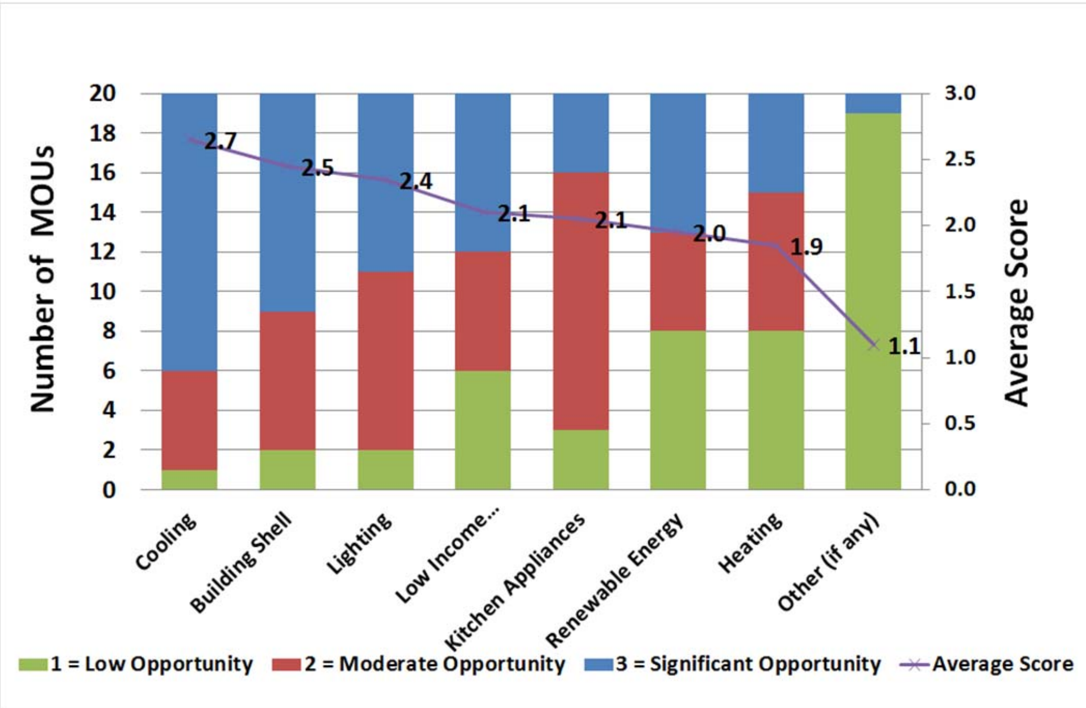


Figure 14. Residential Savings Opportunities by Measure

MOUs rated lighting, HVAC, and building shell measures as offering moderate to significant efficiency opportunities in the small/medium commercial sector (see Figure 15):

The responses indicate that the remaining measures offer low to moderate opportunities in the small/medium commercial sector. While these technologies may not offer significant enough opportunities to justify targeted program offerings, MOUs with larger opportunities in their territories might consider providing incentives through a custom incentive program.

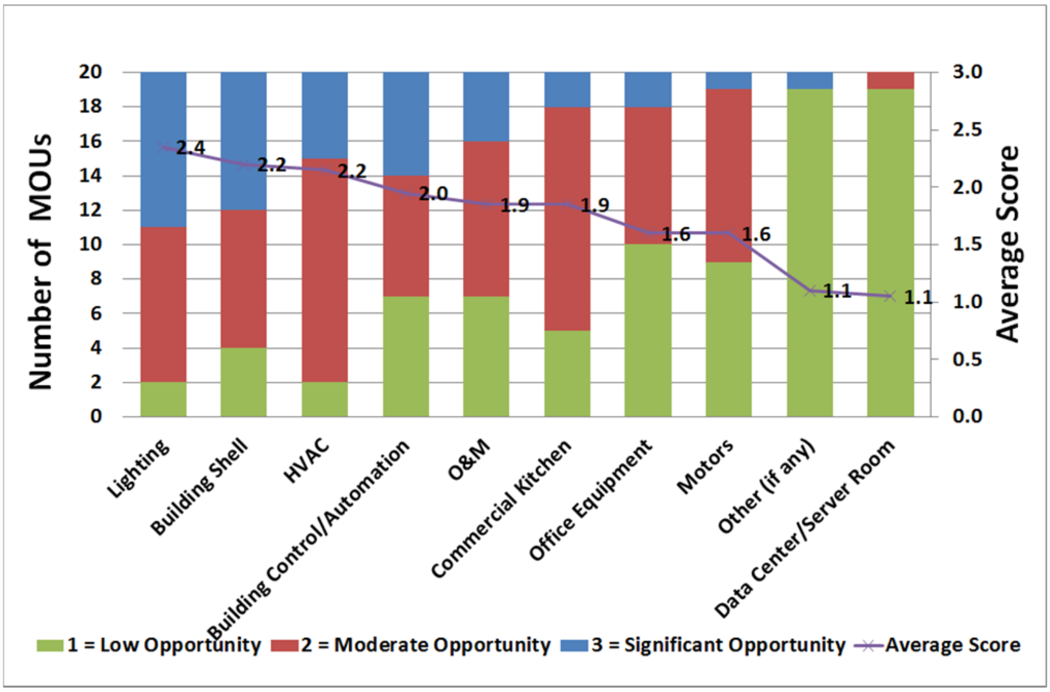


Figure 15. Small/Medium Commercial Savings Opportunities by Measure

As shown in Figure 16, the majority of MOUs rated efficiency potential for all of the technologies in the large C&I sector as low or moderate opportunities. MOUs with significant industrial customer bases might consider offering a custom incentive program.

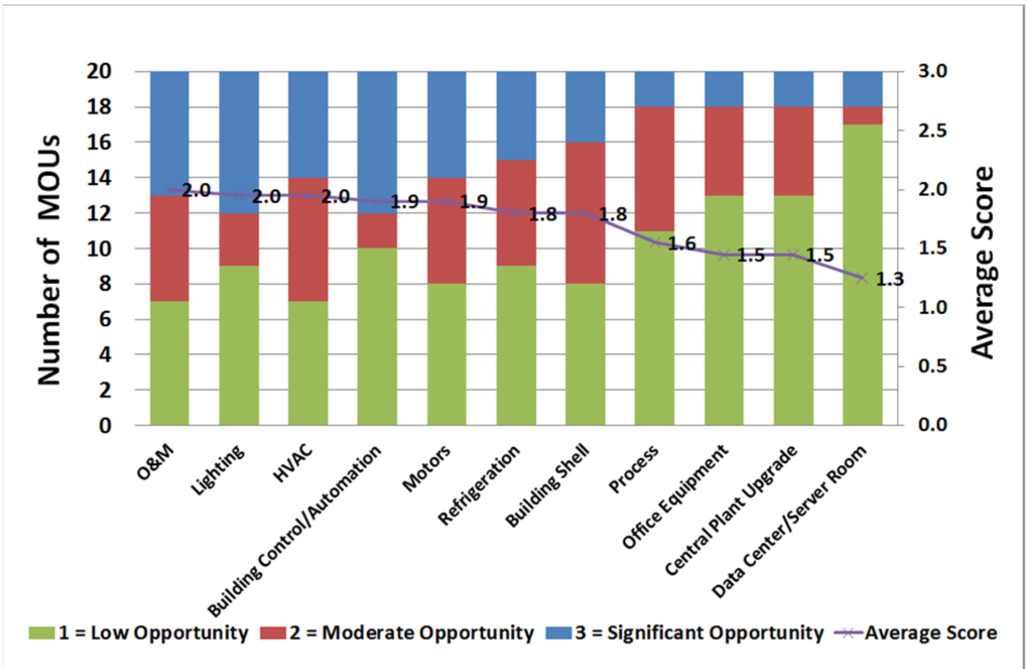


Figure 16. Industrial/Large Commercial Sector Savings Opportunities by Measure

4.1.2.5 Future Programs

In order to better understand the opportunities for future program offerings, the Project Team asked MOU participants a series of questions aimed at capturing relevant information on local market conditions. The results of these inquiries are described below.

Barriers and Constraints

In both the brainstorming discussion and interviews, the Project Team asked the Texas MOUs to rate their internal/operational constraints or barriers, and priorities for implementing energy efficiency programs, as well as perceived customer barriers to participating in programs. In both cases, MOUs indicated similar operational constraints and customer barriers associated with availability of funding and lack of awareness about energy efficiency programs and benefits. These findings are consistent with common utility barriers around the country.

In interviews, the MOUs were given a list of common constraints or barriers to implementing energy efficiency programs and asked to rate each as “not problematic,” which was scored as a 1; “slightly problematic,” which was scored as a 2; and “significant issue,” which was scored as a 3.

The bar charts in this section display the analysis results. The charts display constraints, implementation barriers, and motivations or priorities on the horizontal axis; the left axis shows the number of MOUs whose responses were recorded for this analysis, and the scale on the right side displays the average score for each category. As in the previous section, different colors designate low (green), medium (red) and significant (blue) issues or priorities, respectively.

The analysis of interview responses, shown in Figure 17, indicated that MOUs’ most common constraints to implementing energy efficiency programs are consistent with those identified in brainstorming discussions:

- Lack of available budget or knowledge of how to set up funding mechanisms for energy efficiency programs.
- Lack of staff resources, and to a lesser extent, local skilled contractors.

The analysis also indicated a high level of interest in energy efficiency programs among customers and utility decision makers.

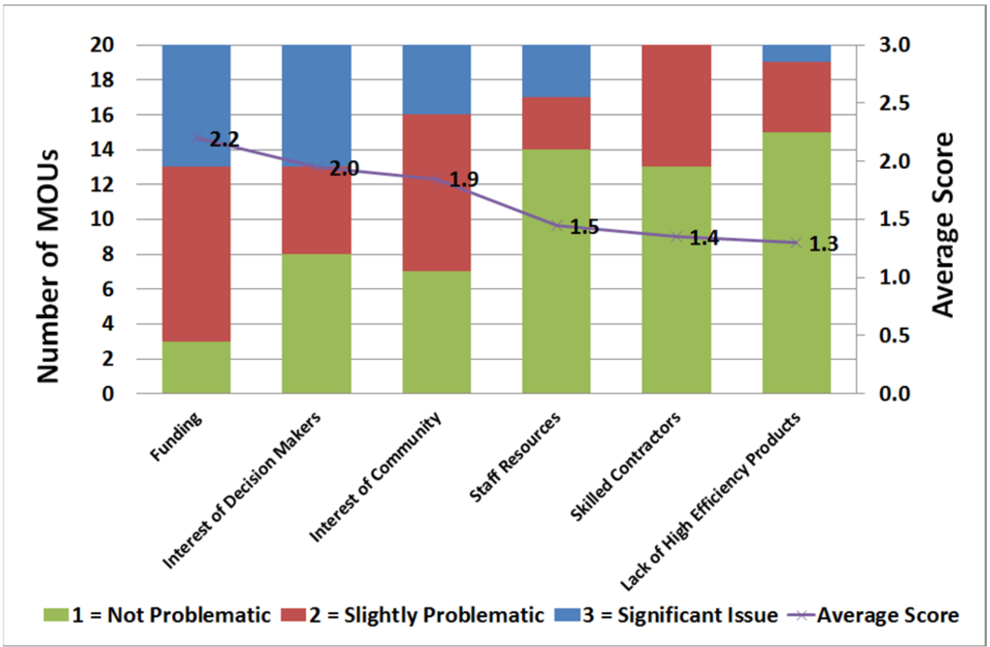


Figure 17. Operational Constraints on Ability to Offer Energy Efficiency Programs

As shown in Figure 18, the most common barriers to customer participation in energy efficiency programs are the following:

- Lack of awareness about energy efficiency programs among community members.
- Lack of awareness about environmental issues among community members.
- High upfront cost for energy-efficient equipment.
- Lack of interest among customers due to limited understanding of the long-term value of energy-efficient technologies.
- High incidences of split incentives due to large percentage of rental properties.

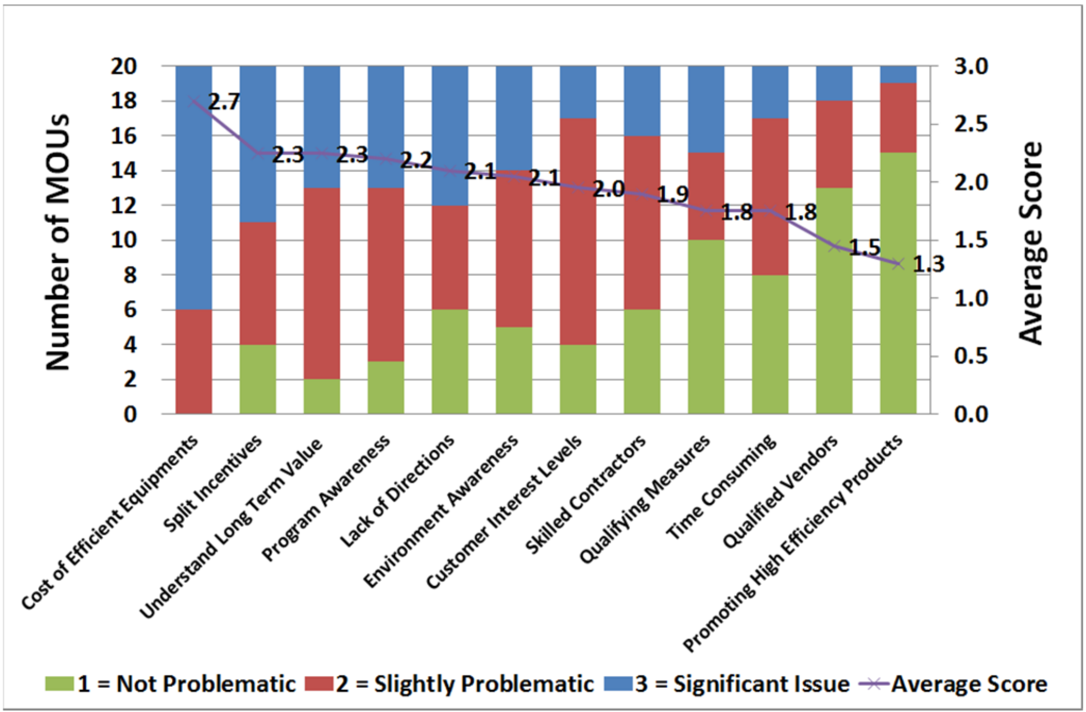


Figure 18. Common Barriers to Customer Participation

Priorities & goals

Finally, the Project Team asked MOUs about their priorities for implementing energy efficiency programs in their territories and the goals they would most like to achieve through such programs. MOU responses (shown in Figure 19) indicated that the most common priorities for energy efficiency programs are:

- Achieving high savings from energy efficiency programs at a low cost.
- Reducing peak load.
- Generating good public relations value.
- Educating community members and facilitating market transformation, causing the community to adopt energy efficiency measures.
- Implementing energy efficiency programs without increasing customer electricity rates.

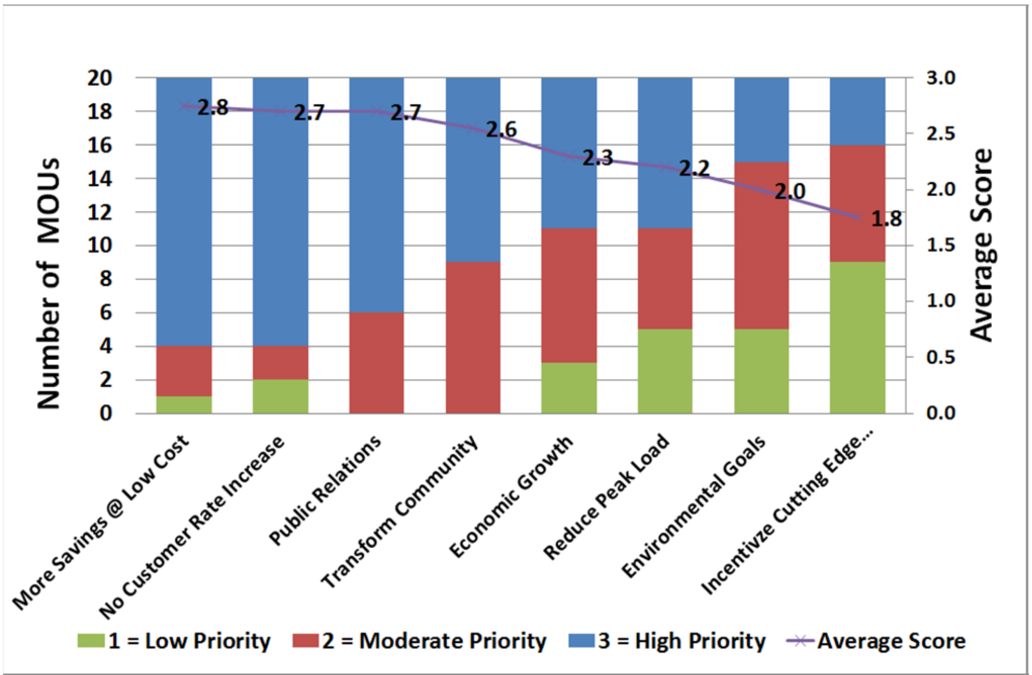


Figure 19. Priorities or Motivations for Energy Efficiency Programs

4.2 Best Practice Program Benchmarking

The Project Team's analytical framework served as a basis for analyzing and benchmarking best practice programs for the study. The analysis and results are discussed in greater detail below.

4.2.1 Development of Program Database

The Project Team developed a spreadsheet database to allow for comparative analysis of program metrics. The Project Team conducted an extensive literature review to compile a preliminary list of programs to populate the database. In total, the Project Team identified over 400 energy efficiency programs through the resources described in the following paragraphs.

Nationwide Recognized Exemplary Programs

The Project Team leveraged energy efficiency best-practices studies within the industry. The following studies provided a vast resource of programs that had already been identified as exemplary programs.

- The ACEEE report - Compendium of Champions: Chronicling Exemplary Energy Efficiency Programs from Across the United States. (u081)
- The ACEEE report - Meeting Essential Needs: The Results of a National Search for Exemplary Utility-Funded Low-Income Energy Efficiency Programs (u053)
- The ACEEE report - States Stepping Forward: Best Practices for State-Led Energy Efficiency Programs (E106)
- The Consortium for Energy Efficiency (CEE) report – Residential HVAC Programs National Summary (Res_HVAC_PS05)

- National Energy Efficiency Best Practices Guide

Texas Utility Programs

Texas IOUs, CPS Energy, and AE have implemented energy efficiency programs for years and accumulated valuable experiences on program design, program management, program monitoring and verification, and long-term cost-effectiveness. Since these utilities all share a Texas customer base and similar market potentials, climate conditions, and other market characteristics, their energy efficiency programs are valuable model programs for Texas MOUs.

Other Programs Selected

The Project Team identified additional energy efficiency programs across the nation through both primary and secondary research, including:

- The Rapid Deployment Energy Efficiency (RDEE) Toolkit
- Energy Efficiency in California's Public Power Sector status report of 2009 and 2010
- 2009 Rocky Mountain Power DSM Annual Report – Idaho and Wyoming
- 2009 Colorado Utilities Report
- Seattle City Light - Energy Conservation Accomplishments: 1977-2006
- Focus on Energy 2007 annual report, Wisconsin's statewide energy efficiency and renewable energy initiative
- 2010 Alliant Energy annual report
- 2009 Efficiency Vermont annual report
- Energy efficiency programs managed and evaluated by the Project Team

After compiling the list of energy efficiency programs, the Project Team collected the data elements including, but not limited to, those listed in Table 10. The Project Team's approach relied on secondary research including searches of public utility commission filings, published reports, papers, program administrator databases, and Internet sites. The Project Team also drew on our experience and collected resources based on designing, implementing, and evaluating energy efficiency programs in more than 30 North American states.

Table 10. Program Performance Data Metrics

Program Performance Data	Definition
Utility Sales and Revenue by Sector	These data provide an overview of the service territory characteristics and allowed normalization of data from programs in different territories with different characteristics.
Gross Energy Savings and Gross Capacity Savings	Generally the expected energy and/or demand savings are the drivers behind a program; therefore, these are key measures of the program's impact and success.
Net Energy Savings and Net Capacity Savings	The net savings take into account naturally occurring market adoption and provide some context for the current market conditions in the program territory.
Spending by Cost Category Where Available and Overall	Spending data, combined with energy or capacity savings data, is a measure of the program's efficiency.
Cost-effectiveness Test Results	These data weigh the program's benefits and costs and provide a measure of the program's cost-effectiveness.

4.2.2 Program Categories and Benchmarking Metrics

To ensure an "apples-to-apples" comparison of programs, the Project Team had to identify and collect comparative data on key program components critical to the benchmarking process and to informing recommendations for MOUs. The data had to allow for a reasonable comparison of market segment divisions and program components such as design, administrative approach, and implementation strategy. Therefore, the Project Team grouped the initial list of 400 energy efficiency programs into program categories and some sub-categories as a function of target market, incentive structure, delivery approach, and other possible dimensions. Program categories are described below.

Table 11. Energy Efficiency Program Category

Program Category	Definition
Appliance Recycling	Program is designed to take inefficient appliances out of circulation by offering free or rebated recycling services.
Audit and/or Direct Install	Program provides field inspections or audits of homes or businesses to identify energy efficiency opportunities and/or provides direct installation of low cost measures in the target customer sites. Building tune-up and retrofit commissioning programs are included in this category.
Direct Response	Program is designed to reduce peak load from the power grid, either through behavior change, a load control mechanism, or execution of a previously agreed upon load-cutting measure.
Education and Behavior Impact	Program is focused on educational components (e.g., behavior change). While some education programs may include low cost measures (e.g., efficiency kits), education is the primary program feature.

Program Category	Definition
Equipment Rebates	The program offers cash incentives (prescriptive or custom) to offset the capital cost of energy-efficient equipment (e.g., HVAC, lighting, motors). Renewable technology programs (solar, wind, etc.) are included in this category.
Innovative Financing	Program provides innovative financing to fund energy-efficient improvements (e.g., on-bill financing (OBF)).
New Construction	Program offers incentives to building owners or design teams for more energy-efficient home/building construction.

The analytical framework provided the basis for developing quantifiable performance-benchmarking metrics to facilitate subsequent inter-program and intra-program analyses of performance, as well as readily searchable information fields. Primary metrics included indicators that reflected SECO objectives (e.g., cost-effective energy savings, addressing market barriers, administrative efficiency). Secondary metrics included indicators of program components that may not apply to all programs (e.g., innovative outreach for "hard to reach" (HTR) market segments, success in achieving synergies with other programs). These metrics further facilitated an "apples-to-apples" comparison of data within benchmarking datasets and allowed the Project Team to identify obvious program differences. Where appropriate and available, the secondary metrics included information listed in Table 12.

Table 12. Benchmarking Metrics

Benchmarking Metrics	Definition
Dollars spent per gross kWh saved	The total program budget divided by the annual energy savings provided a normalized value that was compared to the unit cost of energy saved for different programs.
Dollars spent per gross kW saved	The total program budget divided by the net energy savings was compared to dollars per gross energy savings. Comparing these metrics across programs revealed differences in markets between territories.
Dollars spent per net kWh saved	The total program budget divided by the net energy savings was compared to dollars per gross energy savings. Comparing these metrics across programs revealed differences in markets between territories.
Dollars spent per net kW saved	The total program budget divided by the net demand savings was compared to dollars per gross demand savings. Comparing the gross and net savings metrics revealed differences in markets between territories.
Cost per participant or measure	The total program cost per participant was used to compare costs across programs with similar measures. This metric was reviewed alongside the budget breakdown for each program to provide context around the results. For example, did a program have a higher cost per participant because the utility spent more on marketing or because the incentives were higher?

Benchmarking Metrics	Definition
Incentive costs as a % of total budget	The percent of the total program budget spent on incentives was compared across programs with similar measures. Additional information about the incentive budget per year and incentives paid per year were noted when available (e.g., was participation in a program limited because of incentive budget?).
Marketing costs as a % of total budget	The percent of the program budget dedicated to marketing was analyzed in conjunction with program participation metrics to determine which programs were successful with their marketing efforts.
Cost-effectiveness	The program cost-effectiveness was compared, to the extent possible, using available data on cost-effectiveness tests for each program.

4.3 Level One Analysis – Program Performance Review

Through the level one analysis, the Project Team conducted a quantitative screening of programs aimed at narrowing the list of 400 programs down to only those that achieved the best performance in several areas. To best accommodate this process, the Project Team selected benchmarking metrics appropriate for each program category (as described below). In some cases, program categories may contain multiple program delivery sub-categories. The Project Team sought to compare programs within each category and to ensure a good cross-section of program types to serve as models for further research and screening.

Equipment Rebate Program

This program category is the most common and thus the database has the most of these types of programs; they cover the residential, commercial, and industrial market sectors. The programs were divided into four subcategories based on the incentive type in each market sector.

- **Prescriptive rebate and dealer spiff** programs offer a fixed incentive rebate for pre-approved energy efficiency measures (e.g., clothes washers receive a $100 rebate, dishwashers $50). The dealer spiff program pays the incentives directly to a manufacturer, vendors, installers, dealers, or other trade allies, and the program offers as a way to encourage trade allies to promote the utility program to their customers and are sometimes offered in conjunction with a customer. Rebate Dollars spent/gross kWh saved and dollars spent/participant were used to screen the programs.
- **Custom rebate** incentives are based on the kW and/or kWh savings performance of the installed measure(s) or a percentage of the customer's investment. Dollars spent/gross kWh and dollars spent/participant were good indicators of program efficiency.
- **Whole building** programs are based on the whole house or commercial building achieving a specific level of efficiency, or a percentage of the building's efficiency performance. Dollars spent/gross kWh was used to screen the programs.

- **Upstream** programs provide incentives to a manufacturer or dealer and the end user simply pays a lower price for that measure than they would have paid without the incentive. The programs were compared based on cost/kWh saved.

Appliance Recycling Program

- Programs in this category take inefficient appliances out of circulation by offering incentives coupled with free recycling services for customers. All programs in this category are in the residential sector. Dollars spent/gross kWh saved and program cost/participant are used as the screening criteria.

Audit and/or Direct Install Program

The programs in this category inspect a home or business to identify energy efficiency opportunities and/or directly install measures or services. Within this broad category, programs represent several delivery subcategories:

- **Energy audits with or without direct installation of energy efficiency measures**. Because energy audits alone do not generate energy savings, different utilities combine audit programs with various measure installation approaches to achieve cost-effectiveness, making it difficult to compare programs. Thus, the dollars/gross kWh saved metric is less meaningful in this subcategory. In this case, greater emphasis is placed on total participants as an indicator of the program's ability to reach a broad audience and cost/participant or gross kWh/participant as a proxy for the rate of measure uptake.
- **Low income weatherization**. Low income programs typically offer free energy efficiency measures to income qualified participants. Nearly all low income programs are modeled after the federal Low-Income Energy Assistance Program and utility funding is frequently combined with other sources of funding to create a comprehensive measure package for end users. Dollars spent/gross kWh saved and dollars spent/participant are good indicators of program administrative efficiency. Number of participants and gross kWh saved/participant is used to screen the programs for implementer/installer effectiveness.
- **Multifamily audits**. The best practices database includes both low-income and non-low-income multifamily audit and direct install programs. Multifamily facilities are traditionally underserved by utility programs because they are often complicated and expensive to implement. However, based on the Project Team's research, several Texas MOU territories include significant potential for savings in the multifamily sector. Our analysis of these programs looked at total participants, cost/kWh saved and cost/participant to determine their overall ability to in achieve cost-effective energy savings.

Because a purely quantitative screening within these categories can be difficult, the Project Team also considered program innovation factors based on the collected program information.

Education and Behavior Impact Program

The programs falling in this category are focused on educating end users on energy-efficient behaviors and practices. While some education programs may include low-cost measures (e.g., efficiency kits), education is the primary program feature.

The programs in the education and behavior category cannot be screened quantitatively because:

- Savings are not in consistent units and are measured differently between programs.
- Many of the programs do not have enough data.
- There are several different types of programs that fall under the broad definition of education and behavior, with a range of different operating strategies. The variety of programs is too different to be effectively compared.

The programs with complete data are divided into subcategories, first based on sector, and then on program type. There are four predominant types of education programs: C&I facility manager training, residential home energy reports (i.e., the OPower model), energy kits that come with either in-person or written educational materials, and school-based programs aimed at educating school-aged children. The programs are compared qualitatively within these subcategories, starting with notes in the database and further reviewing reports to gather more information as needed to identify model programs.

New Construction Program

New construction programs fall into two categories: energy efficiency codes and standards and traditional new construction programs that offer incentives to the building owner or design team for home/building construction that exceeds the efficiency standards of local energy codes. Very few utilities have the bandwidth to affect efficiency codes and standards, but because municipal utilities in Texas are in a unique position to influence local building codes, the Project Team provided insights on local efforts to enact new building regulations to achieve a higher level of efficiency in new construction, although it did not include this program category in its benchmarking process.

For traditional new construction programs, savings/participant and cost/participant were used as the primary screening criteria. Additionally, given the depressed new construction market over the last 2-3 years, the Project Team looked for any programs that achieved particularly good participation results during this time, as an indicator that they mitigated the economic barrier new construction programs currently face.

Innovative Financing Program

The programs in this category provide innovative financing to fund energy efficiency improvements. Savings/participant was the primary criteria for the initial screening. However, because utility financing programs are evolving rapidly and a broad range of innovative program designs have recently emerged, the Project Team sought input from its internal financing experts to help identify newer programs and recent innovations that are achieving success, particularly in a municipal utility environment. The Project Team used this expertise to help identify model programs and best practice program attributes that were well suited to Texas MOUs.

Demand Response Program

This type of program is based on reducing peak load, either through behavior change, a load control mechanism, or execution of a load-cutting measure. The DR programs cover residential, commercial, and industrial sectors. In each market sector, dollars spent/gross kW saved and dollars spent/participant were used to screen programs.

The level one screening allowed the Project Team to narrow the list of programs in the database down to 58 programs, distributed across the program categories, that achieved the highest performance results based on metrics defined for each category.

4.3.1 Summary of Best Practice Programs by Program Category

The programs that scored highest in the Project Team's level one screening analysis for each program category are identified in the tables below. These programs, selected from the 400 evaluated in the Project Team's analysis, achieved the highest results in the mix of performance metrics used to indicate program success in that category. Program summaries are provided in Appendix B. Table 13 through Table 19 list the best practice programs by program category.

Table 13. Equipment Rebate Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
DTE Energy	Residential and Small Business ENERGY STAR® Products Program	Residential	MI	2009
DTE Energy	Residential Multifamily Program	Residential	MI	2009
Idaho Power	Energy-efficient Lighting	Residential	ID	2009
Alliant Energy – Iowa	Residential Prescriptive Rebates	Residential	IA	2010
Southern California Edison (SCE); Pacific Gas & Electric (PG&E); San Diego Gas & Electric	High Efficiency Appliance Rebate Program	Residential	CA	2006
AEP Texas Central Company	Residential Standard Offer Program (SOP)	Residential	TX	2010
Entergy Texas Inc.	Residential SOP	Residential	TX	2009
SCE; PG&E; San Diego Gas & Electric	California Statewide Multifamily Energy Efficiency Rebate Program (MEERP)	Residential	CA	2006
Idaho Power	Heating & Cooling Efficiency Program	Residential	ID	2009
Nevada Power Company	Residential Energy-efficient Lighting	Residential	NV	2009

Utility	Program Name	Target Sector	State	Program Year
PG&E	Upstream Lighting Program	Residential	CA	2000-2006
Seattle City Light	$mart Business Program	Commercial	WA	2006
Xcel Energy	Lighting Efficiency	C&I	MN	2002-06
Southwestern Public Service Co	Small Commercial SOP	Commercial	TX	2010
CenterPoint Energy Houston Electric, LLC	Large Commercial SOP	Commercial	TX	2010
Alliant Energy – Iowa	Custom Rebates	Commercial	IA	2010
Idaho Power	Easy Upgrades	Commercial	ID	2009
Efficiency New Brunswick	Bright Ideas Commercial Lighting	C&I	NB Canada	2007

Table 14. Appliance Recycling Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
Alliant Energy	Residential Direct Load Control	Residential	IA	2010
Nevada Power Company	Air Conditioning Load Management Program (DR Program)	Residential	NV	2009
Idaho Power	FlexPeak Management	C&I	ID	2009
Oncor Electric Delivery Company	Commercial Load Management SOP	Commercial	TX	2010

Table 15. Audit and Direct Installation Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
NYSERDA	Residential Audit and Weatherization Program	Residential	MN	2009
National Grid	Retired Engineers Technical Assistance Program (TAP)	C&I	AK	2004-2008
Focus on Energy	Home$ense Program	Residential	NY	1992-2005
Idaho Power	Assisted Multifamily Building Program (AMP)	Residential	VT	2000-2005
AE	Multifamily Low Income Program	Residential	CT	1997-2002
Alliant Energy	Energy Opportunities Program	C&I	NY	2007
Xcel Energy	Flexible TAP	C&I	MA	2004-2007
NYSERDA	Whole Building Assessment/ Benchmarking	C&I	WI	2006

Utility	Program Name	Target Sector	State	Program Year
National Grid	Apartment and Condominium Efficiency Services	Residential	ID	2008-2009
Focus on Energy	Weatherization Assistance for Qualified Customers	Residential	TX	2009
Idaho Power	Free Weatherization	Residential	IA	2010
AE	Home Energy Audit & Insulation	Residential	MN	2010
CenterPoint Energy	Retro-Commission (RCx) Program	Commercial	TX	2010
Alliant Energy	Energy Lighting Efficiency Program	Commercial	MN	2003

Table 16. Education and Behavior Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
Idaho Power	Residential Energy Efficiency Education Initiative	Residential	ID	2009
AE	Residential Online Energy Analysis	Residential	TX	2010
Northwest Energy Efficiency Alliance	Energy Star Homes	Residential	WA	2009
City of Ames Electric Services	Power Watch	Residential	IA	NA
City of Waverly	House of Green	Residential	IA	2006
City of Westerville Electric Division	EnergySmart Westerville	Residential	OH	NA

Table 17. New Construction Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
Colorado Governor's Energy Office	Colorado ENERGY STAR® New Homes Program	Residential	CO	2009
We Energies	Energy Incentives from We Energies C&I New Construction Program	Commercial	WI	2008
San Diego Gas & Electric Company	Sustainable Communities Program	Commercial	CA	2004-2008
National Grid	Advanced Buildings Program	Commercial	RI	2007
Long Island Power Authority (LIPA)	Commercial New Construction Program	Commercial	NY	2006-2007

Utility	Program Name	Target Sector	State	Program Year
Alliant Energy – Iowa	New Home Construction	Residential	IA	2010
CenterPoint Energy Houston Electric, LLC	ENERGY STAR® Market Transformation Program (MTP)	Residential	TX	2010

Table 18. Innovative Financing Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
Alliant Energy	Performance Contracting	Commercial/ Industrial	IA	2001-2011
AE	Home Performance with ENERGY STAR® (HPwES) Loans	Residential	TX	2010-2011
Electric Cooperatives of South Carolina (ECSC)	Help My House Pilot Program	Residential	SC	2006-2007
Midwest Energy	How$mart	Residential/Small Commercial	KS	2007-2011
Manitoba Hydro	Power Smart Residential Loan	Residential	Canada	2001-2011

Table 19. Demand Response Best Practice Programs

Utility	Program Name	Target Sector	State	Program Year
Alliant Energy – Iowa	Residential Direct Load Control	Residential	IA	2010
Nevada Power Company	Air Conditioning Load Management Program	Residential	NV	2009
Idaho Power	FlexPeak Management	Commercial/ Industrial	ID	2009
Oncor Electric Delivery Company, LLC	Commercial Load Management SOP	Commercial	TX	2010

4.4 Level Two Analysis – Program Process Review

In the level two analyses, the Project Team conducted a qualitative review to gain insights into how the identified best practice programs achieved exceptional results. The Project Team assessed each program in detail and analyzed individual program attributes to identify best practice characteristics that differentiated the successful programs. This review entailed two evaluations of program best practices:

- ***Cross-cutting program best practices.*** These program features ensure effective program delivery and management, a high level of quality and customer satisfaction, and the achievement of strong participation and cost-effective energy savings results.

- ***Implementation level best practices by program category.*** Best practices program attributes relevant to specific energy efficiency program categories.

4.4.1 Cross-cutting Program Best Practices

The Project Team looked at each identified best practice program, as well as our accumulated literature review findings to assess best practice program features that are common across all program categories. These cross-cutting program best practices ensure effective program delivery and management, a high level of quality and customer satisfaction, and the achievement of strong participation and cost-effective energy savings results. Through this process, the Project Team identified cross-cutting program best practices in four categories: (1) program design, (2) program management, (3) program implementation, and (4) evaluation.

The Project Team leveraged best practices research sponsored by the California Best Practices Advisory Committee, a consortium of energy industry professionals, to help identify high-level best practices that cut across the vast array of utility energy efficiency program types.

Under each best practice category, the Project Team identified key best practices that utilities should incorporate into their program delivery strategies to ensure high quality and high-performing programs. The Project Team reviewed the identified best practice programs against the high level attributes defined by the California Best Practices Advisory Committee and against its research on market conditions among the Texas MOUs to determine which best practices would be most useful to the MOUs to address their identified internal delivery constraints, participation barriers, and programmatic priorities. Table 20 through Table 23 show the identified cross-cutting best practices in each category.

Program Design

Program design is critical to initiating a successful energy efficiency program. Good program design begins with clear program objectives and thorough understanding of market conditions. In other words, the design should translate energy efficiency program objectives into activities that appeal to customers and will work in the market. The design should articulate individual program components that will result in meeting the defined objectives. Program design elements should account for potential market barriers, include strategies to overcome them, articulate the steps involved in delivery, delineate management responsibilities and structures, and include details on individual measure savings, participation, and cost-effectiveness.

Table 20. Best Practices in Program Design

Best Practice	Rationale
Develop a well-designed and complete program plan	Consider all market actors in the program design, including the program administrator, trade allies, and the customers. Predetermine the program elements that may deter customer participation.
Link strategic approach and targets to policy objectives and constraints	Program strategic approach and target should be linked to policy objectives and constraints to help ensure the strategic and tactical approaches will lead to the desired results.

Best Practice	Rationale
Apply a well-articulated theory or program logic	Having defined program theory and logic can help define program goals, identify any gaps in program focus or effort, and bolster the justification for the program to decision makers. They can also provide a valuable resource to program administrator and trade allies in terms of clarifying and validating the program objectives and protocols.
Apply the stated theory to the program tactics	Articulating a program theory and basing program tactics on the program theory assures that programs are fundable, feasible, and capable of being evaluated.
Leverage national programs to increase the availability of energy-efficient products and expand marketing reach	Work with national efforts (e.g., CEE Tied products and EPA ENERGY STAR®) to increase the availability of energy-efficient equipment and leverage a common brand for customers and trade allies to associate with high-value energy savings.
Research the market and understand the local market condition	Exhaustive market research can inform the program design to align program goals with the interest of market players. The program should recognize and apply lessons learned from programs offered by other utilities and in other areas.
Always pre-test the market	Using a pilot model to offer the program at a small scale is a cost-effective method to determine whether any program components need to be revised.
Develop verification processes during the design phase	The verification process should be considered at the design phase to avoid inconsistencies and last-minute changes.
Involve stakeholders, including those who could benefit from the program, trade allies, and regulators / policy makers.	Including multiple stakeholders will bolster the plan's credibility, produce programs that reflect local market conditions, and improve deliverability from the perspective of a range of sometimes divergent viewpoints. A well thought-out plan will contribute to smooth program implementation. Get stakeholder buy-in through communication and collaboration.
Ensure both societal and non-energy benefits are included in cost-effectiveness calculations	People often neglect the non-energy benefits when evaluating cost-effectiveness. To gain support for programs, include societal and non-energy benefits in cost-effectiveness calculations. These benefits and the related program goals should be clearly stated in program plans.
Incorporate customers' and trade allies' feedback into the program design	Engage customers and stakeholders in the program design process to provide input and feedback on program structures and strategies.

Program Management

Program management can be further divided into sub-components of project management, reporting and tracking, and quality control.

- **Project Management**. The success of an energy efficiency program depends not only on how well the program is designed but also on how efficiently and effectively the program is managed. A well-managed program has clearly defined responsibilities and expectations for the program management team, contractors, and trade allies, as well as customers.

- **Project Reporting and Tracking.** To measure the success and effectiveness of energy efficiency programs, the sponsoring utility needs to carefully track participant and site information, equipment replaced and installed, contractor/vendor/installer information, and other data. These data are used to measure the program against goals and report to utility management and municipal oversight committees. A user-friendly electronic tracking and reporting system is invaluable to facilitate measurement and reporting.
- **Quality Control**. Each program should have a customized quality assurance and quality control approach based on best practices for that type of program. Quality control often includes some mix of data reviews; a random sample of site visits to ensure the integrity of measures and trade ally installations; other evaluations to assess the quality of program delivery, accuracy, and comprehensiveness of the collected project data; and process evaluations to assess customer satisfaction, market impacts, and the utility's reputation. A good quality control approach can also help recruit participants, while reducing free riders and outliers.

Table 21. Best Practices in Program Management

Best Practice	Rationale
Regularly check program progress to ensure the program is on the right track	By monitoring the program continuously the utility can make adjustments to address needs as they arise.
Utilize electronic work flow management and web-based communications	Publishing program information and applications on the web can increase efficiency, reduce administrative costs, and facilitate electronic tracking of program documents.
Work with cities and community-based organizations to promote energy efficiency	Partnerships can offer marketing leverage, credibility, and economies of scale, and can be used to promote programs, create education opportunities, demonstrate products, and sign customers up for programs.
Maintain flexibility to respond to changing market conditions	Markets can change rapidly. Energy efficiency programs need to be flexible enough to respond to market needs.
Foster good relationships with trade allies. Promote energy efficiency in trade ally association trainings, annual meetings, etc.	Trade ally promotion is more effective than mass marketing at generating project leads. Utilities that foster good relationships with trade ally communities have the most success in terms of program participation.
Maintain program stability and consistency; especially in nonresidential programs	A stable and consistent program offering will allow customers to plan for efficiency investments and give trade allies assurances that the program will be available over the long term.
Ensure program data accuracy through rigorous quality control	Program results can be easily distorted by inconsistent, inaccurate, or incomplete data. To ensure the credibility of program results, verify data integrity through a rigorous quality control process.

Best Practice	Rationale
Maintain regular, open communications with related program staff, contractors, and trade allies	Ongoing, consistent communications between and among all staff supporting a program helps to maintain consistency, allow for adequate planning, address unexpected events efficiently, and reduce the risk of problems due to lack of coordination.
Verify quality on all customer-facing program support staff	Program delivery contractors and trade allies should be required to undergo checks on both skills/competency and personal integrity before interacting with customers to avoid shoddy workmanship or poor customer satisfaction results.
Offer ongoing technical training to contractors and trade allies	To ensure measure installers are up to date on current installation protocols, provide technical training, at no cost, for participating contractors and trade allies
Use competitive procurement for all third-party program support	For programs that use outside support staff for measure installation, administrative processing, turnkey delivery, or other functions, use a competitive procurement process to ensure the best quality contractor at the lowest cost as well as to avoid conflicts with regulators, customers, and other trade allies and contractors.
Develop program manuals to define program rules, procedures, and responsibilities	Program manuals ensure all participants fully understand their roles and expectations and clearly articulate program rules and processes.

Program Implementation

Program implementation is further disaggregated into market outreach; participation process; and installation, measurement, and verification.

- **Market Outreach**. Effective program marketing is one of the key elements of best practices. Each program should have a semi-customized marketing plan that clearly articulates marketing channels, tactics, messaging, and target audience and also incorporates a diverse range of outreach strategies to increase the program's reach.
- **Participation Process**. Using a standardized, simple, straightforward, and user-friendly program participation process is an important best practice to encourage participation. Providing customer technical and/or program assistance can also contribute to an effective participation process.
- **Installation, Measurement, and Verification**. The installation process should be guided by sound program design and quality control protocols. Measurement and verification (M&V) are also important features of an effective program process. M&V protocols should be custom-designed for the specific program features and integrated with the installation and quality assurance process to ensure accurate savings and incentive payment (if any).

Table 22. Best Practices in Program Implementation

Best Practice	Rationale
Make the program participation process easy	A streamlined program participation process will help reduce unnecessary work for the program administrator and increase customer satisfaction.
Provide a range of measures and services, including those less likely to be installed.	Offering rebates for less common measures can increase energy savings for the program overall.
Use a whole-building approach to achieve maximum energy savings	Approaching the building as a system may achieve greater depth of energy savings but can dramatically increase the program's resource requirements. If this approach is adopted, additional time and budget may be required to integrate building systems, model interactions, and install measures.
Tie incentives to building performance	Custom incentives provide more flexibility than prescriptive incentives and can result in significant energy savings when applied to large C&I facilities with complex building systems and process measures.
Promote a life cycle cost/benefit perspective to encourage participation.	Quantify the program benefits using return on investment (ROI), health, and productivity. A clear presentation of this information can be persuasive.
Allow customers to submit program applications online or at outreach events	Complicated application processes are a barrier to some programs. Offering assistance at events or providing simple online forms makes the application process simple.
Promote messages that equate efficiency upgrades with home improvement	Marketing messages should increase customer awareness of the value of investments in residential energy efficiency and prompt them to act. Messages that appeal to homeowner's desire to improve property value and comfort are effective.
Make program participation part of a routine transaction	Promote energy efficiency as part of a home improvement routine, such as purchasing energy-efficient light bulbs or annual winterizing.
Use the program brand to differentiate energy-efficient homes from conventional homes.	Brands help capture the market value of energy efficiency and serve as a recognition mechanism for homeowners interested in the status efficiency gives their homes.
Cooperate with contractors to get the message out	One-on-one and word of mouth promotion is the most effective marketing and outreach strategy; and contractors, equipment dealers, and installers acting as program partners can serve as highly effective program ambassadors.
Use door-to-door marketing by a turnkey vendor to achieve a high penetration rate	Face-to-face marketing is an extremely effective marketing strategy and using a vendor that provides turnkey services can simplify program delivery.
Understand customer needs. Sell customer benefits first, then energy efficiency	The program proponents must understand the customer's needs first and then articulate the program benefits in a language the customer understands and finds compelling.

Best Practice	Rationale
Showcase properties that have completed program upgrades	Identifying and promoting properties with completed program upgrades can not only provide recognition to past participants (which in turn can compel them to "tell a friend") it also helps potential customers understand and "visualize" the benefits of energy efficiency upgrades.
Stimulate behavior change	Provide customers with the tools to stimulate key behavior changes, such as free CFLs or discounted programmable thermostats. This creates longer-term savings opportunities.
Use multilingual marketing materials	Multilingual marketing materials will help the utility reach a broader range of potential participants.
Provides customers with options for incentives or low interest financing	Allowing customers to choose between incentives or financing, or better, offering both incentives and financing, gives them greater control over their choices and can significantly offset the first cost barrier.
Support retailer involvement in promoting appliance rebates	Provide retailers with point-of-purchase (POP) marketing materials, in store applications, training, and other tools to encourage and support store staff promoting the program.
Offer instant rebates at the time of purchases	Instant rebates make customer participation easier than traditional mail-in-rebates.
Co-market programs	Customers making one efficiency upgrade are often likely to do even more. Use customer interactions in programs as opportunities to promote other energy efficiency or DR opportunities.
Provide program marketing materials to each customer on an annual basis	New residents are potential program participants. Provide energy efficiency materials to every customer on a regular basis. This will help keep program opportunities at "top of mind" so that customers will recall the program when they are most in need of the efficiency product or service the program offers.
Offer zero-percent or low-cost financing to offset high capital cost of energy-efficient equipment	Zero-percent or low-cost financing, with convenient terms and short repayment periods, can improve customer acceptance rates by overcoming the high capital cost of energy efficient equipment.
Offer OBF to overcome the split incentive barrier	OBF allows customers to pay for measures over time using the utility bill as the vehicle for repaying the loan. The payments are transferred to new tenants when the property changes hands.

Program Evaluation

Program evaluations typically fall into two categories: process and impact evaluations. Process evaluations typically use surveys, interviews, focus groups, and/or site visits to assess the program's performance from a process standpoint. Impact evaluations rely on quantitative data collection to assess to what degree the program has met its savings, participation and other quantifiable goals. Impact evaluations typically use measured data, engineering reviews, and/or mathematic models to calculate savings.

Table 23. Best Practices in Program Evaluation

Best Practice	Rationale
Regularly check program progress to ensure it is on the right track	Monitor the program continuously and adjust it if any needs come up.
Develop inspection and verification processes during the design phase	The verification process should be considered at the design phase to avoid inconsistencies and last-minute process changes.
Evaluate the program data annually and address the high priority issues.	Routine verification and tracking of related data is important to ensure accurate calculation of energy savings associated with each measure as well as customer satisfaction. Review the program tracking database annually to ensure the database calculates program impacts accurately.
Perform market assessments and impact evaluation regularly though not necessarily annually	To address market changes, evaluate, and track long term market effects. Market impact evaluations should occur concurrently with program changes.
Estimate free ridership and spillover	Evaluations that include net-to-gross and spillover modules can help utilities confirm savings results and understand the sources of program delivery issues. Efforts to reduce free ridership will ensure the program generates savings for the utility without paying for unnecessary measures.
Evaluation metrics should correspond to program goals	The evaluation should assess the program progress against the predetermined goals, so evaluation metrics should be designed accordingly.
Choose an experienced evaluator with an understanding of the market context in which a program operates	The program evaluator needs to fully understand the program dynamics. Clear communication between implementation staff and the evaluator is very important.
Incorporate evaluation recommendations into the program	To the extent possible, all evaluation recommendations and lessons learned should be used to improve the program performance.
Use PUCT-approved baseline documents to determine appropriate energy impact and incremental cost benchmarks	Use PUCT baseline to ensure the measure saving calculation is correct and easy to follow.
Conduct customer satisfaction surveys to get feedback from customers. Show survey results to the public.	Customer surveys can provide valuable suggestions to improve program processes. Sharing survey results can help spread the program's message and convince more people of the benefits of the program.
Develop a baseline document that provides guidelines for benchmarking energy impacts and incremental cost calculations	Establishing appropriate baselines for calculating energy saving will help ensure the accuracy of energy savings calculations. A baseline document can also help program staff determine project impacts with greater certainty.

4.4.1.1 Level Two Benchmarking Metrics

To facilitate the Program Team's review of the 58 identified best practice programs, the Project Team sought to answer several researchable questions pertinent to meeting the qualitative criteria above. These factors also helped the Project Team cross-reference best practice attributes with Texas market conditions and identify those attributes that are transferable to Texas MOUs' Long-Term Energy Efficiency Plan. The Project Team used the benchmarking metrics and researchable questions listed in Table 24 below to assess each program's success in achieving the qualitative criteria.

Table 24. Level Two Analysis Benchmarking Metrics

Benchmarking Metrics	Researchable Questions
Market impact	How has the program impacted the market? Has the program achieved an unusually high level of participation or market penetration? Has the program instigated an increase in skilled technicians in the region to facilitate delivery?
Customer service and satisfaction	Qualitative measure of customer satisfaction and program delivery success.
Operations and delivery	What key implementation factors contribute to program success? Are the program's operational requirements consistent with the MOUs' capacity to deliver them?
Innovation	Is there something unique about the program that differentiates it and perhaps makes it more successful or effective than other similar programs?
Transferability and scalability	Can the program be replicated for a municipal utility?
Overcoming barriers	Does the program overcome market barriers in certain customer sectors or segments to achieve good penetration where other programs have failed? Does the program overcome barriers common among Texas MOUs?

4.4.2 Implementation-Level Best Practices by Program Category

In addition to identifying cross-cutting operational and management best practices, the Project Team sought to drill down to implementation-level best practices appropriate for specific program types that would be appropriate given MOUs' market and operating characteristics and that would help drive strong program results. Specifically, the Project Team wanted to identify best practice attributes that would:

- Support high quality programs at a lower average delivery cost by leveraging external resources and economies of scale where available
- Be relatively simple to implement and limit utility staff resource requirements
- Be relatively simple to participate in and help overcome customer barriers
- Generate strong participation and savings results
- Continue and enhance MOUs' strong local relationships and records of customer service

- Educate customers so that energy efficiency becomes a key factor in their purchasing decisions

To identify implementation-level best practices for specific program types, the Project Team conducted general research on each of the seven identified program categories to determine best practice program attributes considered to be key to program success. The Project Team's research into the programs that scored highest in the level 1 screening helped inform this research, as did the Project Team's extensive experience designing, supporting, and evaluating utility energy efficiency programs around the country. Each summary below highlights the important features and practices that the Project Team identified for each program category.

4.4.2.1 Equipment Rebate Programs

Equipment rebate programs provide incentives to customers who purchase and install qualified energy-efficient equipment. The Project Team evaluated equipment rebate programs that use four primary incentive structures: prescriptive rebates, custom incentives, upstream buy-downs, and dealer spiffs.

Prescriptive Rebates

Prescriptive rebates have been mainstays of utility energy efficiency program offerings for decades and continue to generate high energy savings at the lowest administrative and delivery costs for many utilities. One of the primary reasons prescriptive programs are so popular is that they are straightforward to deliver and simple to participate in. The rebate/incentive is typically structured as a fixed amount for pre-approved measures or services.

Custom Incentives

Custom incentive programs are often incorporated into utility DSM portfolios, specifically targeting large C&I customers. Custom programs use a performance-based incentive structure that provides customers with a calculated rebate amount based on either their total investment or on their kWh savings for installing single measures or for installing larger, more comprehensive projects. Because custom projects are often large, complicated, and entail significant documentation requirements, best practice custom programs typically provide some level of technical support integrated with the installation incentive to help customers pay for the cost of facility audits or project engineering.

Upstream Buy-down

Upstream buy-down programs provide the utility incentive directly to the manufacturer so that customers purchasing the measure receive the incentive at the time of purchase and no further action is required on their part. Upstream programs have become an extremely popular and effective mechanism for delivering residential lighting programs. Upstream lighting programs achieve energy savings at a very low cost and can provide a substantial proportion of a utility's energy savings requirements. One disadvantage to upstream programs is that customers often do not realize the measure has been discounted nor do they generally associate a discount with the utility. However, this disadvantage is outweighed by the enormous savings potential and low cost provided by this delivery mechanism.

Dealer Spiffs

Dealer spiffs are incentives to a manufacturer or vendor. Best practice programs in the equipment rebate category recognize that external vendors, installers, dealers, or other trade allies represent a utility's most valuable and most effective program marketing tool. Dealer spiffs are offered as a way to encourage trade allies to promote the utility program to their customers and are sometimes offered in conjunction with a customer rebate. For example, when an HVAC contractor up-sells his customer to a higher efficiency new central air conditioning system, the utility provides a small incentive to the contractor in addition to the customer's larger prescriptive rebate. This model works well in areas where utility DSM programs are new and trade allies may not understand the benefits of selling higher efficiency equipment.

Regardless of the incentive structure, equipment rebate programs benefit from incorporating some of the following best practices.

- Maintain program design flexibility and make changes in the program design to accommodate market trends, unanticipated bottlenecks or barriers, customer barriers or other factors as they come up.
- The program offers benefits to, and fosters good relationships with, the trade allies such as equipment dealers, installers, and contractors, and regards them as significant partners. Benefits may include technical or program training, co-branding or other marketing support, ongoing technical support and incentives.
- Program marketing and outreach includes:
    - ✓ Collateral such as program brochures, flyers, and FAQs
    - ✓ Community partnerships and outreach to customers, trade allies, new home builders, advocacy groups, local government agencies, and nonprofit organizations.
    - ✓ A program website that details customer and measure eligibility, incentives, participation procedures, and application forms.
    - ✓ Community-based and social marketing such as attending community events, hosting community workshops or meetings, sponsoring local activities, and engaging in online social marketing through social media such as Facebook, Twitter, and LinkedIn.
    - ✓ Participation in industry-related meeting and events, workshops, and other technology or trade ally-focused activities.
    - ✓ Key account managers and business consultants are given targets and incentives to actively promote the program to mid-sized and large C&I accounts.
- Program applications capture all data necessary to evaluate energy savings performance in a simple, easy-to-use format.

- Provide customers with several application mechanisms such as mail-in rebates, online rebate applications and submittals, or instant rebates that are immediately credited to customers at the time of purchase.

- Set incentives at levels appropriate to encourage high participation among the target population, achieve penetration in HTR markets, and maintain cost-effectiveness.

- Provide technical assistance to customers and trade allies to support compliance with program protocols; accurate reporting; and thorough, high-quality energy audits and technical studies that capture deep energy savings opportunities.

- Perform installation inspections to ensure quality of work is maintained throughout the program.

- Conduct process evaluations to uncover barriers, bottlenecks, and potential program enhancements.

- Evaluate program cost-effectiveness periodically to ensure program goals are met.

4.4.2.2 Appliance Recycling

Appliance recycling programs are designed to help residential customers reduce their energy consumption by removing an existing, inefficient appliance when they purchase a new one or choose to eliminate a second unit, and disposing of the unit in an environmentally responsible manner. Best practice appliance recycling programs provide multiple benefits to customers, typically including:

- Free pickup and hauling of unwanted appliances
- Financial incentives for the removal of appliances
- Safe disposal of all potentially harmful materials in appliances
- Energy savings

Appliance recycling programs primarily target refrigerators; however, many programs also offer recycling services for stand-alone freezers and room A/Cs. Because recycling appliances requires considerable infrastructure needs and specific expertise associated with safe handling and disposal of potentially toxic materials, as well as staff dedicated to pick up and hauling, utilities by-and-large use third-party implementation contractors to deliver their programs. There are two major appliance recycling contractors serving U.S. utilities: JACO Environmental (http://jacoinc.net/) and ARCA Incorporated (http://www.arcainc.com/). Both companies use similar delivery and operating strategies but are able to customize individual programs based on the utility's specific needs. Best practices for appliance recycling programs include:

- Marketing through bill inserts and mass media advertising.

- Creating retail partnerships to promote recycling at the time customers are purchasing a new appliance. Many utilities leverage these partnerships to provide in-store POP materials and program information, train store employees, and allow customers to schedule their appliance recycling pick-up at the time the new unit is delivered.

- Co-promote the appliance recycling program message with other utility, state, or federal incentive programs targeting high-efficiency new appliances, other energy efficiency measures, and DR.

- Cross-promote the recycling program to customers who have received a rebate on a new appliance.

- Offer online appointment scheduling, pick-up on Saturday, and strive to pick up units within one week of scheduling the appointment.

- Conduct random inspections of recycling services contractors to ensure program compliance.

- Active involvement from the program administrator and ongoing communication with the implementation contractor.

- Conduct customer surveys to ensure that units were picked up as reported by the program implementer, incentive was received, and pick-up personnel were professional and courteous. Surveys also help to ascertain customer satisfaction.

4.4.2.3 Audit and Direct Installation

Audit programs vary in their scope and application, but in general the objective of an audit is to evaluate energy consumption to determine ways in which energy can be conserved. Utility-sponsored energy audit programs can target both residential and commercial sector customers. Some programs aim to merely educate and inform customers. Others are more comprehensive in scope, designed to not only inform but to help customers implement the recommended energy efficiency measures. In many cases, utility-sponsored energy audit programs include a direct installation mechanism, whereby the auditor installs measures in the home or business at the time of the audit. This approach generates instant energy savings and can help foster good will with the customer. Residential program measures may include but are not limited to lighting, HVAC, appliances, low-flow shower heads and aerators, and building shell measures. Business measures may add refrigeration, motors, compressed air, and technical assistance services that may include, but are not limited to, training, energy modeling, and design.

It is important to remember that an audit in and of itself does not generate energy savings. It merely serves to educate and inform, paving the way for a more tactical approach to improving the energy efficiency of a home or business. Successful audit programs however, find a way to move the customer from awareness to action. Best practice programs include tactics that result in actual measure installation: replacing, retrofitting, and/or improving existing equipment and controls. Program sponsors use a variety of approaches to achieve this goal, including:

- Direct installation

- Generating instantaneous results that include calculated energy consumption metrics and customized efficiency recommendations with calculated energy savings and ROI information

- Capturing customer’s written commitment to proceed with recommended measure installation, through a work order or bid documents

- Coupling audits with rebates and incentives to reduce cost barriers

- Conducting follow up after the audit to enquire when customers intend to make recommended improvements and to support a continuous improvement process, through surveys, email, telephone, or through the contractor
- Providing information about energy efficiency and conservation in general, to encourage customer's ongoing attention to energy-efficient behaviors and decision making

It should be noted that the audit and direct installation program category also includes low-income weatherization, which, while technically entailing residential energy efficiency assessments and comprehensive direct installation mechanisms, are not subject to the same barriers and delivery constraints as a traditional audit program, since they are typically 1) comprehensive, whole home solutions; 2) entail no out–of-pocket costs for qualifying customers to install recommended measures; and 3) are typically implemented through a central, statewide entity adept at reaching customers and leveraging energy savings to their full extent.

The programs identified through the Project Team's research are all successful audit/direct install programs from across the country that employ various approaches to derive energy savings. The programs utilize many of the same best practices and were chosen to help inform MOUs looking to develop new audit/direct install programs in Texas. The best practice characteristics from these programs should be considered when developing or looking to improve existing audit programs. The best practice characteristics include:

- Program theory and design is well documented and amenable to replication.
- The cost to implement the program is beneficial in comparison to the actual energy savings (kWh/therms) generated by the program.
- Program demonstrated the ability to deliver immediate and long-term energy savings as well as health and safety benefits.
- Program delivers high quality of services to their customers and quality control/verification plays an important role in program success.

Each of the identified programs are well thought out and managed. and practice consistent, accurate reporting and tracking. In addition, regular program evaluations inform program managers on how they may improve the program and recommendations are incorporated into program design. These characteristics have helped each of the programs below provide consistent, measurable, environmental and human health benefits and should serve as good examples for Texas MOUs.

4.4.2.4 Education and Behavior

There are many different types of programs and initiatives used to educate consumers on energy-efficient behaviors and practices. Educational programs differ in cost, administration, and implementation, but all have similar goals. Program types range from community demonstration projects, home energy reports, energy kits, events, online tools, technical and facilities training, and outreach programs (school-based or workplace). All are meant to help change individual' patterns of energy use and encourage ongoing, consistent energy-efficient behaviors (e.g., turning off lights when leaving a room, adjusting the thermostat, etc.) and consideration of energy efficiency options in purchasing decisions and lifestyle choices to create a lasting effect.

The Project Team reviewed six educational programs including mass media/broad-based campaigns, online analysis tools, online energy management, proven EPA-backed programs, community engagement, and school-based programs. All of these programs worked well in markets where they were deployed. One of the most important things a utility implementing new education and behavior programs can do is conduct thorough due diligence. Utility staff should carefully consider their target market to identify the barriers necessary to overcome. Set objectives and metrics for success in the beginning and check them throughout the implementation phase. Understand the target audience and develop appropriate messages to help meet the program's goals. Strategies for reaching audiences vary, but messaging and targeting play major roles. Best practices for education and behavior programs include:

Messaging

- Use positive, fact-based, credible communications to overcome perception barriers about energy efficiency.
- Ensure the educational messages are audience-specific and include a call-to-action.
- Help consumers understand that energy savings equals money saved.
- Use messaging that addresses barriers while raising awareness of the program's attributes and benefits.
- Speak to customers on their own terms using regional mindsets and terminology.

Targeting

- Conduct consumer surveys to identify key attitudes, barriers, and preferences among the target population.
- Leverage available market intelligence to identify audiences most likely to act, and design marketing strategies based on their needs, preferences, attitudes, and behaviors.
- Engage early adopters/prospects and move on to less-disposed audiences, using each captured group as a platform for normative messaging to engage next group.
- Maintain focus on the end goal.
- Build momentum to create a bandwagon effect. A phased approach sometimes works best.

Tactics

- Use normative messaging that conveys energy efficiency as a social norm (e.g., "all of your neighbors have participated in the energy challenge, why haven't you?") to encourage customers to participate in a program or adopt the desired energy efficiency practice or behavior.
- Encourage customers to commit or pledge to take action. Pledges have been shown to be a powerful social driver; research shows that once a person makes a commitment, especially publicly, he or she is much more likely to follow through than if he had not made a formal agreement.

- Offer recognition for participants' contribution. Recognizing residents who demonstrate the desired behavior (i.e., participating in the program) can be a key motivating factor in getting those customers to share their experience with others, which reinforces normative messaging and creates a powerful word-of-mouth continuum.

Educational programs continue to evolve rapidly as technology and markets transform. For instance, many utilities have begun implementing smart grid technology, but consumers don't understand what it is or how it works, and so far, have very little interest in it. Smart grid technologies, unlike other products, like cell phones, iPods, and global positioning system (GPS) units do not have mass appeal. To capitalize on smart grid's full potential, consumers must be informed about its uses, and convinced that using it will offer benefits that outweigh the cost of participating. Educators and marketers need to be careful to select educational campaigns that both promote widespread technology awareness and understanding, but also convey the benefits of its use.

4.4.2.5 New Construction

The best practices in new construction programs have proven to be effective in creating a more energy-efficient new building stock, showcasing new technologies, and supporting the adoption of more energy-efficient building practices throughout a region. The key elements of the best practice programs are training, technical assistance, and financial incentives, regardless of whether the program is commercial or residential. In addition, many of the programs are built on a national model, allowing program sponsors to leverage the national program's economies of scale and expertise, and apply their own limited resources more effectively.

Among the programs identified as best practice examples in the Project Team's research, incentives are the most prominent component. The incentives offered were based on three different models: 1) prescriptive, 2) performance based, and 3) capital cost offset.

- Prescriptive incentives offer predetermined incentives for the installation of prequalified equipment or design strategies.
- Performance-based incentives are typically determined based on the project's projected energy savings, a Home Energy Rating System (HERS) rating in residential projects, or the estimated savings resulting from a specific higher efficiency measure installed.
- Capital cost offset incentives are designed to encourage projects to implement more aggressive energy-efficient strategies by providing financial support to offset higher initial capital costs.

In addition, most of the programs included a tiered incentive structure. A tiered structure provides programs with two advantages. It can effectively support wide scale adoption of nonstandard, higher efficiency, and more expensive strategies. In addition, it builds flexibility into the program to allow program designers to easily phase out technologies or efficiency targets as they become standard practice.

Training and technical assistance were also key in the best practice programs. Depending on the program goals, some include technical assistance for design teams to create showcase projects that highlight what is possible. Others provide industry training on the construction of high performance buildings to facilitate the adoption of better building practices across the board.

Many of the programs leveraged existing national programs (ENERGY STAR®, Advanced Building™ Guidelines, and LEED®). Because these programs have already developed sound concepts, technical rigor, and administration processes, program administrators can focus their resources on other aspects of the program. In addition, the association with a recognized national program can lend credibility to homebuilders and homeowners as well as immediate market recognition.

Some of the practices in national programs can be easily implemented as a stand-alone program, such as an ENERGY STAR® Home program. Some utilities, however, use national programs as one element of a suite of offerings, as Arizona Public Service's (APS's) ENERGY STAR® + Solar Homes - Builder Incentives program does, building on the utility's existing ENERGY STAR® Homes Program**.** In some cases, such as the State of Colorado Governor's Energy Office's ENERGY STAR® New Homes Program, a state-sponsored entity creates economies of scale across regions, to support local and regional initiatives.

4.4.2.6 Innovative Financing

The upfront cost of energy upgrades is a major obstacle for many property owners who might otherwise make improvements. Financing can offer an attractive solution to this problem. If financing is properly structured, monthly loan payments are smaller than the savings produced by the installed efficiency upgrades, generating positive cash flow for the property owner even before the financing is paid off. Structuring the financing to minimize the payment size is a practice common to all financing programs. It is accomplished via two variables:

- *Low Interest Rates.* While a zero percent rate might provide an incentive to action, rates of up to 7 or 8 percent are generally considered acceptable. The interest rate is often determined by a financing program's cost of capital, so finding a low-cost source of capital, or a partner willing to subsidize a lower interest rate, can be a major focus of program development.
- *Long Loan Terms.* The loan term has a larger impact on the payment size than the interest rate. For small projects and improvements that pay for themselves quickly, terms of 3 to 5 years are common. For larger projects involving deeper retrofits, terms of 10 to 20 years are more desirable.

Other best practices of a financing program may include:

- *Broad Eligibility*. While homeowners and businesses with excellent credit may be able to secure financing on their own, the recession and widespread loss of property value are preventing many from qualifying for loans. A common utility program goal is to offer financing to average customers who are unable to obtain financing in the current economic environment.
- *Off-Balance-Sheet Financing.* Many businesses, and even some homeowners, are reluctant to use their limited borrowing capacity for projects that are not critical to their plans. Certain financing programs, such as tariff-based OBF, can address this concern. Midwest Energy's How$mart program, identified as a best practice program, is a good example.
- *Solving the "Split Incentive" Problem*. In tenant-occupied properties, where the tenant pays the utility bill, landlords have little incentive to pay for improvements that will only

result in savings for the tenant. Similarly, tenants are usually reluctant to pay for improvements to a property they do not own. OBF solves this problem by putting both the savings and the monthly loan payment on the same bill.

Financing programs continue to evolve rapidly as utilities and other stakeholders try different combinations of target markets, capital sources, loan security, credit enhancement, and more to find the right program model to fit their customers' needs and internal operating conditions. However, some common themes seem to be emerging:

- *Third-Party Lending.* Many utilities have been uncomfortable with financing programs that put them in the role of lender. Most new financing programs are designed to create and leverage relationships with lenders that are responsible for providing the capital, originating and servicing the loans, etc. AE's HPwES loan program is a good example of this.
- *OBF*. This finance model is gaining momentum as more states, communities, and utilities are recognizing its unique advantages in terms of off-balance sheet financing and overcoming the split incentive barrier.
- *Performance Contracting*. For the commercial sector, performance contracting can offer an inexpensive option to encourage and support energy efficiency improvements. The Alliant Energy program is an example.

Financing will remain an evolving opportunity for utilities and communities in the foreseeable future. Smaller utilities and public utilities, like IOUs, are beginning to explore innovative financing program models, and both state and national efforts are beginning to emerge in support of these programs. For instance, federal legislation has been re-introduced this year that would enable the U.S. Department of Agriculture to loan low-interest money to rural electric co-ops that could be used in turn to make low-interest loans to customers (www.govtrack.us/congress/bill.xpd?bill=s112-1000). The legislation would expand on existing programs that may already be of interest to rural co-ops (www.rurdev.usda.gov/RD_Loans.html; www.rurdev.usda.gov/UEP_HomePage.html). A good resource for information and new developments regarding financing programs can be found at the DOE Solution Center (http://www1.eere.energy.gov/wip/solutioncenter/).

4.4.2.7 Demand Response

DR programs help to reduce upward pressure on rates for all customers, whether they are participants in the programs or not, by lowering peak demand and minimizing high capacity costs during peak demand periods. The Project Team's research looked at DR programs in both the residential and commercial sectors.

Residential DR programs can be subdivided into two categories: direct load control (DLC) and pricing-based programs. DLC programs have been in existence for nearly 30 years. Pricing programs are much newer. Interval metering has been a limiting factor to their widespread use; utilities cannot utilize time-varying rates if they can't measure energy consumption over specific time periods. With the advent of advance metering infrastructure (AMI) and smart grid, utilities are beginning to gain that ability.

With regard to residential DR program best practices, DLC's longevity in the market and record of successfully curtailing large quantities of residential DR load gives it a leg up in terms market acceptance and accumulated learning. However it is important to note that because pricing programs are still relatively new, their history of specific best practices is less robust than that of DLC programs, not because they do not exist, but because the market hasn't yet had time to fully test the approach.

Residential DLC programs generally use DLC technologies to reduce system peak demand by controlling central A/Cs. These programs offer customer incentives in return for their permission to cycle their equipment off for brief increments (typically 15 minutes of every half-hour) during peak demand periods. Customers rarely notice a difference in the comfort of their homes, applying for the program is simple, and once they agree to participate, DLC programs require little to no effort on the customer's part.

Residential pricing programs vary the per kWh rate that customers pay for electricity. Rates during peak demand periods are higher than those during off peak periods. In time-of-use (TOU) programs rates vary during specific hours of the day, but generally do so in the same manner on a daily basis. In dynamic pricing programs, the per-kWh price will vary not only during the day, but also from day to day as DR events are called. Pricing programs can vary tremendously from utility to utility, and experimental evaluation is generally the most appropriate way to ensure that the correct pricing structure is in place for a specific utility's customers.

A major difference between traditional DLC programs and pricing programs is that DLC programs primarily use control switches installed on central air conditioning systems, while newer pricing programs use smart thermostats. Benefits of using smart thermostats include potential for energy efficiency savings (in addition to demand reduction), greater customer acceptance, an added marketing incentive, increased program flexibility, and improved customer awareness. Many customers feel that smart thermostats allow them to retain control of their own homes. Gaining customer acceptance for DLC switches has been challenging in some programs because customers view them as giving the utility control over their A/Cs. Some customers may find a smart thermostat combined with a pricing program a more attractive alternative. Some drawbacks of smart thermostats include a slightly higher installation cost, increased potential for device trouble shooting, and the challenge of gaining access to a customer's home.

Best practices for residential DR programs include:

- Provide each new participant with detailed program materials that explain the program, why it is necessary, what the alternatives are (e.g., higher rates, building more power plants, etc.) and offer tips to help consumers manage peak demand voluntarily (e.g., doing laundry at night). Utilities should also use this opportunity to provide materials on energy efficiency program opportunities.
- Use a combination of marketing methods and utilize multiple messages that appeal to financial, environmental, community, and reliability motivators.
- Provide customers with an opportunity to choose between DR programs (DLC or AMI), but make sure that the decision-making process is not too cumbersome.
- Distribute or support technologies that make participation in DR easy for the customer. Automated control, either through DLC or pricing programs, can ensure that customers continue to participate.

- Encourage customers to utilize DR on multiple appliances to gain additional benefits. Traditional DLC programs can be used to control central A/Cs and electric water heaters. With a smart grid system, the DR opportunities grow to include those and other appliances in the home, such as lighting, clothes washers and dishwashers, electric dryers, refrigerators, and other plug loads.
- Adopt a regular schedule to test appliance cycling devices in the service territory and replace any that are missing or not functioning. Traditionally this can be a time-consuming process as each installation must be field verified. However with a smart grid system the devices can be tested remotely.
- Offer a large enough participation incentive to gain customers' interest; continue to provide an incentive each year the customer participates.
- Conduct customer satisfaction surveys to gather information on program barriers and bottlenecks and solicit feedback from customers.
- Provide annual feedback to customers describing the system-wide benefits of the program and thank them for making a difference.

Commercial and industrial sector DR programs, often referred to as *load curtailment* programs, are generally more complicated, customer-specific, and flexible than residential programs. In the best practice programs that the Project Team identified, incentives were paid to aggregators who work with the utility to identify peak reduction opportunities, and who worked with C&I facilities to help them reduce peak demand during curtailment events. Customers can use a variety of load curtailment strategies such as peak shaving, load shifting, and alternative on-site generation during peak events. Utilities often provide additional incentives, such as technical support and installation of on-site energy management system software that allows customers to monitor their electric loads, track and manage their energy consumption and costs, and communicate more easily with the utility.

Best practices for nonresidential curtailment include:

- Provide customers with no-cost, flexible, and intuitive tools that include a sophisticated optimization engine. These software-based tools can be utilized for planning and analyzing the peak load impacts of DR resources for both long-term and short-term optimization.
- Provide customers with the flexibility to curtail load in whatever way is most cost-effective and feasible for them.
- When alternative generation is allowed, require that on-site generation equipment meet all applicable environmental and interconnection standards.
- Conduct program operation tests prior to the start of the curtailment season to ensure communications, implementation, and tracking systems perform correctly.
- Strive to notify customers of curtailment events 24 hours in advance and never give less than a 2 hour notice of curtailment events.
- Use monitoring software to monitor load levels in near real-time during curtailment events and follow-up immediately with customers that do not perform as expected.
- Maintain consistent, open communications with implementers and customers.

- Program implementers or key account managers provide technical support to help customers identify their load reduction potential and advise them on curtailment strategies.
- Conduct customer satisfaction surveys to identify program barriers and bottlenecks and get feedback from customers.

4.5 Applying Best Practice Programs and Features to Local Conditions

After the program performance (level one) and process review (level two) screens, the Project Team was able to identify a set of best practice energy efficiency programs and program attributes that contributed to high quality and high-performing programs. However, the best practice programs and best practice attributes suitable for one specific utility's service territory do not necessarily apply to another utility. The study team found that significant variability among utilities in terms of their specific market and operating environments make a "one-size-fits-all" program design inappropriate. Important differences in utility conditions included:

- Customer sector breakdown
- Experience designing, managing, implementing, and evaluating efficiency programs
- Funding resources
- Utility infrastructure and delivery capacity
- Existing market conditions and trends
- Regulation and policy support of energy efficiency concepts
- Availability of skilled trade allies or contractors that stock and install qualifying measures
- Customer awareness of energy efficiency impacts and benefits
- Community's reception level to energy efficiency programs

Given this variability, an important outcome of this Guide was to tailor the best practices to the market conditions among Texas MOUs, based on their identified internal delivery constraints, participation barriers, and programmatic priorities.

4.5.1.1 Program Attributes Matched to Local Market Variables

The Project Team further cross-referenced specific best practice attributes in terms of their ability to address various market barriers, utility constraints, and decision-making trends among the participant MOUs.

The Project Team's statistical analysis of MOU interview responses, feedback, and market data allowed us to identify the most prominent operating conditions and market characteristics, efficiency potential, barriers and constraints, and priorities and goals within the MOUs' territories. Based on our understanding of these local factors, the Project Team identified specific programs best suited to Texas MOUs. Table 25 on the following page displays the results of this cross-referencing process.

Further, the Project Team evaluated specific best practice program attributes that were found to be key factors in program success against the findings from our research on MOUs' local markets and internal program delivery practices, constraints and goals. The Project Team recommends MOUs carefully consider the identified specific program in the development of their energy efficiency programs. Table 26 displays the recommended program attributes.

Table 25 . Energy Efficiency Programs Matched to MOU Market Conditions

Market Sector	Best Practices Program type	Operating Conditions					Market Characteristics					Efficiency Potential					Barriers and Constraints					Priorities and Goals			
		Limited Energy Efficiency staff resources	In house delivery & management	Demand constraints	Collaborative model	Limited experience with Energy Efficiency programs	Significant residential sector	Significant small commercial sector	Significant commercial demand	Significant industrial demand	New construction growth	Residential cooling	Building shell	Lighting	Kitchen appliances	Commercial HVAC	Lack of funding resources	Lack of awareness	Lack of staff resources	High upfront cost of equipment	Split incentives	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Residential	Equipment Rebates	X	X			X	X					X			X				X	X		X			
	Lighting	X	X		X	X	X							X								X			X
	Appliance Recycling				X		X																		
	Audit and Direct Installation		X				X						X	X				X		X				X	
	Education and Behavior		X				X										X	X		X				X	X
	New Construction						X				X														
	OBF				X		X					X	X		X		X			X	X				X
	DR			X			X					X											X		

Market Sector	Best Practices Program type	Operating Conditions					Market Characteristics					Efficiency Potential					Barriers and Constraints					Priorities and Goals			
		Limited Energy Efficiency staff resources	In house delivery & management	Demand constraints	Collaborative model	Limited experience with Energy Efficiency programs	Significant residential sector	Significant small commercial sector	Significant commercial demand	Significant industrial demand	New construction growth	Residential cooling	Building shell	Lighting	Kitchen appliances	Commercial HVAC	Lack of funding resources	Lack of awareness	Lack of staff resources	High upfront cost of equipment	Split incentives	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Commercial	Equipment Rebates	X	X			X		X	X	X	X			X		X			X			X			
	Small Commercial Audit/Direct Install							X						X		X				X				X	
	New Construction										X														
	Custom Incentives								X	X										X		X			

Table 26. Energy Efficiency Best Practices Matched to MOU Market Conditions

Best Practice List	Utility Constraints						Customer Participation Barriers									Priority and Goals			
	Lack of funding resources	Lack of knowledge	Lack of decision maker support	Lack of awareness	Lack of staff resources	Few dealers offering high efficiency products	High upfront cost of equipment	Split incentives	Understand long term value	Environment awareness	Qualifying measures	Qualified vendors	Lack of skilled contractors	Participation time-consuming	Lack of directions	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Apply a well-articulated theory or program logic to program tactics. Develop a well-designed and complete program plan.		X							X						X				X
Conduct market research on customer demographics to guide effective marketing strategies.									X						X				X
Pre-test the market, stimulate key behavior changes, and maintain flexibility to respond to changing market conditions.	X	X		X			X		X	X	X	X	X		X			X	
Involve stakeholders, trade allies, and regulators/policy makers in program design.	X		X	X		X													
Leverage national efforts (e.g., CEE, EPA) to increase the availability of energy-efficient products.	X		X			X	X		X							X	X	X	
Maintain program stability and consistency in all sectors.									X										
Leverage efforts of other programs to promote program benefits, including ENERGY STAR® appliances and homes.		X		X			X		X									X	
Use POP marketing and door-to-door canvassing to increase penetration rates.				X					X	X					X			X	

Best Practice List	Utility Constraints						Customer Participation Barriers									Priority and Goals			
	Lack of funding resources	Lack of knowledge	Lack of decision maker support	Lack of awareness	Lack of staff resources	Few dealers offering high efficiency products	High upfront cost of equipment	Split incentives	Understand long term value	Environment awareness	Qualifying measures	Qualified vendors	Lack of skilled contractors	Participation time-consuming	Lack of directions	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Understand customer needs. Sell customer benefits first, then energy efficiency. Offer the program participants a bill guarantee.				**X**					**X**										
Combine mass marketing for the full portfolio of programs.				**X**					**X**	**X**								**X**	
Work with cities and community-based organizations to promote energy efficiency.				**X**	**X**														
Promote energy efficiency in trade ally association trainings, annual meetings, etc.				**X**	**X**														
Showcase properties that have completed program upgrades.				**X**						**X**					**X**			**X**	
Screen and train contractors. Make sure project inspectors have the training and experience required for the task.													**X**		**X**				
Write measure specifications using “contractor-friendly” language and train contractors on expectations. Leverage utility credibility to help contractors and vendors sell the program. Require contractors to follow-up with customers.				**X**	**X**				**X**				**X**	**X**	**X**			**X**	
Provide technical and sales support for program contractors.				**X**									**X**						

Best Practice List	Utility Constraints						Customer Participation Barriers									Priority and Goals			
	Lack of funding resources	Lack of knowledge	Lack of decision maker support	Lack of awareness	Lack of staff resources	Few dealers offering high efficiency products	High upfront cost of equipment	Split incentives	Understand long term value	Environment awareness	Qualifying measures	Qualified vendors	Lack of skilled contractors	Participation time-consuming	Lack of directions	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Keep track of vendor activity. Inspect the first several jobs submitted by new contractors. Rely on third-party contractor for quality control.					X	X						X	X						
Work with retailers to ensure energy-efficient products are stocked and advertised and that POP materials are accurate and clear.				X		X					X	X			X			X	
Offer incentives to upstream retailers.						X	X				X					X			
Keep program funds available throughout the program year.				X					X									X	
Use a simple participation process for vendors. Minimize documentation requirements and issue rebates in shortest possible time.												X		X					
Offer zero-percent or low-interest financing, or high incentive levels to offset high capital cost of energy-efficient equipment and achieve high penetration rates.				X			X				X					X			
Develop guidelines for determining the appropriate baseline for energy impact and incremental cost calculations.											X					X			
Periodically assess the program to reduce free ridership through market studies and consumer surveys.															X				

Best Practice List	Utility Constraints						Customer Participation Barriers									Priority and Goals			
	Lack of funding resources	Lack of knowledge	Lack of decision maker support	Lack of awareness	Lack of staff resources	Few dealers offering high efficiency products	High upfront cost of equipment	Split incentives	Understand long term value	Environment awareness	Qualifying measures	Qualified vendors	Lack of skilled contractors	Participation time-consuming	Lack of directions	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Provide homeowners a mix of services and measures, and promote messages that equate energy efficiency with home improvement.				X			X		X										
Provide a portfolio of eligible measures and services including rebates for those less likely to be considered and installed.				X							X								
Use a whole-building approach to achieve deeper energy savings, and tie incentives to building performance.											X	X				X			
Promote the program on the utility website.				X	X									X				X	
Use an information management system with web interface capabilities for data entry and automated reporting.					X														
Regularly check program progress and make sure the program is on the right track.															X				
Ensure data accuracy with rigorous quality control.	X										X								
Help customers submit program applications through outreach events, workshops, and online tools				X										X	X			X	

Best Practice List	Utility Constraints						Customer Participation Barriers									Priority and Goals			
	Lack of funding resources	Lack of knowledge	Lack of decision maker support	Lack of awareness	Lack of staff resources	Few dealers offering high efficiency products	High upfront cost of equipment	Split incentives	Understand long term value	Environment awareness	Qualifying measures	Qualified vendors	Lack of skilled contractors	Participation time-consuming	Lack of directions	High savings-to-cost ratio	Reduce peak load	Educate community	No rate increases
Perform market assessments and impact evaluations regularly, including an estimation of free ridership and spillover. Track quantifiable economic benefits and align evaluation metrics with program goals. Promote a life-cycle cost perspective of benefits.		X							X	X						X			
Choose an experienced evaluator with a full understanding of the market context in which a program operates.		X			X														
Seriously consider evaluation recommendations and incorporate them into the program.		X																	
Ensure both societal and non-energy benefits are included in cost-effectiveness calculations.			X						X	X									
Evaluate the impacts of free measures. If the impact is small, replace them with alternative measures that generate more energy savings.	X															X			
Provide staff with thorough training and reward good performance.		X			X														

While it will be impossible within the project budget and timeline to complete customized energy efficiency program plans for each of Texas' 72 MOUs, the Project Team has provided the tools and resources that will facilitate the process of identifying programs and program components best suited to each MOU's service territory and customer base, from a selection of identified best practice programs. For each identified program, the Project Team provided basic program design elements, along with implementation tools, rule of thumbs and guidelines to support the MOUs as they develop, launch, deliver, and measure each program.

In this section, the Project Team has provided an overview of energy efficiency opportunities and priorities within two predominant customer sectors: residential and C&I. Further, each recommended program concept includes an introduction that outlines MOU issues and considerations with regard to offering that type of program. These introductory sections are intended to provide insights for each MOU to help it determine whether the program is a good fit for its service territory.

Further, in this section, the Project Team has provided an overview of key considerations and cross-cutting best practices with regard to energy efficiency programs, such as rate impact analysis and evaluation, and M&V. The Project Team has also highlighted several important issues, resources, and innovative program concepts that will help the Texas MOUs plan, develop, implement, and promote long term cost-effective energy efficiency programs.

5.1 Energy Efficiency Program Concepts

The Project Team developed a range of recommended program concepts that may be applied by MOUs in the Texas market according to seven program categories. Program categories were largely assigned based on the program's incentive mechanism and operational characteristics, and in many cases include several program subcategories with similar basic operating parameters. The seven program categories are described in detail in Section 4.

The Project Team used both a top-down and bottom-up approach to develop program concepts that would be most readily applicable to conditions among Texas MOUs. The Project Team began by assigning specific best practice attributes from a pool of program features identified by the National Efficiency Best Practices Study[12] to each of the seven program categories. Next market conditions prevalent in the Texas MOU environments were cross-referenced to determine those best practice attributes that are most likely to help overcome local barriers, address specific market needs or opportunities, and allow for cost-effective MOU implementation given the organizational and financial characteristics common to municipal utility operations.

Next, the Project Team conducted in-depth research on the best practice programs identified through a screening analysis. Through this research, it was determined which best practices, from among the pool of attributes, were being implemented in the program and also identified additional innovations or key delivery features deemed to be vital to the program's success. In some cases, program managers were contacted directly to determine how specific program

[12] http://www.eebestpractices.com/index.asp

functions or characteristics contributed to the program's performance and to better understand nuances associated with program delivery.

While the program recommendations provided below are generally unique concepts, they may draw heavily on the model programs determined based on the research. The Project Team's objective with the development of recommended program concepts was to articulate program strategies that would be best suited to MOUs in Texas; thus each program that was evaluated was filtered according to its adaptability to the Texas municipal utility environment. Best practice attributes designated for each program category were used as a general guide, and applied the best, most adaptable features of each best practice program that was researched, and incorporated key innovations and unique success factors that were determined to provide specific advantages to MOUs or that are generating significant performance results in other jurisdictions.

These features were combined into program concepts that may serve as a roadmap for MOUs, whether they are interested in entering the DSM market for the first time or they wish to expand their current program offerings. It should be noted, that while program recommendations provide specific design strategies and implementation details, they are meant to serve as a guide only. MOUs may wish to modify program details to best suit their specific operations, local conditions, and budgets. In many cases, programs may be scaled up or down based on the MOU's capacity and savings targets or over time as MOUs become more comfortable with delivery protocols and the market matures.

Finally, each program recommendation concludes with a range of "best practices and innovations." These highlight some of the key success factors determined in the Project Team's analysis and ideas for customizing programs to the Texas MOUs' needs. MOUs who adopt these program strategies are highly encouraged to incorporate as many best practice attributes and innovative program features as they can reasonably and cost-effectively deliver. Over time, MOUs may wish to explore some of the identified best practice features on a pilot basis to determine whether they offer significant advantages and are appropriate for their service territories.

Each program concept is preceded by general comments and guidelines to help MOUs determine whether the program is a good fit based on their operational capacity, customer base, and market characteristics. In addition, the matrix (see Table 25) matching efficiency programs to MOUs' local conditions is further intended as a guide to help MOUs select program concepts best suited to their needs.

Recommended program concepts are identified according to three major market sectors: residential, small to mid-sized commercial, and large C&I. Within each market sector, some background is provided regarding the energy efficiency potential for the sector in Texas as a whole and the potential within Texas MOUs based on the research. Program concepts for each market sector may draw from each program category included in the Project Team's research, or in some cases multiple program concepts in a given market sector may derive from a single program category. Where appropriate, the Project Team also provides more detailed information on specific innovations, program features, or operating strategies that are deemed to offer key advantages or address specific needs in the Texas MOU environment.

5.1.1 Residential Program Concepts

The Project Team's analysis showed that the residential sector dominates MOU customer bases and represents slightly under half of utilities' electricity sales. MOUs also have the most experience with implementing residential sector programs, with nearly 53 percent of existing energy efficiency programs among MOUs being targeted to residential customers. Existing residential programs primarily target lighting, HVAC systems, and renewable energy technologies, with additional focus on weatherization, appliance recycling, and other program types.

A 2007 ACEEE study[13] of energy efficiency potential in Texas indicated that in the residential sector, the major opportunities for electricity efficiency resources are housing shell measures (i.e., insulation, air sealing, etc.) that can reduce heating and cooling loads by about 53 percent compared to current average space heating and cooling consumption, combined with more energy-efficient HVAC equipment and systems. Taken together, these heating and cooling measures represent approximately two-thirds of the residential energy savings potential in Texas.

The Project Team's analysis of potential energy savings among MOUs reinforced ACEEE's statewide findings, with nearly all of the MOUs indicating a moderate to significant opportunity for building shell upgrades and two-thirds indicating a significant opportunity for cooling efficiency measures. Yet, among MOUs that have offered DSM programs to their customers in the past, HVAC programs represent only 8 percent of programs, and weatherization represents another 8 percent. Clearly these two program types offer significant energy savings potential in the Texas marketplace.

Many utilities combine incentives for residential weatherization and building shell efficiency measures with residential energy audits. There are several advantages to this model. Energy audit programs alone do not generate energy savings, but are very popular with customers and provide an exceptional "sales" opportunity for larger energy efficiency upgrades. Identifying appropriate building shell efficiency measures requires diagnostic testing by trained professional contractors and special equipment. Attaching building shell upgrades to energy audit programs not only allows the audit program to be more cost-effective, it also adds a quality assurance component that ensures that the best-suited measures are installed in the right places, and by trained professionals.

Additionally, both the ACEEE study and the Project Team's market research on MOUs' efficiency potential indicated significant energy savings opportunities from residential lighting. ACEEE indicated the second-largest potential for energy savings from lighting and appliances combined; and nearly all of the Texas MOUs indicated that residential lighting represents a moderate to significant energy savings opportunity.

Several MOUs also have experience offering residential energy-efficient lighting programs to their customers, with 18 percent having offered some form of lighting program, second only to renewable energy programs. However the delivery model among MOUs varied considerably, ranging from bulb giveaways to a rebate model.

[13] ACEEE: Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Needs. March 2007. Report number E073.

The following residential program recommendations draw from these key areas of potential, as well as standard residential utility offerings, such as appliance recycling and DR. It should be noted, that renewable energy programs have not been included among these recommendations. Although renewable energy programs are very popular with customers, and Texas has excellent solar and wind resources, renewable energy programs are typically among the least cost-effective from both a utility and a total resource cost (TRC) perspective. The program recommendations below are primarily focused on those programs that offer a significant amount of energy savings at a relatively low implementation cost.

5.1.1.1 Residential Equipment Rebate Program

Prescriptive rebate programs are among the most straightforward to implement and are a good entry-level program option. They can be delivered with minimal staff commitments and utilities need not contract with a third-party implementation firm. They are also the most popular programs with customers: they are easy to understand, and participation requires minimal effort. Utilities also gain valuable goodwill with customers – the customer’s incentive is a clear benefit directly resulting from the utility’s intervention.

The Project Team evaluated two types of prescriptive rebates: customer and trade ally incentives, or dealer spiffs. Some utilities have had very good success offering nominal dealer spiffs, generally in conjunction with standard customer rebates. Because these trade allies are by far a utility’s most valuable marketing tool, spiffs are a way to incentivize dealers and installers to promote their programs. Particularly in MOU territories where trade allies have traditionally been less active in promoting high-efficiency equipment, spiffs can be a way to jump-start a program until the market begins to transform.

Table 27. Residential Equipment Rebate Program

Residential Equipment Rebate Program	
Program description	The program promotes the purchase and installation of high-efficiency equipment by providing customers with financial incentives to offset the higher purchase costs of energy-efficient equipment. The program provides a financial incentive in the form of a prescriptive rebate on a per-unit basis to customers installing qualifying equipment and technologies. Rebates are a fixed amount per device, paid by check to customers who complete a rebate application and submit documentation of the equipment purchase. Targeted equipment includes electric heating, cooling, water heating, and appliances (ENERGY STAR®-labeled equipment is specified where available).
Objectives	• Provide customers with opportunities to reduce their energy costs and increase their energy efficiency • Encourage customers to install high-efficiency HVAC equipment and electric appliances. • Encourage the use of high-efficiency/ENERGY STAR®-rated equipment • Promote other energy efficiency programs
Infrastructure and staffing	Estimated utility staffing requirement: 0.5 full-time employee (FTE) for management, promotional, marketing, trade ally support, evaluation, and other administrative functions.
Customer targets and eligibility	This program targets all residential customers in existing single family, multifamily, manufactured and mobile homes. To be as cost-effective as possible, the program should target customers seeking to replace older, inefficient equipment. Participant eligibility is verified through customer rebate applications cross-referenced against customer account numbers. Customers must submit a program application with documentation of the equipment purchase and installation(s) for verification.

<table>
<tr><th colspan="2">Residential Equipment Rebate Program</th></tr>
<tr><td>Implementation</td><td>Equipment rebate programs are relatively simple to implement and administer and can be managed and delivered with in-house staff. Key steps in program implementation include:
Marketing and outreach, including to trade allies.
Provide call center services to respond to customer questions and provide technical and program support.
Review documentation to verify the applicant is an active customer and the installed equipment meets the minimum efficiency standard.
Track program data.
Process rebate checks for qualified equipment.
Verify equipment/appliance installation for a sample of participants.
Customer participation involves:
Customers installing eligible high-efficiency equipment, scheduling the work directly with their equipment dealer or installation contractor.
Work with the equipment/appliance retailer or installation contractor to complete program applications and ensure the required documentation is submitted to the utility for processing.</td></tr>
<tr><td>Program barriers
Higher first cost of energy-efficient equipment and economic environment limit customer’s ability to purchase energy-efficient equipment
Customers needing emergency replacement may not know about the program.
Customers may choose to purchase less energy-efficient equipment</td><td>Mitigation Strategies
Offer rebates to offset higher incremental cost. Educate customers on the long-term cost-saving benefits of higher efficiency equipment.
Market program and general efficiency awareness to customers.
Provide trade ally training and outreach to explain the benefits of selling higher-efficiency equipment.
In-store brochures and collateral.
Promote efficiency awareness to customers and trade allies.</td></tr>
</table>

Residential Equipment Rebate Program	
Marketing and outreach	This program relies on both customer marketing and point-of-sale dealer and installer information for promotion. A high level of trade ally participation and program promotion are critical to ensure program success. The program messaging focuses on the features and benefits of energy-efficient equipment. The marketing strategy for the program may include: • Bill inserts • Utility dedicated program web page • Active trade ally outreach and support • Newspaper, radio, and other mass media • Brand marketing material with ENERGY STAR® • Present program information at seminars, conferences, home shows, and community events • Sponsor co-advertising with trade allies (i.e., equipment dealers, distributors, and installers) • Coordinate marketing opportunities with key market partners (i.e., SECO, community groups) • Publish and distribute program brochure • Cross-promote through other programs

Residential Equipment Rebate Program	
Measures and incentive levels	Program incentives are set at approximately 50 percent of the incremental cost of high-efficiency equipment, but may be adjusted as needed. The following incentive levels are provided as examples. Utilities should endeavor to set incentive amounts at a level appropriate for their own budgets and program strategies.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved[15]: average $0.20/kWh, ranging from $0.15/kWh to $0.34/kWh. • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 5% to 10% ✓ Third-party contractor: less than 5% ✓ Marketing, advertising, trade ally training and outreach: 15%

Measure	Eligibility Rating	Incentive
Central Air Conditioner	Seasonal energy efficiency ratio (SEER) 14.5	$150
Central Air Conditioner	SEER 15	$225
Central Air Conditioner	SEER 16	$300
Room A/C	ENERGY STAR®	$25
Air-Source Heat Pump	SEER 14.5	$250
Air-Source Heat Pump	SEER 15	$325
Air-Source Heat Pump	SEER 16	$400
Heat Pump Hot Water Heater	ENERGY STAR®, EF >= 2.0, or coefficient of performance (COP) >= 2.0[14]	$300
Dishwasher	ENERGY STAR®	$30
Clothes Washer	ENERGY STAR®	$75
Refrigerator	ENERGY STAR®	$50

[14] While there is an ENERGY STAR rating for heat pump hot water heaters, it is relatively new and qualifying equipment is not currently available.

[15] Annual kWh savings is used in this cost of savings calculation, but the kWh savings benefits remain in utility's service territory until the end of the measure's useful life.

Residential Equipment Rebate Program	
	✓ Incentives: 70% to 80% ✓ Evaluation, Measurement and Verification (EM&V): 1% and 5%
Benefits	• Customers can increase their home’s energy efficiency while reducing their costs • Minimal staff requirements • Straightforward to implement with no third-party contracts necessary • Low administrative costs and significant energy savings potential • Popular with customers as it is easy to understand and participate • Minimal effort required from customers
Measuring savings	Calculation of energy savings relies primarily on deemed savings estimates using information on measure installations. Program applications require customers to specifically identify equipment replaced, including make, model, and efficiency level, as well as documentation on energy-efficient equipment installed. Where estimates are not available for specific measures, the utility should conduct an engineering review of per-unit savings and verify installations through field observations or other confirmation (i.e., via telephone) of a statistically valid sample of participants.
Best practices and innovations	• Offer dealer and installer incentives (such as 5–10 percent of customer rebate per unit) to encourage program promotion by trade allies. • Leverage ENERGY STAR® brand, marketing materials, and other resources. • Build strong communication channels with retailers and make extensive use of POP program materials and in-store rebate applications. • Allow retail partners to submit rebate applications on behalf of customers. • Use simple rebate forms and program rules. • Track and utilize retailer's records and equipment information to analyze actual savings. • Educate customers about the benefits and features of energy-efficient appliances and equipment to encourage greater adoption of energy-efficient technologies in the future.

Residential Equipment Rebate Program	
	• Couple equipment incentives with low-cost financing. • Sponsor equipment quality installation and best practices training to gain contractor buy-in and ensure program quality. • Coordinate eligible measures and incentives among regional MOUs to ensure continuity and reduce customer confusion. • Perform installation inspections to ensure quality of work is maintained throughout the program.

5.1.1.2 Residential Lighting Program

Utilities throughout the United States have generated an enormous amount of energy savings from residential lighting programs. There is a rich history of experience with program approaches ranging from CFL giveaways to upstream programs that can inform MOU programs.

Upstream programs are generally considered the best practice residential lighting program model, particularly for CFLs. Lighting rebates simply are not effective; the nominal rebate amount is not adequate to encourage participation or to justify a customer's effort to fill out and submit a program application. However, upstream lighting programs are complicated and can be costly to implement. Some utilities use an experienced third-party implementation contractor to negotiate with manufacturers, handle transactions, and build relationships with retailers; others handle these functions with internal staff, which can be a resource-intensive approach. This program model may not be a good fit for Texas MOUs, many of which indicated they have relatively small budgets, limited staff resources and few big box stores in their service territories.

Texas MOUs may want to consider a simpler model that still uses a retail discount, coupled with event-based CFL giveaways. A modified, coupon-based, incentive program that uses local retail partners to support implementation may be as effective as an upstream buy down approach but with a lower cost, simpler delivery, and greater opportunities for local retailer participation. This approach could be seasonal (e.g., coupons included in spring and fall bill inserts) and provide customers with the same on-site discounts needed to encourage their participation, but without the need to negotiate discounts and incentive payments with manufacturers. The Project Team recommends interested MOUs pursue a collaborative approach that leverages external resources, such as the EPA "Change the World, Start with ENERGY STAR®" campaign (https://www.energystar.gov/index.cfm?fuseaction=globalwarming.showPledgeHome).

The EPA's "Change the World, Start with ENERGY STAR®" campaign is an annual pledge drive aimed at encouraging consumers and organizations to commit to making small changes to reduce their energy consumption. The Change the World, Start with ENERGY STAR® website offers a range of resources for organizations that wish to become involved, such as marketing images and messaging, sample newsletters, an event toolkit, and creative guide. By timing their lighting programs to piggy-back with the ENERGY STAR®campaign, MOUs can leverage excitement about the program and increase general awareness of energy efficiency measures and behavioral changes.

Table 28. Residential Lighting Program

Residential Lighting Program	
Program description	The Residential lighting programs provides free or discounted energy-efficient lighting products (fixtures and/or bulbs depending on the program) to residential customers. Typically these programs provide standard screw-in CFLs and some may offer discounts or rebates for larger varieties of lamp wattages and specialty bulbs. Three possible residential lighting program components are recommended. Utilities should use a strategy that best fits their delivery capacity, budgets, and program objectives. • Upstream buy-down. Utilities or program implementers work with manufacturers and retailers to negotiate bulk purchase pricing and apply incentives before bulbs hit retail shelves. To gain economies of scale with this model, MOUs should pursue a collaborative approach (see discussion below under Implementation). • Coupon-based. Coupons may be provided to customers as a bill insert or through another delivery mechanism. The utility partners. along with local retailers, create an incentive payment mechanism that's invisible to customers. • Giveaway. The utility provides free lighting products (usually CFLs) in exchange for incandescent bulbs, or sometimes no exchange is required.
Objectives	• Provide a mechanism for customers to easily obtain discounted ENERGY STAR®- qualified CFLs and/or other energy-efficient lighting products. • Help customers save energy by switching to higher-efficiency lighting products. • Contribute to transforming the market for ENERGY STAR®-qualified CFLs by increasing the number of qualified products purchased and installed in the utility territory. • Encourage customers to install CFLs obtained from a giveaway program. • Increase consumer awareness and understanding of the energy efficiency of CFLs, as well as proper use of CFLs in various lighting applications.

Residential Lighting Program	
	• Promote consumer awareness and understanding of the ENERGY STAR® label. • Promote other utility energy efficiency programs.
Infrastructure and staffing	Estimated utility staffing requirements vary depending on the type and scope of chosen program components. For a third-party implemented program, approximately 0.5 to 1 FTE for management and coordination of program or third-party implementer and other administrative functions, including monitoring and tracking.
Customer targets and eligibility	This program primarily targets residential customers, but may be made available to all customer classes.
Implementation	Three alternative implementation strategies may be used: **Collaborative approach.** Multiple MOUs collaboratively select a single implementation contractor to provide services in support of an upstream buy-down approach. There are experienced contractors with national presence that provide turnkey services to support utility lighting programs. This approach requires participating MOUs to jointly issue a RFP and select an implementation contractor. **Centralized collaborative approach.** A statewide agency may take the lead on significant program development and coordination tasks and invite utilities to participate. In this approach, the centralized agency may conduct planning and program development tasks independently, or it may coordinate the selection of a third-party implementation contractor. **Utility-led approach.** Many utilities develop and implement lighting programs themselves. This approach may be most applicable to a coupon and/or giveaway program as these are relatively straightforward to develop and deliver. With any approach, key implementation tasks include: • Develop and implement marketing and outreach to consumers. • Coordinate and negotiate with manufacturers and/or retail locations (recruitment, bulk pricing, participation, collaboration, collection of coupons, etc., depending on implementation approach).

Residential Lighting Program	
	• Coordinate with the national Change the World, Start with ENERGY STAR® campaign. • Track program data to calculate participation and savings (varies depending on coupon, giveaway, buy-down, or other type of program approach). • For a coupon-based program: ✓ Design, print, and deliver coupons to customers as bill inserts, at events, or through another delivery mechanism. ✓ Recruit local retail partners and negotiate process for retailer to apply incentives at the register, collect critical program data, and arrange for the utility to transfer funds to cover incentives. • For an upstream buy-down approach: ✓ MOU or implementation contractor coordinates with manufacturers and retailers on program discounts, data tracking, and transfer of funds to cover incentives. • For a giveaway approach: ✓ Plan for and coordinate bulb giveaway mechanism that may include: providing by mail, events, central pick-up location, or door-to-door. • Track number of bulbs sold or given away and calculate savings based on deemed approach and an industry-accepted realization rate, and/or conduct surveys to determine market penetration.
Program barriers • Lack of program awareness among customers • Cost of energy-efficient bulbs • Willingness of retailers to stock CFLs	**Mitigation Strategies** • Robust marketing, education, and outreach strategy, leveraging ENERGY STAR® brand. • Provide upstream incentives or coupons and giveaways. • Robust marketing strategies, including point-of-sale promotions and discounts. Outreach to retailers to solicit participation.

Residential Lighting Program	
• Negative media attention associated with CFL mercury content and CFL disposal • CFL performance	• Provide customer education and outreach on the proper handling and disposal of CFLs. • Ongoing retailer communications, training, outreach, and education.
Marketing and outreach	Utility program staff should coordinate with internal marketing and communications departments and the implementation contractor (if applicable) to ensure program materials are consistent with utility branding and advertising protocols. External marketing can be led internally or by an implementation contractor. The marketing strategy may include: • Bill inserts (potentially with coupons for CFLs twice per year or more) • Utility dedicated program web page • Newspaper, radio, and other mass media • In-store advertising with participating retailers • Use ENERGY STAR® lighting materials and other program tools as a marketing resource; include program on the EPA's Change the World, Start with ENERGY STAR® web page; leverage Change the World, Start with ENERGY STAR® campaign to create excitement, solicit efficiency pledges, and expand the program's educational reach. • Brand program marketing materials with the ENERGY STAR® label • Publish and distribute program information to community organizations, such as Chambers of Commerce, community groups (e.g., churches, Boy Scout troops, senior centers) • Present program information at seminars, conferences, and community events • Cross-promote through other MOU programs

Residential Lighting Program	
Measures and incentive levels	Program may be limited to CFLs or expanded to include energy-efficient fixtures, specialty bulbs, and potentially newer technologies such as light emitting diodes (LEDs). Provide between 2 and 10 CFL bulbs per home depending on program budget and delivery mechanism. Incentives should cover 50% of CFL retail cost for upstream and coupon mechanisms, or 100% of the cost for giveaways.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: \$0.10/kWh to \$0.15/kWh • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 5% to 10% ✓ Third-party contractor: 25% ✓ Marketing and advertising: 10% ✓ Incentives: 65% ✓ EM&V: less than 5%
Benefits	• History of achieving significant energy savings throughout the United States • Several delivery options are available • May be implemented with minimal staff requirements • Low delivery costs and high cost effectiveness • Provides a mechanism for customers to easily save energy • Increase customer awareness and understanding while requiring minimal effort • Partnership opportunities with manufacturers, local retailers, government agencies, and community organizations • Opportunities to transform the market for Energy Star-qualified CFLs

Residential Lighting Program	
Measuring savings	Energy savings estimates for this program rely mainly on deemed savings and use information on measure installations, including: • Number of CFLs sold (from retailer sales data) • Sample-based verification of CFLs installed • Sample-based verification of baseline CFLs • Sample-based verification of location of installations Detailed data on unit characteristics will be collected by the implementer (or if MOU is implementing then by working with the retailer).
Best practices and innovations	• With other MOUs, coordinate a jointly funded municipal residential lighting program with shared administrative and implementation costs, operated by a single program implementation contractor. • Build relationships and partnerships with manufacturers, local retailers, government agencies, and local community organizations to leverage diverse resources and broaden the program's reach. • Leverage the resources of a regional energy efficiency advocacy group to coordinate program development and implementation, allowing MOUs to participate as desired. • Coordinate coupon or giveaway activities, promotions, and events to correspond with the EPA's Change the World, Start with ENERGY STAR® campaign to leverage federal resources and expand the program's reach. • Keep the customer participation process simple, requiring minimal effort. • Conduct telephone surveys with a sample of participants to determine installation rate, satisfaction, program awareness, leakage, and realization rate.

5.1.1.3 Residential Refrigerator Recycling

A 20-year old refrigerator or freezer can consume two to four times more energy annually than a new model, and as a result, can significantly increase customers' electric bills. Older refrigerators also put strain on local power grids, especially during peak hours.

Studies have shown that a large percentage of residents keep old refrigerators, even after purchasing new units. In many cases, these second refrigerators are used infrequently and are empty or nearly so. Additionally, older refrigerators often find their way into a secondary market and are re-sold. Hundreds of utilities across the country have implemented appliance recycling programs to address these issues and ensure that these energy hogs are retired. Utility refrigerator recycling programs often produce a significant amount of energy savings and provide a valuable societal service: ensuring refrigerator components are properly dismantled and disposed of.

Appliance recycling programs have been in existence for many years and the program delivery approach is now relatively consistent across utility territories, using well-established, mature marketing, administrative, delivery, and tracking strategies. The Project Team's study looked at several appliance recycling programs. Because specialized services are required, all of the programs use a third-party implementation contractor with the experience and infrastructure needed to operate best practice programs.

For Texas MOUs, the Project Team recommends that any potential appliance recycling program be implemented using a collaborative approach and leverage existing resources in the state. The California Statewide Appliance Recycling Program offers a good model for a collaborative program approach.

Table 29. Residential Refrigerator Recycling Program

Residential Refrigerator Recycling Program	
Program description	Appliance recycling programs offer free pick-up and disposal of working residential refrigerators. A customer incentive is offered for customers who turn in eligible appliances. Appliances must be in working condition. All units are disposed of in an environmentally responsible manner. This involves removing hazardous materials such as chlorinated fluorocarbons from the refrigerant, preparing refrigerant for reclamation, and recycling other materials, such as metal and plastic.
Objectives	• Encourage customers to dispose of existing, inefficient refrigerators when they purchase new ones or when they eliminate a second unit that may not be needed • Reduce the use of secondary, inefficient appliances • Ensure appliances are disposed of in an environmentally responsible manner • Ensure appliances are not resold in a secondary market • Promote other energy efficiency programs
Infrastructure and staffing	Estimated utility staffing requirement: 0.3 FTE for management and coordination of third-party implementer and other administrative functions.
Customer targets and eligibility	This program primarily targets residential customers, but may be made available to all customer classes with a working, residential grade refrigerator. Participant eligibility is verified at sign-up through customer account numbers. Units must be plugged in and functioning when picked up.
Implementation	There are a small number of experienced contractors with national presence that provide turnkey services to support utility appliance recycling programs. The implementer provides comprehensive services including: • Marketing • Call center services, including customer intake and scheduling • Processing applications and rebates

Residential Refrigerator Recycling Program	
	• Tracking program data • Pick-up, storage, dismantling, and proper disposal of refrigerator components • Providing customer and transaction information Key steps in program participation include: • Implementer schedules and executes appliance collection. • Implementer verifies customer and appliance eligibility. • Implementer picks up and transports appliances to a recycling facility. • Implementer recycles applicable components and appropriately disposes of remaining components. • Implementer tracks customer data, appliances, and outcomes throughout process. • Implementer processes rebate payment and delivers to customers.
Program barriers • Customer must be available for pick-up • Need to fill out rebate forms • Lack of program awareness among customers • Customers do not see benefit of harvesting qualified appliance(s)	**Mitigation Strategies** • Implementer responsible for working with customer to ensure the pick-up is as convenient as possible • Provide simple rebate forms • Robust marketing, education, and outreach strategy, leveraging ENERGY STAR® brand • Implementer works with retailers to display information about the benefits of appliance recycling Customized educational materials that highlight the cost of operating an old refrigerator or freezer and explain environmental benefits of eliminating inefficient appliances

Residential Refrigerator Recycling Program	
Marketing and outreach	Utility program staff coordinates with internal marketing and communications departments and the implementation contractor to ensure program materials are consistent with utility branding and advertising protocols. External marketing is led by the implementation contractor. The marketing strategy may include: • Bill inserts • Utility dedicated program web page • Newspaper, radio, and other mass media • Use ENERGY STAR® refrigerator harvesting materials as a marketing resource; include program on the ENERGY STAR® "Find a fridge or freezer recycling program" web page • Brand program marketing materials with the ENERGY STAR® label • Present program information at seminars, conferences, and community events • Distribute program brochures to community organizations, such as Chambers of Commerce
Measures and incentive levels	Program may be limited to refrigerators or expanded to include stand-alone freezers and room A/Cs. Refrigerators typically must be at least 10 cubic feet in size. Incentives may range from \$25 to \$50 per unit.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: \$0.19/kWh • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 5% to 10% ✓ Third-party contractor costs: 30% ✓ Marketing and advertising: 10% ✓ Incentives: 45% ✓ EM&V: 3% to 5%

Residential Refrigerator Recycling Program	
Benefits	• Produces a significant amount of energy savings • Can reduce strain on local power grids • Offers both monetary and convenience incentives for customers • Produces multiple environmental benefits • Reduces the use of inefficient appliances and lowers customers' electric bills • Widely-used program with consistent delivery approaches and well established strategies • Can be implemented collaboratively with multiple utility partners to gain economies of scale
Measuring savings	Energy savings estimates for this program rely mainly on deemed savings and use information on measure installations, including: • Number of units removed • Unit characteristics: ✓ Model ✓ Size ✓ Age Detailed data on unit characteristics are collected by the implementer.
Best practices and innovations	• Coordinate a jointly-funded, statewide municipal recycling program with shared administrative and implementation costs, operated by a single program implementation contractor. • Allow customers to enroll in the program and schedule pick-up at retail locations when purchasing a new appliance. • Promote the recycling program to customers who have received a rebate on a new appliance. • Partner the recycling program message with state or federal appliance rebate programs. • Offer online scheduling and pick-up on Saturday. • Pick up units within one week of receipt of a request for pick-up. • Conduct random inspections of recycling services contractor to ensure program compliance.

5.1.1.4 Residential Audit and Direct Installation/Weatherization Program

Residential audit and weatherization programs are very popular with customers. Many utility programs offer audits as a free or very low cost service and provide free installation of low-cost energy efficiency measures. From a utility perspective, audit programs that include direct installation can provide instantaneous energy savings with a near 100 percent realization rate (since auditors do the installation on site and verify to the utility the quantity and types of measures installed). They also generate good will with customers and serve as a useful sales tool for other utility programs and the installation of weatherization measures, since audits typically provide data on the home's leakiness. Customers tend to value the information they receive about their homes and the level of service provided by utilities. Customers who have had energy audits are often empowered to implement energy efficiency measures – armed with detailed information on how to best invest their efficiency dollars.

However, audit and weatherization programs have experienced some problems that utilities should be careful to avoid so they maximize the benefits afforded by these programs. The primary issue with residential audit and weatherization programs is that audits, by themselves, do not generate energy savings. It is not unusual for audit customers to enthusiastically embrace their audit and upgrade recommendations, then become distracted and never get around to actually installing the measures. And, because audit programs are often quite expensive to deliver (and the cost of audits increases as quality and accuracy of data collection increase), utilities must use either a direct installation mechanism or attach specific measure incentives to the program to help bring the full program into cost-effectiveness. For Texas MOUs, this may be less of an issue; however, it should be noted that achieving high installation rates should be a primary goal of any energy audit program.

Over time, audit program administrators and implementers have increasingly become aware that in order to achieve real energy savings, an audit should be treated as a sales tool and utilities should make taking the recommended actions as seamless, simple, and inexpensive as possible.

Table 30. Residential Audit and Weatherization Program

Residential Audit and Weatherization Program	
Program description	This program is designed to provide customers with information on their homes' energy performance and recommendations on energy efficiency actions they can take to reduce their energy consumption. Recognizing the varying economic conditions and interest levels among residential customers, the cost of the audit should be subsidized by the utility so that customers' cash outlay is minimal. The program also provides customers with an option to increase the rigor of the energy audit through diagnostic testing for an additional cost. Customers who install a minimum of recommended energy efficiency upgrades in their homes will be reimbursed the cost of the audit and will be eligible for rebates for the installed equipment. A walk-through energy audit will include a thorough visual inspection of the home to evaluate major energy-using equipment (e.g., lighting systems, space conditioning and hot water heating equipment, and appliances), building envelope characteristics, and to identify areas for cost-effective efficiency upgrades. The auditor will provide customers with an audit report that includes recommendations for appropriate follow-up activities. For an additional cost, customers may request a comprehensive energy audit delivered by a Building Performance Institute (BPI) trained and certified energy auditor. The auditors perform specific minimum diagnostic tests. Participating customers in either the walk-through or comprehensive audit: • Receive installation of low-cost energy-saving measures and an A/C tune up, information on the benefits and features of energy-efficient equipment, an assessment of energy savings opportunities, and recommendations for energy-efficient upgrades; • Are eligible for incentives to install weatherization measures, including attic, wall, and foundation insulation, as well as duct sealing; and • Will be directed to other utility programs as appropriate for additional incentives on equipment upgrades.

	Residential Audit and Weatherization Program
	To encourage customers to follow-through on recommendations and implement recommended efficiency upgrades, participants will be reimbursed for the full cost of the audit if they install at least one recommended qualifying measure.
Objectives	• Provide customers with information about their home's energy use and opportunities to save energy. • Provide customers with opportunities to reduce their energy costs and increase their energy efficiency. • Encourage customers to weatherize their homes by providing rebates. • Promote installation of low-cost energy saving measures and A/C tune-ups that may result in immediate savings. • Promote other energy efficiency programs.
Infrastructure and staffing	Estimated utility staffing requirement: 0.5 FTE for management, marketing, trade ally support, evaluation, and other administrative functions. Additional utility staff or third-party contractors will deliver customer energy audits. To deliver comprehensive audits, utility staff or third-party contractors must participate in BPI or equivalent training and be certified in whole home audit delivery. Infrastructure needs to support comprehensive audits include blower door and duct blaster. Use of auditing/residential modeling software, run on a tablet computer for on-site data collection, is strongly recommended.
Customer targets and eligibility	This program targets residential customers in single family homes or mobile homes. Customers in rental housing must have owner's approval to participate. Participants must have electric heat, electric water heating, and/or central air conditioning to qualify. Participant eligibility is verified at the time the audit is scheduled, using customer account number.

Residential Audit and Weatherization Program	
Implementation	Utility staff will manage customer intake, verify customer eligibility, schedule audits, process applications and rebates, and track and verify program data. Additional staff will provide overall strategic direction and program management for the program, marketing, trade ally outreach, evaluation, and other administrative functions. Key steps in program participation include: • Most customers will enter the program by calling the utility. Utility staff will explain the program, verify the customer's eligibility, and schedule an appointment. • The certified energy auditor will conduct an assessment of the customer's home, directly install simple energy efficiency measures, perform a tune-up of the A/C (if present) and inspect major energy-using equipment and building envelope characteristics to identify areas for cost-effective efficiency upgrades. • Customers who request a comprehensive audit will receive diagnostic testing in addition to standard visual inspections. These tests will provide more detailed insight into the performance of the home, and can help identify a greater range of energy-saving opportunities. • The auditor will also review additional available financial incentives or programs that may benefit the customer, discuss best practices for operating home energy systems efficiently, and disseminate educational materials. • Customers will receive an audit report with recommendations for appropriate energy efficiency upgrades and information on incentives available through the audit and other programs, as well as a rebate application for weatherization measures. Energy auditors will provide a copy of the audit report to utility staff for tracking and reporting purposes. • Customers will issue payment to the auditor for the cost of the audit, minus the utility incentive. • Utility staff will follow up with customers to inquire about their audit and any measures the customer has installed, and to encourage customers to implement recommended measures.

Residential Audit and Weatherization Program	
	• Customers installing weatherization measures through the program will contact a third-party contractor to install measures and submit documentation of the installation and the rebate application directly to the utility. • Utility staff process rebate applications and issue payment to the customer.
Program barriers • Higher cost of comprehensive energy audit • Economic environment may limit customer's ability to purchase energy-efficient equipment. • Lack of program awareness • Availability of qualified contractors to install recommended measures	**Mitigation Strategies** • Offer rebates to offset higher incremental cost. Educate customers on the long-term cost-saving benefits of higher-efficiency equipment. • Provide trade ally training and outreach. Target equipment being replaced or customers remodeling or building new. • Use a robust marketing strategy and promote general efficiency awareness to customers and trade allies. • Collaborate with trade schools and other workforce development resources to increase the local contractor base.
Marketing and outreach	This program should leverage both traditional and grassroots social customer marketing for promotion. If the utility chooses to use external auditors to deliver the program, they should be provided tools and resources to support program promotion. The marketing tactics for the program may include: • Bill inserts • Utility dedicated program web page • Newspaper, radio, and other mass media advertising • Brand marketing material with ENERGY STAR®. • Present program information at seminars, conferences, home shows, and community events. • Coordinate marketing opportunities with key market partners (i.e., community groups, local nonprofit organizations).

	Residential Audit and Weatherization Program
	• Publish and distribute program brochure. • Cross-promote through other programs.
Measures and incentive levels	Depending on the delivery model, the cost of audits may vary and utilities can set the audit cost at a level that they deem appropriate to generate customer interest and participation in the program. The Project Team cautions against offering free energy audits, as these typically receive the lowest conversion rate. Customers who pay nothing for a service are much less motivated to install the recommended measures than those who have invested in the program to some extent. In some cases, utilities charge a nominal fee for audit services, but reimburse the cost or offer bonus incentives when customers install a minimum number of recommended measures. Additionally, the majority of programs provide direct installation measures at no cost. The following incentive levels are provided as examples. Utilities should endeavor to set incentive amounts at a level appropriate for their own budgets and program strategies.

<table>
<tr><th>Measure</th><th>Incentive</th></tr>
<tr><td>Walk-through audit</td><td>$25-$50 customer cost. Cost is reimbursed 100% if the customer implements one recommended measure.</td></tr>
<tr><td>Comprehensive audit</td><td>$100-$200 customer cost. Cost is reimbursed at 50% for one installed measure and 100% for two installed measures.</td></tr>
<tr><td>Compact fluorescent lamps</td><td rowspan="3">Free to customer (customer must have electric water heater to qualify for water heater measures).</td></tr>
<tr><td>Electric water heater measures:
• Faucet aerator
• Low flow showerhead
• Water heater pipe insulation
• Water heater setback</td></tr>
<tr><td>AC system tune up</td></tr>
<tr><td>Smart-strip</td><td rowspan="2">Customer co-pay 50% of retail or installed cost.</td></tr>
<tr><td>Programmable thermostat</td></tr>
</table>

Residential Audit and Weatherization Program	
	Infiltration Ceiling insulation Wall insulation Duct sealing — 50% of installed cost with $1,000 cap (customer must have central air conditioning or electric heat to qualify).
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $0.33/kWh • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 5% to 10% ✓ Marketing and advertising: 10% to 15% ✓ Incentives and measure costs (direct install or giveaway): 70% ✓ EM&V: 5%
Benefits	• Options to provide immediate energy savings through direct installation of measures • Popular with customers • Provides customers with immediate energy savings and access to additional rebates for significant energy saving measures • Opportunity for utility to connect directly with customers to enhance relationship and increase customer good will • Opportunity to educate customers on long-term benefits of efficiency and other utility programs • Collaboration opportunities with local workforce • Good local job creation and other economic benefits
Measuring savings	Energy savings for this program will be calculated using information gathered during the energy audit, including energy consumption data and quantities of direct installation measures installed. To ensure data is adequate to conduct impact evaluations, collected information should include: • Participant contact information, including name, address, and participation date. • Essential structural attributes

Residential Audit and Weatherization Program	
	• Household characteristics • Types and quantities of installed measures • Estimated savings • Measure cost • Interval daily electricity consumption • Climate information to calculate heating and cooling degree information Additional savings resulting from weatherization measures installed will be calculated using information from rebate applications for those measures. Rebate applications should require customers or their contractors to provide specific information on pre-installation conditions, including the type, location, and condition of existing insulation as well as the types, locations, and quantities of measures installed.
Best practices and innovations	• Use customer's actual 12 month billing history to inform upgrade measure recommendations and calculate energy savings. • Provide tools and resources for customers to take action after the audit, such as lists of qualified installation contractors and tips on how to select a contractor, simple rebate applications (with online submittal options), technical support hotline, tips for do-it-yourself energy-saving opportunities and behavioral actions, FAQs, and other educational materials. • Use an advanced, software-based, energy audit and analysis tool to enter data on site and generate audit reports that can be delivered instantly through email or printed on a portable printer. • Couple weatherization measures with OBF or low-cost financing mechanism. Structure financing to result in positive cash flow • Partner with other utility, state, or local incentive programs to present a unified program to customers. • Use simple rebate forms and program rules.

Residential Audit and Weatherization Program	
	• Refund some or all of audit cost if customer follows through on recommended actions. • Solicit customer commitment to install recommended measures. Offer to help customers develop a phased implementation approach and generate work orders on site for immediate installation measures. • Provide performance-based incentives that offer greater incentives and interest subsidies the more measures a customer implements. • Provide simple, visually appealing energy audit reports that clearly articulate priority measures and estimated energy savings. • Use community-based marketing approaches to create a word-of-mouth effect.

5.1.1.5 Behavior and Education

Utility education and behavior-based programs can take many forms and the landscape for this program type is evolving very rapidly. Utilities across the country are experimenting with school-based, on-line, in-home, and mail-based programs that provide energy efficiency information ranging from general awareness to customized energy usage information.

Utilities often sponsor school-based energy efficiency programs that integrate energy efficiency education into the general school curriculum through a variety of approaches. The theory is that educating young people encourages them to adopt energy-efficient behaviors that last a lifetime. These programs also can leverage a variety of resources that have been developed to support energy efficiency education.

One of the newest program models gaining traction with utilities is a home energy assessment report approach. Third-party implementers typically deliver these programs, where customers receive a semi-customized individual energy usage report through the mail. The reports use a range of utility data to disaggregate energy consumption into various end uses and generate a comparison to neighbors or others in the community in similar homes. The program theory contends that this use of normative messaging will compel customers to voluntarily implement energy efficiency strategies and change their behaviors in an effort to "keep up with the Joneses."

In reality, these programs have received mixed reviews. While some customers consider the information they provide useful, others consider them an invasion of privacy or claim the comparisons are inaccurate.

Measuring energy savings associated with behavioral programs has also proven to be difficult. Surveys have resulted in inaccurate or misleading information and measure persistence tends to be short. Many utilities have forgone efforts to justify behavioral programs on a cost-effectiveness basis and have simply adopted these programs in an effort to promote their other programs, contribute to long-term market transformation, and provide a general social benefit.

For the Texas MOUs interested in implementing an educational and behavior-based program, the Project Team recommends general awareness education for customers and trade allies, along with a school-based program.

Table 31. Energy Efficiency Education

Energy Efficiency Education	
Program description	This program promotes energy efficiency education and the adoption of energy-efficient behaviors. It contains two components: a school-based educational platform and a general awareness campaign. **School Curriculum** The utility will work with schools to integrate energy efficiency education into the curriculum and extracurricular activities. The program targets elementary-aged children in the fourth and fifth grades. To implement the program, the utility partners with a third-party organization specializing in energy efficiency education. The selected implementation provider should offer some combination of the following: • Teaching guides to support curriculum development • Student workbooks or other materials to reinforce the curriculum • Fun and interesting activities that can be done in a classroom setting or at home • Information on general efficiency awareness, behavioral actions and tips, and other utility programs to be shared with parents • Classroom and/or assembly presentations focused on awareness of energy safety and efficiency concepts that are fun and engaging • Guidelines for extracurricular activities such as science fair projects, school contests, and similar activities • Free energy efficiency kits that contain no-cost/low-cost energy saving measures (e.g., CFLs and energy saving tips) **General Awareness** Utility general efficiency awareness campaigns are aimed at increasing customer knowledge about the benefits of energy efficiency and strategies they can take to reduce their own energy

Energy Efficiency Education	
	consumption. These types of campaigns are particularly appropriate and well received in areas with municipal utilities, since they are often viewed as a way to support the community. Approaches may include: • Media advertising that uses a “did you know…?” approach. • Energy efficiency tips and information on the utility website. • Distribute energy efficiency information through brochures, flyers, door hangers, utility newsletters, and other collateral through one-on-one interactions • Outreach at local events such as community fairs, organization gatherings (e.g., church picnics), farmers markets, parades, etc. • Outreach to trade allies through key account managers, at trade shows, seminars, webinars, etc. • Leverage social media channels (Facebook, Twitter, YouTube, Flickr, LinkedIn) to create two-way dialog with customers regarding energy efficiency. Promote programs, energy-saving tips, and events. • Trade ally training through lunch-and-learn events, webinars, and workshops. • Sponsor demonstrations and presentations to large customers, town hall meetings, community groups, and other venues.
Objectives	• Educate customers (and future customers) about energy use and the benefits of energy efficiency. • Provide customers with information about no-cost/low-cost energy efficiency measures and behaviors that can reduce their energy consumption. • Encourage customers to adopt more energy-efficient behaviors and to install energy efficiency measures in their homes by becoming more aware of how their behavior and practices impact their energy usage. • Inform customers and trade allies about available utility-sponsored energy efficiency programs and incentives.

Energy Efficiency Education	
	• Enhance customer relationships. • Improve the likelihood trade allies will promote utility programs to their customers. • Contribute to long-term market transformation by encouraging customers to consider energy efficiency as a normal part of their daily lives and purchasing decisions.
Infrastructure and staffing	Estimated utility staffing requirement: 0.25 to 0.5 FTE for management, coordination, and other administrative functions. Utility staffing requirements to support education and behavior programs can vary depending on the utility's budget allocation and program objectives. School-based programs typically include curriculum and materials from a third-party vendor. However, low cost resources exist. Infrastructure needs to support general awareness may include a functional utility website, marketing materials, event displays, and training and general awareness presentations and computer/presentation hardware.
Customer targets and eligibility	This program targets residential customers and school children throughout the utility service territory. No eligibility verification is required.
Implementation	Utility staff typically manages and directs the program delivery approach and provides other administrative functions. Key steps in program implementation include: **School Curriculum** • Utility staff will identify curriculum and other educational activities appropriate to the service territory. • Solicit potential school curriculum program providers • Facilitate marketing to local schools to encourage their participation in the program (often through a letter to the school principal) • Coordinate activities with the implementation contractor

Energy Efficiency Education	
	General Awareness General awareness can include a broad range of activities that the utility may wish to undertake, often without a great deal of lead time. Implementation steps may vary by activity. • Planning for awareness activities such as participation in events, advertising campaigns, presentations, etc. • Identifying and developing communication channels, meetings and events, and advertising support appropriate to each activity. • Coordinating activities with partners and other participants. • Developing materials such as media publications, case studies, newsletters, brochures, and other materials. • Evaluating the effectiveness of each activity.
Program barriers • Lack of customer awareness of educational opportunities • Lack of time and resources to participate • Cost of educational curriculum, activities, and materials	**Mitigation Strategies** • Conduct outreach through traditional and non-traditional mechanisms; create a comprehensive marketing strategy. • Provide educational opportunities at no cost. • Use flexible scheduling and streamline programs to ensure energy-efficient use of participants' time. • Leverage programs and curricula created by national organizations.

Energy Efficiency Education	
Marketing and outreach	Marketing strategies for the education and behavior program will vary depending on the program component. The objective of marketing for a school based program is recruiting schools to participate in the program. Many utilities recruit schools by writing a personal letter to school principals or using one-on-one direct contact (email, phone call, or visit) to explain the program and enlist their support. Marketing is an integral part of general awareness program delivery. For several program delivery components, the two are one and the same. The key difference between program marketing and general awareness marketing is that materials use a more informational message, rather than promoting a specific program. General awareness messaging can be delivered through: • Bill inserts • Mass media (e.g., radio, print, digital advertising, public service announcements) • Website • Newsletters • Case studies • Brochures, flyers, FAQs, door hangers, etc. • Presentations, workshops, participation in community events, sponsorships • Trade ally training and industry events • Social media (e.g., Twitter, Facebook, YouTube, Flickr, LinkedIn)
Measures and incentive levels	This program does not cover specific measures and does not provide specific incentives. All education and general awareness activities are provided at no cost to customers.
Budgeting rules of thumb	The cost of education and behavior programs can vary widely depending on the delivery approach. A program focused strictly on general awareness can be categorized as 100% marketing cost. Utilities are encouraged to seek out pricing from a variety of program implementation perspectives to develop budgets.
Benefits	• Provides energy efficiency education to students through fun activities • Begins the process of lifelong awareness of efficiency among future customers • Can increase customer knowledge through approaches that support the community

Energy Efficiency Education	
	• Offers an opportunity for utilities to have a two-way dialogue with customers that enhances customer relationships • Increases awareness of how customers' behavior impacts their energy usage • Can contribute to market transformation by encouraging consideration of energy efficiency in purchasing decisions • Potential to help change individuals' patterns of energy use and encourage ongoing, consistent energy-efficient behaviors • Implementation can include a broad range of activities and partnerships
Measuring savings	This program does not require any measurement or tracking of energy savings. However the effectiveness of individual program activities should be evaluated on a case by case basis, through customer surveys, or by soliciting feedback through other means.
Best practices and innovations	• School-based programs: ✓ Design curriculum that's fun, engaging, visually appealing, and memorable. ✓ Use contests or challenges to engage kids. ✓ Design age-appropriate curriculum and target kids old enough to understand energy concepts and efficiency benefits. ✓ Use a variety of educational materials, activities, and assignments to reinforce curriculum. ✓ Assign take-home projects and provide general awareness information for kids to share with their parents. ✓ Invite guest speakers and community leaders to present in classrooms or at assemblies. ✓ Present curriculum in small doses over an extended period following a phased path. • General Awareness: ✓ Use positive, fact-based, credible communications to overcome perception barriers about energy efficiency.

Energy Efficiency Education	
	✓ Ensure the educational messages are audience-specific and include a call to action. ✓ Speak to customers on their own terms using regional mindsets and terminology. ✓ Maintain focus on the end goal. ✓ Build momentum to create bandwagon effect. A phased approach sometimes works best. ✓ Leverage multiple outreach tactics, such as participation in events, social media, and traditional media ✓ Use normative messaging that conveys energy efficiency as a social norm (e.g., “all of your neighbors have participated in the energy challenge, why haven’t you?”) to encourage customers to adopt energy-efficient behaviors. ✓ Encourage customers to commit or pledge to take action. ✓ Offer recognition for participants’ contribution.

5.1.1.6 New Construction

The best practice programs the Project Team evaluated in residential new construction all share a basic structure and program components. The programs were all based on EPA's ENERGY STAR® New Homes program. Each included marketing and education for the program participants (builders and developers), as well as for the consumers. Each program includes tiered incentives combined with targeted prescriptive options.

The national ENERGY STAR® Homes program provides utilities with a high profile market brand and set of technical requirements for the construction of energy-efficient new homes. Programs provide marketing and education to the community. Program participants use the framework of the Residential Energy Services Network (RESNET®) and accredited HERS to verify that a home meets program qualifications.

Tiered incentive structures provide a program flexibility to adapt to new codes and eliminate incentives for measures that are no longer above the standard. In addition, tiers allow the program to offer higher incentives for strategies that provide greater energy efficiency but have higher upfront costs. Prescriptive incentives allow a utility to target specific strategies and technologies, such as premium performance heating or cooling systems or solar technology.

The Project Team observed that while the best practice programs all shared these basic elements and included tiered prescriptive incentives, the utilities analyzed each faced different challenges, ranging from service areas with multiple energy codes in effect, to the need to differentiate energy sources across their customer bases. In each case the utility was able to apply the same program components and customize the incentive formula to suit its needs.

The Project Team acknowledges that the new construction market in the United States has been virtually flat for the past few years and that many utility new construction programs have suffered from equally low uptake. The Project Team has included a recommendation for a new construction program for possible future consideration. MOUs should carefully evaluate the housing market within their service territories before embarking on a significant new construction program effort. As the residential construction market begins to rebound, MOUs may want to experiment with pilot-level programs before launching a full-scale program.

Table 32. Residential New Construction Program

Residential New Construction Program	
Program description	This program supports the construction of energy-efficient new homes. The program offers a per house incentive for homes built to meet EPA's ENERGY STAR® New Homes requirements, using a tiered incentive structure. A third-party HERS rater is employed by participating builders to confirm that homes meet the ENERGY STAR® Homes requirements. The program provides marketing, education, technical support, and administration.
Objectives	• Support the creation of more energy-efficient housing stock • Educate builders, and thus move the industry to adopt more energy-efficient building practices • Educate consumers about the value and comfort of energy-efficient and high performance homes and the ENERGY STAR® programs
Infrastructure and staffing	Estimated utility staffing requirement: 0.5 FTE for management, marketing, trade ally support, evaluation, and other administrative functions.
Customer targets and eligibility	This program targets all builders of single family homes and duplexes. Participating builders must become ENERGY STAR® Partners. Once in the program, participants are responsible for building homes to meet the designated ENERGY STAR® Homes requirements.
Implementation strategy	An ENERGY STAR® Homes program can be managed and delivered with in-house staff and minimal outside technical support. Key steps in program implementation include: • Promote program participation through industry events and trade allies. • Educate program participants on the ENERGY STAR® Homes program and requirements. • Provide program participants with energy efficiency education and design assistance. • Participate in statewide program activities. • Provide marketing and outreach to consumers.

Residential New Construction Program	
	• Provide program information on the utility website. • Process and track program participation and incentives. • Train builders' marketing and sales staff, lenders, and real estate agents about energy efficiency, the financial savings, and the user comfort benefits of ENERGY STAR® Homes. • Verify that properties meet the incentive requirements. Participation steps include: • Participating builders must attend technical training on the requirements of the ENERGY STAR® New Homes program and become ENERGY STAR® Partners. • Prior to the start of construction, the program participant must submit building plans to a RESNET accredited provider for analysis of the home's anticipated energy consumption to verify project eligibility. • Once the home is completed the physical structure undergoes a comprehensive assessment using diagnostic testing to verify that the ENERGY STAR® Homes requirements have been met. • For volume builders, a predetermined sample of finished structures is tested to verify the entire community. • The HERS rater submits the final evaluation to the program administrator to show compliance.
Program barriers • Builder concern that consumers will not understand or pay for a home built to ENERGY STAR® Homes standards. • Industry stakeholders lack understanding of financial and user benefits of a home built to ENERGY STAR® Homes standards.	**Mitigation Strategies** • Target consumers with marketing and advertising focused on the energy efficiency, savings, and increased comfort of homes built to ENERGY STAR® Homes standards. • Provide outreach and education to builders' sales and marketing staff, as well as lenders and real estate agents on the energy efficiency, savings, and increased comfort of homes built to ENERGY STAR® Homes standards.

Residential New Construction Program	
• Additional upfront costs for the building and verification of ENERGY STAR® Homes. • Participants don't meet the program's design, technical, and verification requirements.	• Provide incentives to offset the additional costs of building and verification of residences built to ENERGY STAR® Homes standards. • Require participants to attend an initial program orientation and provide design and technical assistance.
Marketing and outreach	This program relies on both developing the demand side through customer marketing, and on recruiting active builders. A high level of trade ally participation and program promotion are critical to ensure program success. Program messaging to consumers focuses on the ENERGY STAR® brand and education on the long-term benefits of homes built to ENERGY STAR® Homes standards. Marketing messages for builders should highlight that the program is a way to differentiate their products, while also positioning them to better meet future energy code requirements. Marketing tactics for consumers may include: • Dedicated program web page • Brand marketing material with ENERGY STAR®. • Presenting program information at seminars, conferences, home shows, and community events. • Coordinating marketing opportunities with key market partners (e.g., SECO, neighborhood associations, and city building departments). Marketing to builders may include: • Outreach through industry organizations and events (American Institute of Architects (AIA), the Home Builders Association). • Advertising in trade publications. • Presenting program information at seminars, conferences, home shows, and community events.

Residential New Construction Program	
	• Coordinating marketing opportunities with key market partners (i.e., SECO, city building departments).
Measures and incentive levels	Following are suggested tiers and incentives for an MOU providing electric service to customers in areas that have adopted International Energy Conservation Code (IECC) 2009.

	Requirement	Incentive
Tier 1	ENERGYSTAR Standard v2.5	$250
Tier 2	ENERGYSTAR Standard 3.0	$500
Tier 3	HERS Index of 60 of below	$750
Prescriptive Options	Utility-Specific	

Program adjustment strategies:

- In areas with less stringent energy codes, start tiers with ENERGYSTAR v2 and provide higher incentives.
- If requiring lower versions of ENERGY STAR®, additional tiers can be offered for the installation of higher SEER AC systems or higher window efficiency.
- Partner with relevant gas utilities to enhance whole home incentives.

Additional rebates can be offered for targeted or premium efficiency prescriptive measures. Examples might include solar technologies or premium efficiency air source heat pumps.

Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $0.23/kWh • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 5% ✓ Third-party contractors: 5% to 10% ✓ Marketing and advertising: 5% to 10% ✓ Incentives: 70% ✓ EM&V: between 5% and 10%

Residential New Construction Program	
Benefits	• Educates builders and developers as well as consumers • Tiered incentives allow for flexibility to adapt to changing markets • Provides utilities with a high profile market brand • Increases efficiency of housing stock over time • Can help move the industry to adopt more energy-efficient building practices • Minimal outside technical support is required
Measuring savings	The HERS ratings provided with incentive applications provide estimated energy savings compared with a home built to code. These predicted savings may be adjusted based on post-installation inspections.
Best practices and innovations	• Offer tiered incentives that encourage increasing levels of efficiency. • Partner with local gas utility to create a comprehensive program package that addresses the whole home as a system. • Include incentives for targeted prescriptive measures, such as: ✓ Premium efficiency heating, cooling, lighting, or appliances ✓ Solar-ready homes ✓ Solar technology or geothermal systems • Offer high-quality building science and energy efficiency training to the building community in order to move the entire industry practice forward. • Require builders to attend building science and energy efficiency trainings before being eligible to receive incentives. • Include strategies to encourage builders' subcontractors to attend building science and energy efficiency training. • Provide technical and design assistance to support program participants. • Educate customers about the benefits and features of ENERGY STAR® Homes to encourage greater market adoption.

Residential New Construction Program	
	• Leverage ENERGY STAR® brand, marketing materials, and other resources to the greatest extent possible. • Build strong communication channels with trade allies and builder associations. • Offer training to marketing and sales departments of volume builders to support their ability to successfully sell the benefits of ENERGY STAR® Homes. • Outreach to industry stakeholders (e.g., lenders, real estate agents) with education about the value of ENERGY STAR® Homes. • Work with other MOUs to build economies of scale where possible (e.g., education, training, and marketing).

5.1.1.7 On-bill Financing

OBF is increasingly being used as an important tool for utilities to help customers afford the cost of making energy efficiency improvements. While early versions of OBF were not very attractive to utilities, improvements have been made that now address typical utility concerns. Municipal and cooperative utilities are voluntarily adopting OBF at an increasing rate. In fact, three of the five sample financing programs presented in this report involve voluntary OBF programs: Electric Cooperatives of South Carolina (ECSC), Midwest Energy in Kansas, and Manitoba Hydro, plus a program mentioned in the ECSC write-up that involves four cooperatives in Eastern Kentucky.

OBF offers two advantages over most other financing models: it works for tenant-occupied properties; and the tariff form of OBF offers customers off-balance sheet financing that doesn't add to debt.

For tenant-occupied properties where the tenant pays the utility bills, a common barrier for utility energy efficiency programs is known as "split incentives." In these situations, the landlord has little incentive to pay for energy improvements, since the tenant would be the one to benefit from the savings on the utility bill. Conversely, tenants are normally reluctant to pay for improvements to a property they do not own. OBF addresses this obstacle by putting both the savings and the monthly financing payments on the same bill, with the net result being a lower utility bill overall. OBF is the only financing model that solves this problem.

Another common obstacle to financing is that businesses and homeowners are often reluctant to take on debt for non-essential purposes. Especially in the current economic environment, they may prefer to preserve their borrowing capacity for unforeseen problems or competing needs that are more important. The tariff form of OBF addresses these concerns by tying the repayment obligation to the utility account instead of to the customer. A tariff is not considered a loan; it stays with the property and is transferred to the next customer if the current customer moves. Tariffs do not show up on the customer's financial balance sheet, do not in most programs create a lien on the property, and do not reduce the customer's ability to borrow. It also does not have to compete with other company priorities for capital budget dollars, which can be a significant advantage for utilities.

Table 33. On-bill Financing Program

On-bill Financing Program	
Program description	Financing programs help customers make energy improvements by removing the obstacle of upfront costs. The energy cost savings from the improvements are used to pay off the financing over time. OBF programs use the utility bill as the vehicle for repaying the loan. The utility's role beyond managing the program can vary from providing capital and originating loans to simply serving as the repayment vehicle. OBF programs are generally used to target deeper retrofits. If the loan form of OBF is selected (as opposed to the tariff form), the challenge of complying with consumer lending laws may lead the program to, either avoid the residential sector or to use a third-party lender to originate and service loans to the residential sector. OBF's unique ability to solve the "split incentive" problem makes it the only good financing choice for the multifamily and small business sectors.
Objectives	• Provide customers with opportunities to reduce their energy costs and increase their energy efficiency. • Eliminate the obstacles to customers of the upfront cost of making energy efficiency improvements. • Create a mechanism that helps address the split incentive barrier. • Enable customers to pay for the improvements over time using the savings delivered by the improvements. • Enable customers to pay for energy efficiency improvements without affecting their ability to borrow.
Infrastructure and staffing	Estimated utility staffing requirement: 1.0 FTE for management, trade ally support, evaluation, and other administrative functions.

On-bill Financing Program	
Customer targets and eligibility	OBF can target all sectors (residential, commercial, government, etc.), although it is best to choose one sector to focus on initially. While eligible measures can be prescriptive (e.g., air-sealing, insulation, etc.), most OBF programs encourage deeper retrofits by requiring a comprehensive energy audit that identifies a package of recommended measures and includes an estimate of installation costs and energy savings. Project eligibility is generally based on whether the package will generate positive cash flow for the customer (i.e., they will on average save enough money to cover the monthly financing payments). Participants must own the property and pass a check of their utility bill payment history. Some programs, especially those that use third-party lenders, also check the customer's credit report and debt-to-income ratio.
Implementation	OBF can take a variety of forms. Many utilities engage outside expertise for help determining the best form to meet their specific situation and objectives. There are many different program design approaches utilities can take. Each MOU should explore available options and select the approach that best fits their operational capacity and program objectives. Design variables include: • Sources of Capital: ✓ Utility – system benefits charge (SBC); operating or capital budget; borrowing; and bonds ✓ Third-Party Lenders – local or regional banks or credit unions; and low-interest community development financial institutions (CDFIs) such as nonprofit lenders and state and local housing and economic development authorities ✓ Government – local (fees, budget, revenue bonds); state (energy or development agencies); DOE and EPA grants; zero-interest United States Department of Agriculture (USDA) Rural Economic Development Loans and Grants; Qualified Energy Conservation Bonds; Qualified Zone Academy Bonds for schools; and quasi-governmental entities such as state and local housing and economic development authorities.

On-bill Financing Program	
	• Security: the ability to disconnect service is typically the only security needed, although some programs may file a lien on the property or equipment in lieu of (or in addition to) a disconnect provision. • Risk of Loan Defaults: may be borne by: ✓ a third party lender that makes the loans ✓ program participants (as a small fee or interest rate supplement that covers the few losses) ✓ all ratepayers, since all share in the benefits of avoiding the cost of building new generating capacity, creating installation jobs, and conserving resources (note that, when spread across an entire rate base, typical losses of 1% to 3% are quite minimal). • Loan Origination and Servicing: provided by the utility, third-party lender, or a third-party program administrator • Credit Enhancement: third-party lenders may or may not be willing and able to lend on terms necessary for program success; the utility or another party (see Sources of Capital above) may need to provide an interest rate buy-down or loan loss reserve in order to achieve the desired interest rate, length of loan, and credit requirements. • Loan versus Tariff: loans may be easier to implement, but many businesses and homeowners are reluctant to use their limited borrowing capacity for non-essential purposes; tariffs have the advantages of being off-balance sheet and not adding to debt, and being transferable to a new owner or occupant if the property is transferred.
Program barriers • Utilities may not want to use their capital budget to make loans	**Mitigation Strategies** • Use other non-utility capital (see Sources of Capital above) • Assign the risk of loan defaults to parties other than the utility (see Risk of Loan Defaults above)

On-bill Financing Program	
• Assuming the risk of loan defaults may not be in a utility's interest • Assigning partial bill payments • Utilities may be reluctant to disconnect customers for failure to make the financing payment • Billing software may not be able to handle the monthly finance charge • A tariff may not be easy to implement • Loan origination and servicing may not be of interest to utilities • Lenders may not be interested in participating in the program	• Assign partial payment to the energy bill first, then the financing payment and carry over the remainder • Bear in mind that the total bill is less than before the loan; let low-income energy assistance include the finance payment; take disconnect out of the utility's hands (make it mandatory) • Use the OBF program to help justify upgrading old software to enable line-item billing, perhaps including third-party services that can help subsidize utility rates • Loans are an acceptable option, but tariffs offer significant advantages (see Loan Versus Tariff above) • Use a third-party lender or program administrator to originate and service the loans • Focus on regional and local banks and credit unions, as well as CDFIs such as non-profit lenders and state and local housing and economic development authorities
Marketing and outreach	Utilities often market OBF programs in tandem with their equipment rebate, audit, and direct installation, or other relevant programs – offering financing as an adjunct to traditional equipment rebates. Thus many of the same marketing and outreach strategies apply, including: • Bill inserts • Utility dedicated program web page • Active trade ally outreach and support • Newspaper, radio, and other mass media • Brand marketing material with ENERGY STAR® • Present program information at seminars, conferences, home shows, and community events

On-bill Financing Program	
	• Outreach to and coordinated advertising with trade allies (i.e., equipment dealers, distributors, and installers) • Coordinate marketing opportunities with key market partners (i.e., SECO, community groups) • Publish and distribute program brochure • Cross-promote through other programs
Measures and incentive levels	Eligible measures are typically quite broad. The primary requirement is that a package of measures must generate positive cash flow over the length of the loan. Loan length is usually limited to the average useful life of the measures being financed. Typical energy efficiency measures such as air sealing, insulation, and HVAC equipment are almost always eligible, while renewable energy measures such as solar electric, solar thermal, and geothermal may or may not be included. Financing incentives typically take the form of: • Low Interest Rates – normally in the range of 0% to 7%, depending on the source of capital and the availability of funds to buy down the rate. • Long Loan Terms – often 2 to 3 years for small loans, and 5 to 10 or even 15 years for whole-building retrofits. • Broad Eligibility – OBF programs often include good customers who might not qualify for traditional bank loans, especially since loan security seldom relies on the customer's equity in the property (security is usually provided by a disconnect provision). Rebates and other incentives can be combined with the financing program, and are sometimes offered as an "either/or" choice. AE's "Best Offer Ever," indicates that the combined approach is far more attractive to customers than the either/or approach. Financing incentives may be tiered to help motivate customers to make deeper retrofits.
Budgeting rules of thumb	• Because OBF programs are offered in conjunction with other programs (such as equipment rebate programs), the cost of energy savings is based on the installed equipment.

On-bill Financing Program	
	• Costs for marketing, incentives, and EM&V are born under the companion program. • Program costs typically include labor for approximately 1.0 FTE for program set up, plus 0.2 FTE for ongoing program administration. • Cost of capital depends on capital source. Capital provided internally is equal to the utility's cost of capital. Capital from external sources can vary from 2% to 3% from a CDFI to 7% to 8% from a commercial bank.
Benefits	• Helps customers afford energy efficiency improvements by removing upfront costs and allowing payment over time with low interest rates • Customers often see net reduction in monthly energy bills • Offers a mechanism to overcome the split incentive barrier • Enables customers to improve energy efficiency without increasing debt • Can take a variety of forms for implementation • Opportunity for partnership with contractors, installers, and community organizations
Measuring savings	Energy savings are typically calculated through the energy audit. Many programs include an inspection and/or test-out of the installed improvements, although this is determined more by the overall retrofit program than by the financing program itself.
Best practices and innovations	• Team with lenders to leverage their experience in financing home improvements. • Be familiar with the benefits to lenders of participating in the program, as described in Lawrence Berkeley National Laboratory's Policy Brief on AE's loan program. • Use low-interest financing as a high-leverage tool (the cost of subsidizing the interest rate is a small fraction of the cost of the improvements). • Train trade allies, such as installers, to point customers to the OBF program, as a highly motivated sales channel. • Use a network of trained and qualified contractors to help assure quality workmanship.

On-bill Financing Program	
	• Partner with cities and community-based organizations to help expand participation. • Target rental properties: use OBF to solve the "split incentive" problem associated with tenant-occupied properties. • Use the tariff form of OBF (as opposed to the loan form) to offer customers off-balance sheet financing that is not considered debt and can be transferred to a new customer if the current customer moves. • Collaborate with other utilities to achieve economies of scale and a stronger program. • Approve loans quickly to meet the needs of a reactive market (i.e., customers who must immediately replace equipment, such as a furnace that fails in mid-winter). • Develop a comprehensive marketing program tied to appropriate companion programs. • Design a quick and easy process that eliminates the hassles of getting an audit, obtaining a loan, and making improvements.

5.1.1.8 Residential Demand Response

DR programs are designed specifically to help utilities control energy demand during peak periods. Although few of the MOUs interviewed for this study indicated that demand constraints were a current issue, the ACEEE potential study indicated supply scarcity was a near-term concern.

Residential DR programs can be subdivided into two categories: DLC and pricing programs.

DLC programs primarily target customers who have working central A/Cs or heat pumps. Electric water heaters and pool pumps can also be considered for participation as long as they are in good working order and compatible with the MOU control technology. DLC program participants' A/Cs are equipped with a device that is capable of reducing the energy use of the equipment during peak demand periods when it receives an event signal from the utility. These devices simply interrupt the "on" signal of the unit to reduce the amount of time it operates. Newer DLC programs often utilize smart thermostats that similarly reduce the use of connected equipment when they receive event signals.

Pricing programs typically target the same customers, but their methodology varies slightly. Instead of simply sending signals to DLC devices, pricing programs vary the rate that customers pay for electricity. TOU rates are generally split into higher rates during peak demand periods and lower rates during off-peak periods, but the rates are typically consistent from day to day. Dynamic pricing programs have the same intraday variation as TOU rates, but rates can also vary from day to day to address particularly high demand periods (when DLC events are typically called).

Utilities normally offer customers a nominal incentive (often between $25 and $50 per summer season) in exchange for allowing them to cycle off their air conditioning systems during peak periods. Customers generally notice no difference in the comfort of their homes, so the program is a benefit to both the utility and the customer.

Pricing programs use a pricing structure that incentivizes customers to shift their electric usage to off peak periods. Some pricing programs provide customers with enabling technologies, that alert them to varying pricing and/or control equipment per the customers' preset specifications during peak demand periods.

Table 34. Residential Demand Response Program

Residential Demand Response Program	
Program description	The Residential DR program includes two potential components: a DLC program or a pricing program that utilities may implement based on their operational capabilities and infrastructure. The DLC component primarily targets customers who have working central A/Cs or heat pumps. Electric water heaters and pool pumps can also be considered for participation (as long as they are in good working order and compatible with the MOU control technology). DLC participants are equipped with a device that is capable of reducing the energy use of their equipment during peak demand periods when they receive an event signal from the utility. Either a DLC switch or a smart thermostat can be used as the control technology; both similarly reduce the use of connected equipment when they receive event signals. The pricing program component assigns different rate structures to electricity consumed during different times of the day and/or different days during the peak season. Higher rates are charged during peak periods and lower rates are applied during off-peak periods. Enabling technologies such as smart thermostats, in-home displays (IHDs), or direct load control receivers (LCRs) may be installed in the customer's home. Customers manage their energy use so as to incur the lowest prices.
Objectives	• Reduce peak demand and alleviate strain on the electric system during peak periods. • Provide incentives to customers willing to reduce their energy consumption during summer peak hours, or offer customers lower electric rates when they use equipment during off-peak times. • Educate customers about peak load reduction and energy efficiency.
Infrastructure and staffing	Estimated utility staffing requirement: 1 FTE for internal program management or 0.25 to 0.5 FTE for management of a third-party implementer. If the program is implemented with internal utility staff, additional staff will be required to install switches at customer sites. Additionally, the utility will be required to purchase DLC devices for installation on customer air conditioning systems.

Residential Demand Response Program	
	Third-party implementers offer customizable DR options that can range from complete turnkey programs to only providing technology, or any combination in between.
Customer targets and eligibility	This program primarily targets residential customers, but small commercial customers with compatible central air conditioning systems, heat pumps, water heaters, window A/Cs, and pool pumps, could also be eligible. The program can be offered for both existing and new construction. If the participant resides in rental property he or she must obtain the owner's approval to participate.
Implementation	The utility may either implement the program internally or select an experienced DR contractor with national presence, to provide turnkey program services. The implementer or MOU provides comprehensive services including: • Marketing • Customer recruitment and troubleshooting • Installing control devices on eligible customer equipment, processing applications, tracking program data; paying incentives to customers • Documenting customer and transaction information Key steps in program participation include: • MOU/implementer markets to, enrolls, and contracts with new participants. • MOU/implementer schedules customer visits to install DR equipment (if utilized). • MOU/implementer verifies customer and appliance eligibility. • MOU/implementer provides customer educational materials about the program and ways to manage energy use and peak demand. • MOU/implementer controls units or sends pricing signals during specified peak periods to provide firm load reductions.

Residential Demand Response Program	
	• MOU/implementer tracks customer data, appliances, and outcomes throughout process. • MOU/implementer processes and delivers customer incentives.
Program barriers • Customers do not understand the program. • Ability to maintain comfort levels with air conditioning cycling. • AMI infrastructure compatibility. • Customers override control devices.	**Mitigation Strategies** • Design a robust marketing strategy. • General customer education and awareness. • Use proven technologies and cycling strategies that prevent large temperature swings. • Ensure MOU/implementer fully understands the AMI system. • Limit customer access to controls.
Marketing and outreach	Utility program staff coordinates with internal marketing and communications departments and the implementation contractor to ensure program materials are consistent with utility branding and advertising protocols. External marketing is led by the implementation contractor. The marketing strategy may include: • Direct mail • Bill inserts • Utility dedicated program web page • Newspaper, radio, and other mass media • Present program information at seminars, conferences, and community events • Coordinate advertising opportunities with trade allies • Distribute program brochures to community organizations, such as Chambers of Commerce

Residential Demand Response Program	
Measures and incentive levels	For the DLC component, an LCR or smart thermostat is installed on control equipment by the implementer/MOU at no cost to the customer. Customers participating for the entire peak summer period receive an end-of-summer incentive of $25 to $50 for participation (to be determined by the MOU/implementer). A customer with more than one appliance may be eligible for multiple incentives. Incentives for partial summer participation may be prorated. For pricing programs, enabling technologies such as smart thermostats, IHDs, or LCRs may be installed at no cost to the customer. Customer incentives vary depending on their electric usage. Customers that provide higher levels of demand savings will typically earn greater incentives than customers with low demand reduction. Customers with high on-peak consumption may pay more than they would have if they hadn't participated in the program.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $135/kW but will range depending on the ramp-up of the program because of initial equipment costs • Estimated program costs as a percentage of total program budget: ✓ Administration (internal): 10% ✓ Third-party contractors, trade ally, and technical costs: 30% ✓ Marketing and advertising: 10% ✓ Incentives: 50% ✓ EM&V: 3% to 5%
Benefits	• Provides opportunity to control energy demand during peak periods • History of market acceptance and successful implementation • Benefits both customer and utility • Provides opportunity to educate customers on energy management strategies

Residential Demand Response Program	
Measuring savings	Actual impacts of the DR program will be verified using a statistical comparison of hourly load shapes of program participants between events and a reference (baseline) day. Hourly interval meter readings will be the primary data used in this analysis. These data may be augmented by information on the dwelling unit and household demographics to develop a better understanding of factors affecting demand savings.
Best practices and innovations	• As MOUs traditionally have high levels of customer satisfaction and very trusting customers, it is valuable to clearly outline the program to provide detailed program materials that explain the program, why it is necessary, and what the alternatives are (higher rates, building more power plants, etc.). Materials should offer tips for managing peak demand voluntarily (e.g., doing laundry at night) to each new participant in the DR program. Utilities should also use this opportunity to provide materials on other energy efficiency program opportunities. • Encourage customers to bundle similar programs to gain multiple benefits. • Adopt a regular schedule to test appliance cycling switches in the service territory and replace any that are missing or not functioning. • Offer a large enough incentive to gain customers' interest; continue to provide incentive each year the customer participates. • Conduct customer satisfaction surveys to gather information on program barriers and bottlenecks and solicit feedback from customers. • Provide annual feedback to customers on the system-wide program benefits and thank them for making a difference. • For pricing programs, develop rate structures with significant differences between peak and off-peak rates so as to provide high motivation for load shifting.

Residential Demand Response Program	
Advanced metering infrastructure (AMI) / smart grid implications for DR	• An AMI system can be used to transmit the event signals to DR devices • An AMI system can be used to verify that DLC devices are operational. • Smart thermostats are typically used when an AMI system is available, as they provide the participant with enhanced functionality such as the ability to override an event on the device and near-real time data on energy consumption. • DLC can be marketed as a "Smart Home" feature of the smart grid. • AMI systems make evaluation of the program less costly and improve validity as larger sample sizes are available due to the presence of smart meters.

5.1.2 Commercial Program Concepts

The Project Team's analysis showed that, in aggregate, the C&I sectors combined represent only 16 percent of MOUs' customers; however, this sector consumes 54 percent of the total electricity sold.

According to the ACEEE study[16] of Texas' energy efficiency potential, existing commercial buildings offer significant energy savings opportunities, particularly through energy-efficient lighting, HVAC equipment and systems, high-efficiency refrigeration, and water heating equipment and systems. Commercial lighting accounts for about 43 percent of all electricity consumption in Texas, representing the largest commercial end-use consumer of electricity. ACEEE identified several technologies that could increase the efficiency of these systems, including fluorescent lighting improvements, replacing incandescent lamps with CFLs, daylight dimming systems, and others. These measures offer energy savings potential on the order of 22,552 GWh or nearly 35 percent energy savings.

ACEEE also found significant energy savings potential from a combination of building shell upgrades and HVAC equipment to address HVAC electricity consumption. Less prominent, but still attractive savings opportunities are available through commercial refrigeration and high-efficiency office equipment upgrades. Together these savings make up another 29 percent of energy efficiency potential.

The Project Team's assessment found that Texas MOUs' perceptions of potential are consistent with ACEEE's findings. Of the MOUs interviewed for the study, 90 percent of respondents indicated moderate to significant opportunities to gain energy savings through commercial lighting and HVAC upgrades, and 80 percent indicated that building shell upgrades were a moderate to significant opportunity. These were the highest-rated measures for potential energy savings by MOUs.

In the industrial sector, the ACEEE potential study diverged slightly from the MOU representatives' perceptions of energy savings opportunities. While ACEEE's study estimates the economic efficiency resource potential among Texas' large industrial users at 26 percent, among the MOUs evaluated for this study, industrial energy use represents about 15 percent of total electricity sold and very few MOUs offer energy efficiency programs for the industrial sector since most MOUs have few or no industrial customers.

Given these findings, the Project Team's recommendations for the C&I sectors largely focus on lighting and HVAC measures for smaller commercial customers, but they include offerings that may be implemented by any commercial or industrial customer. One program, a custom program, is targeted strictly to larger C&I customers.

5.1.2.1 Commercial Prescriptive Rebate Program

Prescriptive rebate programs are among the most straightforward to implement, so they offer a good entry-level program option. From a utility perspective, prescriptive rebate programs can be delivered with minimal staff commitments, and utilities need not contract with a third-party implementation firm. Utilities generally have good relationships with their commercial

[16] ACEEE: Potential for Energy Efficiency, Demand Response, and Onsite Renewable Energy to Meet Texas's Growing Electricity Needs. March 2007. Report number E073.

customers, so being in a position to offer valuable energy solutions that can reduce operating expenses can further enhance their relationships with business customers.

From a commercial customer's perspective, prescriptive rebates can be a very compelling option if the program is easy to understand, implementing the required measures is straightforward, and the application process is relatively simple. These are absolutely critical components of commercial rebate programs. Because business owners are generally stretched thin in terms of both capital and time, commercial programs need to offer robust enough incentives to get customers' attention and a simple enough participation process that the customer sees the project through to fruition.

Utilities have amassed a significant amount of energy efficiency program experience and lessons learned from commercial sector program implementation efforts. Successful programs in this market have three essential ingredients: simplicity, robust marketing and outreach, and an engaged trade ally network.

Based on the Project Team's research of local market conditions and energy saving potential, the following program concept includes those commercial measures that scored highest in the interview results analysis: lighting, HVAC equipment, and building shell measures.

Table 35. Commercial Prescriptive Rebate Program

	Commercial Prescriptive Rebate Program
Program description	The program promotes the purchase and installation of high-efficiency equipment by C&I customers in both existing and new facilities. It offers incentives to offset the higher purchase cost of energy-efficient equipment including lighting; HVAC equipment; building shell measures such as insulation, air sealing, and duct sealing; and motors and drives. The program provides a financial incentive in the form of a prescriptive rebate on a per-unit basis to customers installing qualifying equipment and technologies. Rebates are a fixed amount per device, paid by check to customers who complete a rebate application and submit documentation of the equipment purchase. When implemented as part of a commercial program portfolio, the equipment rebate program is a critical implementation vehicle for installing measures recommended in commercial energy audits or new construction assistance processes. The program is delivered with support from a network of trade allies who specify, sell, and install qualified equipment. Additionally, program and technical support is provided by the utility or a program contractor.
Objectives	• Provide customers with opportunities to reduce their energy costs and increase their energy efficiency. • Encourage customers to install high-efficiency lighting, HVAC equipment, and building shell efficiency measures. • Encourage the use of high-efficiency/ENERGY STAR®-rated equipment where appropriate. • Promote other energy efficiency programs.
Infrastructure and staffing	Estimated utility staffing requirement: 1 FTE for management, marketing, trade ally interaction, evaluation, and other administrative functions. An additional 0.5 FTE or a third-party contractor is recommended to provide technical and program support as well as quality assurance/quality control (QA/QC) functions.

Commercial Prescriptive Rebate Program	
Customer targets and eligibility	This program is available to all C&I customers; however the primary program target is small to mid-sized commercial customers. To be as cost-effective as possible, the program should target customers seeking to replace older, inefficient equipment, or building new commercial facilities. Participant eligibility is verified through customer rebate applications cross-referenced against customer account numbers. Customers must submit a program application with documentation of the equipment replaced (if applicable), new equipment purchased, and installation(s) for verification.
Implementation	Equipment rebate programs are relatively simple to implement and administer and can be managed and delivered with in-house staff. Key steps in program implementation include: • Marketing and outreach, including to trade allies. • Provide call center services to respond to customer questions and provide technical and program support. • Verify customer eligibility and ensure that selected equipment meets program qualifications. • Process applications and rebates. • Review documentation to verify the applicant is an active customer and the installed equipment meets the minimum efficiency standard. • Track program data. • Process rebate checks for qualified equipment. • Verify equipment/appliance installation for a sample of participants. Customer participation involves: • Customers installing eligible high-efficiency equipment schedule the work directly with their equipment dealer or installation contractor. • Work with the equipment installation contractor to fill out program applications and ensure the required documentation is submitted to the utility for processing.

Commercial Prescriptive Rebate Program	
Program barriers • Higher first cost of energy-efficient equipment and economic environment limit customer's ability to purchase energy-efficient equipment. • Customers unaware of the program or benefits of high efficiency upgrades in their facilities. • Customers needing emergency replacement may not know about the program. • Customers don't have the time to commit to large projects.	**Mitigation Strategies** • Offer rebates to offset higher incremental cost. Educate customers on the long-term energy cost-saving benefits of higher efficiency equipment. • Market program and general efficiency awareness to customers. • Provide trade ally training and outreach to explain the benefits of selling higher efficiency equipment. • Promote efficiency awareness to customers and trade allies. • Use a simple participation, application, and verification process.
Marketing and outreach	This program relies primarily on equipment dealers that sell qualifying measures to market the program. Dealers promote the program, help customers understand the features and benefits of qualifying equipment, specify and install equipment, and help customers fill out program applications. A high level of trade ally participation and program promotion are critical to ensure program success. Thus, program marketing should target trade allies in addition to customers, to encourage their participation. The following types of trade allies are predominant: ✓ HVAC equipment distributors, dealers, and service providers ✓ Plumbing and mechanical contractors ✓ Lighting distributors and dealers ✓ Electrical contractors ✓ Motor and variable-speed drive distributors and dealers ✓ Insulation installers ✓ Engineering firms ✓ Architects The program messaging focuses on the features and benefits of energy-efficient equipment.

Commercial Prescriptive Rebate Program	
	The marketing strategy for the program may include: • Active trade ally outreach and support • Bill inserts • Utility dedicated program web page • Newspaper, radio, and other mass media • Present program information at seminars, conferences, home shows, trade shows, and community events • Outreach to and coordinated advertising with trade allies (i.e., equipment dealers, distributors, and installers) • Coordinate marketing opportunities with key market partners (i.e., SECO, community groups) • Publish and distribute program brochure • Cross-promote through other programs
Measures and incentive levels	Commercial customers typically require an investment payback of 1.5 years or less. Program incentives may be set to roughly correspond to a 1.5-year payback, or to cover approximately half of the installed cost of the measure, but may be adjusted as needed to stimulate the market or scale back program uptake. The following measures and incentive levels are provided as examples. Utilities should select measures and set incentives at levels appropriate for their own customer bases, budgets, and program strategies.

Measure	Eligibility Rating	Incentive
Cooling Tower-Decrease Approach Temp.	Chiller tonnage > 100 tons	$8/ton
Cooling Tower-Two-Speed Fan Motor	Replace one–speed fan motor	$1/ton
Pipe Insulation	≥ R-4	$1.60/linar foot
Water-Cooled Chiller, Screw Chiler	High-Efficiency /ton 0.2	$7/ton

Commercial Prescriptive Rebate Program			
	Water-Cooled Chiller, Screw Chiller	Premium Efficiency kW/ton = 0.574	$10/ton
	Direct Expansion (DX) Packaged Air Conditioner System	11.0 energy efficiency ratio (EER)	55/ton
		11.5 EER	80/to
		2.0 EER	$105/ton
	Programmable Thermostat	ENERGY STAR®[17]	$55/unit
	Heat Pump - Air Source	EER=11.0, COP=3.5	$75/ton
	Heat Pump - Air Source	EER=11.8, COP=3.8	$160/ton
	Motors	Premium Efficiency	50% of incremental installed cost
	High Efficiency Fixture/Design	15% Lighting Power Density (LPD) Reduction	50% of incremental installed cost up to $10,000
	Improved Exterior Lighting Design	Full Cut Off Fixtures and Photometric Analysis	50% of incremental installed cost up to $10,000
	CFL	ENERGY STAR®	$1.70
	CFL Pin-Base Fixtures	ENERGY STAR®	$30
	Daylighting Controls	Dimming-Continuous, Fluorescent Fixtures	$35/controlled fixture
	LED Exit Lighting	5 W	$15/unit
	Occupancy Sensors	Wall or Ceiling-mounted Lighting Sensor	$45/sensor
	Time Clocks and Timers	Not applicable (N/A)	$100/unit
	High-Pressure Sodium	70 W (Exterior)	$40
	Pulse Start Metal Halide - Exterior	<320 W	$25
		>320 W	$50
	De-lamp and Install Reflectors	Remove 1 or more lamps to equal 2-Lamp 4 ft. T8 + New Reflector	$50/fixture
	Fluorescent High Bay Fixtures Lighting Package	High Bay Lighting - T5HO (4 Lamps, 240 W per fixture)	$18/lamp
		High Bay Lighting - T8HO (6 Lamps, [240 W] estimated per fixture)	$14/lamp
	T8 Lighting Package	4 ft. T8 2-Lamp Fixture (lamp & ballast)	$14/fixture

[17] ENERGY STAR will discontinue rating programmable thermostats after 12/31/2009. PPL Electric will determine appropriate equipment qualification guidelines when this occurs.

Commercial Prescriptive Rebate Program

	4 ft. T8 3-Lamp Fixture (lamp & ballast)	
	4 ft. T8 4-Lamp Fixture (lamp & ballast)	
	8 ft. T8 2-Lamp Fixture (lamp & ballast)	
Variable Speed Drives	Variable Frequency Drives (VFDs) with motor horsepower (HP) >5 and ≤0	$30/HP
Ceiling Insulation	Above code requireent	70% of installedost
Wall Insulation	Above code requirement	70% of installed cost

Budgeting rules of thumb

- Estimated dollars spent per annual gross kWh saved: $0.15/kWh
- Estimated program costs as a percent of total program budget
  - ✓ Administration (internal): 10%
  - ✓ Third-party contractors: 3%
  - ✓ Marketing, advertising, trade ally training and outreach: 10%
  - ✓ Incentives: 80% to 85%
  - ✓ EM&V: between 1% and 3%

Benefits

- Straightforward to implement and simple for customers to participate in
- Potential for significant energy savings
- Low delivery cost and high cost-effectiveness
- Minimal staff requirements with no third-party contracts necessary
- Opportunity to enhance utility relationship with business customers
- Provides opportunities for business customers to reduce energy costs while increasing energy efficiency and improving their building's comfort for employees
- Provides C&I customers opportunities to replace inefficient equipment at a lower out of pocket cost
- Opportunity to engage a robust trade ally network

Commercial Prescriptive Rebate Program	
Measuring savings	This program targets common end uses such as lighting and HVAC. The impact evaluation will therefore be measure-specific and may include pre- and post-installation inspections. Verification of savings will be based on a sample-based validation of installations and operating conditions. For lighting measures, the analysis will be based primarily on engineering validation and will have three components: verification of installation (measure count), calculation of savings (wattage differential), and verification of full-load hours. Run-time is a key parameter in calculation of savings from lighting retrofits. The impact evaluation should include verification of operating hours using light loggers on a sample of installations. The number of points to be monitored will be based on a sample stratified to represent functional areas and variability of savings within each functional area using a 90/10 confidence criterion. HVAC savings may be validated using engineering calculations, calibrated with site-specific data, including climate conditions, and selective interval recording of key parameters, such as run-time. Data necessary for verification savings in this program will consist of the following: • Engineering estimates of savings for each measure installed under the program, according to technical studies; • Facility characteristics; • Daily weather data from local weather stations to calculate heating degree days and cooling degree days; and • Status and interval data for key equipment parameters.
Best practices and innovations	• Limit the program to a small number of measures to begin with, then expand as the utility and customers become more comfortable with the program implementation, documentation, and verification processes. • Build and maintain strong communication channels with trade allies.

Commercial Prescriptive Rebate Program	
	• Create a formal trade ally network and verify trade ally participants' qualifications by requiring certifications, number of years of experience, insurance, background checks, etc. • Conduct regular quality checks on all participating trade ally installations. Decrease the number of site inspections as a trade ally proves its capabilities. • Allow trade allies to submit rebate applications on behalf of customers. • Use simple rebate forms and program rules. • Provide ongoing, active education and outreach to customers about the benefits and features of energy-efficient equipment. • Couple equipment incentives with low-cost financing. • Create program ties with other commercial offerings to provide interested customers with a comprehensive package of services. • Conduct program and quality installation training for all participating trade allies. • Coordinate eligible measures and incentives among regional MOUs and/or create regional partnerships to ensure continuity, enhance program reach, and reduce customer confusion. • Maintain flexibility to allow program managers to make program changes to address problems as they arise, but ensure that all stakeholders are given notice of program changes and ample time to respond. • Offer free technical and program assistance to customers and trade allies (e.g., through a program "hotline"). • Perform process evaluations to gain insights and feedback on the program's effectiveness and inform future program enhancements.

5.1.2.2 Small Commercial Audit and Direct Installation

Marketing energy efficiency to small businesses is notoriously difficult, and persuading them to make energy efficiency upgrades is even more challenging. Across the United States, utilities struggle with this sector more than any other sector. Market barriers are well known, with the greatest being 1) lack of capital, 2) lack of control over the building facilities (business doesn't always own the space), and 3) lack of time on the part of decision makers.

Commercial customers with small facilities are very busy with business priorities, they have constrained budgets, do not have easy access to program information, and may not participate in energy efficiency programs due to language (i.e., primarily non-English), business size (less than ten employees); or geographic (i.e., outside major metropolitan areas) constraints. Customers in this sector have limited knowledge about energy efficiency and may not trust that energy savings estimates will be realized in actual savings; or they may hesitate to dedicate scarce capital resources for future savings that they consider uncertain. In addition, because of the small scale of most projects, fixed transaction costs are higher so energy service companies (ESCOs) and other commercial vendors are often reluctant to address this market. Finally, a large percentage of smaller commercial customers occupy leased space, so the split incentive barrier is a common issue in this market.

Not surprising, given the historical difficulty of reaching small commercial customers, this sector offers significant energy efficiency potential. Few small commercial customers have invested in energy efficiency upgrades; most are unlikely to do so in the absence of incentive programs. To attract customers, efficiency upgrades must be seen as an equally good or better investment than core business improvements, typically with a 1.5 year payback or better. To attract this market, utilities must offer programs that are not only financially attractive, but also minimize customers' direct involvement, provide clear information, and are simple from start to finish.

The most successful programs address small commercial market barriers by offering turnkey solutions *and* providing rebates that pay a significant percentage of project installed costs. The top small business efficiency programs rely on either turnkey delivery by an experienced implementation contractor or an active trade ally program that offers specific benefits to contractor networks to promote services and bring in customers. Many utilities approach their small commercial audit and direct installation programs as an opportunity to connect with customers, install a few energy savings measures, and look for opportunities to sell customers on larger upgrades. Those programs that generate the largest amount of energy savings use a comprehensive, whole building approach whereby bundled energy efficiency measures benefit from more robust incentives. Ideally, the small commercial audit and direct installation program offers a set of larger efficiency measure incentives or is tied to a prescriptive program that can be leveraged for installation of a package of upgrades.

The program concept provided here is designed to be delivered by a third party implementation contractor that specializes in small commercial programs and offered alongside a commercial prescriptive rebate program so that auditors can offer an attractive, turnkey upgrade package that leverages substantial incentive dollars. If MOUs opt not to offer commercial prescriptive rebates, but still wish to offer a small commercial energy audit program, the Project Team recommends they incorporate lighting, HVAC, and building shell upgrade measures into the overall program offering.

Table 36. Small Commercial Audit and Direct Installation Program

Small Commercial Audit and Direct Installation Program	
Program description	This program is designed to provide small commercial customers with information on their buildings' energy performance, direct installation of low-cost energy-efficient measures, and recommendations on energy efficiency actions they can take to reduce their energy consumption. Recognizing the barriers inherent in small commercial energy efficiency programs, the cost of the audit should be either free to customers or sufficiently subsidized by the utility so that customers' cash outlay is minimal. Customers who install a package of recommended energy efficiency upgrades in their buildings will be reimbursed the cost of the audit and will be eligible for rebates for the installed equipment that increase with each subsequent installed measure. Small commercial energy audits include a thorough visual inspection and diagnostic testing of the facility to evaluate major energy-using equipment (lighting systems, HVAC, refrigeration, etc.), building envelope characteristics, and to identify areas for cost-effective energy efficiency upgrades. The auditor will review energy usage and cost patterns in historic energy bills, install simple energy efficiency measures, may tune-up space conditioning systems (i.e., residential type AC systems or packaged rooftop units) and provide customers with an audit report that includes recommendations for appropriate follow-up activities. Following the technical audit, the energy auditor presents the customer with a comprehensive energy efficiency package of measures that includes a detailed financial proposition and incorporates the full range of available utility incentives. To encourage customers to follow-through on recommendations and implement recommended efficiency upgrades, the auditor should be able to generate a formal work order that triggers installation of the package of upgrades. Participants who agree to implement the full upgrade package will be reimbursed for the full cost of the audit, each qualifying measure, and provided with a bonus incentive for implementing each successive measure.

Small Commercial Audit and Direct Installation Program	
Objectives	• Provide customers with information about their facilities' energy use and opportunities to save energy. • Provide customers with opportunities to reduce their operational costs and improve the value of their building through energy efficiency upgrades. • Provide customers with opportunities to increase the comfort of their buildings, which can result in higher staff productivity. • Promote installation of low-cost energy saving measures, which may result in immediate savings. • Provide trustworthy energy savings recommendations from trained energy auditors. • Promote other energy efficiency programs.
Infrastructure and staffing	Estimated utility staffing requirement: 0.5 FTE for management, marketing, trade ally support, evaluation, and other administrative functions. This program assumes a third-party contractors will provide turnkey program delivery, including customer energy audits. The third-party contractor will be expected to offer a full range of diagnostic testing equipment to support the program, as well as commercial modeling software, run on a tablet computer for on-site data collection.
Customer targets and eligibility	This program targets small commercial customers in existing commercial buildings. The program uses building size (recommended: less than 25,000 square feet) and rate classes (those used by smaller business customers) to target and qualify customers. The utility should identify target customers by analyzing the Customer Information System and prioritize them by geography, energy intensity, or business type (North American Industry Classification System (NAICS) Code).

Small Commercial Audit and Direct Installation Program	
Implementation	Utility staff will solicit bids from professional implementation contractors with specific expertise delivering programs to small commercial customers. The selected delivery contractor should be guided by a contract that includes detailed performance expectations with incentives and/or penalties associated with performance metrics. Once a delivery contractor is selected, utility staff will provide overall strategic direction and manage the contractor, work with them to develop marketing and program materials, provide QA/QC and oversight, track progress against goals, oversee evaluation, and provide other administrative functions. The implementation contractor provides turnkey customer delivery of the program including: marketing and outreach to target customers, managing customer intake, verifying customer eligibility, scheduling audits, conducting audits, directly installing measures, analyzing efficiency savings opportunities, working with customers to implement recommended measure packages, processing applications and rebates, tracking and verifying program data. Key steps in program participation include: • The implementation contractor will conduct direct outreach to potential customers, explain the program, verify the customer's eligibility, and schedule an appointment. • The energy auditor will conduct an audit of the customer's facility, directly install simple energy efficiency measures, tune-up space conditioning systems as appropriate, and inspect major energy-using equipment and building envelope characteristics to identify areas for cost-effective efficiency upgrades. • The auditor will identify a package of energy efficiency upgrades that qualify for financial incentives and offer a net payback of one year or less and review the measure package, available financial incentives, investment metrics, and installation process with the customer. • Customers will receive an audit report with recommendations for appropriate energy efficiency upgrades and information on incentives available through the audit and other programs. If the customer opts to proceed with installation of the recommended measure package, the auditor will provide the customer with a written firm or estimated work order, as well as a rebate application and details for obtaining incentives. Energy auditors will provide a copy of the audit report to utility staff for tracking and reporting purposes.

Small Commercial Audit and Direct Installation Program	
	• If the customer commits to installing the recommended measure package, the implementation contractor schedules and conducts measure installation and helps the customer fill out all applicable program applications. The customer's cost for installed measures is paid, minus incentives, directly to the implementation contractor at the time measures are installed. • The implementation contractor submits reports monthly to the utility indicating all participating customers, measures installed, incentives provided and audit subsidies allocated.
Program barriers • Economic environment limits customer's ability to purchase energy-efficient equipment. • Lack of customer program awareness • Limited time, resources, and awareness on how to act on recommendations • Customers don't trust energy-savings calculations • Energy small part of overall operating costs	**Mitigation Strategies** • Offer free on-site energy audits and direct installation of measures for immediate savings; provide rebates to offset higher incremental cost of energy-efficient equipment. Educate customers on the long-term cost-saving benefits of higher-efficiency equipment. • Conduct targeted, active outreach to potential customers. • Provide ongoing follow-ups and technical support to help customers move through the installation steps. • Provide free, independent, expert analysis and recommendations. • Install free energy savings measures that generate immediate cost savings. • Review case studies of actual projects with customers to show evidence of energy savings.
Marketing and outreach	Marketing for the program should be led by the implementation contractor that has experience marketing to this customer sector. Effective marketing to this sector requires that the delivery contractor be considered reliable, credible, and energy-efficient. This program should leverage both traditional and grassroots social customer marketing for promotion, but be cognizant that direct, one-on-one outreach to this sector is essential for program success. The marketing tactics for the program may include: • Door-to-door canvassing • Presentations to targeted customers, trade associations and at seminars, and conferences

Small Commercial Audit and Direct Installation Program	
	• Bill inserts • Utility dedicated program web page • Newspaper, radio, and other mass media advertising • Publish and distribute program brochure • Cross-promote through other programs
Measures and incentive levels	There should be no cost for audits and direct installation measures. Due to the significant and varying customer barriers to implementing programs in this sector, the utility should eliminate the cost barrier completely. The audit program is designed to tie directly to the utility's commercial prescriptive rebate program. To encourage customers to implement a comprehensive package of measures, this program provides an additional incentive, above and beyond prescriptive incentives, for customers who install measures within a reasonable timeframe. The following incentive levels are provided as examples. Utilities should endeavor to set incentive amounts at a level appropriate for their own budgets and program strategies.

Measure	Incentive
Energy audit	Free to customer when measure is recommended
Compact fluorescent lamps	
LED exit signs	
Occupancy sensors	
HVAC tune up	
Vending machine controls	
Electric water heater measures: • Faucet aerator • High pressure rinse sprayers • Water heater pipe insulation • Water heater setback	Free to customer (customer must have electric water heat to qualify for water heater measures).
Bonus Incentives • Ceiling and wall insulation	20% of installed cost added to prescriptive rebate for each recommended measure installed as part of a

Small Commercial Audit and Direct Installation Program		
	• T5 and T8 lighting fixtures and lamps • Efficient HVAC equipment • Programmable thermostats • Efficient electric water heaters • Efficient motors • Refrigerated vending machine controllers • Variable speed drives	comprehensive package.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $0.31/kWh • Estimated program costs as a percent of total program budget: ✓ Administration (internal): 15% to 20% ✓ Third-party contractors: 10% ✓ Marketing, advertising, trade ally training and outreach: 10% to 15% ✓ Incentives: 75% to 80% ✓ EM&V: between 1% and 3%	
Benefits	• Opportunities for significant and immediate energy savings • Provides a mechanism to identify cost effective efficiency strategies and offset capital costs for customers • Utilities provide direct benefits to customers, enhancing their relationships, and offers an entry point with HTR market • Opportunities for customers to improve the value and comfort of their buildings • Educate customers on their facilities energy use • Eliminates cost barriers for customers to make energy efficiency improvements • Opportunities for partnerships with other utilities or local incentive programs	

Small Commercial Audit and Direct Installation Program	
Measuring savings	Energy savings for this program will be calculated using information gathered during the energy audit, including energy consumption data and quantities of direct installation measures installed. To ensure data is adequate to conduct impact evaluations, collected information should include: • Participant contact information, including name, address, and participation date. • Essential structural attributes • Building and business characteristics, including estimated equipment run times • Types and quantities of measures installed • Estimated savings • Measure cost • Interval daily electricity consumption • Climate information to calculate heating and cooling degree information Additional savings resulting from measures installed through the prescriptive rebate program will be calculated using information from rebate applications for those measures
Best practices and innovations	• Conduct an open, competitive solicitation to identify a skilled implementation contractor. Selection criteria should include previous experience and proven success delivering programs to small commercial customers. • Be aware of customer communities dominated by non-English speakers and develop marketing and program materials in multiple languages, where appropriate. • The roles of sales representative and technical energy auditor should be rolled into one person. The auditor should be an articulate program representative who can walk customers through the process and address questions. • Use mobile modeling software with pre-loaded, approved, energy efficiency measures that include capabilities to recommend a measure package tailored for a specific business type, climate, or Standard Industrial Classification (SIC) code, and calculate their costs and benefits. • Provide a concise, short audit report that shows estimated cost and savings (totaled and for each measure), incentives, and net customer benefits (in dollars and kWh).

Small Commercial Audit and Direct Installation Program	
	• Provide concise but thorough printed materials that explain the program process, rules, and value proposition in detail, and include colorful and intuitive graphics. • Initial contact, audits, direct measure installation, and generation of all required documents (e.g., audit reports, contracts, work authorizations, and warranty statements) happen within a single visit. More extensive measure installation may be conducted in a second visit. • Partner with other utility, state, or local incentive programs to present a unified program to customers. • Use simple rebate forms and program rules. • Solicit customer commitment to install recommended measures. Offer bonus incentives to encourage customers to install the full package of measures. • Ensure the payback for the recommended measure package, including bonus incentives, equates to less than a one-year payback. • Consider offering a financing option with positive cash flow for customers who install the full recommended measure package. • Provide simple, visually appealing energy audit reports that clearly articulate priority measures and estimated energy savings. • Measure installation should be provided either by the implementation contractor or by a small network of pre-selected (through an RFP/bid process). Scheduling and installing equipment should be seamless and automatic. In the case of pre-selected contractors, prices should be fixed and under contract so that the auditor can provide firm pricing and work orders at the time of the audit. • Conduct measure verification, savings measurement, and process evaluations for a random sample of participants.

5.1.2.3 Commercial New Construction

As commercial construction has slowed down dramatically in the current economic environment, the cost of running a whole building new construction program may not be a valuable use of limited resources. Several of the programs analyzed by the Project Team integrate the Advanced Building™ Guidelines as either, the basis or as a component of their commercial new construction programs. Using the Advanced Building™ Guidelines and related suite of tools and resources allow utilities to offer a turnkey program to commercial construction design teams for minimal program effort and expense.

The Advanced Building™ Guidelines include prescriptive procedures, tools, and resources to help design teams create high-performance buildings. The Core Performance Guide is the component that defines high performance in building envelopes, lighting, HVAC, power systems, and controls. Design teams that utilize the guide as a part of an integrated design process can create buildings that are up to 30 percent more energy-efficient than model building standards using off-the-shelf strategies, without the expense of energy modeling.

The Advanced Building™ Guidelines were developed by the New Buildings Institute (NBI). NBI is a nonprofit organization focused on transforming the market to include construction of more energy-efficient commercial buildings. The suite of tools is a key part of its efforts. NBI encourages the use of its resources in energy efficiency programs through sponsorship opportunities. By becoming an NBI sponsor, utilities obtain access to additional administrative and technical tools and resources specifically designed to help them leverage the Guidelines. For an annual sponsorship an organization can take advantage of the following:

- Marketing and administration templates
- Monthly sponsor calls to discuss program challenges and share resources
- Technical support
- Program analysis tools
- Attendance at an annual sponsors' conference

Being a sponsor allows organizations to leverage the resources and recognition of a larger, international organization for a minimal cost. More information can be found at http://www.advancedbuildings.net and http://newbuildings.org.

Table 37. Commercial New Construction Program

Commercial New Construction Program	
Program description	This program is based on the nationally tested Guidelines: a national program created to raise the standards for energy efficiency in commercial construction in North America. The primary component of the Guidelines is the Core Performance Guide: a prescriptive, easy-to-follow guide to energy-efficient lighting, HVAC, and insulation strategies. Used in conjunction with the tools and resources specifically designed to support the guide, design teams can create buildings that are 15-30% more energy-efficient than code, without the overhead of energy modeling. The program provides outreach, technical assistance, project verification, and program administration. In addition, the utility provides incentives upon completion of a building that meets the program's performance requirements. When a participant commits to the program, the project design team meets with a program representative to review the program requirements and resources available. The program offers incentives on a per-square-foot basis for meeting the base building requirements and additional incentives for more aggressive energy efficiency measures.
Objectives	• Support the creation of energy-efficient commercial buildings. • Provide a cost-effective program for both the program administration and participants.
Infrastructure and staffing	Estimated utility staffing requirement: 0.25 FTE for management, marketing, trade ally support, evaluation, and other administrative functions. Additionally, third-party technical assistance and verification contractors are needed to support the program.
Customer targets and eligibility	This program targets developers and architects of commercial buildings 20,000 to 100,000 square feet. New construction projects proposed for the program must be located within the utility's territory and certify their intention to purchase electricity from the utility. Customer eligibility is verified when participants initially apply to the program. The building is verified for project compliance upon completion of construction.

Commercial New Construction Program	
Implementation	An Advanced Building program can be managed and delivered through a combination of minimal in-house staff and outside technical support. Implementation includes: • Promote program participation through industry events and trade allies. • Educate program participants on the Advanced Building tools and resources. • Provide program participants with design assistance. • Participate in NBI sponsored support activities. • Provide program information on the utility web site. • Process and track program participation and incentives. Key steps in program participation include: • The customer's project team registers its project at the beginning of the design phase. • Project team meets with a utility program representative to review the Guidelines and program processes. • Design team meets with program technical assistance consultant to review the program's technical requirements and the required energy efficiency features and establish a schedule for periodic follow-up meetings based on the experience of the design team and the complexity and size of the project. • Design team applies the Guidelines specifications and tools to the building design. • Program technical advisor reviews plans and certifies that project meets Advanced Building Checklist and other program requirements. • Project team submits incentive reservation indicating the anticipated energy efficiency measures to be implemented in the project. • Post-construction, on-site verification is performed by a third-party engineer. • Project team submits final incentive paperwork.

Commercial New Construction Program	
Program barriers • Recruiting participants early in their design process. • Owner's resistance to increased upfront costs in building	**Mitigation Strategies** • Outreach to trade allies, offer educational seminars to target market, and perform outreach at architectural and real estate development industry events. • Provide incentives to offset the additional costs of meeting the Guidelines. • Provide education on the increased resale value generated by buildings with lower operating costs. • Provide marketing and promotion through tours, case studies, or web site recognition for qualifying projects.
Marketing and outreach	• Outreach through educational programs, industry ally events (AIA), real estate development, or shopping mall industry organizations). • Promote utility web site. • Advertising in trade publications. • Coordinate marketing opportunities with key market partners (i.e., SECO, community groups). • Outreach to trade allies. • Offer industry educational seminars. • Promote program participants' projects on the utility web site and industry events. • Cross-promote through other programs.
Measures and incentive levels	Incentives for this program include free technical assistance and a rebate to cover a portion of the additional cost of advanced building design and high efficiency equipment. Building incentives may be designed to use either an incentive $ /square foot option (with the value to be determined by the utility, based on the market) or a combination of prescriptive rebates with a lower $/square foot incentive, offered as a bonus for meeting the Guidelines design criteria. In the second option, prescriptive rebates are tied to the utility's commercial equipment rebate program.

Commercial New Construction Program	
	Projects must be verified for compliance with the Guidelines to receive the incentive $/square foot rebate. If appropriate, total incentive can be capped to allow the utility to control total program costs.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $0.23/kWh • Estimated program costs as a percent of total program budget: ✓ Program administration (internal): 5% to 10% ✓ Marketing, advertising, trade ally outreach: 5% to 10% ✓ Rebates/Incentives: 70% ✓ Evaluation: 5% to 10%
Benefits	• Supports transition to higher efficiency commercial building stock and creates long term energy savings • Involvement from the early design stage ensures a whole building approach to efficiency • Program can be managed with minimal in-house staff • Opportunity to educate commercial building owners on energy efficiency • Potential for partnerships with trade allies and real estate professionals • Promotional opportunities for participating buildings
Measuring savings	Calculation of energy savings is conducted during engineering verification of the completed building.
Best practices and innovations	• Include incentives for targeted prescriptive measures. • Provide training and education to the design community on NBI's Advanced Building Guidelines and resources. • Require design team to attend program training before being eligible to receive incentives. • Provide technical assistance to support an integrated design process.

Commercial New Construction Program	
	• Provide technical and design assistance to support program participants. • Promote participating buildings to the public through signage, tours, and recognition. • Promote participating buildings to their target market through industry events, tours, and recognition. • Leverage the Advanced Building Guidelines brand, marketing materials, and other resources to the greatest extent possible. • Build strong communication channels with trade allies and real estate associations. • Work with other MOUs to build economies of scale where possible (education, training, and marketing, where appropriate).

5.1.2.4 Commercial and Industrial Custom Incentives

Large C&I facilities are often characterized by complex systems, unique electrical processes, and significant demand. Many employ dedicated, knowledgeable facility engineers tasked with maintaining energy-efficient operations. For these customers, energy often represents a significant portion of their overall operating costs. Likewise, for utilities, even if large C&I customers represent a small portion of the overall customer base, their energy consumption can make up a significant percentage of overall load. In many cases, these types of facilities can only make limited use of traditional prescriptive rebate programs. Custom incentive programs offer an energy efficiency delivery option for such customers by allowing the installation of a broad range of measures that do not fit neatly into prescriptive rebate programs.

For MOUs, offering a custom program may seem unnecessary if there are only a few large C&I customers in their territories. However, even if the overall customer base is small, a custom program can offer several significant advantages. In particular, even a small participant base can offer significant cost-effective energy savings opportunities when they can be evaluated and implemented on a whole-facility basis. Additionally, because large C&I customers are often a utilities' largest customers, a custom program is a way for utilities to offer added value to these customers through technical assistance and by providing opportunities to help customers hedge against rising energy costs. Custom programs can also allow customers to implement new technologies and alternative energy-savings strategies and may serve as a testing ground for measures that may later be incorporated into prescriptive rebate programs.

Custom programs are typically offered as a supplement to prescriptive rebate programs and promote the types of non-typical efficiency measures or strategies that are more common among industrial customers. Examples of typical custom measures may include refrigeration measures, energy management systems, other building control systems, complex lighting systems, heat recovery measures, large motors and process boilers, compressed air systems, and re-commissioning. Eligibility for custom projects is typically based on estimated energy savings and other performance metrics following an in-depth technical study or comprehensive facility audit. In most cases, to be eligible projects must be shown to be cost-effective using the TRC test or another common cost-effectiveness test.

From a customer perspective, custom programs offer flexibility to implement any process improvement, equipment upgrade, or other improvement and utility incentives often provide a significant portion of the overall project costs. The result can be significant; large custom retrofit projects can generate substantial long-term energy savings that benefit both the customer and the utility.

The recommended custom program concept incorporates two components: a standard custom measure component and services component focused on retrofit-commissioning and equipment optimization.

Table 38. Commercial and Industrial Custom Efficiency Program

Commercial and Industrial Custom Efficiency Program	
Program description	The C&I Custom Incentive Program provides a delivery channel and financial incentives to customers installing individual equipment measures or systems not covered by prescriptive rebates, extensive energy efficiency projects, retrofit -commissioning, repairs, equipment optimization, and operational and process improvements that result in cost-effective energy efficiency savings. The program is delivered via two components: **Custom measures:** incentives are provided to cover a portion of the capital cost of retrofitting facilities with new cost-effective energy-efficient equipment. To qualify for financial incentives, eligible customers must provide documentation that their proposed efficiency upgrades pass the utility's cost-effectiveness threshold and technical criteria. **Services:** the program provides incentives to cover a portion of technical studies, retrofit-commissioning studies, equipment tune-ups, and optimization. Any qualifying service may qualify for incentives under this component, based on the program manager's authorization. Custom projects may benefit from incentives in one or both components. For example, the services component provides incentives to help customers cover the cost of a technical study, and the custom measure component may provide additional incentives to implement recommended facility retrofits. Likewise, the services component would cover a portion of the cost of a retrofit -commissioning study and equipment optimization services, while the custom measures component would provide incentives for any qualifying equipment needed to maximize the existing equipment's efficiency. These incentives may be performance-based on avoided or reduced kWh or designed to cover a percentage of the project installed cost. Incentives may be subject to an annual cap for each project and for each participating customer.

Commercial and Industrial Custom Efficiency Program	
Objectives	• Encourage the installation of high-efficiency equipment not covered by prescriptive rebates by C&I customers in new and existing facilities. • Encourage equipment repairs and optimization and operational or process changes that reduce electricity consumption and peak demand. • Encourage a "whole facility" approach to energy efficiency. • Increase customer awareness of the features and benefits of electric energy-efficient equipment. • Increase the market penetration of high-efficiency equipment. • Support emerging technologies and non-typical efficiency solutions in cost-effective applications.
Infrastructure and staffing	Estimated utility staffing requirements will vary depending on the implementation strategy. At a minimum 1 FTE with strong technical skills is required for management, marketing, and outreach to customers, trade ally interaction, project analysis, evaluation, and other administrative functions. An additional 0.5 FTE or a third-party contractor is recommended to provide technical and program support as well as QA/QC functions.
Customer targets and eligibility	This program targets all new and existing C&I facilities. The program will be available for any type of new or replacement energy-efficient equipment, whole-facility retrofit measures, or facility optimization services that are not eligible for prescriptive rebates. All measures, packages of measures, retrofit -commissioning services, and process changes must be cost-effective as substantiated through a technical analysis. Participant eligibility is verified by utility staff by cross-referencing customer applications against customer account numbers. Customers must submit a program application with documentation of the equipment replaced (if applicable), new equipment purchased and installed, analysis of project cost effectiveness, and estimated energy savings.

Commercial and Industrial Custom Efficiency Program	
Implementation	This program may be implemented using a relatively straightforward process led by utility staff or through a third party delivery model. Under a utility-led model, a program manager conducts one-on-one outreach to large C&I customers and works with the customer and the customer's technical assistance provider (e.g., an engineering firm or ESCO) to identify and assess energy efficiency opportunities and calculate incentives and energy savings. Utility staff then continues to work with the customer's project team throughout the implementation process and facilitates the incentive payment. A third-party delivery model relies on an outside contractor and trade allies for implementation. In most cases, a third-party implementer will provide turnkey services and deliver a contractually-agreed level of savings. The implementer will handle customer intake and routing; will work directly with customers to help identify and flesh out project ideas; perform technical analyses; confirm scope, cost, and potential energy savings of proposed projects; conduct field verification of completed projects; and adjust energy savings from installed projects, if appropriate. Utility staff provides oversight and program management, marketing, trade ally support, evaluation, and other administrative functions. The project development process for the Custom Incentive Program is more fluid than other programs and may not follow a precise work path. The following workflow is an example of a typical scenario through which a utility-led, equipment-based custom efficiency project may proceed: • The utility manager reaches out to a potential customer to explain the program, its benefits, and the potential opportunities for capital improvements at the customer's facility. • The program manager works with the customer to evaluate their facility's energy efficiency opportunities, develop potential project ideas, and solicit potential contractors to perform technical services. • A professional engineering firm or other qualified contractor, under contract to the customer, performs a detailed technical study of potential projects and evaluates their cost-effectiveness.

Commercial and Industrial Custom Efficiency Program	
	• The program manager evaluates the customer's technical study report to qualify projects. This involves confirming project incremental cost and potential energy and capacity savings data and evaluating cost-effectiveness. • The customer schedules installation of eligible high-efficiency equipment upgrades, operational or process changes, or other eligible measures directly with an installation contractor. • The program manager verifies equipment installation, operational, or process changes or other eligible work for all participants. • Processing rebates for qualified equipment or extensive building efficiency projects.
Program barriers • Higher first cost of energy-efficient equipment and economic environment limit customer's ability to purchase energy-efficient equipment. • Not a high priority; limited access to discretionary cash/credit. • Lack of program awareness and "emergency replacement" scenario among target customers. • Low dealer, customer, and trade ally awareness. • Procurement policies that specify low first-cost instead of life-cycle cost	**Mitigation Strategies** • Offer customized incentives on equipment and technical study to offset higher cost • Market program and general efficiency awareness to customers. • Robust marketing strategy that markets to decision makers and facility operators to facilitate understanding of capital budget and operating concerns. • Marketing to equipment dealers, distributors and installers, and other trade allies.

Commercial and Industrial Custom Efficiency Program	
Marketing and outreach	This program relies on one-on-one outreach to large C&I customers through utility program staff, key account managers, and trade allies, such as engineering firms and ESCOs to market the program. Staff and trade allies promote the program, help customers understand the features and benefits of the program, scope projects, specify and install equipment, and help customers fill out program applications. A high level of trade ally participation and program promotion are critical to ensure program success. Thus, program marketing should target trade allies in addition to customers, to encourage their participation. The program messaging focuses on the features and benefits of energy-efficient equipment. The marketing strategy for the program may include: • Active trade ally outreach and support • Bill inserts • Utility dedicated program web page • Present program information at on-site customer presentations and webinars • Targeted marketing to high-potential market sectors. • One-on-one marketing to C&I customers through key account managers and the program manager. • Targeted marketing to facility managers and building or process engineers, building owners and managers associations, HVAC contractors, energy services firms, architects and engineers, real estate developers, economic development organizations, customer advocacy groups, trade associations, and other trade allies to encourage installation of new energy-efficient technologies and adoption of best operating practices. • Targeted marketing to specific sectors identified as having a high level of unrealized energy efficiency potential, such as manufacturing and data centers.
Measures and incentive levels	The program provides customer incentives for technical studies and for implementation of qualifying measures or large projects. Program incentives may be set to roughly correspond to a

Commercial and Industrial Custom Efficiency Program	
	1.5-year payback, or to cover approximately half of the installed cost of the measure, but may be adjusted as needed to stimulate the market or scale back program uptake. The following measures and incentive levels are provided as examples. Utilities should select measures and set incentives at levels appropriate for their own customer bases, budgets, and program strategies.
Budgeting rules of thumb	• Estimated dollars spent per annual gross kWh saved: $0.20/kWh • Estimated program cost as a percent of total program budget: ✓ Program administration (internal): 5% to 10% ✓ Third-party contractors: 5% ✓ Marketing, advertising, trade ally outreach: 5% to 10% ✓ Rebates/Incentives: 70% to 80% ✓ EM&V: 5% to 10%

Measure	Qualification	Incentive
Technical study or retrofit-commissioning study	Performed by professional engineer or other qualified firm	50% of technical study cost. Another 50% of technical study cost may be rebated if customer proceeds with the project. Capped at $20,000 total incentive.
Equipment measure or whole-facility upgrade project	1.0 benefit-to-cost ratio	Performance based: $0.10/kWh saved based on technical study results, up to $500,000 per customer site. Standard: 50% of installed cost, up to $500,000 per customer site.
Retrofit-commissioning, repairs, optimization, and operational or process changes	1.0 benefit-to-cost ratio	50% of the cost of the service up to a total cap of $50,000.

Commercial and Industrial Custom Efficiency Program	
Benefits	• Offers customers an opportunity to install measures not covered by rebates • Provides program opportunity for customers with large, complex facilities, and systems • Encourages installation of energy-efficient equipment that may not be considered otherwise • Opportunity to support emerging technologies • Provides increased customer awareness of energy-efficiency options • Opportunity to reduce electricity consumption and peak demand by supporting repairs and process changes • All new and existing C&I facilities are eligible
Measuring savings	The M&V analysis for custom measures will be based on regression-based statistical billing analysis using a Statistically Adjusted Engineering (SAE) specification. The advantage of this specification is it will provide estimates of actual savings realization rates for groups of measures affecting the end uses targeted by the program. Energy simulation modeling may be used in more complex projects involving multiple measures with interactive effects. The simulation modeling will use the DOE's DOE2, eQuest, or an American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) Standard 140 compliant tool. The models will be informed with directly observed characteristics for local climate and possibly selective metering of certain equipment. Final determination of the impact evaluation methodology will occur after publication of the statewide EM&V protocols. Monitoring of certain equipment in existing buildings may be necessary to calibrate the energy simulation models. In such cases, end uses would be monitored for a period of at least three weeks during cooling or heating seasons as required under the International Performance Measurement and Verification Protocols (IPMVP) Option B. The impacts estimated under Option B will be weather-normalized to long-term average weather data. End-use data will be applied to energy simulation, consistent with the IPMVP Option D for use in the demand and energy impact calculations.

Commercial and Industrial Custom Efficiency Program	
Best practices and innovations	• Use one-on-one outreach and leverage relationships with large customers to market the program. • Build and maintain strong communication channels with trade allies. • Use a formal review and certification process to vet and verify trade ally participants' qualifications. • Conduct regular quality checks on all participating trade ally installations. Decrease the number of site inspections as a trade ally proves its capabilities. • Allow trade allies to submit rebate applications on behalf of customers. • Develop a simple participation process and program rules. • Conduct program and quality installation training for all participating trade allies. • Maintain flexibility to allow program managers to make program changes to address problems as they arise, but ensure that all stakeholders are given notice of program changes and ample time to respond. • Offer free technical and program assistance to customers and trade allies (e.g., through a program "hotline"). • Perform process evaluations to gain insights and feedback on the program's effectiveness and inform future program enhancements.

5.2 Key Preliminary Considerations

Before embarking on the design and development of new energy efficiency efforts, MOUs should first consider several factors to help them determine what types of programs are the right fit for their organization, at what scale they wish to implement a program, and how they should proceed.

Several steps are involved in choosing and developing DSM programs.

Identify Objectives and Guiding Principles: A utility's first step is to identify its goals and establish a set of principles that will serve as a platform for program decision making. This requires a keen understanding of the utility's service territory and customer needs. Among the key considerations in this process are the following:

- What factors are driving the need for energy efficiency programs?
- Should the utility offer programs focused on customer service, reducing system demand, conserving energy, or something else?
- How do market conditions in the service territory support, or create barriers to, the program?
- What are the areas of greatest need? And greatest opportunity?
- How will success be measured? Should the utility adopt targets and/or metrics against which to measure progress?
- What values should the program incorporate (e.g., equity among customer classes, a special focus on low-income customers, customer service as the highest priority)?

Determine Load Shape Objectives: Most DSM programs impact system load, so the utility must identify load shape objectives. Knowing the program's impact on the system will help the utility plan for future needs. Examples of how DSM programs impact system load are shown below:

- Peak shaving: These programs, which generally include DR and pricing programs, are designed to reduce demand during peak periods.
- Load shifting: These programs also address peak demand but shift load from peak to off-peak periods.
- Conservation: Energy efficiency programs are generally designed to reduce energy consumption at all times. They can reduce a utility's need to add generation capacity or help diversify the resource base.

In planning to implement DSM programs, the utility should identify its resource objectives and determine the most beneficial load impacts (as well as impacts to avoid).

Once identified, the load shape objectives will help inform program design approaches that address customer end uses and in turn, produce the intended impact.

Conduct an Economic Analysis: Although Texas MOUs are not required to meet a formal cost-test criteria and commonly do not include this analysis in their evaluation of program options, an economic analysis is a useful tool to determine resources needed to implement the program and whether it will result in a net benefit or net cost to the utility. Section 5.5 of this Guide provides guidelines on conducting economic analysis of programs to help utilities understand how energy efficiency programs will impact their rates and customer bills.

Commit the Resources: Before undertaking final program planning, the utility needs to commit both funding and human resources to ensuring the program design and implementation are fully supported to achieve success. Depending on what program(s) the utility plans to implement, resources may be required for start-up and administration activities:

- Train existing staff
- Hire new staff
- Develop implementation plans, program manuals, rebate forms, tracking systems, and/or other documentation
- Purchase software, equipment, or other infrastructure to support the program
- Upgrade billing and other administrative systems
- Plan for and implement market strategies
- Manage program incentive payments
- Solicit and contract with third-party program support

5.3 Developing Budgets

In developing budgets for DSM portfolios, it is important to consider the range of costs from administration and communications to planning and evaluation. An overview of cost categories and considerations follows.

5.3.1 Program Development and Administration

Program development includes researching delivery strategies, estimating market potential, designing program concepts, performing economic analyses, and preparing implementation plans. In administering a program, the following should be included:

- Fully-loaded personnel costs
- Training costs
- Industry related sponsorships and memberships
- Tracking system

Tracking system costs can range substantially depending on the system requirements. In budgeting for this cost, expectations should be clearly defined as early as possible and consider reporting requirements, understanding of system users, and data transfers.

5.3.2 Program Marketing and Trade Ally Activities

Marketing and promotion activities typically include producing and distributing program literature, displays, events, promotional items, bill inserts, and communications. Program advertising encompasses all forms of media such as direct mail, print, radio, and Web activities.

Trade allies include heating contractors, weatherization contractors, product installers, retailers and other vendors, auditors, community groups, and trade associations. Depending on the nature of the program, interaction with trade allies can range from providing program literature to conducting comprehensive program and technical training. Budgets should include all training and education activities, vendor recruitment, and coordination costs.

5.3.3 Customer Incentives and Technical Studies

Typically, customer incentives can include a variety of costs from direct rebates to customers who purchase energy-efficient equipment to technical study or other support. For more targeted or technically challenging programs, such as audit, direct install, and custom incentive programs, the costs of audits and technical studies can represent a significant portion of the overall costs. Program administrators must also budget for the cost of free or direct-install measures.

5.3.4 Program Implementation

Costs associated with implementation can include third-party contractor costs, lead intake, customer service, rebate application processing, quality assurance, and reporting costs. Often, programs delivered by turnkey providers, such as appliance recycling programs encompass the full range of program implementation costs, including marketing, while rebate processing is a larger concern for energy-efficient equipment programs. Program implementation requirements are outlined in more detail in Section 5 for each program concept.

5.3.5 Evaluation, Measurement, and Verification

While the industry standard is to assume 5 percent of total budget for EM&V activities, this should only be applied at a portfolio level, since program evaluation costs can differ substantially depending on the required evaluation activities. Planners must consider whether site visits or metering are required, which can increase overall costs dramatically. Survey costs are also important and should take into account the sample size and the target population. For example, surveys of non-residential customers are generally more costly than residential customer surveys. Non-participant surveys are substantially more expensive than participant survey costs. Trade ally, program staff, implementer, and stakeholder interview costs will vary depending on program delivery and size of the program. Availability and cost of relevant and necessary information, such as billing data for participating customers, is also an important cost component. Regulatory reporting requirements (frequency, format, etc.) will also impact the overall costs.

5.4 Evaluation, Measurement, and Verification

Evaluation is the process of independently determining and documenting the results, benefits, and lessons learned from an energy efficiency program. Utilities use evaluation results in planning for future programs and determining the value and potential of a portfolio of energy efficiency programs in an integrated resource planning process. The results can also be used to assess implementers' performance, the effectiveness of program incentives, and the effectiveness of motivators such as payments and penalties.

There are many components and concurrent tasks involved in evaluating energy efficiency and DR programs. A diagram of the evaluation protocols is depicted in Figure 20.

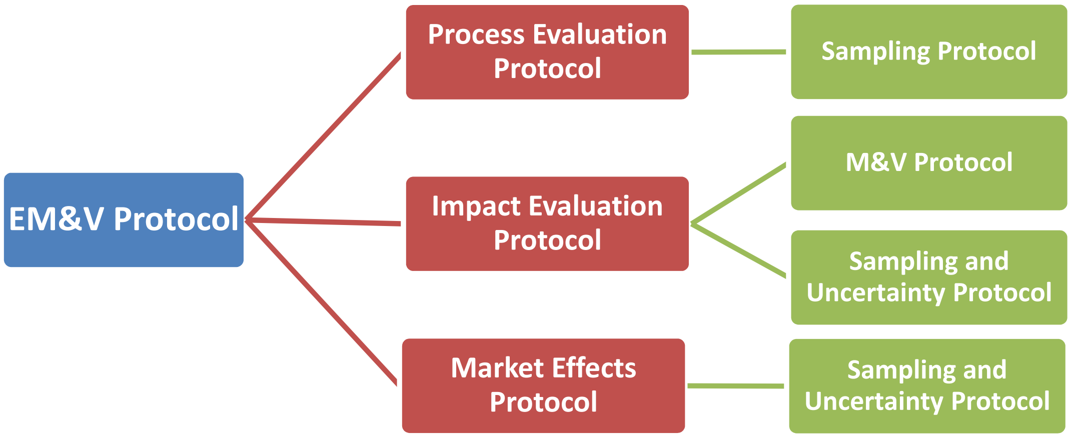


Figure 20. EM&V Protocol Diagram

5.4.1 Impact Evaluation

Impact evaluations determine program-induced benefits that include reductions in energy and demand usage (kWh, kW, and therms) and avoided air emissions that can be directly attributed to an energy efficiency program. One of the primary research objectives of an impact evaluation is to calculate the verified gross savings, which are the savings directly achieved by the program, validated by an independent third-party evaluator. Impact evaluations begin at the installation or site level. Depending on the measure type and level of engineering rigor, the M&V protocols for impact evaluation can vary. These paths are depicted in Figure 21, which provides guidance on choosing the level of rigor by measure type.

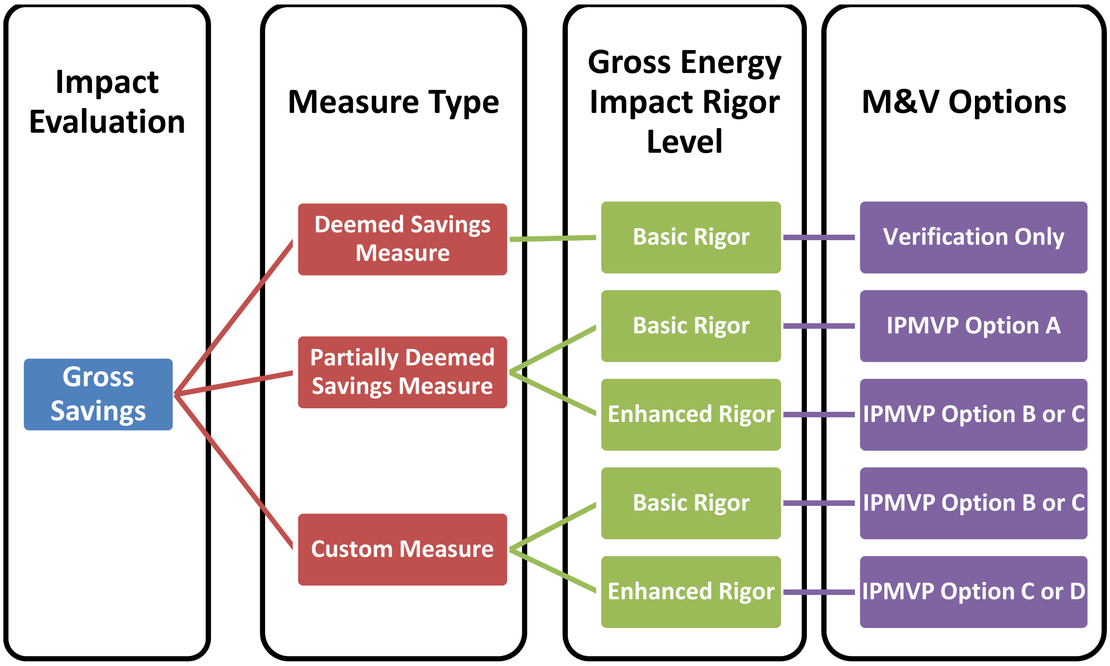


Figure 21. Required Protocols for Impact Evaluations

IPMVP is a recognized industry standard approach to M&V that has broad application for businessmen, energy managers, law makers and educators and could become the national standard document for M&V. A detailed discussion and definition of the IPMVP options A, B, C, and D can be found in Appendix H.

Detailed M&V activities associated with typical energy efficiency program measure types are listed in Table 39 below.

Table 39. Measurement and Verification Activities by Measure Type

Measure Type:	Basic Rigor Level:	Enhanced Rigor Level:
Appliance Recycling	• Verification of utility inputs (type of unit, energy source, usage, location).	• Verification of project inputs. • Spot measurements (kW). • Short term metering (kW, operating hours).
Residential Lighting/ CFL Rewards/ Giveaway	• Verification of quantity based on invoices for bulbs purchased, by category (wattage, size, etc.). • Predefined operating hours.	• Verification of quantity installed in sockets and estimates of operating hours based on participant surveys.
Weatherization, Envelope Improvements	• Verification of measure installation. • Software simulation for verifying energy savings.	• Verification of measure installation. • Software simulation for verifying energy savings. • Billing analysis

Residential HVAC	• Verification of measure installation (quantity, type, efficiency). • Baseline efficiency defined by Energy Efficiency Program Manual (baseline equals efficiency of old equipment for early replacement; for end of life replacement, and new construction, baseline equals efficiency of code-compliant equipment). • New equipment efficiency from manufacturers' catalog data. • Stipulated operating hours (pre-defined by baseline studies or customer reported)	• Verification of measure installation (quantity, type, efficiency). • Pre- and post-installation site visits to verify efficiency levels. • Baseline efficiency equals efficiency of old equipment for early replacement; for end of life replacement, and new construction, baseline efficiency equals efficiency of code-compliant equipment). • Short term metering (pre- or post-) to calculate Equivalent Full Load Hours (EFLH).
C&I Lighting	• Verification of measure installation (fixture quantity, type). • Pre- and post-installation fixture types and performance. • Operating hours	• Verification of measure installation (fixture quantity, type). • Pre- and post-installation fixture types and performance. • Short term metering to log operating hours and stipulated categories.
C&I HVAC Efficiency	• Verification of measure installation (quantity, type, efficiency). • Baseline efficiency defined by utility (baseline equals efficiency of old equipment for early replacement; for end of life replacement, and new construction, baseline equals efficiency of code-compliant equipment). • New equipment efficiency from manufacturers' catalog data. • Stipulated operating hours (defined by utility, baseline studies, or customer-reported)	• Verification of measure installation (quantity, type, efficiency). • Pre- (where applicable) and post-installation site visits to verify baseline and retrofit equipment information. • Short term or continuous metering (kW) for a minimum of three weeks to calculate pre- and post-installation energy use.

5.4.2 Process Evaluation

The primary purpose of a process evaluation is to assess program design and delivery characteristics in order to provide specific and detailed recommendations for program changes.

Typically, recommendations are designed to affect one or more areas of the program's operational practices, such as marketing, program delivery bottlenecks, internal communications, or the incentive application process. Process evaluations are a significant undertaking, designed to produce more energy efficient, successful, and cost-effective programs.

Process evaluation is an important tool in the evaluation toolbox. A process evaluation consists of in-depth examinations of the design, delivery, and operations of an energy efficiency program in order to improve its ability to achieve energy savings and accomplish other program goals. Process evaluation findings and recommendations are a valuable tool for program designers and managers who use the evaluation results to improve the cost-effectiveness and operational efficiency of their programs. The process evaluation examines the effectiveness of the following program components:

- Program design and operational systems
- Program tracking and information management systems
- Internal and external program communications
- Program delivery organization and staffing
- Program staff understanding of the program's goals and objectives
- Skill levels needed to implement the program
- The methods and procedures used to target customers for outreach efforts
- The incentive levels used to promote the program
- Program operations related to the program theory and logic model
- Marketing and outreach channels, tactics, materials, and messages
- Customer satisfaction with the program, equipment, installation contractors, utility, and other service experiences
- Program barriers and bottlenecks

Most programs do not need a process evaluation every year of their implementation cycle. As stated earlier, new programs may want to undergo a process evaluation in the first year and involve the program evaluation staff early in the design process. For this reason, MOUs should consider having their process evaluation team on board and engaged during the early development efforts and conduct an early process evaluation within the first year of program implementation.

5.4.3 Sampling and Uncertainty Protocol

The energy and demand savings and other evaluation parameters for a program are developed by surveying all or some of the population of the program participants. There are three major options for surveying a population of program participants; these are outlined in Table 40.

Table 40. Survey Options

Option	How Many Are Measured & Resulting Precision of Estimates	Rank Order of Contribution to Defensibility	Rank Order of Cost
Census:	Measure entire population. Statistical precision is not applicable because every outcome is counted and the evaluation effort, therefore, achieves enumeration	Highest	Highest
Sample: ***Probability Sample:*** **Simple random and stratified random**	Measure a randomly selected subset of the population. Probability of a unit entering the sample is known. Sampling precision depends on the number of items, i.e., participants measured. The more measured, the better the precision.	Varies	Varies
Systematic*:* **Any non-random method of sampling**	Measure a non-randomly selected subset of the population. Probability of selection unknown. Statistical precision is not applicable. Carefully selected representative samples are sometimes claimed to have properties "similar to" probability samples.	Lowest	Various

One challenge in evaluating energy efficiency programs is the impossibility of directly measuring the primary end result—energy savings. Energy savings are a reduction in a level of energy use that did not happen. What can be measured is actual energy consumption after, and sometimes before, the energy efficiency actions took place. Consequently, the difference between (a) actual energy consumption and (b) what energy consumption would have been, had the efficiency measures not been installed, is an estimate of energy (and demand) savings.[18]

Since impact evaluations seek to reliably determine energy and demand savings with reasonable accuracy, the value of the estimates as a basis for decision making can be called into question if the sources and level of uncertainty of reported savings estimates are not fully understood and described. While additional investment in the estimation process can reduce uncertainty, tradeoffs between evaluation costs and reduced uncertainty are inevitably required.

For each program's impact evaluation to produce reliable and accurate results, the evaluation process should adhere to a specified set of sampling and uncertainty protocols. Sampling and uncertainty protocols are generally dependent on the type of analysis desired, M&V protocols specified, and inherent uncertainties in measure, demand, and usage[19].

[18] National Action Plan for Energy Efficiency (2007). *Model Energy efficiency program Impact Evaluation Guide*. Prepared by Steven R. Schiller, Schiller Consulting, Inc. <www.epa.gov/eeactionplan>

[19] Note: The elements of evaluation uncertainty developed for the State of Pennsylvania Act 129 Energy Efficiency and Conservation Programs have been adapted from *The California Evaluation Framework* prepared by TecMarket Works for the California Public Utilities Commission and the Project Advisory Group in June 2004.

5.5 Program Cost-effective Analysis and Utility Level Rate Impact Analysis

5.5.1 Program Cost-effective Analysis

To ensure the Texas MOUs initiate and implement a cost-effective energy efficiency plan, they are encouraged to conduct a program economic analysis concurrent with the program design process, and to evaluate and verify the program impacts. The Project Team summarized cost-effectiveness analysis methods at a portfolio level, sector level, and end-use level from three perspectives—the utility cost test (UCT), the total resource cost test (TRC), the societal cost test (SCT), and the participant cost test (PCT) perspectives. The specification of each analysis model is described below.

The UCT perspective assesses cost-effectiveness to the utility (or program administrator), and indicates whether the cost of implementing energy efficiency measures or programs is greater or less than the cost of generating and delivering an equivalent amount of energy. Benefits are measured by the avoided costs of utility energy supply (e.g., electrical, gas, and other energy costs, as well as avoided capacity costs). Costs include the total program costs to the utility, including incentive payments plus any administrative costs of implementing programs.

$$\text{UCT} = \frac{\Delta\text{kWh} \times \text{Utility Avoided Cost}}{\text{Incentives} + \text{Program Admin \& Marketing}}$$

The TRC test seeks to determine whether the cost of generating and delivering a particular amount of energy is greater or less than the cost of implementing measures or programs to save that amount of energy. Benefits are measured by the avoided cost of utility energy supply. From a DSM program perspective, TRC costs include both the incremental costs of purchasing, installing, and maintaining energy efficiency measures plus any administrative costs to implement programs (program administrative costs were not included in the measure-level analysis).

$$\text{TRC}_{\text{Program}} = \frac{\Delta\text{kWh} \times \text{Utility Avoided Cost}}{\text{Measure Cost} + \text{Program Admin \& Marketing}}$$

The SCT is similar to the TRC, except the SCT explicitly quantifies externality benefits such as avoided pollutant emissions not represented in market prices and other non-energy benefits (e.g., improved health/productivity).

$$\text{TRC}_{\text{Program}} = \frac{\Delta\text{kWh} \times \text{Utility Avoided Cost} + \text{non-energy benefits}}{\text{Measure Cost} + \text{Program Admin \& Marketing}}$$

The PCT perspective assesses cost-effectiveness to participants, and indicates whether participation in a program would result in net benefits to a customer. Benefits are measured by the reduction in participants' energy costs plus any incentives received to offset energy efficiency measure costs. Costs include the incremental costs of purchasing, installing, and maintaining energy efficiency measures.

$$\text{PCT} = \frac{\Delta\text{kWh} \times \text{Retail Electric Rate} + \text{Incentives}}{\text{Measure Cost}}$$

5.5.2 Utility Level Rate Impact Analysis

Based on feedback from Texas MOUs through the in-depth phone interview process, the Project Team recognized the utilities' needs for funding resources to implement and expand energy efficiency programs. While some financing and funding resources may be available to assist MOUs with planning, marketing, and other program costs (see Section 5.3), the utility may still need to consider increasing utility rates to fund continuous energy efficiency plans. The Project Team also recognized that rate increases to pay for energy efficiency programs—and even the perception of rate increases— can pose a significant barrier to implementing energy efficiency programs for MOUs. The typical response to rate impact concerns is to limit energy efficiency program budgets. However this response is rarely based on a thorough assessment of rate and bill impacts, and will deprive customers of the many benefits offered by energy efficiency programs, as well as significantly limiting opportunities to achieve important public policy goals such as mitigating climate change and future supply constraints.

The ratepayer impact measure (RIM) test is often utilized to analyze cost-effectiveness from an electricity ratepayer perspective, which seeks to determine whether the effects of energy program implementation would cause electricity rates to go up or go down as compared to a baseline resource plan without the program. Benefits are measured by the avoided costs of electric utility energy supply (e.g., electrical energy costs, as well as avoided capacity costs). RIM costs include any administrative costs to implement programs, plus any direct financial incentives given to customers who implement energy efficiency measures, plus revenues lost as a direct result of the energy efficiency programs.

$$\text{RIM} = \frac{\Delta\text{kWh} \times \text{Utility Avoided Cost}}{\text{Incentives} + \text{Program Admin \& Marketing} + \text{Utility Lost Revenues}}$$

While widely used, the RIM is an insufficient indicator of rate and bill impacts, as it is overly narrow and does not present rate and bill impacts in a way that is useful to regulatory bodies. However, the Project Team has provided this section to introduce the utilities to the general principles of the RIM test and framework for utilizing the principles in rate impact analysis and mitigation strategies.

In analyzing rate and bill impacts of energy efficiency programs, it is important to account for the long-term savings as well as the short-term costs. It is also important to account for all ways in which rates may be affected, including reduced generation costs and reduced wholesale electricity prices.

5.5.2.1 General Principles

In lieu of limiting or curtailing the energy efficiency plan budget with increased utility rate requirements, the utilities, city council, and other stakeholders should first analyze the extent of the impacts. Based on the Project Team's experience assisting utilities with utility rate impact analysis and cost caps, the central concern generally pertains to impacts of energy efficiency programs on nonparticipants. In other words, nonparticipants experience higher rates without receiving the benefits of the energy efficiency programs. From this perspective, it is necessary for utility decision makers to assess the impacts of energy efficiency programs on all customer levels, and ensure the opportunity to benefit from energy efficiency services is provided to the vast majority of customers with the help of a thoughtful program design.

5.5.2.2 Framework for Rate and Bill Impact Analysis

In order to present the rate and bill impact analysis to stakeholders in a meaningful and quantifiable way, MOUs should account for the following factors:

- Perform impact analysis at a portfolio level, in addition to a program-level analysis.
- Divide impacts among program participants, nonparticipants, and all customers on average.
- Account for long-term and full potential costs and benefits of the energy efficiency programs. The potential costs may include program costs, shareholder incentives, lost base revenue collections, and decoupling adjustments, while the potential benefits may include the avoided generation, transmission and distribution costs and losses, avoided environmental compliance costs, and wholesale market price suppression effects.
- Compare the estimated rates and bills with and without the energy efficiency programs in place.
- Present both the percentage and absolute dollar increases in total rates and total bills.

5.5.2.3 Mitigation Strategies

Once utilities gain a thorough and meaningful understanding of rate and bill impacts, decision makers and stakeholders can consider possible approaches to mitigating rate impacts from energy efficiency programs:

- Minimize program administrative costs as much as is feasible.
- Maintain a balance between minimizing program costs and overcoming market barriers.
- Maintain a balance between minimizing program administrative cost and providing sufficient incentive payments.
- Deliver all cost-effective efficiency measures to each participant, in order to leverage marketing and delivery costs.
- Provide all customer types, especially low-income customers, with opportunities to participate.
- Offer energy efficiency measures specifically tailored to each customer type.
- Consider a collaborative utility model to achieve economies of scale and to share lessons learned, as discussed further in Section 5.2.5.

5.6 Energy Independence and Security Act

In 2007, Congress passed the Energy Independence and Security Act (EISA) that establishes minimum efficiency and lifetime performance standards for light bulbs. EISA will begin to take effect starting January 1, 2012, when traditional 100 watt incandescent bulbs are phased out. This will be the first of three waves in which certain bulb wattages will be restricted: 100 watt bulbs in 2012, 75 watt bulbs in 2013, and both 60 watt and 40 watt bulbs in 2014. Lumen ranges, or the amount of light a bulb puts out, as well as the lifetime rating per bulb are required to remain constant.

While manufacturers are doing their best to make strategic production decisions and hedging bets on which technologies will dominate the lighting landscape, the market is changing at a rapid pace. Industry players' predictions on the market outlook for specific non-incandescent lighting products remain mixed and conflicted. In the short term (pre-2013), it appears likely that halogens, CFLs, and LEDs (if they become cost-competitive) will dominate the market. In the longer run, new technologies under development will likely emerge in the lighting market. However, consumer purchasing preferences and satisfaction will dictate which technologies take hold.

There is currently a large knowledge gap between industry professionals and the general public. In surveys, consumers are either unaware, or have expressed confusion about the new legislation, and of those that are aware of EISA, some express a strong preference for current lighting options. In one study, when asked what customers will do when faced with the new standards, the most frequent response was to stockpile incandescent bulbs; the least common response was to purchase CFLs. In fact, the majority of consumers across multiple studies mentioned that they already are or plan on stockpiling incandescent bulbs before EISA takes effect.

Consumer opinion of CFL bulbs is dominated by concerns about lighting quality and fears about mercury content. Many consumers are apprehensive about regulations that would force them to use products that they felt were substandard in quality and safety. Industry leaders have high hopes that LED bulbs will gain better market acceptance, but at this point they are still too expensive to be cost-competitive.

Impact of EISA on Utility CFL Programs

Although utility CFL programs will likely see a decline in savings (as the residential baseline will shift once EISA takes effect), these programs are still valid and CFLs will continue to produce energy savings. As EISA phases in, there is expected to be a one-year lag before the baseline changes, as incandescent bulbs in existing sockets remain in use; thus current savings levels from CFL programs will most likely continue into 2013.

Some manufacturers are concerned that because historically CFLs have not been consumers' first choice lighting option, they could be less popular than other post-EISA lighting options (e.g., halogens). Many utilities offering high-efficiency residential lighting programs are preparing by developing and delivering educational components that address EISA and alternative lighting options, and testing the market acceptance of new high-efficiency bulbs. Another way for utilities to influence residents to select the most energy-efficient lighting products post-EISA will be to increase CFL direct install and giveaway programs and to phase in LED options as they become more cost-effective.

5.7 Building Codes

Energy codes are one component of a group of standards governing new building construction. Historically, building codes were simply the minimum requirements necessary to ensure building safety. However, today codes often are designed to support societal goals, including energy efficiency, resource conservation, and accessibility. However, code requirements still represent a minimum level of performance compared to what is possible or optimal.

The International Codes Council (ICC) sets a model IECC that provides standardized energy efficiency protocols to govern new building construction. The IECC model codes are updated on three-year cycles.

Texas Energy Codes

In Texas, SECO has the authority to adopt the state energy codes. In April 2011, SECO officially adopted the 2009 IECC for residential (excluding single-family), commercial, and industrial building construction as the state's energy code. This updates the previous Texas Building Energy Performance Standards that were based on the 2000 IECC with 2001 Supplement. Full adoption of the 2009 IECC should produce approximately 8-15 percent savings in residential and commercial energy use. For single-family residences, the 2009 International Residential Code goes into effect January 2012.

Texas is considering adopting the IECC 2012 code, which is designed to achieve a 30 percent increase in energy savings compared to the IECC 2006, in both residential and commercial buildings. For more information on IECC standards, see Appendix E.

Home Rule

Texas is a home rule state. Although there is a state code, it does not apply to jurisdictions until they adopt it. Local ordinances can adopt code amendments provided they are at least as stringent as the state code. Dallas, Austin, San Antonio, and Houston have all adopted codes that are more stringent than the state's. Municipal utilities are uniquely positioned to influence the adoption of more stringent building codes in their communities. Such actions can significantly influence the energy efficiency of the local building stock and shift the burden of efficiency to the builder, eliminating the need for new revenues to support program implementation.

Impacts of Energy Codes

- **New Construction** is the most cost-effective point in the life of a building to establish energy efficiency elements. Building energy codes serve as a starting point to lower the energy use of the building stock over time.
- **Existing Buildings**. In the state of Texas, alterations and additions to existing buildings must comply with applicable local codes. Local jurisdictions may amend the code to increase stringency or better define how they apply to existing buildings. Municipalities around the country are looking at how codes can help increase the energy efficiency of existing buildings.
- **Builder-Friendly**. Keeping track of different code requirement in neighboring jurisdictions can be onerous for builders. Having consistent codes across jurisdictions increases efficiency.

5.8 Collaborative Utility Model

As mentioned in a prior section, there is no "one-fits-all" solution to apply the identified best practices to each Texas MOU. Each Texas MOU is encouraged to gain a thorough knowledge and understanding of its service territory and its own deliverable capabilities to identify the most suitable best practices for itself.

On the other hand, the Texas small to mid-sized MOUs do share similar constraints, barriers, priorities, and interests. For example they have funding and staffing limitations related to marketing and implementing comprehensive energy audit programs. Application and training process requirements for trade allies who want to participate in multiple energy efficiency programs offered by different MOUs can be redundant. Many MOUs lack experience measuring, verifying, and documenting savings and program costs, as well as experience evaluating program cost-effectiveness. As a solution, small and mid-sized MOUs might consider adopting a collaborative utility model to initiate or expand their current energy efficiency plan. The benefits of doing so include the following:

- Standardized program design, implementation, and tracking systems
- Centralized resources for information, data, and documents
- Standardized rebate administration and processing
- Standardized evaluation, monitoring, and verification
- Standardized savings and program cost documentation and reporting process
- Uniform trade ally training and quality control schematics
- Synchronized regulatory and policy support

Two case studies of collaborative utility efforts on managing, implementing, and tracking energy efficiency programs are given in the following subsections.

5.8.1 Case Study: Texas IOU Collaboration – EUMMOT

In 1999, the Texas Legislature passed Senate Bill 7 (SB 7) that mandated at least 10 percent 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 (House Bill (HB) 3693) that raised the goals for energy efficiency to 20 percent of each utility's annual growth in demand by 2009, superseding the goals set by SB 7.

In 2010 and 2011, the PUCT underwent a rulemaking process to modify Substantive Rule §25.181 and Senate Bill 1125 that mandates starting in 2013, IOUs must meet at least 30 percent of their annual growth in demand by December 31 of each year.

Utilities are required to administer energy savings incentive programs that are implemented through retail electric providers and energy efficiency service providers (EESPs). All programs are designed to reduce system peak demand, energy consumption, or energy costs. Utilities must achieve their energy efficiency goals through, either SOPs or targeted MTPs. Programs are made available to all customers, in all customer classes. This gives each customer a choice of a variety of energy efficiency alternatives. Per PUCT Substantive Rule §25.181, the utilities are required to file an annual EEPR. The EEPR details the utility's future plans for energy efficiency and reports on the most recent year's actual achievements.

EUMMOT is a voluntary organization of electric IOUs formed to address utility industry energy efficiency issues. Further, EUMMOT serves as a forum to facilitate coordination among the energy efficiency program managers responsible for administering programs designed to meet Texas goals for energy efficiency. EUMMOT serves the IOUs listed below:

- American Electric Power-Southwestern Electric Power Company (AEP-SWEPCO)
- American Electric Power-Texas North Company
- CenterPoint Energy Houston Electric LLC
- El Paso Electric Company
- Entergy Texas, Inc.
- Texas-New Mexico Power Company
- Oncor
- Xcel Energy Company[20]

EUMMOT's objectives and deliverables include:

- Convey common perspectives on efficiency program design and implementation.
- Provide for exchange of information on markets and technologies.
- Advance understanding and participation in energy efficiency programs.
- Consolidate the results from each utility and produce an EEPR Summary report, highlighting statewide achievements.

5.8.2 Case Study: Colorado IOU Collaboration – Excess Is Out

In 2008, the state of Colorado enacted legislation requiring all IOUs, regardless of size, to meet specific energy savings targets.

This ruling affected several small utilities in Colorado, which because of their smaller customer bases would incur a higher proportion of administrative costs to deliver programs than larger utilities that can spread costs over a larger customer population. In an effort to design a cost-effective portfolio, three small gas utilities: Atmos Energy, SourceGas Distribution, and Colorado Natural Gas formed a collaborative to serve as a base for their collective energy efficiency programs. The trio of utilities also partnered with the Colorado Governor's Energy Office to further leverage available promotional resources, state efficiency incentives, and low-income program delivery.

The Excess Is Out collaborative (http://excessisout.com/) has now been operational for nearly three years. Through the collaborative mechanism, the three utilities share the costs of the activities below:

- Program design and planning
- Marketing and website hosting
- Trade ally training
- Residential energy audit and low income program implementation
- Rebate administration and processing
- Evaluation, monitoring, and verification

[20] Voluntary participant in energy efficiency programs.

The collaborative strategy was essential to the three utilities achieving a cost-effective program portfolio and provided additional benefits, described below:

- Economies of scale associated with common program costs such as marketing, administration, delivery, tracking, as well as bulk purchases of program materials.
- Common marketing, efficiency measures, and rebate structures support a consistent message and decrease confusion among customers.
- Integrated training on program protocols, guidelines, and installation best practices offers administrative cost savings, helps ensure consistent quality protocols, and offers streamlined participation for trade allies and delivery contractors.

5.9 Financing Sources, Utility Resources, Tools, and Available Incentives

A range of financing and technical resources are available to help support MOUs implementing new DSM programs. This section summarizes the Project Team's research findings of potential useful resources that were found to be the most relevant, including:

- Financing Strategies for Municipal Energy Efficiency – this report describes a sustainable financing mechanism for energy efficiency retrofits in municipal buildings in eight of Michigan's poorest cities.
- Compendium of Best Practices – Sharing Local and State Successes in Energy Efficiency and Renewable Energy from the United States, this report describes more than 20 practices and includes examples of their effective implementation in states or cities.
- Recovery.gov website provides easy access to data related to Recovery Act spending.
- EPA website publishes federal funding opportunities on a monthly basis.
- Office of Energy Efficiency and Renewable Energy (EERE) works with business, industry, universities, and others to increase the use of renewable energy and energy efficiency technologies.
- State of Energy Conservation Office in Texas website provides several funding and incentive opportunities for Texas consumers, schools, businesses, and local governments.

There are several ways for municipal utilities to fund their programs. These are described in the sections below.

5.9.1 Grants

Texas received about $2 billion from the 2009 American Recovery and Reinvestment Act (ARRA). Of this amount, approximately $808.3 million funds energy efficiency efforts. Two state agencies, SECO and the Texas Department of Housing and Community Affairs (TDHCA) received the ARRA funding. SECO is managing the State Energy Program (SEP) and Energy Efficiency and

Conservation Block Grant Program (EECBG[21]). TDHCA is managing the Weatherization Assistance Program (WAP).

EECBG helps Texas communities develop, implement, and manage local energy efficiency programs. Large cities and urban counties (cities over 35,000/counties over 200,000) received an EECBG allocation of $163,121,800 in total, directly from DOE. These allotment grants are administered directly by DOE[22]. SECO received $45,638,100 that was redistributed to 1,130 cities and 244 counties that did not receive direct EECBG funds from DOE. SECO and the Comptroller of Public Accounts made the decision to distribute the grant equitably to smaller cities and all nonurban counties across Texas, disseminating grants of $46,000 and $23,000 for smaller cities and counties. Those cities and counties have to apply and qualify by submitting details of eligible projects relating to energy efficiency, energy-efficient transportation, and renewable energy. SECO played a "marketing" role in these block grants by helping cities with determining eligibility criteria and offering suggestions on eligible projects. The grant recipient reports can be found at the government's recovery website[23].

Other grant opportunities can be found at the DOE, EPA, and Grants.gov websites.

5.9.2 Bonds and Loans

Bonds are an important and frequently used funding route for launching new energy efficiency and renewable energy programs. The municipalities use bond measures to facilitate energy efficiency or renewable energy investment in communities and repaying them with public funds typically obtained through routine tax revenues. The interest paid by municipal bonds is typically tax-exempt. This allows the municipalities to pay lower interest rates to the investors but still be competitive in the market. In 1988, the city of Ann Arbor utilized its bonding authority to fund a $1.4 million project for energy efficiency upgrades in 30 city facilities. The city paid off the original bond loan without hardship since the payment was offset by lower energy bills. After the initial bond was paid in full, the city continued to contribute $100,000 annually of its energy cost savings to create the Municipal Energy Fund.

Qualified Energy Conservation Bonds

A qualified energy conservation bond (QECB) is a debt instrument that enables qualified state, tribal, and local government issuers to borrow money to fund energy conservation projects (it is important to note that QECBs are not grants). A QECB is among the lowest-cost public financing tools available; the U.S. Department of Treasury subsidizes the issuer's borrowing costs.

For more information see:
http://www1.eere.energy.gov/wip/solutioncenter/financialproducts/QECB.html

Qualified Zone Academy Bonds

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[21] Energy Efficiency and Conservation Block Grant Program, http://www1.eere.energy.gov/wip/eecbg.html

[22] U.S. Department of Energy. Energy Efficiency and Conservation Block Grant Program, online available: http://www1.eere.energy.gov/wip/eecbg.html

[23] U.S. Recovery website, http://www.recovery.gov/Pages/TextViewProjSummary.aspx?data=recipientAwardsList&State=TX&Agency=89&AwardType=CGL

In 1997, Congress created a new financial instrument, the qualified zone academy bond (QZAB), to help schools raise funds to:

- Renovate and repair buildings
- Invest in equipment and up-to-date technology
- Develop challenging curricula
- Train quality teachers

QZABs also encourage schools and businesses to cooperate in innovative ways that expand students' learning opportunities and help schools prepare students with the kinds of skills employers, and the nation, need to compete in the global economy.

For more information see: http://www2.ed.gov/programs/qualifiedzone/faq.html

Revolving Loans

Revolving loans allow an initial fund to continue indefinitely. A portion of project savings is returned to a central fund that refills until it has sufficient capital for additional projects. The Texas LoanSTAR (Loans to Save Taxes and Resources) program uses a revolving loan mechanism. The program was initiated by the Texas Energy Office with a pool of $98.6 million in 1988 and has become one of the most successful energy efficiency programs in the United States. As of November 2007, LoanSTAR has funded a total of 191 loans totaling over $240 million dollars. The LoanSTAR program provides low-interest loans to assist selected public entities in financing their energy-related cost reduction efforts. The awards are structured as low-interest 2 percent loans of up to $10 million, of which up to $2 million may be used for renewable energy systems. The term of the loan is for 10 years or less; if at least 10 percent of the project cost contains renewable energy technologies, the loan may qualify for up to a 15-year payback.

Rural Economic Development Loan and Grant

The Rural Economic Development Loan and Grant (REDLG) program provides funding to rural projects through local utility organizations. Under the REDLoan program, the U.S. Department of Agriculture provides zero interest loans to local utilities that they, in turn, pass through to local businesses (ultimate recipients) for projects that will create and retain employment in rural areas.

For more information see: http://www.rurdev.usda.gov/rbs/busp/redlg.htm

5.9.3 Municipal Budget Allocation

An energy efficiency program can be funded by a municipality by allocating funds in the annual budget. The main advantages of this mechanism are that it ensures that energy efficiency becomes a line item in future capital budgets and is perceived as a vital service to the community.

5.9.4 Service Charges on Utility Bills

Energy efficiency programs can be funded by an SBC. An SBC is determined by either legislation or a regulatory process. The charge is usually a fixed amount on the utility bill and is set for a number of years. The energy efficiency program funded through this mechanism has a more stable funding source.

Third-Party Financing – Performance Contracting and Demand Side Bidding

For all municipalities, especially those with limited capital or staff resources, performance contracts are a simple approach to financing energy efficiency retrofits. In performance contracting, the financing is structured so that the energy savings cover the cost of the contractor's services and the cost of the energy efficiency equipment. For a municipality new to energy management, working with an ESCO provides a comfortable level of technical support. The municipal managers should think strategically about pursuing more comprehensive retrofits that will yield more energy and cost savings in the long run if they choose this type of financing.

In addition to these financing incentive options, there are some free energy efficiency resources available to Texas MOUs.

5.9.5 Technical Assistance

Technical Assistance Program:

DOE's Technical Assistance Program (TAP) supports the EECBG Program and the SEP by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs. TAP offers one-on-one assistance on topics including energy efficiency and renewable energy technologies, program design and implementation, financing, and performance contracting. Its extensive online resource library includes webcasts, events calendars, the TAP blog, best practices, and project resources.

TAP solution center link: http://www1.eere.energy.gov/wip/solutioncenter/default.html

Technical Assistance Center:
http://www1.eere.energy.gov/wip/solutioncenter/technical_assistance.html

ENERGY STAR® Portfolio Manager

EPA's Portfolio Manager (PM) is a free, web-based tool for benchmarking existing buildings. It provides benchmarking for all commercial buildings, including ENERGY STAR® scores for eligible buildings and normalized energy use intensities (EUI) for all buildings. The benchmarking activity in PM has continued to increase since 1999. The PM rating 50 is average and a rating of 75 qualifies the building for ENERGY STAR®. ENERGY STAR® provides ratings for many building types. If the building type doesn't fall into an ENERGY STAR® category, ENERGY STAR® PM can still be used to track water use, EUI, and emissions. ENERGY STAR® PM reports a statement of building energy performance. The users can create custom views to demonstrate savings from EECBG retrofit projects. The PM reporting tool provides many capabilities, e.g., it gives access to much more data and allows users to download data in different formats. PM can be a useful tool for MOUs to support implementation of commercial sector programs.

There are many benefits of benchmarking.

- Enable portfolio-wide continuous energy management strategy and reductions
- Verify pre- and post-project energy use, GHG emissions, and energy costs
- Identify under-performing facilities
- Assess effectiveness of current operations, policies, and practices
- Assist in planning: set goals, targets, and timelines

- Set investment priorities
- Be more responsive to ongoing issues
- Identify billing errors
- Conduct low cost "pre-audits" of building energy use

The ENERGY STAR® PM link:
http://www.energystar.gov/index.cfm?c=evaluate_performance.bus_portfoliomanager

Clean Energy Ambassadors

Clean Energy Ambassadors (CEA) work to share winning strategies for energy efficiency and renewable energy development at community-owned utilities. The program is all about developing leadership, taking a broad view, and fostering productive public participation in energy efficiency and renewable energy development. Many of the services, including expert advice and on-site meetings, are provided at no cost. CEA collaborates with established networks, including the APPA's EER Central, the national Clean and Efficient Energy Program, Midwest Energy Efficiency Alliance, state farmer's unions, tribal groups, and more, bringing regional and national research, field experience, and market transformation to your hometown.

For more information see: http://cleanenergyambassadors.ning.com/

American Public Power Association: "Energy Services that Work Guidebook."

This comprehensive handbook for understanding and implementing utility DSM and energy services programs covers 21 program areas for residential, commercial/community, industrial, and agricultural customers. It communicates successful program implementation by identifying pitfalls and presenting best practices and insights that have helped utilities offer better programs and services to their customers. This guidebook will help utility staff understand the costs and benefits of prescriptive and customer programs along with key considerations for program development, implementation, and marketing. This resource is available as a hard-copy handbook and as a web-based handbook. Available through the APPA Website: $150 for APPA members. http://www.publicpower.org.

Department of Energy Industrial Technologies Program

Traditionally, the industrial sector has been underserved by utility-sponsored, energy efficiency programs. To help increase awareness and provide training and education for industrial customers, MOUs can offer design assistance for construction of new industrial facilities as well as partner with the DOE Industrial Technologies Program (DOE-ITP). The DOE-ITP offers several layers of support for industrial energy efficiency programs. The DOE-ITP "leads the national effort to reduce energy use and carbon emissions in industry…" To achieve this, the program:

- Conducts research and development (R&D) on energy-efficient new technologies
- Promotes distributed generation and fuel and feedstock flexibility
- Supports the commercialization of emerging technologies
- Helps plants access and use proven technologies, energy assessments, software tools, and other resources
- Promotes a culture of energy efficiency and carbon management in industry"

(Source: http://www1.eere.energy.gov/industry/about/pdfs/mypp_program_overview.pdf)

Program Objectives

- Provide national leadership in energy-efficient, low-carbon manufacturing and products
- Harness the scientific ingenuity of academia, industry, and the National Laboratories to transform energy use in manufacturing
- Promote the use of proven, advanced technologies and strategies throughout the industrial supply chain
- Foster industrial productivity to stimulate economic growth and jobs creation

(Source: http://www1.eere.energy.gov/industry/about/pdfs/itp_program_fact_sheet.pdf)

Financial Assistance and Other Resources

MOUs can apply for solicitations from DOE-ITP for rebates, grants, loans, assessments, and other incentives via the State Incentives and Resource Database located at: http://www1.eere.energy.gov/industry/states/state_activities/incentive_search.aspx.

This database is organized by region/state, sponsor type, resource type, industrial system type, and energy type and provides a listing of potentially compatible programs.

Additional resources provided by ITP are:

- Combined Heat and Power (CHP) Project Profiles Database- Database of select CHP project profiles.
- Industrial Assessment Centers Database- Database of small- to medium-sized manufacturer energy assessments
- *Save Energy Now* Participating Plants Database-Detailed information on completed on-site plant assessments.

(Source: http://www1.eere.energy.gov/industry/resources/databases.html)

Section 6 Conclusions and Final Remarks

As stated at the beginning of this report, energy efficiency has been long recognized and accepted as one of the most cost-effective resources that contribute to the country's growing electricity needs. Numerous organization, agencies, and utilities across the country are utilizing energy efficiency in their resource portfolios by offering programs to help reduce demand. Through extensive research, interviews, data collection, and analysis, the Project Team identified significant potentials for energy conservation in local markets, and great interest among the MOUs to uncover energy savings through initiating new energy efficiency programs or expanded energy efficiency plans to incorporate successful program initiatives and cost saving measures. Meanwhile, the Project Team also recognized energy efficiency best practices and disseminated them among locally owned electric providers so that decision makers can assess, select, and implement the policies and programs that align best with local conditions and constraints.

This comprehensive Guide is intended to be a first, not final, step in a process that seeks to identify and communicate best practices on an on-going or periodic basis. The Guide does not expect to produce a concensus of best practices across all types of programs. The large scope and changing nature of energy efficiency programs and energy markets requires that a dynamic approach be deployed. Like any study of this type, resource and schedule constraints must limit the scope of the effort. It is anticipated that future phases of the work can expand the number and types of programs covered.

The Project Team, along with DOE and SECO, will provide assistance and support to Texas MOUs with their planning and implementation of energy efficiency programs that will ultimately result in energy and electric bill savings for their customers. This Guide is also a resource to support SECO's commitment to reach 1 percent annual electricity savings statewide.

Appendix A. Project Introductory Letter to Texas MOUs

MEMORANDUM

TO: TPPA-Member Municipally Owned Utilities

FROM: Mark Zion, Executive Director, TPPA

DATE: June 9, 2011

SUBJECT: Energy Efficiency Programs for Your Customers and Community

- ***Please consider participating in a new public power project which, at no cost to your utility, can give you the tools to implement proven energy efficiency programs in your community,***
- ***Please fill out and return the attached questionnaire to TPPA no later than June 23, 2011. Please call if you have any questions or need additional information.***

This memorandum is to enlist your participation in a project, which at no cost, can help your utility implement or expand energy efficiency projects in your community.

The project is just getting underway. It is being funded by DOE and will be conducted by TPPA and the Texas State Energy Conservation Office (SECO). It will consist of an energy-efficiency best practices study for municipally owned utilities (MOUs) in Texas. The results are intended to provide clear benefits for TPPA member utilities like yours, including:

- Locally-appropriate and ready-to-implement programs based on other successful *and* cost-effective energy-efficiency efforts. If you participate, the results of the study can be tailored to your MOU to help you plan future energy efficiency efforts at the local level.
- The tools your utility needs to help your customers realize energy and electric bill savings, and to help our state reach its goal of saving energy.

SECO has retained the nationally recognized energy efficiency consulting firm Nexant to conduct this project. Nexant has broad experience, including the development of energy efficiency programs for CPS Energy, San Antonio's municipal electric system. Beginning in June, Nexant will conduct a study to identify best practices in energy-efficiency programs that are compatible with your local service area conditions. The end result will be a comprehensive guide available to TPPA members: ***"SAVING ENERGY and MONEY: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State."*** With fully developed program implementation plans, this guide will give you the option to deliver customer-focused energy-efficiency programs, and the tools you need to move forward.

However, to ensure the best practices guide that is *locally meaningful* - YOUR PARTICIPATION IS NEEDED. The Nexant team will match proven energy-efficiency best practices to the individual customer and market characteristics of MOUs like yours. That way, the programs identified in the study will be suitable for adoption if you so choose, implementable, and developed in recognition of your local situation and needs.

Today, different MOUs in Texas have different energy efficiency programs and needs. Very large systems have mature efficiency programs. This project is aimed primarily at (1) mid-sized systems that already have a number of efficiency programs which they may want to expand or refine, and (2) other mid-sized and smaller MOUs that may just be getting started or that may have very basic programs (like customer education).

To support our collective study efforts, please complete the attached questionnaire and return to me at mzion@tppa.com or 512-472-5965 (fax) no later than June 23, 2011. We will then forward your responses to Nexant. Your participation will help us create a thorough, beneficial, no-cost guide for public power's future energy-efficiency program development efforts.

Thanks, Mark

XC: Pam Groce, SECO; Jessy Shao, PE, Nexant

ATTACHMENT – Questionnaire and FAQ.

Texas State Energy Conservation Office and Texas Public Power Association Introductory Survey: MOU Energy-Efficiency. PLEASE RETURN BY JUNE 23, 2011 to mzion@tppa.com or 512-472-5965(fax).

1. Organization/utility name: ____

   Number of customers your organization serves: _________________________

2. Does your organization currently offer any energy-efficiency, renewable energy, or demand programs?

   YES____

   NO____

3. If yes, what types of programs do you currently offer? Please complete the table below, adding more rows if necessary, or provide the information in an attachment.

Program Name	Targeted Customer Segment	Brief Summary of the Program

4. Using a scale of 1-5, where **1 indicates "not interested"** and **5 indicates "very interested,"** please rate your interest in offering new programs or expanding/refining your existing energy-efficiency programs portfolio. Please choose ONE RESPONSE:

   ____ 1 – Not Interested
   ____ 2
   ____ 3
   ____ 4
   ____ 5 – Very Interested

5. What types of energy-efficiency programs are you most interested in?____________________

   ____

6. May someone from Nexant, the consulting firm retained by TPPA and SECO, contact you (or someone else at your organization) to better understand the characteristics of your service territory and further explore your energy-efficiency program goals?

   YES____

   NO____

7. Please provide the name, phone number, and e-mail address for the best person at your organization for us to contact when following up about energy-efficiency programs.

   Name:____

   Phone:____

   E-mail address:_______________________________________

If you have any questions, please feel free to contact Mark Zion or Wendell Bell at TPPA, 512-472-5965.

Texas State Energy Conservation Office and Texas Public Power Association FAQs: MOU Energy-Efficiency Best Practices Guide Participation

How will your survey participation – and the best practices guide - benefit your utility?

- This project will to match national best practice energy-efficiency programs and program characteristics with those well suited for TPPA MOU utilities.
- It will give you Locally-appropriate and ready-to-implement programs based on other successful *and* cost-effective energy-efficiency efforts. If you participate, the results of the study can be tailored to your MOU to help you plan future energy efficiency efforts at the local level. You will have the opportunity to provide feedback on which program elements might be most desirable in your community.
- The resulting guide, ***"SAVING ENERGY and MONEY: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State."*** will help you select, develop, and implement customer-focused energy efficiency programs based on proven best practices. It will provide the tools your utility needs to help your customers realize energy and electric bill savings, and to help our state reach its goal of saving energy.

Will resources be available to support energy-efficiency programs in my community?

- Options and recommendations for available financing solutions and potential incentives for program participants will be included in this best practices guide.
- Technical support and implementation assistance may be available to support pilot programs.

What is involved in participation – and what is the timeframe?

Level 1 - Respond to the brief introductory survey.

Level 2 - Submit information to follow-up request to provide existing, published data (annual reports, etc.).

Level 4 - Join in a one-hour brainstorming session (webinar or conference call).

Level 5 - Participate in a one-hour telephone interview to discuss the unique characteristics of your community, utility, and energy efficiency goals.

Level 6 – Respond to research findings when Nexant presents its initial research and best practice program findings at the TPPA annual statewide conference in July. This study participant session will give you an opportunity to respond to early results, explore the applicability of identified best practice elements to your communities, and develop topics for further examination. A written feedback mechanism will be provided to those who are unable to attend the TPPA conference in San Antonio.

MEMORANDUM

TO: TPPA-Member Municipally Owned Utilities[1]

FROM: Mark Zion, Executive Director, TPPA

DATE: June 9, 2011

SUBJECT: Energy Efficiency Programs for Your Customers and Community

- ***Please consider participating in a new public power project which, at not cost to your utility, can give you the tools to: (1) expand or refine your current energy efficiency programs, and/or (2) implement new energy efficiency programs based on proven best practices.***
- ***This project can help your municipally owned utility comply with SB-924 – new legislation which will require your MOU to report annually to the state on your efficiency efforts. You will have to make these new reports every year starting in 2012 in a state-standardized format.***
- ***Previous law only required a one-time MOU report on energy efficiency. Your MOU made that report to SECO in 2009 and a copy of the summary sheet is attached. Please update that form and return it to TPPA no later than June 23, 2011. Please call if you have any questions or need additional information.***

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The project is just getting underway. It is being funded by DOE and will be conducted by TPPA and the Texas State Energy Conservation Office (SECO). It will consist of an energy-efficiency best practices study for municipally owned utilities (MOUs) in Texas. The results are intended to provide clear benefits for TPPA member utilities like yours, including:

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- The tools your utility needs to help your customers realize energy and electric bill savings, and to help our state reach its goal of saving energy.

SECO has retained the nationally recognized energy efficiency consulting firm Nexant to conduct this project. Nexant has broad experience, including the development of energy efficiency programs for CPS Energy, San Antonio's municipal electric system. Beginning in

[1] To MOUs >500,000 MWH sales in 2005 and subject to SECO reporting requirements. A similar communication has been sent to smaller MOU systems.

June, Nexant will conduct a study to identify best practices in energy-efficiency programs that are compatible with your local service area conditions. The end result will be a comprehensive guide available to TPPA members: ***"SAVING ENERGY and MONEY: HOW TO START, EXPAND, OR REFINE MOU PROGRAMS, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State."*** With fully developed program implementation plans, this guide will give you the option to deliver customer-focused energy-efficiency programs, and the tools you need to move forward.

However, to ensure the best practices guide that is *locally meaningful* - YOUR PARTICIPATION IS NEEDED. The Nexant team will match proven energy-efficiency best practices to the individual customer and market characteristics of MOUs like yours. That way, the programs identified in the study will be suitable for adoption if you so choose, implementable, and developed in recognition of your local situation and needs.

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To support our collective study efforts, please complete the attached questionnaire and return to me at mzion@tppa.com or 512-472-5965 (fax) no later than June 23, 2011. We will then forward your responses to Nexant. Your participation will help us create a thorough, beneficial, no-cost guide for public power's future energy-efficiency program development efforts.

Thanks, Mark

XC: Pam Groce, SECO; Jessy Shao, PE, Nexant

ATTACHMENT – 2009 Energy Efficiency Report Summary Sheet

SECO In-depth Interview Guide for MOUs

Respondent name/organization:____
Respondent phone/email: ____
Interview date: ____
Interviewer:____

Introduction

Hi, my name is [NAME] from Nexant team. Nexant team is hired by the State Energy Conservation Office (SECO) to conduct a study of energy-efficiency best practices for Texas municipal utilities. You may recall receiving an email from TPPA in June with some information about this study.

The purpose of the interview is to gather information about local conditions and get your feedback about what kinds of energy-efficiency programs you are interested in. This interview should take approximately one hour. Do you have any questions before we begin?

More Information About This Study (if needed):

TPPA, in partnership with the State Energy Conservation Office, and with funding support from the U.S. Department of Energy, is embarking on a study of energy-efficiency best practices for Texas municipal utilities. This study will identify and catalogue best practices gleaned from demand-side management programs offered throughout the country and analyze those best practices for their compatibility with conditions in local service areas.

The results of this study will be offered in a comprehensive guide entitled: "*SAVING ENERGY and MONEY: HOW TO GET STARTED, A Guide to Best Practices for Energy Efficiency in Locally Governed Electric Services Areas in the State.*" The information in this Guide will provide a valuable resource for TPPA members interested in developing customer-focused energy-efficiency programs, and who want to contribute to the statewide municipal utility goal of one percent energy savings over the next three years.

Operational Structure

First, I'd like to start by asking some questions to learn about how your organization operates.

1. Can you begin by telling me what your title is, and what your typical responsibilities include?

2. How many employees does your utility employ?

1. Is there someone in the utility or on city staff who is in charge of energy-efficiency and/or environmental services? If yes, may we contact them?

2. Are there utility customer reps? If Yes, does the utility break down accounts by customer reps? Also may we contact the customer reps?

3. Does your organization use third-party contractors to deliver any functions within your utility, for example, marketing, call center, billing?

4. Can you talk a little about how your utility develops its electricity rates?
    a. What is the board or council's role in this process?

    b. Is there separate utility charge on the electric demand use? If so, how do you define the demand period?

    c. Have there been any recognizable trends either increasing or decreasing in your rates over the last five years? [PROBE FOR REASONS WHY]

    d. Would your utility decision makers consider a rate increase to help pay for energy efficiency programs for your customers?

5. Have there been any other changing trends in population or energy usage over the past five or so years? [PROBE FOR REASONS WHY]

6. How does your utility obtain electricity?
    a. Do you own generation resources?

Does your utility every have trouble meeting demand during peak periods? (i.e. – brownouts)

Local Market Conditions

I'd like to learn about your service territory. These next questions will help me gain a better understanding of your customer base.

1. How does your utility typically interact with the community (not just for energy-efficiency programs, but all interactions) (e.g., events, news releases, etc.)?

2. I'd like to know more about the potential for and specific opportunities for energy-efficiency in your territory. For each customer sector (e.g., residential, commercial, industrial) I am going to list a range of energy uses, please indicate whether you feel there is low, moderate, or significant energy savings potential in your community related to these technologies. [NOTE WE ARE ONLY LOOKING FOR THEIR OPINION ABOUT SAVINGS POTENTIAL, NOT ABOUT THEIR ABILITY TO OFFER A PROGRAM] [PROBE ON MOST COMMON TYPES OF EXISTING TECHNOLOGIES, ADD INSIGHTS AND DISCUSSION NOTES BELOW TABLE].

Sector/technology	**Savings potential** **[SELECT ONE]**
	1=low opportunity 2=moderate opportunity 3=Significant opportunity
Residential	
Lighting	
Heating	
Cooling	
Building shell (**insulation**, air sealing, windows, solar screens)	
Kitchen appliances (refrigerator, dishwasher, oven, washer/dryer)	
Renewable energy (Solar PV, geothermal heat pump) solar water heat	
Other (list)	
Low Income weatherization or other opportunities (if different from broader residential sector)?	

Lighting	
HVAC	
Data Center/Server Room	
Building Controls/Automation/System Operation Optimization	
Motors	
Building shell (Insulation, Window film)	
Office Equipment	
Refrigeration	
O&M Measures	
Process	
Central Plant Upgrade	
Other (list)	

Discussion notes:

1. Is there anything else you can tell me about the energy usage characteristics or opportunities for energy savings in your territory?

2. Do you have any especially high-usage customers like industrial facilities, data centers, or college campuses in your territory?

Local Delivery Capacity

3. Are you aware of any outside efforts to promote energy-efficiency in your service territory, either through nonprofit organizations, the city or county, or other organizations? [PROBE FOR DETAILS AND CONTACT INFORMATION]

4. Are you aware of any efforts to distribute CFLs or other energy efficiency measures in your service territory, either through these types of organizations or through your utility? [PROBE FOR DETAILS AND CONTACT INFORMATION]

1. Do you know if these trade allies are already integrating energy-efficiency into their business practices?

2. Do you know if the local home improvement stores such as Best Buy, Lowes, or smaller locally-owned stores sell high-efficiency products?

Program Offerings

The next several questions are about energy efficiency programs specifically.

Current Program Offerings

[Fill out table on following page with programs and available information before interview, ask for information gaps during interview]

1. Does your utility *currently* offer energy efficiency programs for your customers? [If no, skip to question 25]

	Programs			
Program name→				
Measures				
Year launched				
Participation Eligibility				
Target Customer Sector				
How is it funded?				
Who implements (e.g., in house, 3rd party)?				
How do you market?				
Are there goals (e.g., participation, savings)?				
How are the goals or targets decided?				
Are goals being met?				
Process and other notes (e.g., how does the program work?)				

1. How did you evaluate, measure and verify the savings for your programs?

2. How did you track and report the programs?

3. Do you measure program cost effectives? [If yes], how?

4. Of the past program participants, how well is the program received? Is the feedback you've received overall positive or negative? [PROBE FOR WHY]

5. How well is the program received by utility officials and decision making boards/councils?

6. How does your utility make decisions on whether or not to offer programs? Please describe the process.

7. Has the utility ever produced any type of annual report that provides detail on your programs, such as eligibility, incentive amounts, program budgets, spending, participation, etc.? If yes, would you be willing to share a copy of this with us?

8. Has your utility offered programs in the past that are no longer offered? [IF YES] Why were they discontinued?

Future Program Offerings

9. Are there any/other types of programs you are interested in offering? [PROBE FOR WHY]

10. Now I'm going to read you a list of common operational constraints utilities face in offering energy efficiency programs. For each, please indicate whether this constraint is not problematic, slightly problematic, or a significant issue for your utility.

Constraint	Prevalence of Constraint [ENTER 1-3]
	1=Not problematic 2=Slightly Problematic 3= Significant Issue
Lack of funding	
Lack of interest among city/utility decision makers	
Lack of interest among community members	
Lack of staff resources	
Lack of skilled contractors needed to deliver programs	
Few dealers/retailers offer high efficiency options	

Discussion notes:

1. Do you face any additional operational constraints that I have not mentioned? [ADD TO TABLE; PROBE WITH PREVALENCE QUESTION FOLLOW-UP]

2. I'm going to read you a list of common barriers for customers to participate in energy efficiency programs. For each, please indicate whether this barrier is not problematic, slightly problematic, or a significant issue in your territory.

Barrier	Prevalence of Barrier [ENTER 1-3]
	1=Not problematic 2=Slightly Problematic 3= Significant Issue
Lack of program awareness among customers or trade allies	
Lack of awareness or concern about general environmental issues	
Lack of availability of qualifying measures	

1. Do you face any additional barriers that I have not mentioned? [ADD TO TABLE; PROBE WITH PREVALENCE QUESTION FOLLOW-UP]

2. If more additional labor resources were needed to offer energy efficiency programs, would your organization have to generate additional funding to add staff? Or, do you think the organization could absorb these costs with your current resources?

3. Now I'm going to read you a list of considerations associated with a utility's decision to offer energy efficiency programs. For each, please indicate whether it is high, moderate, or low priority consideration for your organization.

Consideration	**Priority [ENTER 1-3]**
	1=Low priority 2=Moderate priority 3= High Priority
Obtain the most energy savings for the lowest cost	
Reduce peak load to avoid high peaking costs or blown-outs	
Good utility public relations value	
Contributes to local economic growth (job creation)	
Contributes to local environmental goals (emission, pollution reduction)	
Educate or transform the community to be aware of and adopt energy efficiency measures	
Incentivizes cutting edge technologies	
Can be implemented without customer rate increases/alternative funding available	

4. Does your organization have any additional priorities that I have not mentioned? [DESCRIBE BELOW; PROBE WITH PREVALENCE QUESTION FOLLOW-UP]

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Chill Out	London Hydro	ON Canada		Equipment Rebates	Prescriptive rebates	Res				84,600							
ENERGY STAR® Lighting and Appliance Program	Nevada Power Company; Sierra Pacific Power Company	NV	2006-2007	Equipment Rebates	Prescriptive rebates	Res	Lighting and appliances		700,000	63,182							
Cool Cash Incentive Program	Rocky Mountain Power	UT	2007-2008	Equipment Rebates	Upstream	Res	Multiple measures										
High Efficiency Appliance Rebate Program	Southern California Edison; San Diego Gas & Electric; PG&E	CA	2006	Equipment Rebates	Prescriptive rebates	Res	White goods		57,364	4,800	1.7						
New York Energy $mart Products Program	New York State Energy Research and Development Authority (NYSERDA)	NY	2006	Equipment Rebates	Prescriptive rebates	Res	White goods	■	756	647,000			TRC	■	■	■	■
Northeast ENERGY STAR® Lighting and Appliance Initiative	Multiple Utilities	CT	2006	Equipment Rebates	Prescriptive rebates	Res	Multiple measures	■	2,645								
Northeast ENERGY STAR® Lighting and Appliance Initiative	Multiple Utilities	MA	2006	Equipment Rebates	Prescriptive rebates	Res	Lighting, appliances	■	2,645								
Northeast ENERGY STAR® Lighting and Appliance Initiative	Multiple Utilities	VT	2006	Equipment Rebates	Prescriptive rebates	Res	Lighting, appliances	■	2,645								

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
WashWise Program	Seattle City Light; Seattle Public Utilities	WA	2002	Equipment Rebates	Prescriptive rebates	Res			4,817	9							
Torchiere Retail Coupon Program	Seattle City Light	WA	2002	Equipment Rebates	Prescriptive rebates	Res	Lighting		1,103	9							
Residential and Small Business ENERGY STAR® Products Program	DTE Energy	MI	2009	Equipment Rebates	Prescriptive rebates	Res	clothes washers, thermostats, showerheads, CFLs	■	2,095,290	92,454							
Residential Lighting and Appliance Program	Ameren Illinois	IL	2009	Equipment Rebates	Prescriptive rebates	Res	room AC, dehumidifiers, ceiling fans, CFLs		1,015,490	40,350.187	2.91683						
New Heating and Cooling Equipment Program	Ameren Illinois	IL	2009	Equipment Rebates	Prescriptive rebates	Res	HVAC		7917	10,489	5.26						
Residential HVAC Program	DTE Energy	MI	2009	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	5091	1,166							
COOL Advantage Program	Multiple Utilities	NJ	2006	Equipment Rebates	Prescriptive rebates	Res		■	13,241	11,500	9.6						
Residential Efficiency Programs	AE	TX	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■			0.023						
Massachusetts COOL SMART with ENERGY STAR®	Multiple Utilities	MA	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■									
Residential Heating and Cooling Program	Connecticut Light & Power and United Illuminating Company	CT	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	7,473								
Consumer Rebate Program	Los Angeles Department of Water and Power	CA	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■		1,400	1.8						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Residential Equipment Program	MidAmerican Energy Company	IA	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■		9,566,922	5.348						
Rhode Island COOL CHANGE with ENERGY STAR®	National Grid	RI	2005	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	210								
Equipment Efficiency Program	Sacramento Municipal Utility District	CA	2005	Equipment Rebates	Prescriptive rebates	Res		■	6,300	2,000	2						
Heat Pump System Rebate	Tacoma Power	WA	2005	Equipment Rebates	Prescriptive rebates	Res	Heat Pumps			500							
Residential High Efficiency Air Conditioning	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates	Res	Air Conditioning	■	24,721	14,367.659	7.591		TRC				■
Residential Audit and Weatherization Program	DTE Energy	MI	2009	Audit and/or Direct Install	Whole building	Res	Weatherization	■	11,458	2,415	0.96						
Home Energy Performance Program	Ameren Illinois	IL	2009	Audit and/or Direct Install	Whole building	Res	Multiple measures		2,987	1,140	0.09847						
Mass Save	National Grid; NSTAR; Unitil; Cape Light Compact; Western Massachusetts Electric Company	MA	2010	Audit and/or Direct Install	Whole building	Res	Multiple Measures		16,380								
ENERGY STAR® New Homes Program	Rocky Mountain Power	UT	2006-2008	New Construction	Whole building	Res	Multiple measures	■	5,934	8,982.301			TRC	■	■	■	■
New Jersey ENERGY STAR® Homes Program	New Jersey Clean Energy Program	NJ	2001-2006	New Construction	Whole building	Res	Multiple measures		26,309	24,018	51.7						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
ENERGY STAR® New Homes Program	Multiple Utilities	CA	2006-2008	New Construction	Whole building	Res	Multiple measures		25,064	1,837							
Homebase New Construction/ Vermont ENERGY STAR® Homes	Vermont Gas Systems, Inc. and Efficiency Vermont	VT	2006	New Construction	Whole building	Res	Multiple measures	■	200	2,161	0.444						
Iowa New Home Construction Program	Interstate Power and Light Company; MidAmerican Energy	IA	2006	New Construction	Whole building	Res	Multiple measures	■	5,866	3,302.088	1.952						
LIPA ENERGY STAR® Labeled Homes Program	LIPA	NY	2006-2007	New Construction	Whole building	Res	Multiple measures	■	342	972	0.98						
ENERGY STAR® Homes Program	Oncor Electric Delivery	TX	2006	New Construction	Whole building	Res	Multiple measures	■	14,000	25,180	28						
Tucson Electric Power Guarantee Home Program	Tucson Electric Power	AZ	2006	New Construction	Whole building	Res	Multiple measures		7,118	35,200	41						
Colorado ENERGY STAR® New Homes Program	Colorado Governor's Energy Office	CO	2009	New Construction	Whole building	Res	Multiple measures	■	2,350	11,181							
Energy Plus New Homes	Nevada Power Company	NV	2009	New Construction	Whole building	Res	Multiple measures	■	1,023	2,041.407	0.919		TRC				■
Saver’s Switch	Xcel Energy	CO	2008	DR	Prescriptive rebates	Res	HVAC		100,000								
Saver’s Switch	Xcel Energy	MN	2008	DR	Prescriptive rebates	Res	HVAC		300,000								
Air Conditioning Load Management Program (DR Program)	Nevada Power Company	NV	2009	DR	Prescriptive rebates	Res	HVAC	■	18,000	3,219.918	54.707		TRC				■
Neighborhood Power Project	Seattle City Light; Phinney Neighborhood Association	WA	2002	Equipment Rebates	Prescriptive rebates	Com			7,100	600							

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Green Power	Seattle City Light	WA	2002	Equipment Rebates	Prescriptive rebates	Com			12,000	0.12							
CHP Demonstration Program	NYSERDA	NY	2009	Education and Behavior Impact	Whole building	Com	CHP										
CHP Demonstration Program	NYSERDA	NY	2009	Education and Behavior Impact	Whole building	Ind	CHP										
CHP Demonstration Program	NYSERDA	NY	2009	Equipment Rebates	Whole building	Com	CHP	■	146	109,461	203						
CHP Demonstration Program	NYSERDA	NY	2009	Equipment Rebates	Whole building	Ind	CHP	■	146	109,461	203						
Retiree Environmental Technical Assistance Program (RETAP)	Minnesota Pollution Control Agency (MPCA)	MN	2004-2008	Audit and/or Direct Install	Prescriptive rebates	Com		■	143	1,070.881				■	■		■
RETAP	MPCA	MN	2004-2008	Audit and/or Direct Install	Prescriptive rebates	Ind		■	143	1,070.881				■	■		■
Local Government Energy Watch Partnership Program	PG&E	CA	2006-2008	Audit and/or Direct Install	Prescriptive rebates	Res	Multiple Measures	■	22	66,230	10.9						
Local Government Energy Watch Partnership Program	PG&E	CA	2006-2008	Audit and/or Direct Install	Prescriptive rebates	Com	Multiple Measures	■	22	66,230	10.9						
Local Government Energy Watch Partnership Program	PG&E	CA	2006-2008	Audit and/or Direct Install	Prescriptive rebates	Ind	Multiple Measures	■	22	66,230	10.9						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
PRIME Program	Connicut Light & Power; Connecticut Energy Efficiency Fund	CT	2007	Audit and/or Direct Install	Prescriptive rebates	Com											
PRIME Program	Connecticut Light & Power; Connecticut Energy Efficiency Fund	CT	2007	Audit and/or Direct Install	Prescriptive rebates	Ind	Manufacturing efficiency	■	55	3,100							■
Focus on Energy Industrial Program	Focus on Energy	WI	2007	Education and Behavior Impact	Prescriptive rebates	Com											
Focus on Energy Industrial Program	Focus on Energy	WI	2007	Education and Behavior Impact	Prescriptive rebates	Ind	Industrial Energy Efficiency Programs	■	1,500	141,000	20.7		TRC				■
New York State Residential ENERGY STAR® HVAC Training, Education, Certification, & Awareness (TECA) Program	NYSERDA	NY	2005	Education and Behavior Impact	Prescriptive rebates	Ind	HVAC										
Energy Education and Consultation	Nevada Power Company	NV	2009	Education and Behavior Impact	Prescriptive rebates	Ind	Trainings and education sessions	■	45,034	3,895.7	5.217						
California Statewide Emerging Technologies Program	PG&E; SCE; Southern California Gas; San Diego Gas & Electric	CA	2004-2008	Innovative Financing	Financing	Res		■	79	n/a	n/a						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Innovative Designs for Energy Efficiency Applications	SCE	CA	2006	Innovative Financing	Prescriptive rebates	Res		■	100								
Refrigerator Recycling Program	Ameren Missouri	MO	2010	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling		704								
Residential Appliance Recycling Program	DTE Energy	MI	2009	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	9,574	13,891	1.65						
California Statewide Appliance Recycling Program	PG&E	CA	2006-2008	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	70,663	50,423.895	8.038						
Water Heater Rebate Program	Seattle City Light	WA	2002	Equipment Rebates	Prescriptive rebates	Res	Water heaters		2,042		1.25						
Early Replacement of Inefficient Residential Central Air Conditioners	Focus on Energy	WI	2009	Appliance Recycling	Prescriptive rebates	Res	HVAC										
Second Refrigerator Collection and Recycling Program	Nevada Power Company	NV	2009	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	9,054	12,439.4	2.913		TRC				■
New Hampshire Weatherization Program	DOE (Federal); Public Service of New Hampshire; Unitil; New Hampshire Electric Cooperative; Granite State Electric; Keyspan; Northern Utilities	NH	2006	Audit and/or Direct Install	Whole building	Res	Weatherization	■	656	463.136			TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Massachusetts Low Income Program	National Grid; NSTAR; Unitil; Cape Light Compact; Western Massachusetts Electric Company	MA	2010	Audit and/or Direct Install	Whole building	Res	Multiple Measures										
Washington Low Income Weatherization Program (LIWAP)	Pacific Power	WA	2003-2005	Audit and/or Direct Install	Whole building	Res	Weatherization	■	419				TRC	■	■	■	■
LIWAP	Salt River Project (SRP)	AZ	2010	Audit and/or Direct Install	Whole building	Res	Weatherization	■	93	1,113.15							
Utah LIWAP	Rocky Mountain Power	UT	2007-2009	Audit and/or Direct Install	Whole building	Res	Weatherization	■	601	632.3333333			TRC	■	■	■	■
Idaho LIWAP	Rocky Mountain Power	ID	2007-2009	Audit and/or Direct Install	Whole building	Res	Weatherization		88.66666667	179.3333333			TRC	■	■	■	■
Electric Partnership Program	Multiple Utilities	OH	2006-2008	Audit and/or Direct Install	Whole building	Res	Weatherization		17,842	25,062.242							
Ameren LIWAP	Ameren Corporation	MO	2006-2008	Audit and/or Direct Install	Whole building	Res	Weatherization		472	1.256							
Iowa Weatherization Program	DOE (Federal); Home Energy Assistance Program (HEAP) (State funded); Interstate Power and Light Company; MidAmerican Energy; Black Hills Energy	IA	2009	Audit and/or Direct Install	Whole building	Res	Weatherization	■	2,700	2,995.569	0.975	0.494					

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Ohio Home WAP	DOE (Federal); HEAP (State funded); American Electric Power; Columbia Gas; Dominion; Vectren Energy Delivery of Ohio; Cinergy	OH	2003	Audit and/or Direct Install	Whole building	Res	Weatherization		290	604.616							■
Low Income Usage Reduction Program	PECO	PA	2008	Audit and/or Direct Install	Whole building	Res	Weatherization/ Education	■	8,812	1.85							
Energy Management Assistance	SCE	CA	2001-2004	Audit and/or Direct Install	Whole building	Res	Weatherization	■	46,921.25	27,750	8.025		TRC				■
Low Income Single Family Service	Multiple Utilities	VT	2000-2005	Audit and/or Direct Install	Whole building	Res	Weatherization		1,099	1,870.6					■		
NHSAVES@Home; HEAP	Multiple Utilities	NH	2002-2004	Audit and/or Direct Install	Whole building	Res	Weatherization/ Education	■	978	2,947.2							■
Energy $avings Partners	Multiple Utilities	CO	2003-2004	Audit and/or Direct Install	Whole building	Res	Weatherization	■	4,000	24.35801002			TRC				■
Residential Energy Affordability Partnership Program	LIPA	NY	2000-2004	Audit and/or Direct Install	Whole building	Res	Weatherization/ Education	■	4076.6	3958.8	0.45528						
Low Income DSM Programs	Multiple Utilities	OR	2001-2004	DR	Whole building	Res	Weatherization	■	1277.4	1534.1855							
Home$ense Program	Golden Valley Electric Association (GVEA); Interior Weatherization, Inc	AK	1992-2005	Audit and/or Direct Install	Whole building	Res	Weatherization	■	277.1428571	2,000	1.071428571						
Assisted Multi-Family Building	Multiple Utilities	NY	2000-2005	Audit and/or Direct Install	Whole building	Res	Weatherization	■	7.333333333	14,625							

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Program																	
Multifamily Low Income Program	Efficiency Vermont; Vermont Gas Systems; Burlington Electric Department	VT	1997-2002	Audit and/or Direct Install	Whole building	Res	Weatherization	■	989.5	2,048.5							
Energy Conservation Helping Oregonians	Oregon Housing & Community Services; Portland General Electric; PacifiCorp	OR	2002-2004	Audit and/or Direct Install	Whole building	Res	Weatherization	■	1,465	5,681.666667							
Low Income Refrigerator Replacement Program	State of Utah; Utah Power; Program Grantees	UT	2005	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	671.3333333	458							
Indiana LIWAP and Refrigerator Replacement Program	Cinergy/ PSI; State of Indiana Weatherization; Indiana Community Action Programs	IN	2001-2002	Audit and/or Direct Install	Whole building	Res	Weatherization	■	1,988.5	788.171	0.042522		TRC				■
Low Income Weatherization SOP	TXU Electric Delivery	TX	2003-2005	Audit and/or Direct Install	Whole building	Res	Weatherization	■	16978.66667	25,760.33333							
Targeted HPwES	Focus on Energy; Wisconsin Energy Conservation Corporation	WI	2003-2005	Audit and/or Direct Install	Whole building	Res	Multiple measures	■	213.6666667	172.2153333			TRC				■
Wisconsin HEAP	Focus on Energy	WI	2004	Audit and/or Direct Install	Prescriptive rebates	Res	Weatherization										
WAP	Focus on Energy	WI	2004	Audit and/or Direct Install	Whole building	Res	Weatherization										
Oregon WAP	Office of Housing	OR	2003-	Audit and/or	Whole	Res	Weatherization										

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	and Community Services		2005	Direct Install	building												
Appliance Management Program and Low Income Services	National Grid	RI	2006-2007	Audit and/or Direct Install	Whole building	Res	Weatherization	■	3333.333333	4,200	0.48	0.67					
EmPOWER New York	NYSERDA	NY	2006-2007	Audit and/or Direct Install	Whole building	Res	Weatherization		5907.666667	9933.333333	1.366666667		TRC				■
Energy Partners	PG&E	CA	2006	Audit and/or Direct Install	Whole building	Res	Weatherization/ Education	■	66,043	24,300							
CenterPoint Energy non-Profit Affordable Housing Project	CenterPoint Energy	MN	2007-2008	Audit and/or Direct Install	Whole building	Res	Weatherization	■	56.375								
The Neighborhood Energy Saver	Progress Energy	FL	2007	Audit and/or Direct Install	Whole building	Res	Weatherization/ Education	■	2,000	3688.888889	0.844444444						
Universal Services Program	PECO	PA	2004-2005	Audit and/or Direct Install	Whole building	Res	Weatherization		113440.3333								
Low Income Usage Reduction Program	Allegheny Power	PA	2008-2010	Audit and/or Direct Install	Whole building	Res	Weatherization	■	1,062								
First Response Program	Colorado Governor's Energy Office	CO	2006-2007	Education and Behavior Impact	Prescriptive rebates	Res	Weatherization/ Education	■	2,378								
New Jersey Comfort Partners Seniors' Pilot Program	Jersey Central Power & Light	NJ	2003-2004	Audit and/or Direct Install	Whole building	Res	Weatherization		305	170.19							
Low Income Customer Assistance Program	Niagara Mohawk	NY	1998	Audit and/or Direct Install	Whole building	Res	Weatherization		704	6.887197223							
New Jersey LIWAP	DOE (Federal)	NJ	2004	Audit and/or Direct Install	Whole building	Res	Weatherization	■	336	154.56							
New Jersey Comfort Partners	New Jersey Board of Public	NJ	2004	Audit and/or Direct Install	Whole building	Res	Weatherization	■	6,268								

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Program	Utilities (NJBPU) Office of Clean Energy																
Residential Energy Efficiency Assistance Program	DTE Energy	MI	2008	Audit and/or Direct Install	Prescriptive rebates	Res	Weatherization	■	829	2,686	0.03						
Iowa Energy Wise Program	Alliant Energy – IPL, Black Hills Energy, and MidAmerican Energy	IA	2009	Education and Behavior Impact	Prescriptive rebates	Res	Education		2,500	456.459							
Comfort Savings	Nevada Power Company	NV	2009	Audit and/or Direct Install	Whole building	Res	Weatherization	■	980	3,327.228	0.944		TRC				■
Small Commercial HVAC Pilot Program	Northwest Energy Efficiency Alliance (NEEA)	OR	2008	Equipment Rebates	Custom rebates	Com	HVAC			2.074							■
Small Commercial HVAC Pilot Program	NEEA	OR	2008	Equipment Rebates	Custom rebates	Com	HVAC			2.074							■
Small Commercial HVAC Pilot Program	NEEA	WA	2008	Equipment Rebates	Custom rebates	Com	HVAC			2.074							■
Small Commercial HVAC Pilot Program	NEEA	WA	2008	Equipment Rebates	Custom rebates	Com	HVAC			2.074							■
New York Energy $mart Commercial Lighting Program	NYSERDA	NY	2009-2010	Equipment Rebates	Custom rebates	Com	Lighting	■	81.81818182	7,860	2.13		TRC				■
New York Energy $mart Commercial Lighting Program	NYSERDA	NY	2009-2010	Equipment Rebates	Custom rebates	Ind	Lighting	■	81.81818182	7,860	2.13		TRC				■
APS ENERGY STAR® Residential Lighting Program	APS	AZ	2006-2007	Equipment Rebates	Upstream	Res	Lighting	■	83	65,600							
ENERGY STAR® Residential	NEEA	OR	2005-2006	Equipment Rebates	Upstream	Res	Lighting		8,800,000								

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Lighting Program																	
ENERGY STAR® Residential Lighting Program	NEEA	WA	2005-2006	Equipment Rebates	Upstream	Res	Lighting		8,800,000								
Puget Sound Energy ENERGY STAR® Residential Lighting Program	Puget Sound Energy	WA	2006-2007	Equipment Rebates	Upstream	Res	Lighting	■	1,600,000	55,300							
Upstream Lighting Program	PG&E	CA	2000-2006	Equipment Rebates	Upstream	Res	Lighting	■	4428571.429	338714.2857	5						
Community Lighting Events	Efficiency Vermont	VT	2006	Equipment Rebates	Upstream	Res	Lighting	■	24,050								
Lighting Program	Efficiency Maine	ME	2006	Equipment Rebates	Upstream	Res	Lighting		265,053	75,638.75	22.167						
Oncor Electric Delivery Air Conditioning Installer Information and Training MTP	Oncor Electric Delivery	TX	2006	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	41	10386	8.9						
Cool Homes	LIPA	NY	2006-2007	Equipment Rebates	Upstream	Res	HVAC	■	4,444	13277.77778	18.71111111						
Bright Ideas Commercial Lighting	Efficiency New Brunswick	NB (Canada)	2007	Equipment Rebates	Upstream	Com	Lighting	■	37,800	3,500	1.75						
Bright Ideas Commercial Lighting	Efficiency New Brunswick	NB (Canada)	2007	Equipment Rebates	Upstream	Ind	Lighting	■	37,800	3,500							
AC Distributor MTP	TXU Electric Delivery	TX	2005	Equipment Rebates	Upstream	Res	HVAC	■			10						
Residential Energy Efficient Lighting	Nevada Power Company	NV	2009	Equipment Rebates	Upstream	Res	Lighting	■	2,667,278	113,868.8	9.786		TRC				■
Energy Efficient Pool Pumps	Nevada Power Company	NV	2009	Equipment Rebates	Upstream	Res	Pool pumps	■	1,102	4,232.584	0.564		TRC				■
ENERGY STAR® Manufactured Homes	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates	Res	Multiple measures	■	0	0	0		TRC				0

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Focus on Energy Renewables Program	Focus on Energy	WI	2009	Equipment Rebates	Prescriptive rebates	Res	Renewables		738	982.478	0.279						
One-Stop Efficiency Shop Lighting Rebate Program	Xcel Energy	MN	2000-2007	Equipment Rebates	Prescriptive rebates	Com	Lighting	■	319.125	14,262.5	3.825						
One-Stop Efficiency Shop Lighting Rebate Program	Xcel Energy	MN	2000-2007	Equipment Rebates	Prescriptive rebates	Ind	Lighting	■	319.125	14,262.5	3.825						
Lighting Efficiency	Xcel Energy	MN	2002-2006	Equipment Rebates	Prescriptive rebates	Com	Lighting	■	971.2	61,000	11.65						
Lighting Efficiency	Xcel Energy	MN	2002-2006	Equipment Rebates	Prescriptive rebates	Ind	Lighting	■	971.2	61,000	11.65						
Motor and HVAC Distributor Rebate Program	PG&E	CA	2006	Equipment Rebates	Upstream	Com	Motors and HVAC Equipment	■	95%	16,550.0	8.79						
Motor and HVAC Distributor Rebate Program	PG&E	CA	2006	Equipment Rebates	Upstream	Ind	Motors and HVAC Equipment	■	95%	16,550.0	8.79						
C&I Non-Prescriptive Program	DTE Energy	MI	2009	Equipment Rebates	Custom rebates	Com	Custom lighting, HVAC, Motor, Custom Electric, Custom Gas	■	99	15,176.0							
C&I Non-Prescriptive Program	DTE Energy	MI	2009	Equipment Rebates	Custom rebates	Ind	Custom lighting, HVAC, Motor, Custom Electric, Custom Gas	■	99	15,176.0							
C&I Prescriptive Program	DTE Energy	MI	2009	Equipment Rebates	Prescriptive rebates	Com	Lighting, motors and drives, controls, HVAC, refrigeration, and food service equipment	■	5,400	48,629.0							

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C&I Prescriptive Program	DTE Energy	MI	2009	Equipment Rebates	Prescriptive rebates	Ind	Lighting, motors and drives, controls, HVAC, refrigeration, and food service equipment	■	54,00	48,629.0							
Business Energy Solutions: New Building	Energy Trust of Oregon	OR	2007-2008	New Construction	Whole building	Com	Whole Building	■	440	19.9							
Business Energy Solutions: New Building	Energy Trust of Oregon	OR	2007-2008	New Construction	Whole building	Ind	Whole Building	■	440	19.9							
Design 2000plus (MA) and NH Saves @ Work-New Construction (NH)	National Grid	MA	2007	New Construction	Whole building	Com	Whole Building	■									
Design 2000plus (MA) and NH Saves @ Work-New Construction (NH)	National Grid	MA	2007	New Construction	Whole building	Ind	Whole Building	■									
Design 2000plus (MA) and NH Saves @ Work-New Construction (NH)	National Grid	NH	2007	New Construction	Whole building	Com	Whole Building										
Design 2000plus (MA) and NH Saves @ Work-New Construction (NH)	National Grid	NH	2007	New Construction	Whole building	Ind	Whole Building										
Energy Conscious Blueprint Program	Connecticut Light & Power; The United Illuminating Company;	CT	2006	New Construction	Whole building	Com	Multiple measures	■	300	13.8	4.7						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
	Connecticut Energy Efficiency Fund																
Energy Conscious Blueprint Program	Connecticut Light & Power; The United Illuminating Company; Connecticut Energy Efficiency Fund	CT	2006	New Construction	Whole building	Ind	Multiple measures	■	300	13.8	4.7						
Energy Design Assistance-Customer Consulting	Xcel Energy	CO	2006	New Construction	Whole building	Com	Whole Building	■	103	57,400.0	14.1						
Energy Design Assistance-Customer Consulting	Xcel Energy	CO	2006	New Construction	Whole building	Ind	Whole Building	■	103	57,400.0	14.1						
Energy Incentives from We Energies C/I New Construction Program	We Energies	WI	2008	New Construction	Whole building	Com	Whole Building	■	71	20,300.0	6.8						
Energy Incentives from We Energies C/I New Construction Program	We Energies	WI	2008	New Construction	Whole building	Ind	Whole Building	■	71	20,300.0	6.8						
Sustainable Communities Program	San Diego Gas & Electric Company	CA	2004-2008	New Construction	Whole building	Com	Whole Building	■	14	3,500.0							
Sustainable Communities Program	San Diego Gas & Electric Company	CA	2004-2008	New Construction	Whole building	Ind	Whole Building	■	14	3,500.0							
Advanced Buildings Program	National Grid	RI	2007	New Construction	Whole building	Com	Whole Building	■	7	38,000.0							

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Advanced Buildings Program	National Grid	RI	2007	New Construction	Whole building	Ind	Whole Building	■	7	38,000.0							
Business New Construction	Efficiency Vermont	VT	2006	New Construction	Whole building	Com	Whole Building	■	84	4,000.0	2; Total for C&I						
Business New Construction	Efficiency Vermont	VT	2006	New Construction	Whole building	Ind	Whole Building	■	84	4,000.0	2; Total for C&I						
Commercial New Construction Program	LIPA	NY	2006-2007	New Construction	Whole building	Com	Whole Building	■	3,401	130,000.0	25						
Commercial New Construction Program	LIPA	NY	2006-2007	New Construction	Whole building	Ind	Whole Building	■	3,401		25						
WorkPlace New Construction Program	Vermont Gas Systems, Inc.	VT	2006	New Construction	Whole building	Com	Whole Building	■	26	6,784.0	43.7						
WorkPlace New Construction Program	Vermont Gas Systems, Inc.	VT	2006	New Construction	Whole building	Ind	Whole Building	■	26	6,784.0	43.7						
New Buildings Program	Energy Trust of Oregon	OR	2008	New Construction	Whole building	Com	Multiple measures			28,111.5							
New Buildings Program	Energy Trust of Oregon	OR	2008	New Construction	Whole building	Ind	Multiple measures			28,111.5							
Commercial New Construction	Nevada Power Company	NV	2009	New Construction	Whole building	Com	Multiple measures	■		59,394.1							
Commercial New Construction	Nevada Power Company	NV	2009	New Construction	Whole building	Ind	Multiple measures	■		59,394.1							
Self-Direction Credit Program	Rocky Mountain Power	WY	2008	Equipment Rebates	Upstream	Com	lighting, motors, other industrial mechanical measures		18	6,384.3			TRC	■	■	■	■
Self-Direction Credit Program	Rocky Mountain Power	WY	2008	Equipment Rebates	Upstream	Ind	lighting, motors, other industrial mechanical measures		18	6,384.3			TRC	■	■	■	■
Refrigerant Charge and Air Flow Tune-Up	PG&E	CA	2006-2007	Audit and/or Direct Install	Prescriptive rebates	Res	HVAC	■	62,500	9,550.0	16.15						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Program																	
Refrigerant Charge and Air Flow Tune-Up Program	PG&E	CA	2006-2007	Audit and/or Direct Install	Prescriptive rebates	Com	HVAC	■	62,500	9,550	16.15						
Refrigerant Charge and Air Flow Tune-Up Program	PG&E	CA	2006-2007	Audit and/or Direct Install	Prescriptive rebates	Ind	HVAC	■	62,500	9,550	16.15						
Energy FinAnswer and FinAnswer Express	Rocky Mountain Power; Pacific Power	WY	2006	Equipment Rebates	Prescriptive rebates	Com	lighting, HVAC, premium efficiency motors, and others			100,000.0			TRC				■
Energy FinAnswer and FinAnswer Express	Rocky Mountain Power; Pacific Power	WY	2006	Equipment Rebates	Prescriptive rebates	Ind				100,000.0			TRC				■
Energy Initiative (MA) and NH Saves @ Work-Large C/I Retrofit (NH)	National Grid	MA	2006	Audit and/or Direct Install	None	Com	Whole Building										
Energy Initiative (MA) and NH Saves @ Work-Large C/I Retrofit (NH)	National Grid	MA	2006	Audit and/or Direct Install	None	Ind	Whole Building										
Energy Initiative (MA) and NH Saves @ Work-Large C/I Retrofit (NH)	National Grid	NH	2006	Audit and/or Direct Install	Whole building	Com											
Energy Initiative (MA) and NH Saves @ Work-Large C/I Retrofit (NH)	National Grid	NH	2006	Audit and/or Direct Install	Whole building	Ind											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Energy Opportunities Program	Multiple Utilities	CT	2007	Audit and/or Direct Install	Whole building	Com	Whole Building	■	700	49,516	10.8						
Energy Opportunities Program	Multiple Utilities	CT	2007	Audit and/or Direct Install	Whole building	Ind	Whole Building	■	700	49,516	10.8						
Flexible TAP	NYSERDA	NY	2004-2007	Audit and/or Direct Install	Whole building	Com	Whole Building	■	116	18,125.0	3.375						
Flexible TAP	NYSERDA	NY	2004-2007	Audit and/or Direct Install	Whole building	Ind	Whole Building	■	116	18,125.0	3.375						
Custom Efficiency	Xcel Energy	CO	2006	Equipment Rebates	Custom rebates	Com	Whole Building	■	9	2,000.0	0.4						
Custom Efficiency	Xcel Energy	CO	2006	Equipment Rebates	Custom rebates	Ind	Whole Building	■	9	2,000.0	0.4						
Custom Efficiency	Xcel Energy	MN	2006	Audit and/or Direct Install	Whole building	Com											
Custom Efficiency	Xcel Energy	MN	2006	Audit and/or Direct Install	Whole building	Ind											
Whole Building Assessment/ Benchmarking	National Grid	MA	2006	Audit and/or Direct Install	Whole building	Com	Audits	■	64	2,461.0							
Whole Building Assessment/ Benchmarking	National Grid	MA	2006	Audit and/or Direct Install	Whole building	Ind	Audits	■	64	2,461.0							
Workplace Retrofit Program	Vermont Gas Systems, Inc.	VT	2006	Equipment Rebates	Custom rebates	Com	cost-effective, natural gas-saving space, water, process heating measures	■	37.92857143								
Workplace Retrofit Program	Vermont Gas Systems, Inc.	VT	2006	Equipment Rebates	Custom rebates	Ind	cost-effective, natural gas-saving space, water, process heating measures	■	37.92857143								
Custom Process	CenterPoint	MN	2006	Equipment	Custom	Com	equipment										

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Rebate Program	Energy			Rebates	rebates		installed										
Custom Process Rebate Program	CenterPoint Energy	MN	2006	Equipment Rebates	Custom rebates	Ind	equipment installed										
Heavy Industrial and Manufacturing Energy Efficiency Program	PG&E	CA	2007	Audit and/or Direct Install	Whole building	Com	Whole Building		500	101,000.0	12.3						■
Heavy Industrial and Manufacturing Energy Efficiency Program	PG&E	CA	2007	Audit and/or Direct Install	Whole building	Ind	Whole Building		500	101,000.0	12.3						
Production Efficiency	Energy Trust of Oregon	OR	2006	Audit and/or Direct Install	Whole building; custom rebates	Com	Multiple measures	■	229	38.2			SCT				■
Production Efficiency	Energy Trust of Oregon	OR	2006	Audit and/or Direct Install	Whole building; custom rebates	Ind	Multiple measures	■	229	38.2			SCT				■
New Jersey Pay for Performance	New Jersey Clean Energy Program	NJ	2009-2010	Audit and/or Direct Install	Whole building	Com	holistic	■	66	78,400.0							
New Jersey Pay for Performance	New Jersey Clean Energy Program	NJ	2009-2010	Audit and/or Direct Install	Whole building	Ind	holistic	■	66	78,400.0							
Apartment and Condominium Efficiency Services	Focus on Energy	WI	2008-2009	Audit and/or Direct Install	Whole building; custom rebates	Res	Multiple measures		431	915.5							
Residential Multifamily Program	DTE Energy	MI	2009	Equipment Rebates	Prescriptive rebates	Res	Multiple measures	■	119	8,743.0							
California Statewide MEERP	PG&E; SCE; Southern California Gas; San Diego Gas &	CA	2006	Equipment Rebates	Whole building	Res	Multiple measures		168,537	51,296.9	5.3						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
	Electric																
EnergyWise (MA) and Home Energy Solutions (NH)	National Grid	MA	2006	Equipment Rebates	Whole building	Res	Multiple measures	■	18,000	12,800.0							
EnergyWise (MA) and Home Energy Solutions (NH)	National Grid	NH	2006	Equipment Rebates	Whole building	Res	Multiple measures	■	18,000	12,800.0							
Multifamily Housing	Efficiency Vermont	VT	2006	New Construction	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters; education	■	1,318	18,000,000	4						
Multifamily Performance Program	NYSERDA	NY	2007	Equipment Rebates	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters; education	■	11	94							
Food Service Program	CenterPoint Energy	MN	2006	Equipment Rebates	Prescriptive rebates	Com	White goods; Education	■	500								
Food Service Technology Center	PG&E	CA	2006	Equipment Rebates	Prescriptive rebates	Com	White goods; Education	■		1,300,000							
California Statewide Food Service Equipment Program	Multiple Utilities	CA	2006	Equipment Rebates	Prescriptive rebates	Com	White goods; audits; education		3,477								
High Tech Energy Efficiency Program	PG&E	CA	2006-2007	Equipment Rebates	Prescriptive rebates; Financing	Com	Audits; Data Computing Equipment; Education	■		18,200	2.18						
High Tech Energy Efficiency Program	PG&E	CA	2006-2007	Equipment Rebates	Prescriptive rebates; Financing	Ind	Audits; Data Computing Equipment; Education	■		18,200	2.18						
Energy Smart Schools	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates	Com	Weatherization	■	142	5,309.732	2.1258		TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
80 PLUS and ENERGY STAR® Plug Load	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates; upstream	Com	Data Computing Equipment; Education	■		2,700			TRC				■
80 PLUS and ENERGY STAR® Plug Load	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates; upstream	Ind	Data Computing Equipment; Education	■		2,700			TRC				■
Wastewater Efficiency Program	NYSERDA	NY	2009	Education and Behavior Impact	Whole building	Ind	Education	■	25	16,100							
Lead by Example Program	Hawaii Department of Business, Economic Development, and Tourism	HI	2006-2009	Education and Behavior Impact	No Incentive	Com	Energy-efficient retrofits	■	26	16,970							
Minnesota Sustainable Building Guidelines	Minnesota Department of Administration and the Department of Commerce	MN	2004-2010	Education and Behavior Impact	No Incentive	Com	New construction	■	110	36,200	9.4						
B3 Benchmarking	Minnesota Department of Administration and the Department of Commerce	MN	2004-2010	Education and Behavior Impact	No Incentive	Com	Benchmarking	■	1,120	220,000							
Sustainable Building 2030	Minnesota Department of Administration and the Department of Commerce	MN	2008-2010	Education and Behavior Impact	No Incentive	Com	Building performance standards	■	44								
Public Buildings Enhanced Energy Efficiency Program	Minnesota Department of Administration and the	MN	2009-2010	Education and Behavior Impact	No Incentive	Com	Energy-efficient retrofits	■	1,120								

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
	Department of Commerce																
California Statewide Codes and Standards Program	PG&E; SCE; Southern California Gas; San Diego Gas & Electric	CA	2006-2008	Education and Behavior Impact	No Incentive	Res	Building performance standards	■		195,333	56						
California Statewide Codes and Standards Program	PG&E; SCE; Southern California Gas; San Diego Gas & Electric	CA	2006-2008	Education and Behavior Impact	No Incentive	Com	Building performance standards	■		195333.3333	56						
California Statewide Codes and Standards Program	PG&E; SCE; Southern California Gas; San Diego Gas & Electric	CA	2006-2008	Education and Behavior Impact	No Incentive	Ind	Building performance standards	■		195333.3333	56						
Commercial Retrofit Incentives	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates; upstream; direct install	Com	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	714	114,572.1			TRC				■
Commercial Retrofit Incentives	Nevada Power Company	NV	2009	Equipment Rebates	Prescriptive rebates; upstream; direct install	Com	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	714	114,572.1			TRC				■
A/C Cool Credit	Idaho Power	ID	2009	DR	Prescriptive rebates	Res	HVAC	■	30,391		38.5		TRC				■
A/C Cool Credit	Idaho Power	OR	2009	DR	Prescriptive rebates	Res	HVAC	■	30,391		38.5		TRC				■
Ductless Heat	Idaho Power	ID	2009	Audit and/or	Prescriptive	Res	HVAC	■	96	409.18			TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Pump Pilot				Direct Install	rebates												
Ductless Heat Pump Pilot	Idaho Power	OR	2009	Audit and/or Direct Install	Prescriptive rebates	Res	HVAC	■	96	409.18			TRC				■
Energy Efficient Lighting	Idaho Power	ID	2009	Equipment Rebates	Prescriptive rebates	Res	Lighting	■	549,846	13,411			TRC				■
Energy Efficient Lighting	Idaho Power	OR	2009	Equipment Rebates	Prescriptive rebates	Res	Lighting	■	549,846	13,411			TRC				■
Energy House Calls	Idaho Power	ID	2009	Audit and/or Direct Install	Direct Install	Res	weatherization; lighting; audits; water heater; education	■	1,266	928.875			TRC				■
Energy House Calls	Idaho Power	OR	2009	Audit and/or Direct Install	Direct Install	Res	weatherization; lighting; audits; water heater; education	■	1,266	928.875			TRC				■
ENERGY STAR® Homes Northwest	Idaho Power	ID	2009	New Construction	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters	■	474	705.784	1.1		TRC				■
ENERGY STAR® Homes Northwest	Idaho Power	OR	2009	New Construction	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters	■	474	705.784	1.1		TRC				■
Heating & Cooling Efficiency Program	Idaho Power	ID	2009	Equipment Rebates	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters	■	349	1,274.829			TRC				■
Heating & Cooling Efficiency Program	Idaho Power	OR	2009	Equipment Rebates	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters	■	349	1,274.829			TRC				■
Home Improvement	Idaho Power	ID	2009	Equipment Rebates	Prescriptive rebates	Res	Weatherization	■	1,188	1,338.876			TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Program																	
Home Products Program	Idaho Power	ID	2009	Equipment Rebates	Prescriptive rebates	Res	Weatherization	■	9,499	1,638.038			TRC				■
Home Products Program	Idaho Power	OR	2009	Equipment Rebates	Prescriptive rebates	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters	■	9,499	1,638.038			TRC				■
Oregon Residential Weatherization	Idaho Power	OR	2009	Audit and/or Direct Install	Audit; Prescriptive; Financing	Res	Weatherization; audit	■	1	2.907							
Rebate Advantage	Idaho Power	ID	2009	Equipment Rebates	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters; education	■	57	247.348			TRC				■
Rebate Advantage	Idaho Power	OR	2009	Equipment Rebates	Whole building	Res	White goods; Lighting; HVAC; Weatherization; Audit; water heaters; education	■	57	247.348			TRC				■
Residential Energy Efficiency Education Initiative	Idaho Power	ID	2009	Education and Behavior Impact	None	Res	Education										
Residential Energy Efficiency Education Initiative	Idaho Power	OR	2009	Education and Behavior Impact	None	Res	Education										
See Ya Later Refrigerator	Idaho Power	ID	2009	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	1,661	1,132.80			TRC				■
See Ya Later Refrigerator	Idaho Power	OR	2009	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	1,661	1,132.80			TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Weatherization Assistance for Qualified Customers	Idaho Power	ID	2009	Audit and/or Direct Install	Direct Install; Financing	Res	Lighting; HVAC; Weatherization; Audits; Water Heaters; Education	■	437	4,678.815			TRC				■
Weatherization Assistance for Qualified Customers	Idaho Power	OR	2009	Audit and/or Direct Install	Direct Install; Financing	Res	Lighting; HVAC; Weatherization; Audits; Water Heaters; Education	■	437	4,678.815			TRC				■
Weatherization Solutions for Eligible Customers	Idaho Power	ID	2009	Audit and/or Direct Install	Direct Install; Financing	Res	Lighting; HVAC; Weatherization; Audits; Water Heaters; Education	■	41	211.72			TRC				■
Building Efficiency	Idaho Power	ID	2009	New Construction	Whole building	Com	Lighting; HVAC; Weatherization; Audits	■	72	6,146.14	1.3		TRC				■
Building Efficiency	Idaho Power	ID	2009	New Construction	Whole building	Ind	Lighting; HVAC; Weatherization; Audits	■	72	6,146.14	1.3		TRC				■
Building Efficiency	Idaho Power	OR	2009	New Construction	Whole building	Com	Lighting; HVAC; Weatherization; Audits	■	72	6,146.14	1.3		TRC				■
Building Efficiency	Idaho Power	OR	2009	New Construction	Whole building	Ind	Lighting; HVAC; Weatherization; Audits	■	72	6,146.14	1.3		TRC				■
Commercial Education Initiative	Idaho Power	ID	2009	Education and Behavior Impact	None	Com	Audits; Education										
Commercial Education Initiative	Idaho Power	ID	2009	Education and Behavior Impact	None	Ind	Audits; Education										
Commercial Education Initiative	Idaho Power	OR	2009	Education and Behavior Impact	None	Com	Audits; Education										

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Commercial Education Initiative	Idaho Power	OR	2009	Education and Behavior Impact	None	Ind	Audits; Education										
Easy Upgrades	Idaho Power	ID	2009	Equipment Rebates	Whole building	Com	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	1,224	35,171.63	6.1		TRC				■
Easy Upgrades	Idaho Power	ID	2009	Equipment Rebates	Whole building	Ind	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	1,224	35,171.63	6.1		TRC				■
Easy Upgrades	Idaho Power	OR	2009	Equipment Rebates	Whole building	Com	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	1,224	35,171.63	6.1		TRC				■
Easy Upgrades	Idaho Power	OR	2009	Equipment Rebates	Whole building	Ind	White goods, Lighting, HVAC, Weatherization, Audits, Water heaters; Education	■	1,224	35,171.63	6.1		TRC				■
FlexPeak Management	Idaho Power	ID	2009	DR	Prescriptive Rebates	Com	n/a	■	33		19.3		TRC				■
FlexPeak Management	Idaho Power	ID	2009	DR	Prescriptive Rebates	Com	n/a	■	33		19.3		TRC				■
Holiday Lighting Program	Idaho Power	ID	2009	Equipment Rebates	Prescriptive Rebates	Com	Appliance Recycling; Lighting; Education	■	32	142.109			TRC				■
Holiday Lighting Program	Idaho Power	ID	2009	Equipment Rebates		Ind											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Holiday Lighting Program	Idaho Power	OR	2009	Equipment Rebates	Prescriptive Rebates	Com	Appliance Recycling; Lighting; Education	■	32	142.109			TRC				■
Holiday Lighting Program	Idaho Power	OR	2009	Equipment Rebates		Ind											
Oregon Commercial Audits	Idaho Power	OR	2009	Equipment Rebates		Ind											
Oregon Commercial Audits	Idaho Power	OR	2009	Audit and/or Direct Install	None	Com	Audits	■	41								
Custom Efficiency	Idaho Power	ID	2009	Equipment Rebates	Whole building	Com	White Goods; Lighting; HVAC; Weatherization; Audits; Water Heaters;Education	■	132	51,835.612	6.7		TRC				■
Custom Efficiency	Idaho Power	ID	2009	Equipment Rebates	Whole building	Ind	White Goods; Lighting; HVAC; Weatherization; Audits; Water Heaters;Education	■	132	51,835.612	6.7		TRC				■
Custom Efficiency	Idaho Power	OR	2009	Equipment Rebates	Whole building	Com	White Goods; Lighting; HVAC; Weatherization; Audits; Water Heaters;Education	■	132	51,835.612	6.7		TRC				■
Custom Efficiency	Idaho Power	OR	2009	Equipment Rebates	Whole building	Ind	White Goods; Lighting; HVAC; Weatherization; Audits; Water Heaters;Education	■	132	51,835.612	6.7		TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Irrigation Efficiency Rewards	Idaho Power	ID	2009	Equipment Rebates	Custom rebates	Ind	pumps, other irrigation equipment and design	■	887	13,157.619	3.4		TRC				■
Irrigation Efficiency Rewards	Idaho Power	OR	2009	Equipment Rebates	Custom rebates	Ind	pumps, other irrigation equipment and design	■	887	13,157.619	3.4		TRC				■
Irrigation Peak Rewards	Idaho Power	ID	2009	DR	Prescriptive Rebates	Ind	pumps, other irrigation equipment and design	■	1512		160		TRC				■
Irrigation Peak Rewards	Idaho Power	OR	2009	DR	Prescriptive Rebates	Ind	pumps, other irrigation equipment and design	■	1512		160		TRC				■
Appliance Rebate Program	Aspen Municipal Utility	CO		DR	Prescriptive rebates	Res											
Lighting Rebate Program	Colorado Springs Utilities	CO		Equipment Rebates	Prescriptive rebates	Com	Lighting										
Prescriptive Rebate Program	Colorado Springs Utilities	CO		Equipment Rebates	Prescriptive rebates	Com											
Builder Incentive Program	Colorado Springs Utilities	CO		New Construction	No Incentive	Com											
Peak Demand Rebate	Colorado Springs Utilities	CO		DR	Bill credit	Com											
Windows Rebate Program	Colorado Springs Utilities	CO		Equipment Rebates	Prescriptive rebates	Res	Windows										
Business Environmental Program Series	Fort Collins Utilities	CO		Education and Behavior Impact		Com											
Load Management Program	Fort Collins Utilities	CO		DR	Bill credit	Com											
Electric Efficiency Program	Fort Collins Utilities	CO		Equipment Rebates	Prescriptive rebates	Com											
Zero-Interest Loans	Fort Collins Utilities	CO		Innovative Financing	Financing	Res											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Air Conditioner Tune-Up	Fort Collins Utilities	CO		Audit and/or Direct Install		Res	HVAC										
EnergySmart Lighting Program (in partnership w/ MEAN)	Fort Morgan Electric Light & Gas Department	CO		Equipment Rebates	Prescriptive rebates	Com	Lighting										
EnergySmart Lighting Program (in partnership w/ MEAN)	Fort Morgan Electric Light & Gas Department	CO		Equipment Rebates	Prescriptive rebates	Ind	Lighting										
Commercial Matching Grant Program	Longmont Power & Communication	CO		Equipment Rebates	Prescriptive rebates	Com											
Residential Matching Grant Program	Longmont Power & Communication	CO		Equipment Rebates	Prescriptive rebates	Res											
Lighting with a Twist (in partnership with Platte River Power Authority (PRPA))	Longmont Power & Communication	CO		Equipment Rebates	Prescriptive rebates	Res	Lighting										
Tier 1 Energy Audit and Easy Direct Install	EPA	USA		Audit and/or Direct Install	Direct install	Res	Audits										
Earth Day CFL Promotion	BPUB	TX		Equipment Rebates	Prescriptive rebates	Res	Lighting		11,839								
Online Residential & Commercial Energy Suite	BPUB	TX		Education and Behavior Impact		Com			29,513								
Air Conditioning Rebate	AE	TX	2010	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	4,444	5,353.000	4.15		SCT			■	■
HPwES	AE	TX	2010	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	2,941	5,808.000	5.29		SCT			■	■
Free Weatherization	AE	TX	2010	Audit and/or Direct Install	No Incentive	Res	Weatherization	■	456	498.000	0.43		SCT			■	■
Multifamily Incentive	AE	TX	2010	Equipment Rebates	Custom rebates	Res	Lighting	■	18,234	13,231.000	4.48		SCT			■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
The Power Partner	AE	TX	2010	DR	Bill credit	Res	HVAC	■	4,617	45.000	2.3		SCT			■	■
Cycle-Saver Water Heater Timers	AE	TX	2010	DR	Bill credit	Res	Water heaters	■	2,009	12.000	1.31		SCT			■	■
Duct Diagnosis and Sealing	AE	TX	2010	Audit and/or Direct Install	Direct install	Res	HVAC										
Refrigerator Recycling Program	AE	TX	2010	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	3,428	2,530.000	0.66		SCT			■	■
Residential Online Energy Analysis	AE	TX	2010	Education and Behavior Impact		Res											
Commercial Rebates	AE	TX	2010	Equipment Rebates	Prescriptive rebates	Com		■	315	37,126.000	10		SCT			■	■
Small Business Lighting	AE	TX	2010	Equipment Rebates	Prescriptive rebates	Com	Lighting	■	384	5,311.000	1.94		SCT			■	■
Commercial Power Partner	AE	TX	2010	DR	Bill credit	Com	HVAC	■	780	8.000	0.6		SCT			■	■
Thermal Energy Storage	AE	TX	2010	Equipment Rebates	Prescriptive rebates	Com	Renewables	■	0	0.000	0.01		SCT			■	
Smart Vendor	AE	TX	2010	Equipment Rebates	Upstream	Com	vending misers	■	120	137.000	0.02		SCT			■	■
Green Building Programs	AE	TX		Education and Behavior Impact	Codes/Standards	Res											
$mart Business Program	Seattle City Light	WA	1995-2001	Equipment Rebates	Prescriptive rebates	Com	Lighting	■	209	25,413.000	2.901						
Custom Incentive Program	Focus on Energy	WI		Equipment Rebates	Custom rebates	Com											
Custom Incentive Program	Focus on Energy	WI		Equipment Rebates	Custom rebates	Ind											
Energy Star Homes	Efficiency Vermont	VT		New Construction	Whole building	Res		■	964	1,588.000	0.179	0.336				■	
Residential Rebate Program	Great River Coop	MN		Equipment Rebates	Prescriptive rebates	Res		■		23,416.000							
New Jersey Clean Energy Program	New Jersey BPU	NJ		Equipment Rebates	Prescriptive rebates	Res		■		577,091.000							
Hard-to-Reach Lighting Turn-In	San Diego Gas & Electric Company	CA	2004-2006	Equipment Rebates	Prescriptive rebates	Res	Lighting		5,577				TRC				■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Program																	
Home Energy Audit & Insulation	Alliant Energy - Iowa	IA		Audit and/or Direct Install	Prescriptive rebates	Res	Weatherization	■	6,624	4,724.500	6.14		TRC	■	■	■	■
Residential Prescriptive Rebates	Alliant Energy - Iowa	IA		Equipment Rebates	Prescriptive rebates	Res		■	131,339	43,536.000	7.709		TRC	■	■	■	■
New Home Construction	Alliant Energy - Iowa	IA		New Construction	Whole building	Res		■	794	2,943.000	1.38		TRC	■	■	■	■
Low-Interest Financing	Alliant Energy - Iowa	IA		Innovative Financing	Financing	Res											
Residential Efficiency-First Renewable Cash Back Rewards	Alliant Energy - Iowa	IA		Equipment Rebates	Prescriptive rebates	Res	Renewables	■	0	0.000	0		TRC	■	0	■	
Appliance Recycling	Alliant Energy - Iowa	IA	2009-2013	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	9,395	14,198.000	1.933		TRC	■	■	■	■
Residential Direct Load Control	Alliant Energy - Iowa	IA		DR	Bill credit	Res	HVAC	■	53,996	206.000	33		TRC	■	■	■	■
Shared Savings	Alliant Energy - Wisconsin	WI		Audit and/or Direct Install	Financing	Com	Audits										
Performance Contracting	Alliant Energy - Iowa	IA		Innovative Financing	Direct install	Com		■	12	4,593.000	0.4		TRC	■	■	■	■
Custom Rebates	Alliant Energy - Iowa	IA		Equipment Rebates	Custom rebates	Com		■	270	40,008.000	6.289		TRC	■	■	■	■
Custom Rebates	Alliant Energy - Iowa	IA		Equipment Rebates	Custom rebates	Ind		■	270	40,008.000	6.289		TRC	■	■	■	■
Commercial New Construction	Alliant Energy - Iowa	IA		New Construction	Prescriptive rebates	Com		■	33	15,058.000	3.634		TRC	■	■	■	■
Non-Residential Prescriptive Rebates	Alliant Energy - Iowa	IA		Equipment Rebates	Prescriptive rebates	Com		■	5,521	27,748.500	5.052		TRC	■	■	■	■
Iowa Farm Rewards	Alliant Energy - Iowa	IA		Equipment Rebates	Prescriptive rebates	Agricultural		■	295	5,584.500	0.605		TRC	■	■	■	■
CheckMe! Plus AC Program	NV Energy	NV		Equipment Rebates	Prescriptive rebates	Res	HVAC										
Cool Share for	NV Energy	NV		DR	Bill credit	Res	HVAC										

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Southern Nevada																	
Energy Star Homes	NEEA	WA		Education and Behavior Impact	No Incentive	Res											
Energy Lighting Efficiency Program	Xcel Energy	MN		Audit and/or Direct Install	audit / prescriptive rebates / financing	Com	Lighting	■	535				TRC				■
Business Energy Services Team Program	KEMA-XENERGY	CA	2004	Audit and/or Direct Install	audit / prescriptive rebates / financing	Com		■	179				TRC				■
EZ Turnkey Program	San Diego Gas & Electric Company	CA	2004	Audit and/or Direct Install	audit / prescriptive rebates / financing	Com		■	687				TRC				■
Small Commercial Prescriptive Lighting Initiative	Sacramento Municipal Utility District	CA	2004	Equipment Rebates	Prescriptive rebates	Com	Lighting	■	1,478				TRC				
Small Business Energy Advantage Program	Connecticut Light and Power	CT	2004	Equipment Rebates	audit / prescriptive rebates / financing	Com		■	605				TRC				■
Express Efficiency Program	Four CA IOUs	CA	2004	Equipment Rebates	Prescriptive rebates	Com		■	9,621				TRC				■
Express Efficiency Program	Four CA IOUs	CA	2004	Equipment Rebates	Prescriptive rebates	Ind		■	9,621				TRC				■
Cool Choice Program	Multiple Utilities		2004	Equipment Rebates	Prescriptive rebates	Com	HVAC	■	1,390	702.000			TRC				■
Cool Choice Program	Multiple Utilities		2004	Equipment Rebates	Prescriptive rebates	Ind	HVAC	■	1,390	702.000			TRC				■
HVAC Maintenance Program	Avista	ID	2004	Audit and/or Direct Install	Prescriptive rebates	Com	HVAC	■	2,700	13,000.000			TRC				
Express Efficiency Program - HVAC Element	California	CA	2004	Equipment Rebates	Prescriptive rebates	Com	HVAC		389	2,901.000			TRC				

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Chiller Efficiency Program	Los Angeles Department of Water and Power	CA	2004	Equipment Rebates	Prescriptive rebates	Com	HVAC	■	26				TRC				
Commercial and Industrial HVAC Program	Florida Light and Power	FL	2004	Equipment Rebates	Prescriptive rebates	Com	HVAC	■	523	54,112.000	20.395		TRC				
Commercial and Industrial HVAC Program	Florida Light and Power	FL	2004	Equipment Rebates	Prescriptive rebates	Ind	HVAC	■	523	54,112.000	20.395		TRC				
Commercial Kitchen Equipment Rebates	Puget Sound Energy	WA		Equipment Rebates	Prescriptive rebates	Com											
CFL Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Res	Lighting		1,726,942	65,346.000	99.466						
Home Efficiency Program	CPS Energy	TX	2009	Equipment Rebates	No Incentive	Res	New windows		2,339	1,952.000	0.861						
Residential HVAC Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Res	HVAC		7,990	7,173.000	2.734						
Solar PV & Water Heater Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Res	Renewables		42	327.000	0.176						
Air Flow Performance Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Res	HVAC		302	490.000	0.304						
New Homes Construction Program	CPS Energy	TX	2010	New Construction	No Incentive	Res											
Refrigerator Recycling Program	CPS Energy	TX	2010	Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling										
Wash Right Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Res	Wash Machine		2,331	334.000	0.57						
Commercial Large Lighting	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Com	Lighting		147	21,739.000	5.596						
Commercial Small Lighting Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Com	Lighting										
Commercial HVAC	CPS Energy	TX	2009	Equipment	Prescriptive	Com	HVAC		112	5,476.000	3.24						

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Program				Rebates	rebates												
Motors Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Com	Motors		1	1.951	0.001						
Window Film Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Com	Window Film		9								
Roof Coating Program	CPS Energy	TX	2009	Equipment Rebates	Prescriptive rebates	Com	Roof		28	207.621	0.174						
Restaurant Equipment Program	CPS Energy	TX	2010	Equipment Rebates	Prescriptive rebates	Com											
Lean Clean Energy	CPS Energy	TX	2010	Audit and/or Direct Install	No Incentive	Ind	Audits										
Commercial New Construction Program	CPS Energy	TX	2010	New Construction	No Incentive	Com											
Commercial Custom Program	CPS Energy	TX	2009	Equipment Rebates	Custom rebates	Com	HVAC		1	244.477	0.005						
Peak Saver	CPS Energy	TX	2009	DR	Bill credit	Res	programmable thermostat		25,696	735.000	16.7						
DR Program	CPS Energy	TX	2009	DR	Bill credit	Com	load curtailment		19	615.000	16.8						
Power Watch	City of Ames Electric Services	IA		Education and Behavior Impact		Res											
Energy Efficiency & Environmental Stewardship Programs	Connecticut Municipal Electric Energy Cooperative	CT		Equipment Rebates	Prescriptive rebates	Res											
SRP M-Power	SRP	AZ		Equipment Rebates		Res											
Outreach to Underserved Customers	Silicon Valley Power	CA		Appliance Recycling	Direct install	Res	Appliance Recycling										
Grease to Gas Program	City of Riverside Public Utilities	CA		Equipment Rebates		Com	Renewables										
House of Green	City of Waverly	IA		Education and Behavior		Res											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
				Impact													
High-Energy Cost Community-Service Cost Assistance Program	Public Utility District #1 of Ferry County	WA		Equipment Rebates	Prescriptive rebates	Res	Renewables										
PaloAltoGreen	City of Palo Alto	CA		Equipment Rebates		Res	Renewables										
EnergySmart Westerville	City of Westerville Electric Division	OH		Education and Behavior Impact		Res											
Electric Thermal Storage	Concord Municipal Light Plant	MA		Equipment Rebates	Prescriptive rebates	Com	Renewables										
Electric Thermal Storage	Concord Municipal Light Plant	MA		Equipment Rebates	Prescriptive rebates	Ind	Renewables										
InvestSmart	JEA	FL	2010	Equipment Rebates	Prescriptive rebates	Com											
InvestSmart	JEA	FL	2010	Equipment Rebates	Prescriptive rebates	Ind											
InvestSmart	JEA	FL	2010	Equipment Rebates	Custom rebates	Com											
InvestSmart	JEA	FL	2010	Equipment Rebates	Custom rebates	Ind											
InvestSmart	JEA	FL	2010	Audit and/or Direct Install	Direct install	Com	lighting										
InvestSmart	JEA	FL	2010	Audit and/or Direct Install	Direct install	Ind	lighting										

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Reduce The Use	Santee Cooper	SC	Sep 16 2009-present	Equipment Rebates	Prescriptive rebates	Com											
Reduce The Use	Santee Cooper	SC	Sep 16 2009-present	Equipment Rebates	Custom rebates	Com											
Smart Energy Homes	Santee Cooper	SC		New Construction	Codes/Standards	Res											
WarmWise	Columbia Gas of Virginia	VA		Equipment Rebates	Prescriptive rebates	Res											
WarmWise Home Savings Evaluation	Columbia Gas of Virginia	VA		Audit and/or Direct Install		Res											
Business Savings	Columbia Gas of Virginia	VA		Equipment Rebates	Prescriptive rebates	Com											
Business Custom	Columbia Gas of Virginia	VA		Equipment Rebates	Custom rebates	Com											
Residential	City of Danville, VA	VA		Equipment Rebates	Prescriptive rebates	Res											
RCx	ComEd	IL	2009-2011	Audit and/or Direct Install		Com				22,100.000							
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	AL	2009	Equipment Rebates	Prescriptive rebates	Com											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	AL	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business -	Tennessee Valley Authority	GA	2009	Equipment Rebates	Prescriptive rebates	Com											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Standard Rebate Program																	
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	GA	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	KY	2009	Equipment Rebates	Prescriptive rebates	Com											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	KY	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	MS	2009	Equipment Rebates	Prescriptive rebates	Com											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	MS	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	NC	2009	Equipment Rebates	Prescriptive rebates	Com											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	NC	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	TN	2009	Equipment Rebates	Prescriptive rebates	Com											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	TN	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	VA	2009	Equipment Rebates	Prescriptive rebates	Com											
EnergyRight Solutions for Business - Standard Rebate Program	Tennessee Valley Authority	VA	2009	Equipment Rebates	Prescriptive rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	AL	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	AL	2009	Equipment Rebates	Custom rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	GA	2009	Equipment Rebates	Custom rebates	Com											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	GA	2009	Equipment Rebates	Custom rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	KY	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	KY	2009	Equipment Rebates	Custom rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	MS	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	MS	2009	Equipment Rebates	Custom rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	NC	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	NC	2009	Equipment Rebates	Custom rebates	Ind											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	TN	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	TN	2009	Equipment Rebates	Custom rebates	Ind											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	VA	2009	Equipment Rebates	Custom rebates	Com											
EnergyRight Solutions for Business - Custom Incentive Program	Tennessee Valley Authority	VA	2009	Equipment Rebates	Custom rebates	Ind											
Technical Assistance & Technology Incentives (TATI)	SCE	CA	2009-2011	DR	Custom Incentive	Com											
TATI	SCE	CA	2009-2011	DR	Custom Incentive	Ind											
Refinery Energy Efficiency Program (REEP)	SCE	CA	2010-2012	Equipment Rebates	Custom Incentive	Ind		■		2,300.000	0.267						
Chemical Products Efficiency Program (CPEP)	SCE	CA	2010-2012	Equipment Rebates	Custom Incentive	Ind		■		6,900.000	0.8						
Continuous Energy Improvement (CEI)	SCE	CA	2010-2012	Audit and/or Direct Install	Other	Ind		■									
Engineering Support 2010	Southern California Gas Co.	CA	2009-2011	Audit and/or Direct Install	Custom rebates	Com											
Engineering Support 2010	Southern California Gas Co.	CA	2009-2011	Audit and/or Direct Install	Custom rebates	Ind											
Customized Retrofit Incentives (formerly Non-Residential Retrofit)	PG&E	CA	2000-2012	Equipment Rebates	Custom incentive	Com											
Customized Retrofit Incentives	PG&E	CA	2000-2012	Equipment Rebates	Custom incentive	Ind											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
(formerly Non-Residential Retrofit)																	
Savings by Design (Non-Residential New Construction)	PG&E	CA	2005-2012	Equipment Rebates	Custom incentive	Com				44,824.000	6.17						
Savings by Design (Non-Residential New Construction)	PG&E	CA	2005-2012	Equipment Rebates	Custom incentive	Ind				44,824.000	6.17						
PG&E RCx	PG&E	CA	2006-2012	Audit and/or Direct Install	Custom incentive	Com	RCx			3,517.000	0.182						
PG&E RCx	PG&E	CA	2006-2012	Audit and/or Direct Install	Custom incentive	Ind	RCx			3,517.000	0.182						
Large Integrated Energy Audit	PG&E	CA	2006-2012	Audit and/or Direct Install	No Incentive	Com				2,379.000	1.966						
Calculation Assistance	PG&E	CA	2008-2012	Audit and/or Direct Install	No Incentive	Com				1,900.000	0.23						
Calculation Assistance	PG&E	CA	2008-2012	Audit and/or Direct Install	No Incentive	Ind											
Industrial Technical and Calculation Support	PG&E	CA	2008-2012	Audit and/or Direct Install	No Incentive	Ind	Process										
Refinery Energy Efficiency Program	PG&E	CA	2006-2012	Equipment Rebates	Custom incentive	Ind	HVAC, Process			15,000.000	1.8						
Industrial Recommissioning	PG&E	CA	2010-2012	Audit and/or Direct Install	Custom incentive	Ind	RCx			2,800.000	0.33						
Laboratory Energy Management Program	Silicon Valley Power	CA	2009-2011	Equipment Rebates	Custom incentive	Com											
Alameda Municipal Power - reAMP	Alameda Municipal Power	CA	2009-2010	Equipment Rebates	Custom incentive	Com	Lighting			0.900	0.22						
Continuous Energy Improvement	SCE	CA	2010-2012	Equipment Rebates	Custom incentive	Com		■									
Continuous	SCE	CA	2010-	Equipment	Custom	Ind		■									

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Energy Improvement			2012	Rebates	incentive												
CPEP	SCE	CA	2010-2012	Equipment Rebates	Custom incentive	Ind		■									
Production Efficiency Program	PGE and Pacific Power via Energy Trust of Oregon	OR	2008-2011	Equipment Rebates	Custom rebates	Ind											
New Buildings Program	PGE and Pacific Power via Energy Trust of Oregon	OR	2008-2011	New Construction	Custom rebates	Com											
Self-Direction Credit Program	Rocky Mountain Power	UT	2003-2011	Equipment Rebates	Bill credit	Com		■		94,13.342			TRC	■	■	■	■
Self-Direction Credit Program	Rocky Mountain Power	UT	2003-2011	Equipment Rebates	Bill credit	Ind		■		9,413.342			TRC	■	■	■	■
Self-Direction Credit Program	Rocky Mountain Power	WY	2003-2011	Equipment Rebates	Bill credit	Com		■	0								
Self-Direction Credit Program	Rocky Mountain Power	WY	2003-2011	Equipment Rebates	Bill credit	Ind		■	0								
Cool Cash	Rocky Mountain Power	UT	2003-2011	Equipment Rebates	Prescriptive rebates	Res	HVAC	■	2,661	1,011.640			TRC	■	■	■	■
Utah State Industrial Program	State of Utah, no utility	UT	2010	Equipment Rebates	Custom rebates	Ind											
Recommissioning Program	Rocky Mountain Power	UT	2006-2011	Audit and/or Direct Install	Custom rebates	Com	RCx						TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	UT	2005-2011	Equipment Rebates	Custom rebates	Com		■	166	62,753.885			TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	UT	2005-2011	Equipment Rebates	Custom rebates	Ind		■	166	62,753.885			TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	ID	2005-2011	Equipment Rebates	Custom rebates	Com		■	4	1,650.440			TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	ID	2005-2011	Equipment Rebates	Custom rebates	Ind		■	33				TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	WY	2005-2011	Equipment Rebates	Custom rebates	Com		■	1	237.062			TRC	■	■	■	■
Energy FinAnswer	Rocky Mountain Power	WY	2005-2011	Equipment Rebates	Custom rebates	Ind		■	0	237.062			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain	CA	2005-	Equipment	Prescriptive	Com		$									

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
	Power		2011	Rebates	rebates			0									
FinAnswer Express	Rocky Mountain Power	CA	2005-2011	Equipment Rebates	Prescriptive rebates	Ind		$ 0									
FinAnswer Express	Rocky Mountain Power	WA	2005-2011	Equipment Rebates	Prescriptive rebates	Com											
FinAnswer Express	Rocky Mountain Power	WA	2005-2011	Equipment Rebates	Prescriptive rebates	Ind											
FinAnswer Express	Rocky Mountain Power	UT	2005-2011	Equipment Rebates	Prescriptive rebates	Com		■	690	40,970.925			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain Power	UT	2005-2011	Equipment Rebates	Prescriptive rebates	Ind		■	690	40,970.925			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain Power	ID	2005-2011	Equipment Rebates	Prescriptive rebates	Com		■	4	927.494			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain Power	ID	2005-2011	Equipment Rebates	Prescriptive rebates	Ind		■	23	927.494			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain Power	WY	2005-2011	Equipment Rebates	Prescriptive rebates	Com		■	34	2,356.075			TRC	■	■	■	■
FinAnswer Express	Rocky Mountain Power	WY	2005-2011	Equipment Rebates	Prescriptive rebates	Ind		■	6	2,356.075			TRC	■	■	■	■
EnergyStar for New Homes	Rocky Mountain Power	UT	2011	New Construction	Prescriptive rebates	Res		■	2,077	3,688.913			TRC	■	■	■	■
HPwES	State of Utah, no utility	UT	2010-2011	Equipment Rebates	No Incentive	Res											
Questar Weatherization	Questar Gas	UT	2008-2011	Audit and/or Direct Install	Prescriptive rebates	Res	Weatherization										
Questar Weatherization	Questar Gas	WY	2008-2011	Audit and/or Direct Install	Prescriptive rebates	Res	Weatherization										
Questar Business Rebates	Questar Gas	UT	2007-2011	Equipment Rebates	Prescriptive rebates	Com											
Questar Business Rebates	Questar Gas	WY	2007-2011	Equipment Rebates	Prescriptive rebates	Com											
Questar Custom Rebates	Questar Gas	UT	2008-2011	Equipment Rebates	Custom rebates	Com											
Commercial and Industrial RCx Program	PG&E	CA	2010-2011	Audit and/or Direct Install	Custom rebates	Com											

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Commercial and Industrial RCx Program	PG&E	CA	2010-2011	Audit and/or Direct Install	Custom rebates	Ind											
Large Integrated Energy Audits Program	PG&E	CA	2010-2013	Audit and/or Direct Install	Custom rebates	Com											
Large Integrated Energy Audits Program	PG&E	CA	2010-2013	Audit and/or Direct Install	Custom rebates	Ind											
CasinoGreen Program	PG&E	CA		Equipment Rebates	Custom rebates	Com				1,576.000	0.393						
AEP Texas CARE$ Energy Efficiency for Not-for-Profit Agencies SOP	AEP Texas Central Company	TX		Equipment Rebates	SPIFF	Com		■	13	181.250	0.049		UCT	■	■	■	■
Commercial Solutions Pilot MTP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Com		■	47	4,967.964	1.167		UCT	■	■	■	■
Commercial SOP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Com		■	87	10,956.115	2.51		UCT	■	■	■	■
CoolSaver AC Tune-Up Pilot MTP	AEP Texas Central Company	TX		Audit and/or Direct Install	Custom rebates	Com	HVAC	■	6	9.446	0.003		UCT	■	■	■	■
Load Management SOP	AEP Texas Central Company	TX		DR	Custom rebates	Com		■	70	22.253	9.452		UCT	■	■	■	■
SCORE/ CitySmart MTP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Com		■	20	4,859.023	1.816		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Com	Renewables	■	2	61.488	0.032		UCT	■	■	■	■
CoolSaver AC Tune-Up Pilot MTP	AEP Texas Central Company	TX		Audit and/or Direct Install	Custom rebates	Res	HVAC	■	32	30.627	0.011		UCT	■	■	■	■
ENERGY STAR® New Homes MTP	AEP Texas Central Company	TX		New Construction	Whole building	Res		■	340	618.375	0.344		UCT	■	■	■	■
Residential Energy Efficiency Pilot	AEP Texas Central Company	TX		Audit and/or Direct Install	Direct install	Res		■	51	109.744	0.039		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
MTP																	
Residential SOP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Res		■	8,661	22,230.458	7.473		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Res	Renewables	■	13	132.867	0.069		UCT	■	■	■	■
Hard-to-Reach SOP	AEP Texas Central Company	TX		Equipment Rebates	Custom rebates	Res		■	4,051	12,054.889	3.618		UCT	■	■	■	■
Targeted Low-Income Energy Efficiency Program	AEP Texas Central Company	TX		Audit and/or Direct Install	Direct install	Res		■	514	1,430.525	0.379		UCT	■	■	■	■
AEP Texas CARE$ Energy Efficiency for Not-for-Profit Agencies SOP	AEP Texas North Company	TX		Equipment Rebates	SPIFF	Com		■	9	92.055	0.024		UCT	■	■	■	■
Commercial Solutions Pilot MTP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Com		■	22	2,414.532	0.58		UCT	■	■	■	■
Commercial SOP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Com		■	15	6,361.351	1.069		UCT	■	■	■	■
Load Management SOP	AEP Texas North Company	TX		DR	Custom rebates	Com		■	5	5.604	1.401		UCT	■	■	■	■
SCORE/CitySmart MTP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Com		■	11	1,240.402	0.555		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Com	Renewables	■	5	188.440	0.098		UCT	■	■	■	■
Residential SOP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Res		■	1,114	2,441.915	0.844		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Com	Renewables	■	12	107.336	0.056		UCT	■	■	■	■
Hard-to-Reach SOP	AEP Texas North Company	TX		Equipment Rebates	Custom rebates	Res		■	643	1,211.436	0.422		UCT	■	■	■	■
Targeted Low-Income Energy Efficiency Program	AEP Texas North Company	TX		Audit and/or Direct Install	Direct install	Res		■	42	131.373	0.042		UCT	■	■	■	■
Large Commercial SOP	CenterPoint Energy Houston	TX		Equipment Rebates	Custom rebates	Com		■	121	50,878.110	10.6		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
	Electric, LLC																
The Texas SCORE MTP	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Com		■	28	15,511.280	6.47		UCT	■	■	■	■
Large Commercial Load Management SOP	CenterPoint Energy Houston Electric, LLC	TX		DR	Custom rebates	Com		■	92	163.040	81.52		UCT	■	■	■	■
RCx	CenterPoint Energy Houston Electric, LLC	TX		Audit and/or Direct Install	Custom rebates	Com		■	11	9,081.040	1.72		UCT	■	■	■	■
Energy Star MTP	CenterPoint Energy Houston Electric, LLC	TX		New Construction	Whole building	Res		■	9,569	25,640.830	11.82		UCT	■	■	■	■
A/C Distributor Program	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res	HVAC	■	2,557	6,443.760	2.01		UCT	■	■	■	■
Residential SOP	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res		■	859	1,897.540	0.73		UCT	■	■	■	■
Advanced Lighting Program	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res	Lighting	■		15,670.890	1.15		UCT	■	■	■	■
Multi-Family Water & Space Heating - MTP Residential (RES)	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res		■	93	422.530	0.04		UCT	■	■	■	■
City of Houston Weatherization (RES)	CenterPoint Energy Houston Electric, LLC	TX		Audit and/or Direct Install	SPIFF	Res		■	394	690.250	0.3		UCT	■	■	■	■
Hard-To-Reach SOP	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res		■	2,052	4,695.160	1.76		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Multi-Family Water & Space Heating MTP Hard-to Reach (HTR)	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res		■	424	1,801.980	0.18		UCT	■	■	■	■
Res HTR - Affordable Home	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	SPIFF	Res		■	71	71.220	0.08		UCT	■	■	■	■
TDHCA Low-Income Weatherization (SB-712)	CenterPoint Energy Houston Electric, LLC	TX		Audit and/or Direct Install	Custom rebates	Res		■	127	353.000	0.11		UCT	■	■	■	■
City of Houston Weatherization (HTR)	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	SPIFF	Res		■	1,275	2,079.620	0.95		UCT	■	■	■	■
Rebuilding Together Houston	CenterPoint Energy Houston Electric, LLC	TX		Equipment Rebates	Custom rebates	Res		■	855	1,442.140	0.64		UCT	■	■	■	■
Agencies in Action MTP	CenterPoint Energy Houston Electric, LLC	TX		Audit and/or Direct Install	Direct install	Res		■	909	2,822.400	0.9		UCT	■	■	■	■
Commercial SOP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Com		■	6	1,917.000	0.376		UCT	■	■	■	■
Small Commercial SOP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Com		■	1	70.000	0.022		UCT	■	■	■	■
Large C&I Solutions Pilot MTP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Com		■	63	7,554.000	1.39		UCT	■	■	■	■
Texas School/University Programs (SCORE) MTP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Com		■	133	4,543.000	1.937		UCT	■	■	■	■
Load Management SOP	El Paso Electric Co	TX		DR	Custom rebates	Com		■	6	5.000	4.554		UCT	■	■	■	■
Residential SOP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Res		■	0	0.000	0		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Res & Small Comm. Solutions MTP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Res		■	290	3,290.000	0.821		UCT	■	■	■	■
LivingWise MTP	El Paso Electric Co	TX		Education and Behavior Impact	Codes/Standards	Res		■	7,385	1,217.000	0.035		UCT	■	■	■	■
Appliance Recycling MTP	El Paso Electric Co	TX		Appliance Recycling	Prescriptive rebates	Res	Appliance Recycling	■	1,172	1,015.000	0.138		UCT	■	■	■	■
PV/Solar Pilot MTP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Res	Renewables	■	18	142.000	0.074		UCT	■	■	■	■
Hard-to-Reach SOP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Res		■	72	248.000	0.045		UCT	■	■	■	■
Hard-to-Reach Solutions MTP	El Paso Electric Co	TX		Equipment Rebates	Custom rebates	Res		■	831	1,039.000	0.391		UCT	■	■	■	■
Energy Saver (TDHCA)	El Paso Electric Co	TX		Audit and/or Direct Install	SPIFF	Res		■	433	364.000	0.074		UCT	■	■	■	■
Commercial Solutions MTP	Entergy Texas Inc.	TX		Equipment Rebates	Custom rebates	Com		■	40	7,100.000	1.6		UCT	■	■	■	■
Load Management SOP	Entergy Texas Inc.	TX		DR	Custom rebates	Com		■	5	0.000	2.74		UCT	■	■	■	■
Texas SCORE/ CitySmart MTP	Entergy Texas Inc.	TX		Equipment Rebates	Custom rebates	Com		■	28	7,249.000	3.044		UCT	■	■	■	■
Residential SOP	Entergy Texas Inc.	TX		Equipment Rebates	Custom rebates	Res		■	2,293	4,555.000	2.05		UCT	■	■	■	■
ENERGY STAR® Homes MTP	Entergy Texas Inc.	TX		New Construction	Codes/Standards	Res		■	867	1,464.000	1.9		UCT	■	■	■	■
Solar PV Pilot MTP	Entergy Texas Inc.	TX		Equipment Rebates	Custom rebates	Res	Renewables	■	22	277.000	0.152		UCT	■	■	■	■
Premium Lighting MTP	Entergy Texas Inc.	TX		Equipment Rebates	Upstream	Res	Lighting	■	7,231	4,511.000	0.451		UCT	■	■	■	■
Hard-to-Reach SOP	Entergy Texas Inc.	TX		Equipment Rebates	Custom rebates	Res		■	2,559	3,472.000	1.312		UCT	■	■	■	■
Commercial SOP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	558	108,914.129	19.883		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Emergency Load Management SOP	Oncor Electric Delivery Company, LLC	TX		DR	Custom rebates	Com			0	0.000	0		UCT	■	■	■	
Educational Facilities MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	248	16,098.534	6.409		UCT	■	■	■	■
Government Facilities MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	52	1,777.984	0.4		UCT	■	■	■	■
Data Centers MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	5	7,649.167	0.82		UCT	■	■	■	■
Third Party DSM Contracts	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	0	0.000	0		UCT	■	■	■	■
Small Commercial SOP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com		■	54	1,390.835	0.286		UCT	■	■	■	■
Air Conditioning Distributor MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Com	HVAC	■	24	474.293	0.188		UCT	■	■	■	■
Commercial Load Management SOP	Oncor Electric Delivery Company, LLC	TX		DR	Custom rebates	Com		■	61	0.000	39.308		UCT	■	■	■	■
Home Energy Efficiency SOP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Res		■	12,704	39,319.090	12.893		UCT	■	■	■	■
ENERGY STAR® Homes MTP	Oncor Electric Delivery Company, LLC	TX		New Construction	Codes/Standards	Res		■	1,836	3,982.986	3.475		UCT	■	■	■	■
A/C Installer MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Res	HVAC	■	31	147.215	0.061		UCT	■	■	■	■
Refrigerator/Freezer Recycle MTP	Oncor Electric Delivery Company, LLC	TX		Appliance Recycling	Prescriptive rebates	Res		■	0	0.000	0		UCT	■	■	■	

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Air Conditioning Tune-Up MTP	Oncor Electric Delivery Company, LLC	TX		Audit and/or Direct Install	Direct install	Res		■	2	1.388	0.001		UCT	■	■	■	■
Res DR SOP	Oncor Electric Delivery Company, LLC	TX		DR	Custom rebates	Res		■	8,478	0.000	4.885		UCT	■	■	■	■
Air Conditioning Distributor MTP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Res	HVAC	■	743	1,753.201	0.584		UCT	■	■	■	■
ENERGY STAR® Low-Rise MTP	Oncor Electric Delivery Company, LLC	TX		New Construction	Codes/Standards	Res		■	769	981.244	0.238		UCT	■	■	■	■
Hard-to-Reach SOP	Oncor Electric Delivery Company, LLC	TX		Equipment Rebates	Custom rebates	Res		■	12,868	40,679.086	10.757		UCT	■	■	■	■
Targeted Weatherization LI SOP	Oncor Electric Delivery Company, LLC	TX		Audit and/or Direct Install	SPIFF	Res		■	903	2,616.263	0.933		UCT	■	■	■	■
Commercial Solutions Pilot MTP	Southwestern Electric Power Co (SWEPCO)	TX	2008-present	Equipment Rebates	Custom rebates	Com		■	38	2,307.809	0.630		UCT	■	■	■	■
Commercial SOP	SWEPCO	TX		Equipment Rebates	Custom rebates	Com		■	20	4,551.035	0.904		UCT	■	■	■	■
CoolSaver© A/C Tune-Up Pilot MTP	SWEPCO	TX		Audit and/or Direct Install	Custom rebates	Com		■	11	8.231	0.004		UCT	■	■	■	■
Load Management SOP	SWEPCO	TX		DR	Custom rebates	Com		■	10	157.541	9.297		UCT	■	■	■	■
SCORE MTP	SWEPCO	TX		Equipment Rebates	Custom rebates	Com		■	12	3,412.786	1.120		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	SWEPCO	TX	2009-present	Equipment Rebates	Custom rebates	Com	Renewables	■	4	161.520	0.084		UCT	■	■	■	■
SWEPCO	SWEPCO	TX		Equipment Rebates	SPIFF	Com		■	7	29.626	0.010		UCT	■	■	■	■
CoolSaver© A/C Tune-Up Pilot	SWEPCO	TX	2010-prese	Audit and/or Direct Install	Custom rebates	Res	HVAC	■	30	18.078	0.009		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
MTP			nt														
Residential SOP	SWEPCO	TX		Equipment Rebates	Custom rebates	Res		■	1,439	4,453.468	1.636		UCT	■	■	■	■
SMART SourceSM Solar PV Pilot MTP	SWEPCO	TX		Equipment Rebates	Custom rebates	Res	Renewables	■	5	50.784	0.026		UCT	■	■	■	■
Hard-to-Reach SOP	SWEPCO	TX		Equipment Rebates	Custom rebates	Res		■	734	2,656.619	0.792		UCT	■	■	■	■
Home$avers	SWEPCO	TX		Audit and/or Direct Install	SPIFF	Res		■	177	670.440	0.235		UCT	■	■	■	■
Large Commercial & Industrial SOP	Southwestern Public Service Co	TX		Equipment Rebates	Custom rebates	Com		■	36	11,512.000	2.21		UCT	■	■	■	■
Small Commercial SOP	Southwestern Public Service Co	TX		Equipment Rebates	Custom rebates	Com		■	8	247.000	0.06		UCT	■	■	■	■
Residential SOP	Southwestern Public Service Co	TX		Equipment Rebates	Custom rebates	Res		■	1,415	3,272.000	1.12		UCT	■	■	■	■
Hard-To-Reach SOP	Southwestern Public Service Co	TX		Equipment Rebates	Custom rebates	Res		■	446	668.000	0.28		UCT	■	■	■	■
Low Income Weatherization	Southwestern Public Service Co	TX		Audit and/or Direct Install	SPIFF	Res		■	0	0.000	0		UCT	■	■	■	■
Large Commercial SOP	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Com		■	1	224.000	0.039		UCT	■	■	■	■
Small Commercial SOP	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Com		■	1	28.000	0.007		UCT	■	■	■	■
Texas SCORE/ CitySmart/ Comm Solutions Pilot	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Com		■	44	5,454.000	2.075		UCT	■	■	■	■
Load Management Pilot	Texas-New Mexico Power Co	TX		DR	Custom rebates	Com		■	3	0.613	0.207		UCT	■	■	■	■
Residential SOP	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Res		■	1,128	3,141.000	1.191		UCT	■	■	■	■
ENERGY STAR® Homes MTP	Texas-New Mexico Power Co	TX		New Construction	Codes/Standards	Res		■	542	804.000	0.909		UCT	■	■	■	■
Solar PV Pilot	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Res	Renewables	■	6	67.000	0.035		UCT	■	■	■	■
Underserved Area SOP	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Res		■	510	1,004.000	0.239		UCT	■	■	■	■

Program Name	Utility Name	State	Year	Program Category	Incentive Structure	Target Sector	Predominant Measure	Total Cost	Number of Participants	Gross Annual MWh	Gross Summer MW	Gross Winter MW	Primary Test	Net Present Value (NPV) Costs	NPV Benefits	Net Benefits	B-C Ratio
Hard-to-Reach SOP	Texas-New Mexico Power Co	TX		Equipment Rebates	Custom rebates	Res		■	384	1,033.000	0.433		UCT	■	■	■	■
Low Income Weatherization Pilot	Texas-New Mexico Power Co	TX		Audit and/or Direct Install	Whole building	Res		■	83	180.000	0.054		UCT	■	■	■	■
Focus on Energy Renewables Program	Focus on Energy	WI	2009	Equipment Rebates	Prescriptive rebates	Com	Renewables		383	17,728.991	2.04						
Focus on Energy Renewables Program	Focus on Energy	WI	2009	Equipment Rebates	Prescriptive rebates	Ind	Renewables		383	17,728.991	2.04						
Oncor Commercial Energy Audit Program	Oncor Electric Delivery Company, LLC	TX		Audit and/or Direct Install	Free Audit	Com	Multiple Measures			28,573	13.476						
Oncor Target Industrial Energy Efficiency Program	Oncor Electric Delivery Company, LLC	TX		Audit and/or Direct Install	Free Audit	Ind	Multiple Measures			50,000	11.25						

Appendix D. Best Practice Program Summaries

1. Equipment Rebate Programs

Residential and Small Business ENERGY STAR® Products Program – DTE Energy, MI

The Residential and Small Business ENERGY STAR® Products Program was designed to increase the awareness and sale of ENERGY STAR® lighting and appliances among residential and small business customers. Through the program, DTE Energy offered products through a variety of retail channels and provided incentives to subsidize the incremental cost of energy efficiency products.

The program was available in DTE Energy's service territory, and incentives were offered for both electric and gas products. DTE Energy offered upstream incentives to manufacturers to subsidize the cost of both standard and specialty CFLs. In addition to incentives, participating retailers received POP marketing materials and guidance on how to best display program products.

Best practices from this program include:

- DTE Energy conducted regular checks of the tracking reports to assess how the program was working and to make program corrections that would ensure success.
- The program was designed to achieve energy savings as well as to make the ENERGY STAR® label more recognizable.
- DTE Energy offered upstream incentives to manufacturers to subsidize the cost of CFLs and other specialty light bulbs.
- In addition to incentives, retailers received POP marketing materials and guidance on how to best display program products.
- Marketing efforts reached customers who did not purchase discounted equipment through the program, in order to increase their knowledge and awareness about ENERGY STAR® lights and appliances. This was meant to encourage the purchase of energy-efficient products in the future, resulting in additional energy savings.
- DTE Energy built a strong communication channel with retailers and customers to ensure program participation and success.
- DTE Energy tracked and utilized retailer records and equipment information to help them analyze and report actual savings.

Residential Multifamily Program – DTE Energy, MI

Through the Residential Multifamily Program, DTE Energy provided energy-efficient upgrades for the multifamily buildings or complexes they served with five or more units per building. No cost entry was provided to multifamily property managers for receipt of energy efficiency measures through direct installation of CFLs, low-flow showerheads, faucet aerators, and pipe wrap insulation in residential units. The program also included an on-site building assessment of common areas to identify eligible measures. DTE Energy provided incentives to the property managers who worked with contractors to install high-efficiency equipment in common areas.

Best program practices include:

- DTE Energy focused the program on educating tenants and property managers about energy-efficient measures in order to ensure program success.
- DTE Energy developed a network of contractors and educated them about optimal energy-efficient equipment and installation practices.
- DTE Energy improved measure persistence by prescreening and removing participants who were likely to remove the measures after installation.
- DTE Energy conducted inspection activities to ensure the contractors' work quality.
- The program was primarily focused on energy savings, but energy efficiency education played a large role in achieving program success.
- DTE Energy educated customers (tenants/property managers) about energy efficiency in order to build trust in the program.
- DTE Energy performed customer/contractor satisfaction surveys to evaluate the program processes and effectiveness. They incorporated the results of these surveys in future program practices to ensure continuous program improvement.

Energy-Efficient Lighting – Idaho Power, ID

Idaho Power's Energy-Efficient Lighting Program strived for residential energy savings by replacing less energy-efficient lighting with more energy-efficient technology. In 2009, Idaho Power worked with Fluid Market Strategies (Fluid) to promote ENERGY STAR®-qualified spiral bulbs priced at roughly 99 cents each.

Idaho Power also participated in the Bonneville Power Administration (BPA) Change a Light promotion that focused on specialty bulbs. Portland Energy Conservation, Inc. (PECI) managed this promotion that ran the entire 2009 year. Both PECI and Fluid regularly visited stores to check pricing, stock, and signage.

Additional program activities included direct install and in-store events. During 2009, Idaho Power participated in 18 in-store events with large and small national retailers. They redesigned their program brochures to add educational information about energy–efficient lighting.

Notable/replicable program components include:

- PECI and Fluid regularly visited retail stores to check pricing, stock, and signage.
- Idaho Power participated in store events with retailers in order to communicate directly with customers at the point-of-sale. They set up tables with light displays at the entrances of stores and answered customer questions about CFLs.
- The program worked with ENERGY STAR® and BPA to promote energy-efficient lighting.

Residential Prescriptive Rebates – Alliant Energy, IA

The Residential Prescriptive Rebates Program provided a range of energy efficiency options for Alliant Energy customers. Alliant Energy offered cash rebates to residential customers for the purchase of high-efficiency electric and natural gas equipment, as well as offered incentives to dealers who sold that equipment. Alliant Energy also offered low-interest financing to eligible customers on qualifying, energy saving equipment and measures. Customers had to choose between receiving the incentive and receiving the low-interest loan.

Through the Residential Prescriptive Rebates Program, Alliant Energy supported the System Adjustment and Verified Efficiency (SAVE) program that trained approximately 260 individual contractors in the fall of 2010 on how to verify the efficiency of HVAC systems. Alliant Energy worked with stakeholders and other IOUs to ensure that the verification component of the SAVE program was consistent across all of the IOUs.

The best practices of this program include:

- Alliant Energy provided customers with several options to participate in their energy efficiency program.
- Alliant Energy educated customers and dealers about energy efficiency.
- Alliant Energy enhanced their Residential Prescriptive Rebates Program by adding a coupon-based campaign in the fall of 2010 to their buy-down opportunities throughout the year.
- Alliant Energy sought opportunities to reach out to customers and encourage them to make additional energy saving improvements after participating in their energy efficiency program.

High-Efficiency Appliance Rebate Program – Pacific Gas & Electric, CA

The PG&E High-Efficiency Appliance Rebate Program provided rebates to customers for the purchase of energy-efficient appliances, including clothes washers, dishwashers, room A/Cs, and water heaters. The program started in 1983 and progressed based on energy efficiency standards developed by ENERGY STAR® and the CEE.

PG&E was on the CEE appliance committee that worked with manufacturers to improve energy efficiency standards in the marketplace. Program-qualifying product specifications for clothes washers were based on specifications developed by CEE; dishwasher standards were based on specifications developed by ENERGY STAR® and CEE. The program achieved 1.7 MW and 4.8 GWh of savings in 2006.

The best practices of this program include:

- PG&E worked with manufacturers to improve energy efficiency standards in the marketplace.
- The average energy efficiency of residential appliances continues to increase. PG&E recognized this trend and worked with ENERGY STAR® to promote the most energy-efficient appliances on the market.

- PG&E offered mail-in rebates to customers, and also offered instant rebates that were immediately credited to customers at the time of purchase.
- PG&E developed a co-marketing strategy with local municipals to promote water and energy savings.

Residential Standard Offer Program – Entergy Texas, Inc., TX

Entergy Texas, Inc. designed their Residential SOP to achieve a high level of energy and demand savings in the residential sector. The program provided incentives to customers for installing one or more of a wide range of measures that reduce energy costs, reduce peak demand, and/or save energy in existing residential facilities. Certain new construction single family and multifamily affordable housing projects were also eligible for incentives. The primary objective of the Residential SOP was to achieve cost-effective reductions in peak summer demand.

Best program practices include:

- Entergy Texas, Inc. reduced participation barriers by streamlining program procedures and M&V activities.
- Entergy Texas, Inc. developed a complete and well thought-out program plan, and had well-articulated program logic.
- Entergy Texas, Inc. prepared a comprehensive and easy-to-use database tool for reporting implementation measures. The tool also calculated appropriate savings and incentive amounts.
- Entergy Texas, Inc. offered high-incentive levels, as appropriate, in segments and for program designs that required high penetration rates in order to be cost-effective and where policy goals demanded high penetration levels.
- Entergy Texas, Inc. used a PUCT-approved baseline document that provided guidelines for determining the appropriate benchmark for energy impacts.
- Entergy Texas, Inc. hired a turnkey vendor/sponsor to conduct door-to-door marketing to achieve a high penetration rate.
- Entergy Texas, Inc. evaluated the program cost-effectiveness, periodically, to ensure program goals were met.

California Statewide Multifamily Energy-Efficiency Rebate Program –Pacific Gas & Electric, Southern California Edison, Southern California Gas and San Diego Gas & Electric, CA

The California Statewide MEERP was a collaboration between California's four major IOU's: PG&E, SCE, Southern California Gas, and San Diego Gas & Electric. The program promoted energy efficiency and provided equipment rebates to owners and tenants of multifamily properties.

MEERP encouraged owners and tenants to install qualifying energy-efficient products in individual tenant units and in common areas of residential apartment buildings, mobile home parks, and condominium complexes with two or more units. The program drove long-term change in the state through the installation of ENERGY STAR® interior and exterior hardwire fixtures and other permanent energy efficiency equipment and products.

Best program practices include:

- The IOUs paid incentives to property owners for investing in the installment of energy-efficient measures inside tenant dwellings that allowed them to avoid the split incentive barrier.
- The IOUs actively administered and promoted the program to develop a relationship with the multifamily market sector.
- The IOUs communicated effectively with program customers through multiple media outlets.
- The IOUs continuously refined the program structure, increased communications, and refined the rebate structure to reach more customers and reflect the newest energy efficiency technologies.

Heating and Cooling Efficiency Program – Idaho Power, ID

Idaho Power's Heating and Cooling Efficiency Program provided incentives to residential customers and HVAC contractors for purchasing and properly installing qualified heating and cooling equipment and services. The objective of this program was to achieve energy savings.

Best program practices include:

- Idaho Power maintained program design flexibility and made changes as required.
- Idaho Power conducted periodic customer and contractor participation surveys to receive feedback about program processes.
- Idaho Power worked with contractors to ensure they understood program requirements.
- Idaho Power performed installation inspections to ensure that the quality of work was maintained throughout the program.
- Idaho Power conducted a cost-effectiveness study for all the measures annually and excluded less cost-effective measures in next subsequent program years.

Residential Energy Efficient Lighting Program – Nevada Power Company, NV

The Residential Energy-Efficient Lighting Program was market-based and targeted existing residential customers through retail channels. Nevada Power Company delivered incentives to customers through discounted retail pricing for energy-efficient CFLs, as well as through direct distribution, community outreach events, and builder model homes.

Nevada Power contracted with Ecos Consulting in 2009 to deliver this program to customers in southern Nevada. The rebates and upstream buy-downs are only part of the program efforts. Nevada Power also participated in a number of community and commercial events to work towards market transformation by promoting ENERGY STAR® lighting. The M&V analysis reported a verified annual savings of 113,868.8 MWh and a peak demand reduction of 9,786 kW. Through the program, Nevada Power developed synergistic relationships with energy auditors, customer service representatives, major account executives, energy educators, and staff from other energy efficiency and conservation programs in an effort to yield additional kWh savings.

Program best practices include:

- Nevada Power worked directly with local residents, customers, new home builders, and a variety of agencies and organizations to deliver the program.
- The appliance portion of this program was cancelled in 2007, as it was no longer cost-effective due to a high level of freeriders.
- For the program, Nevada Power participated in a number of community and commercial events to work towards market transformation by promoting ENERGY STAR® lighting.
- Nevada Power contracted with ADM Consulting to perform M&V analysis. ADM examined the database for systemic entry errors and conducted in-store intercept interviews to verify the number of CFLs purchased as a result of the program. ADM subsequently interviewed CFL purchasers by telephone two to three months after the in-store intercepts to verify installations.
- The program team expanded relationships with other program teams within Nevada. Not only did energy auditors distribute CFLs to customers during each in-home audit, the CFL recycling team gave a pack of CFLs to program participants who called to have their second refrigerator picked up.

Upstream Lighting Program – Pacific Gas & Electric, CA

PG&E's Upstream Lighting Program provided incentives to manufacturers and retailers to reduce the price of pre-approved ENERGY STAR®-qualified CFLs and other energy-efficient lighting products to residential and small commercial customers at the point of sale. Consumer did not need to submit a rebate application to receive the savings.

PG&E had incentive agreements with 13 manufacturers, who partnered with over 640 retailers in 2007. As of October 31, 2007, PG&E had paid incentives of more than $23 million and realized savings of almost 55,195 kW and more than 460 GWh. Recognizing the potential to reach a large number of commercial customers, PG&E searched for new energy saving and innovative products to promote.

Notable/replicable program components include:

- PG&E encouraged manufacturers to work with retail partners to provide consumer educational materials at the point of sale.
- PG&E offered manufacturer buy-down and retailer point-of-sale instant discounts.
- The program administrative costs were significantly reduced by avoiding traditional rebate application processing.

$mart Business Program – Seattle City Light, WA

For the $mart Business Program, Seattle City Light provided per-fixture rebates to small commercial customers who replaced inefficient lighting with approved energy-efficient lighting.

Customers could use their own licensed contractor or choose from a pre-approved contractor list. Seattle City Light paid incentives to the customer upon completion of the work. Seattle City Light conducted on-site verifications after installation was completed.

Notable/replicable program components include:

- The media coverage of the West Coast energy crisis during 2001 helped market outreach of the program.
- Seattle City Light took advantage of utility outreach channels and program brands for marketing.
- Seattle City Light kept consistent program funding throughout the year.

Light Efficiency – Xcel Energy, MN

Light Efficiency was offered by Xcel Energy for its Minnesota service territory. Xcel Energy paid rebates to customers who purchased and installed qualifying lighting equipment for retrofit projects or new constructions. They routinely updated the qualified equipment list to reflect new technologies and products and to remove those that became standard in the market. Wherever the newly installed equipment was not on the qualified list, Xcel Energy would evaluate the savings and cost/benefits to determine whether it was eligible for a rebate based on the demand saving.

The program also had a lighting redesign study component that provided a complete lighting system analyses for customers with over-lit or inappropriately lit spaces, and recommended the base approach to improving the design by de-lamping while maintaining the proper lighting levels. Xcel Energy offered telephone customer service to answer energy conservation questions from customers. Xcel Energy was successful in establishing strong relationships with customers through the program, as well as maintaining strong relationship with lighting vendors, providing regular updates to the trade, and providing marketing and promotions.

Notable/replicable program components include:

- Xcel Energy constantly improved the program by adopting new technology and products, as well as by monitoring marketing changes.
- The program process and impact evaluation helped Xcel Energy improve the program services.

Small Commercial Standard Offer Program – Southwestern Public Service Co., TX

The Small Commercial SOP from Southwestern Public Service Co. targeted commercial customers with either a single meter demand of less than or equal to 100 kW, or with a commonly owned meter demand of less than 250 kW. Southwestern paid incentives to program sponsors for energy efficiency measures in new construction or retrofit projects.

Southwestern used an online database to record all program activity, such as installed measures, inspection results, and authorized incentives. Project sponsors could also access the database. They applied a deemed savings method for most of the projects, and applied the approved M&V protocol outlined in the IPMVP for installations where the deemed method was not applicable.

The program website was the primary medium for program updates and information, as well as for project sponsor applications. Southwest offered program marketing and outreach at workshops, industry-related meetings, and through mass e-mail notifications.

Notable/replicable program components include:

- The online database was used by program administrators to ensure that duplicate incentives were not provided from this program and other programs provided by Southwestern.
- Southwestern coordinated with the National Association of Energy Service Companies to notify all its members about the program.

Commercial Standard Offer Program – CenterPoint Energy Houston Electric, LLC, TX

CenterPoint Energy Houston Electric, LLC offered a Commercial SOP targeting commercial customers with a minimum demand of 100 kW. CenterPoint paid incentives to project sponsors for installing energy efficiency measures in new construction or retrofit projects that resulted in verified demand and energy savings. Based on the specific application, CenterPoint applied the deemed savings calculation method approved by PUCT, a simplified M&V method, or a full M&V method to calculate the demand and energy savings. They also required pre- and post-inspections to verify the savings.

Notable/replicable program components include:

- CenterPoint paid the incentives on a first-come, first-served basis.
- The program website provided detailed project eligibility, end-use measures, incentives, procedures, and application forms.
- CenterPoint used mass e-mail notifications to inform potential project sponsors about the program.
- CenterPoint conducted marketing and outreach for the program at appropriate industry-related meetings, events, and workshops, and through area-wide outreach activities.

Custom Rebates – Alliant Energy, IA

Through the Custom Rebates Program, Alliant Energy promoted energy efficiency products and practices to encourage large C&I customers towards more energy-efficient utilization of energy. They provided custom rebates to customers for installing new high-efficiency equipment and for implementing energy efficiency measures.

The Custom Rebates Program integrated the following components: C&I energy audits, feasibility studies, RCx, and building staff Building Operator Certification (BOC).

- Free ASHRAE level II audits were provided to customers through the energy audits component. Customers received an audit report with a description of major building features and energy-using systems; a utility bill analysis; and an end-use breakdown, energy benchmarking, and description of facility and energy management improvements with estimated costs and savings.

- Through the feasibility studies component, Alliant Energy offered technical assistance and funded the study to identify energy saving projects.
- Alliant Energy evaluated a facility's usage and systems, and identified ways to optimize its direct digital controls and process controls through the RCx component.
- For the BOC component, Alliant Energy worked with the State of Iowa to offer rebates to C&I customers for successfully completing the BOC training and certification.

Notable/replicable program components include:

- Key account managers and business consultants actively promoted the program for large C&I accounts.
- Alliant Energy included energy audits and studies to enhance the program.
- Alliant Energy conducted customer survey to uncover roadblocks and potential program enhancements.

Easy Upgrades Program – Idaho Power, ID

The Easy Upgrades Program was offered by Idaho Power to encourage C&I customers to implement energy efficiency retrofits. They paid incentives up to $100,000 per site for the installation of eligible measures covering lighting, HVAC, motors, building shell, plug loads, and grocery refrigerator. Although the program was designed for easy implementation, it was one of Idaho Power's largest and most complex programs.

To participate in the program, the customer would first need to contact their equipment supplier, contractor, or Idaho Power service representative to assess their energy-saving opportunities. They were required to submit a preliminary application to Idaho Power before initiating any projects with expected incentive of more than $1,000. For projects with an expected incentive of less than $1,000, the customer was permitted to skip the preliminary application and only submit a final application for payment. There was a program requirement that the projects must have been completed no more than six months before customers submitted the application for payment. Idaho Power paid the incentive to the contractor only if the customer specified the contractor was to be paid in their application; otherwise they paid the incentive to the customer.

Idaho Power applied a deemed savings method for the demand and energy savings calculation if valid data was available. Wherever the deemed method was not appropriate, they calculated the savings based on pre-measure levels of specific inputs, such as building operating hours, square footage, and tonnage size.

Notable/replicable program components include:

- Idaho Power established a good relationship with trade allies and contractors, and regarded them as significant program partners.
- The program website provided the application documents, and Idaho Power included an auto-response e-mail function to help their customers obtain basic program information.

- Idaho Power conducted program marketing and outreach through distributing program brochures, flyers, and other materials outlining FAQs.
- Idaho Power used marketing and outreach activities to promote the program to trade allies, and presented program details to various business and professional groups.
- Idaho Power conducted customer and trade ally surveys to obtain feedback about program improvement suggestions.

Bright Ideas Commercial Lighting Program – Efficiency New Brunswick, Canada

Efficiency New Brunswick provided incentives to commercial customers in New Brunswick through their Bright Ideas Commercial Lighting Program to reduce energy costs and improve lighting quality by installing new high-efficiency products. Based on market research results, they adopted an upstream approach for the program, and contracted with eight unique lighting distributors in the province to deliver the program.

Efficiency New Brunswick paid incentives to the participating distributors for each unit of qualifying high-efficiency T8 products they sold and installed in a commercial, institutional, industrial, or other non-residential facility. The incentive amount was based on the average incremental cost of each technology, and was intended to overcome the incremental cost barrier to the customer, as well as the cost of participation by the distributor. For this purpose, Efficiency New Brunswick worked very closely with the lighting manufacturer sales representatives to determine the program structure and incentive rates. Based on the monthly reported eligible products sold by participating distributors, Efficiency New Brunswick calculated the energy saving and reimbursed distributors. Efficiency New Brunswick also conducted random site inspections to ensure that products sold were actually installed.

Notable/replicable program components include:

- Efficiency New Brunswick targeted decision makers and stressed availability from the supply side, making it easy for trade allies, participating distributor, and customers to participate.
- Due to the low number of program partners, the program was easy to administer.
- The program cost was low due to comparatively low incremental costs.

2. Appliance Recycling

Second Refrigerator Collection and Recycling Program – Nevada Energy, NV

The Second Refrigerator Collection and Recycling Program was designed to help residential customers reduce their energy consumption by removing a functional second refrigerator/freezer from their home that usually operated inefficiently, and permanently removed that unit from the marketplace. The recycling process safely disposed of all potentially environmentally harmful materials.

Potential customers would call the primary contractor to schedule the appliance pick up, or were enrolled by a retailer at the time they purchased a new appliance. The contractor or retailer collected the old unit and recycled it at their EPA-approved disposal site. Upon verification that the refrigerator was recycled, Nevada Energy paid an incentive to the contractor that covered the full recycling cost, and paid an incentive to the customer.

Nevada Energy contracted with JACO Environmental to implement the program and with ADM Consulting, Inc. for program M&V services. The data was entered into the program database. ADM determined the energy savings by conducting a detailed analysis of the program data extracted from the database. ADM calculated a census of model numbers and unit ages, and they also developed an equipment degradation factor for use in the savings estimation.

Notable/replicable program components include:

- The program implementer solicited customers through bill inserts and media ads, and also leveraged Nevada Energy's retail network to promote the program.
- M&V staff also performed telephone surveys with a sampling of customers to ensure that units were picked up as reported by the program implementer, and that the customer received an incentive.

Appliance Recycling Program – Alliant Energy, IA

The Appliance Recycling Program offered by Alliant Energy was designed to help residential customers remove and safely dispose of their old, inefficient refrigerators, freezers, and room conditioners. The program was also designed to prevent existing primary equipment from become secondary equipment when customer purchase new units. Certified agents removed the old equipment from customers' homes and prepared it for recycling in an environmentally friendly manner. This recycling included various unit material components, such as metals, foam, and plastic.

Notable/replicable program components include:

- Alliant Energy cross-promoted the recycling program to customers who received a new appliance rebate.
- The Appliance Recycling Program implemented coordinated marketing with state and federal appliance rebate programs.

California Statewide Appliance Recycling Program – Pacific Gas & Electric, Southern California Edison, Southern California Gas, San Diego Gas & Electric, CA

The California IOUs PG&E, SCE, Southern California Gas, and San Diego Gas & Electric jointly offered this Appliance Recycling Program in their respective service territories. The program encouraged residential and small business customer to remove old refrigerators, freezers, and A/Cs and recycle them, with a focus on the refrigerators and freezers.

The IOUs that offered the program shared a common platform and menu of services, though differences existed between each IOU. The IOUs paid rebates to customers who turned in their old, inefficient refrigerators or freezers that could have been a primary or secondary unit. The program contractors recycled the returned units. The contractors could also pick the units up from participating customers. The IOUs contracted with JACO Environmental, Inc. or Appliance Recycling Centers of America to implement, manage, or administrate the program. The program received very significant savings each year, and reached a high customer satisfaction as reported by customers during a survey.

Notable/replicable program components include:

- The IOUs offered online appointment scheduling and pick-up on Saturdays, and strived to pick the units up within one week of the scheduled appointment.
- The IOUs conducted random inspections of contractors' recycling services to ensure program compliance.
- The IOUs coordinated program promotional and outreach activities with other energy efficiency and demand response programs.

Low-Income Refrigerator Replacement Program – Utah Power & State of Utah, UT

The Low-Income Refrigerator Replacement Program was administrated by the State of Utah Department of Community and Culture, in conjunction with the full services from the DOE WAP. The State of Utah contracted with Utah Power for 50 percent of the program funding. The other 50 percent of funding came from matching federal funding or other sources.

The program required that every refrigerator under consideration for replacement be tested and evaluated for a minimum of 72 hours. The State of Utah compiled a comprehensive database with these test results. It was mandatory for every refrigerator to be tested and for the results to be run in the audit software (according to the program guideline). All refrigerators that were replaced needed to have a savings-to-investment ratio of 1.0 or greater.

Notable/replicable program components include:

- Minimum 72 hours of refrigerator testing.
- The program administrator had active communication with all sponsoring organizations.
- The program administrator followed-up with customers to verify the savings on customers' utility bills.

3. Audit and Direct Install Programs (including weatherization) Overview

Minnesota Pollution Control Agency, MN

Minnesota RETAP is a multiyear initiative run by MPCA whose mission is to develop a service corps of retired, experienced engineers and other professionals to help Minnesota small/mid-size businesses and institutions reduce waste, prevent pollution, and improve energy efficiency while reducing costs. RETAP employs skilled retirees from3M, Honeywell, General Mills, and other companies, pays them a modest hourly wage on a part-time basis, (some operate as volunteers taking minimal or no compensation), to provide tailored technical assistance through onsite visits and analysis of utility bills. The retirees then follow-up the analysis with an in-person (or over-the-phone) review with the client to answer questions and help prioritize possible actions. In addition, the program conducts a follow-up survey in the first year after the assessment to check with clients and determine how many recommendations have been implemented. To date, RETAP clients implement recommendations at a rate higher than 30 percent compared to the typical 11-15 percent for similar audit-based programs.

The program is administered by the MPCA and coordinated on a day-to-day basis by a RETAP consultant allowing for local oversight and quality control. All information is tracked and analyzed using a database (created by a RETAP member) and provides administrative, analysis, and reporting functions.

This program does have many positive attributes but would require qualified, experienced, engineers interested in providing free (low-cost) services and therefore does not appear to be compatible with Texas municipal utility delivery and operations. Nonetheless, RETAP program best practices attributes include:

- Collaboration with private sector stakeholders at a low cost is effective way to deliver energy efficiency services. Note: RETAP supplies information and recommendations on energy efficiency and sustainability improvements but leaves the implementation to the business.
- Collaboration with other public sector entities allows for RETAP's success, having partnered with Minnesota State University
- Good job of benchmarking, data tracking, to capture potential energy savings for projects.
- Follow-up surveys and in person meetings are essential to ensure that the company is implementing the recommended measures and ensure that the organization understands the report that was delivered
- Achieves success by targeting sectors underserved by utility programs
- Utilizes existing resources such as ENERGY STAR® PM

Your Energy Savings Audit and Weatherization Program – DTE, OH

DTE Energy's Your Energy Savings (YES) Audit and Weatherization Program is a multiyear effort designed to help customers take action to reduce energy use. Customers participate in the program either through an online or in-home audit, or by applying for a rebate for weatherization measures in the Detroit Edison Electric and Michigan Consolidated Gas Co. (MichCon) service areas. Actual rebate levels vary for YES according to whether the customer receives MichCon gas, DTE electric service, or both, and based on the selected audit level.

The Program offers four audit options, including:

1. A free, self-administered online energy audit. Once completed DTE sends the customer an energy savings kit.
2. An in-Home Energy Consultation (HEC). Customers receive a list of energy-saving actions and the consultant directly installs CFLs, water pipe insulation, water saving shower heads and faucet aerators.
3. A comprehensive in-home energy audit from a certified auditor that includes a blower door test, specific energy efficiency recommendations, and ROI analysis.

4. A comprehensive energy audit with HERS score; this includes a blower door test, thermal imaging, a list of recommendations and ROI analysis.

DTE leverages the YES program to educate its customers about the benefits of energy efficiency and promote other DTE energy efficiency measures and programs. DTE implemented many best practices when developing the program, including conducting active, ongoing process evaluations and constantly making improvements to the program. DTE has in-house program managers to oversee the program and an implementation contractor that manages the audit program, tracks data (DTE manages the online tracking in-house), and coordinates and trains subcontractors.

This program does appear to be compatible with municipal utility delivery and operations, by virtue of the following best practice attributes:

- Collaborative effort between different electric/gas companies (though they are subsidiaries of the same holding company) utilizing a duel fuel approach to efficiency.
- Multiple options for audits (online/in-home) to increase opportunity for audit uptake.
- In-home audits provide educational materials, as well as direct installs ensuring energy savings.

Interior Weatherization, Inc: Home$ense Program - Golden Valley Electric Association, IL

The GVEA Home$ense program is a multiyear initiative designed to provide clients with effective DSM and energy efficiency education and best practices. The cornerstone of the program is for trained energy specialists to assess a client's electric energy use, identify potential high-use devises, and convey the energy saving potential by showing clients the purpose of each energy efficiency measure employed. GVEA uses customer data to identify and target high energy use customers and then markets the Home$ense program to those customers. GVEA also targets marketing to subsidized-housing clusters as another means of reaching low-income customers.

The Home$ense program is provided for a $40 fee, but is accessible to low-income residents through the state's WAP for free. Home$ense provides clients with an in-home energy efficiency assessment, at which time the rater provides some energy-efficient products at no additional cost. Items include a refrigerator thermometer and coil cleaning brush, adjustable weather-proof vehicle plug-in timer (if applicable), replaces CFLs, and reviews educational materials and best practices with the clients. In addition, homes equipped with electric water heaters may also receive an insulating blanket, pipe wrap, faucet aerators, and a low-flow shower head. Low-income customers also receive weatherization services, such as shell insulation, air sealing, and heating system repair/upgrades. Funding for the program is approved by GVEA's board of directors and expensed by the cooperative utility. All GVEA members pay for Home$ense and the utility's suite of DSM programs without any outside funding.

This program does appear to be compatible with municipal utility delivery and operations by virtue of the following best practice attributes:

- Low cost to implement the program
- Regular communications and performance reviews (twice a year) with low-income weatherization agency to review/assess performance and adjust/improve program
- Employing simple, effective tools such as a light meter to compare light levels before and after retrofits, watt meter/monitoring tool to educate residents about energy intensive devices
- Flexible schedule (including nights/weekends), to maximize the audience of people who might participate in the program (particularly important for low-income households)
- Provides educational materials that cover a whole-house approach to efficiency – specialists review the materials with the homeowner and answer questions as part of the audit program

Multifamily Low-Income Program - Efficiency Vermont, VT

Also listed under New Construction Programs

The Multifamily Low-Income Program is a multiyear collaborative effort delivering comprehensive package of energy efficiency education, technical assistance, and incentives for both new and existing residential multifamily housing across much of northwestern Vermont. Managed by Efficiency VT, the program operates in both Vermont Gas Systems and Burlington Electric Department service areas to deliver a duel fuel approach to efficiency. The program works together with the low-income WAP, to present recommended energy-saving measures to building owners where tenants qualify for WAP services. The weatherization team goes to the property and performs an audit and identifies potential improvements and then provides renovation construction services.

The incentives are delivered to support a comprehensive project, not as one off measures. This encourages building owners to adopt all cost-effective energy efficiency measures, not just quick payback options. The developer receives building plan reviews, at no cost, and discusses potential improvements identified by Efficiency VT. Site visits are provided during the construction process to assist with air sealing details and purchasing decisions, and to ensure that insulation and energy-efficient products are selected and installed.

The program works with virtually all new subsidized multifamily construction in the state, as well as a high percentage of privately owned new construction projects. Training programs are in high demand. Efficiency VT Implements the program on a joint basis that allows for the development of a shared vision and big-picture thinking regarding projects, as well as for consistent messaging from multiple companies, rather than different messages depending on service territories.

This program does appear to be compatible with municipal utility delivery and operations by virtue of the following best practice attributes:

- Understands the market and builds relationships with all market actors across the state spanning project types or customer classes which enables the program to find solutions to market barriers

- Implements the program on a joint basis allowing for the development of a broader, shared vision regarding the projects – delivering a consistent message to multifamily building operators and developers and trade allies
- Efficiency VT has developed and implemented a design guide for multifamily housing as well as a comprehensive track for new construction/rehab projects

4. Education and Behavior

Residential Energy Efficiency Education Initiative - Idaho Power, ID

Idaho Power's *Residential Energy Efficiency Education Initiative*'s goal is to promote energy efficiency to the residential community sector by creating and delivering educational programs that result in energy-efficient and conservation-oriented behaviors and choices. The program encompasses a wide variety of customer education and outreach activities to reach a wide variety of customers in several different demographic groups.

Education and Outreach activities include:

- Collateral (Energy Savings Booklet), paid media (radio, print, TV), content in customer newsletters, a speaker's bureau, sponsorship at local events, a library series, content on company website, coordination with community organizations, and school programs.

With strong management support and positive community perception, Idaho Power leverages this program to educate customers to use energy wisely, make energy-efficient behavior choices and increase participation in existing residential programs.

Residential Online Energy Analysis - Austin Energy, TX

AE has a suite of energy efficiency programs marketed as the Power Saver Program. One piece is their online Home Energy Analysis tool for residential customers. It's an online tool to help customers find energy wasters in their home. The online tool provides specific feedback using the customer's energy consumption information that they enter online. It shows customers how they use energy in their home, how their home compares with others, and how they can save on their utility bills using easy to read graphs and custom energy saving advice.

It's an easy to use system. Customers simply fill out information about their home such as property details, property features, equipment and amenities, utility details, and personal information including their utility account information.

The four main components of the tool are:

- Analyze- Customers fill out their energy profile then are able to look at the data to see if their home is energy efficient, review what appliances use the most energy, and see potential savings.
- Learn- The portal provides information about: energy safety, how to read the ENERGY STAR® guide label, and explore energy-related topics to help make their home more energy efficient, comfortable and safe.

- Improve- Getting the most out of: their heating and cooling systems, energy-efficient appliances, home improvement projects with built-in energy savings, and access to tools and calculators that focus in on specific areas.
- Save- Explains surefire ways to reduce energy use, how to save without spending a lot upfront, shows how and when energy efficiency improvements provide an ROI, and get the bottom-line information on specific energy-saving ideas that will work in their particular home.

Currently, AE uses Aclara software, but there are numerous home energy reporting companies on the market. The reports use advanced customer data analytics, behavioral science, and the latest software, web and/or hardware technology to educate customers. They are meant to be an active medium to inform customers about their energy use in order to help them lower their utility bill and reduce overall demand. Best practices with these reports are to roll out on a pilot basis to make sure they are relevant for your market. Things to think about when selecting a vendor are cost and accessibility, ease of use, input/outputs, accuracy, and applicability to US climate zones.

ENERGY STAR® New Homes Program - Northwestern Energy Efficiency Alliance, OR

NEEA's Northwest *ENERGY STAR® New Homes program* promotes the construction and sale of new homes built to the Northwest ENERGY STAR® Homes specification. It was designed specifically for the states of Washington, Oregon, Idaho, and Montana. Homes built are at least 15 percent more energy efficient than Washington and Oregon State energy codes. The new homes include high-efficiency lighting, windows, appliances, water heaters, insulation, and heating and cooling equipment. As a result, the new homes are designed to save an average of 1,000 to 1,500 kWh per year for gas-heated homes and 3,700 kWh annually for electrically heated homes. Builders use the ENERGY STAR® label to differentiate themselves in the marketplace, as well as increase revenue and enhance overall customer satisfaction. Consumers and builders see an ENERGY STAR® home as a quality home of greater value.

In 2009, the U.S. EPA recognized NEEA with a 2009 ENERGY STAR® Partner of the Year award for their work to increase market share of energy-efficient ENERGY STAR® qualified products, homes and buildings through comprehensive outreach, education, and marketing efforts in both the residential and commercial sectors. Even despite the severe downturn in the new homes market, their efforts in the residential sector led to nearly doubling the market share for Northwest ENERGY STAR® certified homes in 2008.

This program is an off-the-shelf-proven solution to leverage a powerful brand, along with fully-developed technical specifications, implementation policies, marketing tools, sales training, and technical support available from the EPA at no cost. It also provides increased customer value with co-branding outreach and educational efforts. However, every market is different and each would need to do extensive research before implementing the program. In NEEA's market they identified a lack of consumer demand and an industry resistance to change. Based on knowledge gained through market research and targeted key regional barriers to build participation, they implemented a broad marketing strategy that included cooperative advertising, training, and strategic partnerships.

Power Watch - City of Ames Electric Services, IA

The City of Ames Electrical Services' *Power Watch* is an energy information and call-to-action program that uses a thermometer, gauge, and colors to explain to customers the correlation between temperature and electricity usage. The gauge is divided into different colored quadrants, each color corresponding to a different Power Watch level (green – awareness, blue – preparedness, yellow – watch, and red – peak alert). Power Watch is an energy education program aimed at raising community awareness. It provides timely and meaningful energy conservation messages based on the actual demand for electricity. The program helps increase energy conservation during times of high demand by providing a channel to send the information. It provides real-time information between the utility and the public. The goal is to inform, educate, and help customers develop good energy habits aimed at conserving energy at a time that is most appropriate and advantageous to the utility system, such as during a peak. Based on real-time monitoring of electricity demand levels and temperatures, it adjusts and prioritizes energy messages to participating customers. To ensure maximum impact information is broadcast in many different ways such as visual signals, recorded phone messages, newspaper and radio ads, brochures, and the Internet. The real-time communication effort increases the public's ability to conserve energy when it is most beneficial to the utility so the City of Ames can increase reliability, and reduce energy use to keep rates low, reduce individual bills, and improve the environment.

This program is a good example of a new way to connect to their customers in real time. Studies show that customers do a better job of conserving energy if they are given real-time energy-use feedback. The more frequent the feedback the more action they take. For example, in a March 2006 paper, "The Impact of Real-Time Feedback on Residential Electricity Consumption," researcher Dean Mountain, a professor of economics at the McMaster Institute for Energy Studies in Hamilton, Ontario, reported data from an energy-dashboard study conducted by a Canadian utility, Hydro One. On average, the 400 Ontario households that received a PowerCost whole-house electricity monitor reduced their electricity usage by 6.5%. Mountain noted, "An important observation from the study is that the behavioral response remained persistent and did not decrease over time during the study period."

Also, an article titled, "Evaluating Energy Use Feedback Devices," reports the results of a Florida study of electricity-use monitors. Three researchers from the Florida Solar Energy Center measured electricity savings in houses equipped with an electricity monitor called The Energy Detective. After correcting the data for reductions in energy use that were weather-related, the researchers concluded that the homes with energy monitors had average electricity savings of 7.4 percent.

House of Green - City of Waverly (Waverly Light & Power), IA

Waverly Light and Power built the *House of Green* in 2006 to demonstrate energy efficiency, passive solar design, and green building. The home incorporated renewable building products, passive solar design, and landscaping for energy efficiency. Using the latest and best practices, Waverly Light & Power has showcased unique features that can be utilized by consumers and contractors. The features set an example in educating other public power systems working with new developments, as well as techniques for energy savings in existing homes. Waverly Light & Power also used this opportunity to monitor the home's energy use and KW demand by separately monitoring the HVAC system, hot water heater, appliance loads, and other plug load. The data was used to educate customers on real-time energy and demand savings.

It was designed to set the standard in energy efficiency and to show the utilities strong commitment to energy efficiency and environmental stewardship. They educated consumers through demonstrations. It was a three bedroom, 1,500 square foot home designed to meet the needs of the average size family. Their 2006 annual report was designed to showcase the house and motivate consumers to take action. The report included information on lighting, appliances, energy-saving recipes, rebates, sustainable material information, GoodCents Program information, and other home improvement information.

Energy Smart Westerville - City of Westerville Electric Division - OH

The City of Westerville Electric Division's *Energy Smart Westerville* describes the leadership role and initiatives the City undertook to educate its customers and the public on alternative energy and energy efficiency. The City of Westerville Electric Division partnered with the Ohio Energy Project and Westerville City schools to promote energy education through a number of school outreach programs that they continuously improve year after year. The Ohio Department of Development has designated Westerville as one of the Governor's Energy Smart Communities, an honor that not many cities receive. The program includes innovative projects, mentoring, educational, and instructional materials, a resourceful website, online tools, energy calculators, and community outreach.

Specific examples of initiatives include:

- Solar initiatives- Installed solar arrays at two schools for power and as a teaching tool, and added solar flashing signals and a solar back-up power supply for a vital traffic signal.
- The City's Fuel Cell Project- Demonstrated a commercial-scale, "next generation" molten carbonate fuel cell.
- Residential On-Line Energy Audit and Energy Calculator- Enables customers to perform their own on-line energy audit.
- One school's "Wacky Watts" project centered on its fifth grade students mentoring the school's second graders about heat, light, sound, and electricity.
- Another school's project focused on the connection between landscaping and energy efficiency. Students also performed an energy audit and held an energy fair.

5. New Construction

The best practices in new construction programs have proven to be effective in creating a more energy-efficient new building stock, showcasing new technologies, and supporting the adoption of more energy-efficient building practices throughout a region. The key elements of the best practice programs are training, technical assistance, and financial incentives, regardless of whether the program is commercial or residential. In addition, many of the programs are built on a national model, allowing them to leverage the national program's economies of scale and expertise, and apply their own limited resources more effectively.

Incentives are the most prominent component of the programs identified. The incentives offered were based on three different models: prescriptive, performance based, and capital cost offset. Prescriptive incentives offer predetermined incentives for the installation of prequalified equipment or strategies. Performance based incentives were determined on either the projected energy savings of the project, the HERS rating in residential projects, or the estimated savings generated by a specific higher efficiency measures installed. Capital cost offset incentives are designed to encourage projects to implement more aggressive energy-efficient strategies by providing financial support to offset higher initial capital costs. In addition, most of the programs included a tiered incentive structure. A tiered structure provides programs with two advantages. It creates a mechanism to support wide-scale adoption and the implementation of nonstandard, higher efficiency and more expensive strategies. In addition, it builds flexibility into the program to easily phase out technologies or efficiency targets as they become more standard practice.

Training and technical assistance were also key aspects of the best practice programs. Depending on the goals of the program some include technical assistance for design teams to create showcase projects. Highlighting for a community what is possible. Others provide industry training on the construction of high performance buildings to facilitate the adoption of better building practices across the board.

Many of the programs leveraged existing national programs (ENERGYSTAR®, Advanced Building ™ Guidelines, and LEED®). As the national programs have already developed the concepts, technical soundness, and administration process, the program administrators can focus their resources on other aspects of the program. In addition, the association with a recognized national program can give a program credibility with the building community and consumers, as well as immediate market recognition.

Some of the practices can be easily implemented as a standalone program, such as an ENERGYSTAR® Home program. Others are only effective implemented as a part of a suite of offerings, as APS's ENERGYSTAR® + Solar Homes - Builder Incentives program does, building on their existing **ENERGYSTAR® Homes Program**. Another strategy to consider is creating economies-of-scale across regions, as the State of Colorado did with the Governor's Energy Office's ENERGYSTAR® New Homes Program. a state sponsored program to support local and regional initiatives.

Sustainable Communities Program – San Diego Gas and Electric, CA

The goal of the Sustainable Communities Program is to increase the market adoption of energy-efficient technologies and sustainable design practices that offer greater energy efficiency at lower costs over their life cycle than many of the more commonly adopted energy-efficient technologies. The Sustainable Communities Program supports the building of demonstration projects incorporating measures that can increase energy efficiency by more than 30 percent, higher than California's Title 24 requirements. The demonstration projects are then used as showcases of energy-efficient design and building practices.

The program offers incentives, technical and design assistance, marketing and outreach, and project promotion. To be eligible, projects must exceed Title 24 requirements by 30 percent. The State of California offers a variety of programs that encourage participants to invest in energy-efficiency options that exceed the California Title 24 requirements by 10 to 25 percent.

To support the implementation of measures that have higher upfront costs but offer greater benefits over the life of the projects, the program provides incentives 15 percent higher than the State programs for specific measures. The eligible measures are those with generally higher up-front capital costs but a longer EULs, and lower O&M costs. In addition, the program is also attempting to increase the market acceptance of LEED® standards, and offers incentives to cover approximately 50 percent of the costs associated with LEED® registration and certification for LEED® buildings.

Colorado ENERGY STAR® New Homes – Colorado Governor's Energy Office, CO

The Governor's Energy Office (GEO) ENERGY STAR® New Homes (ESNH) Program is run by the Colorado GEO. The program goal is to increase consumer awareness of ENERGY STAR® homes, the energy-efficiency options in residential new construction, and to support participating Colorado ENERGY STAR® homebuilders. The state energy office partners with counties, cities, nonprofit organization, and utilities to offer local programs to support and promote ENERGY STAR certification in new residential construction. GEO manages a fund for the program and local and regional partnerships apply for funding based on numerous criteria, including their ability to implement an ESNH program suitable to their local market, and their ability to align with existing efforts.

Energy Incentives from WE Energies Commercial and Industrial New Construction Program - WE Energies, MI

The We Energies Commercial and Industrial New Construction Program is designed to transform the market and reduce peak loads. The program works with the building community to help them deliver high performance buildings through the implementation of more energy-efficient building systems and the use of an integrated design process. This is achieved through technical assistance and a tiered incentive program for both the design and implementation of energy-efficient strategies. In addition, the program provides education, information, and outreach to both program participants and the broader community to facilitate a market transformation. This outreach is also used to recruit program participants.

Projects accepted into the program will follow one of two potential paths: comprehensive or the Advanced Buildings ™ Approach. The comprehensive approach is based on an integrated design process and is generally applied to larger projects and allows for greater potential energy efficiency. The Advanced Buildings ™ Approach also uses integrated design, but is more streamlined and more applicable to smaller projects. The comprehensive approach offers higher potential energy efficiencies and its participants receive a higher level of technical assistance and are eligible for higher incentives than participants applying the Advanced Buildings ™ Approach. The building size, project type, design stage, and opportunities dictate which approach is pursued.

Commercial Construction Program - Long Island Power Authority, NY

LIPA's Commercial Construction Program promotes the adoption of energy-efficient electric technologies through incentives and technical assistance. The new construction program offers participants three approaches: prescriptive, custom, and whole building. In addition the program incentivizes LEED certification and commissioning related to energy efficiency.

The prescriptive option provides predetermined incentives for pre-qualified electric energy-efficient equipment. The custom option supports customers that are installing higher efficiency equipment, designing lighting, or incorporating control systems not available through the prescriptive option. Incentives are capped on a per project basis of $200,000 dollars. The whole building option supports a more comprehensive approach to building energy efficiency offering greater incentives and more flexibility. In addition, the program supports LEED certification for buildings by offering higher total incentives available to the project. For non-LEED projects incentives are capped on a per project basis of $400,000 dollars. LEED projects can receive up to $500,000 per project.

Incentives for both the custom and whole building options are calculated on a case-by-case basis based on the cost differential between a standard technology or approach and the higher efficiency technology or approach being implemented. Incentives being paid cannot exceed the energy-savings dollars (electric benefits) to the utility. In addition, the utility will pay for technical assistance to program participants for $10, and 50 percent of any additional costs, up to $50,000.

ENERGY STAR® Market Transformation Program – CenterPoint, TX

CenterPoint's ENERGYSTAR® MTP program offers developers and builders incentives for the construction of energy-efficient homes. Both ENERGY STAR® builders and non ENERGYSTAR® builders are accepted into the program (see note below regarding ENERGYSTAR® V3). Builders constructing homes that meet or exceed the ENERGYSTAR® New Homes Version 2 standards are qualified to participate. Incentives are based on the amount of energy savings from specific measures implemented, based on the kW and kWh baseline indicated from REM/Rate files for the home. Builders are encouraged to build to higher energy standards through a two tiered incentive system, paying higher incentives for measures installed in higher efficiency homes. Participants in the program also receive technical assistance and training for their sales and operations teams and the program helps build demand through advertising and marketing targeted consumers. CenterPoint Energy does not pay direct incentives to homeowners for this program.

New Home Construction – Alliant Energy, IA

The goal of the New Home Construction program is to make energy efficiency a standard design practice in new homes. Targeting home builders, the program provides builders with education, design assistance, and incentives to build more energy-efficient housing. The incentives are tiered, based on which of two options a builder pursues: installing a prescriptive option package or building to ENERGYSTAR® qualifications. The prescriptive option incentivizes the implementation of a pre-specified set of measures. ENERGYSTAR® homes are eligible for a higher tier of incentives. Homes pursuing either option are also eligible for additional incentives for installing premium-efficiency heating and cooling equipment. In addition to the tiers, rewards are based on the square footage of the home, and whether or not the home receives heating and/or cooling energy from Alliant Energy. The program markets to both the supply side of the industry (builders, lenders, and real estate agents) and to consumers to help create demand.

The program also applies to multifamily residential buildings of three stories or less that qualify for the ENERGYSTAR® label.

ENERGYSTAR® + Solar Homes - Builder Incentives - Arizona Public Service, AZ

APS's ENERGYSTAR® + Solar Homes - Builder Incentives program encourages the adoption of solar technologies on a neighborhood-wide scale. Built on the foundation of their APS ENERGYSTAR® Homes Program, the Solar Homes Builder Incentives requires homes to first meet the ENERGYSTAR® home efficiency requirements and then incentivizes the integration of either solar voltaic or solar thermal technologies. Primary components of the program include the ENERGYSTAR® Homes program, tiered incentives, and a nationally recognized builder education program.

To be eligible for the program a builders must be an ENERGYSTAR® partner, the homes/communities must meet the APS ENERGYSTAR® Homes Program requirements, and the homes must include room pressure balancing and mechanical fresh air ventilation. The APS ENERGYSTAR® Homes Program requires s builders to attend the APS ENERGYSTAR® workshop. These workshops are a fundamental part of the program's success in delivering the desired energy efficiency and comfort to the homes. Reinforcing how valuable solid training is to APS, they fly in a company nationally-renowned for the quality of their trainings for building teams on how to construct high performance buildings.

Once a builder is accepted into the program, they are eligible to receive incentives and support. Incentives are paid on a per home basis and are based on three variables: the HERS rating of the homes, whether homes are solar ready or have solar technology installed, and the percentage of homes in a community a builder commits to the program. Based on the combination of these variables, builders receive incentives ranging from $100 to $1,000 per home. To ensure program consistency, it includes a twelve-month reservation life-cycle. In addition to the incentives, the program helps market the communities, provides builders with technical assistance, and provides builder's sales and marketing teams with additional training. Payments are paid directly to the builder and are above and beyond the standard APS renewable energy incentives.

Advanced Buildings™ Program – National Grid , NY

The goals of National Grid's Advanced Buildings™ Program are to encourage the construction of 20,000 to 100,000 square foot, energy efficient, commercial buildings in a manner that is simple and cost effective for both the projects and the program. Utilizing the resources provided through the New Building Institute's Advanced Building ™ Guidelines, the program is able to offer design teams a prescriptive path, design tools and technical support to create buildings that are 10 to 30 percent more energy efficient than if built to code. When a project commits to the program the design team meets with a program representative to review the program requirements and resources available. The program offers incentives on a per square foot basis for meeting the base building requirements, and additional incentives for more aggressive energy efficiency measures. The additional incentives are customized based on the incremental costs and potential energy savings above a standard technology. The program is marketed almost entirely through educational seminars and brown bag lunch presentations.

Multifamily Low-Income Program - Efficiency Vermont, VT

Also listed under Audit and Direct Install Programs

The Multifamily Low-Income Program is a multiyear collaborative effort delivering a comprehensive package of energy-efficiency education, technical assistance, and incentives for both new and existing residential multifamily housing across much of northwestern Vermont. Managed by Efficiency VT, the program operates in both Vermont Gas Systems and Burlington Electric Department service areas to deliver a duel fuel approach to efficiency. The program works together with the low-income WAP, to present recommended energy-saving measures to building owners where tenants qualify for WAP services. The weatherization team goes to the property and performs an audit and identifies potential improvements and then provides renovation construction services.

The incentives are delivered to support a comprehensive project not as one-off measures. This encourages building owners to adopt all cost-effective efficiency measures, not just quick payback options. The developer receives building plan reviews at no cost and discusses potential improvements identified by Efficiency VT. Site visits are provided during the construction process to assist with air sealing details and purchasing decisions, and to ensure that insulation and energy-efficient products are selected and installed.

The program works with virtually all new subsidized multifamily construction in the state, as well as a high percentage of privately owned new construction projects. Training programs are in high demand. Efficiency VT Implements the program on a joint basis that allows for the development of a shared vision and big picture thinking regarding projects, as well as for consistent messaging from multiple companies, rather than different messages depending on service territories.

This program does appear to be compatible with municipal utility delivery and operations by virtue of the following best practice attributes:

- Efficiency VT understands the market and builds relationships with all market actors across the state spanning project types or customer classes that enables the program to find solutions to market barriers
- Efficiency VT implements the program on a joint basis allowing for the development of a broader, shared vision regarding the projects – delivering a consistent message to multifamily building operators and developers and trade allies
- Efficiency VT has developed and implemented a design guide for multifamily housing as well as a comprehensive track for new construction/rehab projects

The New Building Institute's Advanced Buildings' ™ Tools:

Several of the programs reference the New Building Institute's Advanced Building ™ Guidelines. The NBI is a nonprofit organization focused on transforming the market to build more energy-efficient commercial buildings. A key part of their efforts is the development and sharing of The Advanced Buildings ™ suite, a set of guidelines, tools, and resources to help design teams create high performance buildings. The Core Performance Guide is the component that defines high performance in building envelopes, lighting, HVAC, power systems, and controls. Design teams that utilize the guide as a part of an integrated design process can create buildings that are up to 30 percent more energy efficient than model building standards. The guidelines are written to use off the shelf strategies, be adapted into beyond code programs, and include regional variations.

In addition to tools and resources for design teams, the NBI offers a suite of services to help sponsor organizations administer programs based on the Advanced Building ™ Guidelines. For an annual sponsorship an organization can take advantage of a host of administrative and technical tools and resources, including:

- Marketing and administration templates
- Monthly sponsor calls to discuss program challenges and share resources
- Technical support
- Program analysis tools
- Attendance of an annual sponsors' conference

Being a sponsor allows organizations to leverage the resources and recognition of a larger, international organization for a minimal cost. More information can be found at http://www.advancedbuildings.net and http://newbuildings.org.

6. Financing

Performance Contracting Program - Alliant Energy, WI

Alliant Energy works with ESCOs, including an in-house contracting team, to offer all non-residential customers the option to make energy efficiency improvements at no upfront cost. The cost is paid by a third-party lender facilitated by the ESCO, and is repaid by the customer from the energy savings. The ESCO models and recommends the improvements, guarantees the savings, installs the measures, and guides the customer through the entire process from start to finish. The utility serves as the program administrator and is responsible for managing the overall program, approving project applications, and verifying the savings estimates.

A unique feature of the program is that the utility pays the ESCO a "risk premium" incentive, in order to encourage deeper retrofits. For the ESCO, the risk of the savings guarantee decreases with each marginal improvement. The incentive is based on the verified kWh savings during the first year, and is increased from $0.06/kWh to $0.14/kWh for more extensive retrofits.

The best practices from this program include:

- A guarantee of savings is provided to the customer by the performance contractor
- An economic incentive encourages performance contractors to participate in the program
- Incentives are linked to building performance; the incentive is based on measured savings
- A whole-building approach maximizes energy savings; deeper retrofits earn a higher incentive

Home Performance with ENERGY STAR® Loans - Austin Energy, TX

AE has teamed with a local lender, Velocity Credit Union (VCU), to provide financing for over 1,800 energy upgrades since 2006 as part of their HPwES program. Participants may choose between rebates of up to 20 percent of the project cost or low-interest unsecured financing through VCU. AE buys down the interest rate on the loans to between 0 percent and 6 percent depending on the extent of the upgrade, loan term, and the customer's credit score. Loan terms are from three to ten years, loan amounts range from $1,500 to $11,000, and there is no minimum credit score.

In 2010, AE ran a promotion named the “Best Offer Ever” and allowed participants to receive both the rebates and the financing. The promotion was very successful, with over 300 comprehensive retrofits financed as a result.

This program is a good example of the growing trend in which utilities team with lenders to help customers finance the cost of energy upgrades. While national lenders have generally been reluctant to develop products for this small but growing market, utilities are finding that local and regional banks and credit unions can be willing partners. Non-profit lenders known as C can also be attractive partners, since they may be able to offer below-market interest rates.

The best practices from this program include:

- Teaming with lenders leverages their experience in financing home improvements.
- Low-interest financing serves as a high-leverage tool.
- A network of local installers has been trained and quality assurance procedures are in place.
- Installers help sell the program to their customers.

Help My House Pilot Program - The Electric Cooperatives of South Carolina, SC

Eight rural electric coops in South Carolina have joined forces to test OBF as an acquisition strategy. Led by the ECSC and Central Electric Power Cooperatives, the Help My House Pilot Program provides low-cost financing (2.5 percent interest) to fund the full upfront cost of a home’s energy efficiency improvements. The financing is paid back over time (up to 10 years) through the homeowner’s monthly electric bill. The monthly financing payments are offset by the energy savings, so that the resulting utility bill is less than it was before the improvements. The financing is attached to the electric service account, rather than the property owner or tenant; if the home is sold or the tenant moves, the financing can simply transfer to the next occupant. For the pilot, the utilities are actively identifying homeowners based on above-average energy use, and are offering free energy audits as well as assistance with contractor selection and supervision.

An important feature of OBF is that it works for rental properties. Normally, if the tenant pays for utilities, the landlord has little incentive to pay for energy improvements, since the tenant would be the one to benefit from the savings on the utility bill. Conversely, tenants are usually reluctant to pay for improvements to a property they do not own. This problem of “split incentives” is solved by OBF, since the tenant both enjoys the savings and also makes the monthly financing payment, with the net result being a lower utility bill overall. A similar cooperative effort among four utilities is taking place in Kentucky.

The best practices from this program include:

- A collaboration among utilities leads to economies of scale and a stronger program.
- Low-interest financing serves as a high-leverage tool.

- Information about customers is used to target homeowners with above-average energy use.
- OBF is used to solve the "split incentives" problem associated with tenant-occupied properties.

Power Smart Residential Loans - Manitoba Hydro, Manitoba, Canada

Manitoba Hydro is a government-owned gas and electric utility serving over 500,000 customers throughout the province of Manitoba. Since 2001, the utility has issued 51,000 loans for more than $200 million for residential energy-efficiency measures. This is an OBF program, with repayment via the utility bill. Loan terms are up to five years (15 years for furnaces), and the interest rate is currently subsidized from 5.5 percent down to 4.9 percent. The loan can be combined with a grant available from the federal ecoENERGY program.

The success of this large program is attributed to a fast and easy loan application process and strong relationships with contractors and retailers. Customers simply fill out a one-page application and then quickly learn if they are approved, usually within three to five minutes. More than 90 percent of the contractors in the province participate in the program, along with about 800 suppliers. Windows and doors make up half of all installations, followed closely by heating systems, with insulation constituting less than 5 percent of installations.

The best practices from this program include:

- Low-interest financing serves as a high-leverage tool.
- Loans are approved quickly.
- A network of local installers has been trained and quality assurance procedures are in place.
- Installers help sell the program to their customers.

How$mart - Midwest Energy, KS

Midwest Energy is a gas and electric cooperative utility serving 48,000 customers in western Kansas. Their How$mart OBF program funds the full up-front cost of energy upgrades for residential and small commercial customers. Repayment is provided via a tariff, or surcharge, attributed to the meter rather than the customer. The surcharge includes the project costs, the cost of capital, and the administrative cost of the program (roughly 5 percent of the project cost). The cost of capital is just 4 percent, thanks to the Kansas Housing Resources Corporation that contributes half of project funds at 0 percent interest. Terms are up to 15 years for homeowners and 10 years for small businesses.

One advantage of the tariff is that it is not considered a loan and does not show up on a company's financial balance sheet. As such, it does not eat into the borrowing capacity of the business, and does not have to compete with other company priorities for capital budget dollars. These are significant advantages in the commercial sector.

In 2009, Midwest Energy partnered with the Climate & Energy Project to sponsor the Take Charge Challenge, a contest between six communities to reduce energy use over the course of one year. The kickoff event in each town was a major event with participation of town leaders, followed by quarterly events and community celebrations. The challenge generated 87 How$mart audits and conservation plans, 97 percent of which were either installed or pending.

The best practices from this program include:

- Partnerships with cities and community-based organizations were used to expand participation.
- Low-interest financing serves as a high-leverage tool.
- OBF is used to solve the "split incentives" problem associated with tenant-occupied properties.
- Off-balance sheet financing addresses business concerns about borrowing capacity and capital budget priorities.

Assisted Multifamily Building Program, NYSERDA, NY

NYSERDA's AMP was a multiyear initiative providing a range of technical and financial services to help multifamily building owners and tenants identify, finance, implement, and monitor energy-saving measures and increase the health and safety benefits for building occupants. The program was designed to change the market for energy-efficiency investments in low-income multifamily buildings. AMP emphasized energy and bill savings for low-income tenants through contractual and policy directives. The program also provided free training to owners, maintenance staff, and building operators in the proper use and maintenance of energy-efficient technologies.

AMP was a single point-of-entry across the state for multifamily building owners and developers interested in improving the energy efficiency of new and existing buildings. The program leveraged all DSM incentives available through local utilities, as well as outside funding from local, state, and federal agencies to create a unified structure across the state. The program worked with buildings that would not typically qualify for a conventional loan by providing low-interest financing secured by 80 percent of the projected savings from energy-efficiency rehabilitations. A high priority was placed on program tracking and quality assurance and control to ensure program practices were consistent and easily replicated. In addition, the program has developed a host of policies to establish consistency and reduce barriers across both internally and externally across the state; this includes building relationships with regulators and government agencies and collaborative efforts to modify regulations and incorporate higher energy efficiency standards.

Despite the high program budget, this program does appear to be compatible with municipal utility delivery and operations by virtue of the following best practice attributes,

- A "gap funding" model that has proven to be an extremely efficient way to use NYSERDA resources – the program takes maximum advantage of outside funding (local, state, federal, and utility programs) before providing "gap funding" in the form of a grant.
- NYSERDA developed strong relationships with regulators and then successfully implemented and refined a host of statewide policies to coordinate desperate groups, incorporate higher efficiency standards, apply new technologies and methods, and navigate various marketplace/program barriers.

- Employed health and safety measures as part of the AMP analysis providing tenants with better living conditions (lighting, ventilation, air pollution reduction, safer buildings)
- Placed a high priority on quality assurance and control; stringent underwriting standards as well as rigorous documentation requirements; a detailed policy and procedures manual; all of which ensured program practices were consistent and easily replicated.

7. Demand Response

Air Conditioning Load Management (Cool Share) – Nevada Power Company, NV

The DR Program, which prior to its expansion was the Air Conditioning Load Management Program, and was recently marketed as the Cool Share Program, was a DLC program that reduced system peak loads by providing incentives to customers in return for their permission to allow the Nevada Power Company to control their air conditioning loads during peak times.

Through the program, the Nevada Power Company sought to reduce the upward pressure on rates for both participating and non-participating customers by offsetting capacity costs. By deploying programmable communicating thermostats, the program could be used as a peaking resource that helped reduce or avoid the necessity to purchase higher cost capacity and energy, and delayed the construction of new generation and/or distribution assets.

For the 2007-2009 Action Plan period, the Nevada Power Company installed 120 MW of demand reduction capacity. They curtailed customers on 31 days during the summer of 2009. The highest one-hour average load reduction achieved during the 31 days of thermostat set-backs of 4° Fahrenheit was 2.1 kW per air conditioning unit; which occurred on June 29, 2009 from 4:00 p.m. to 5:00 p.m. Over the three year Action Plan period, the Nevada Power Company achieved 120 percent of their demand reduction target through the program and actual expenditures were 100 percent of the original budget for the same period.

Notable/replicable program components include:

- In 2004 and 2005, the Nevada Power Company piloted a sophisticated load control and customer information gateway system; however, due to operating complications and vendor issues, they removed these installations in 2006 and largely replaced them with Carrier two-way programmable communicating thermostats.
- The Nevada Power Company migrated the programs' Microsoft Excel® model to a tool that was more flexible and intuitive and had a more sophisticated optimization engine. They could use this updated model to plan and analyze the peak load impact of DR resources for both long-term and short-term optimization.

Residential Direct Load Control– Alliant Energy, IA

The DLC Program operates during the peak summer season from May 15 to September 15, 2010. Alliant Energy shuts off a participant's A/C for 15 minutes of every half hour and then returns the compressor to the set control temperature for the remaining 15 minutes of the half hour. A typical cycling event lasts six hours, from 1:00 p.m. to 7:00 p.m., on weekdays. Participants' water heaters are turned off for the duration of the cycling event.

Alliant Energy partnered with Michaels Engineering to test the appliance cycling switches. Through testing and switch upgrades and replacements, Alliant Energy has the potential to achieve a reduction of approximately 38 MW by the end of 2012.

Some of the programs' best practices are:

- Alliant Energy partnered with an ESCO to test appliance cycling switches in their service territory and replace those that are missing or not functioning properly.
- The program marketing materials include descriptions of other energy efficiency program offered by Alliant Energy. Alliant Energy provides cross-marketing to all DLC program participants with ideas for them to bundle related measures (e.g., install a programmable thermostat in conjunction with installing a new air conditioning unit).
- The program provides materials to each new participant that explains the DLC program and other Alliant Energy related programs when installing the DLC switch. They also provide similar energy efficiency program materials to existing participants on an annual basis.

FlexPeak Management – Idaho Power, ID

FlexPeak Management was a DR program provided by Idaho Power. The program objective was to reduce the demand on Idaho Power's system during peak times through customers' voluntary electrical-use reduction. The program targeted industrial and large-commercial customers.

The program hours were defined as June 1 to August 31, 2009 between the hours of 2:00 p.m. and 8:00 p.m. on non-holiday weekdays. Customers received notification of a demand-reduction event two hours prior to the start of the event, and events would last between two and four hours.

Idaho Power contracted with EnerNOC, Inc. to implement the program. EnerNOC was responsible for marketing plans, enrolling participants, installing the equipment to reduce demand, and reporting the results to Idaho Power. Idaho Power initiated DR events by notifying EnerNOC, who then implemented the requested load reduction to the Idaho Power system. Idaho Power then monitored the real-time energy-usage data and the demand-reduction event in aggregate. Customers could also continuously monitor their demand-reduction performance using their individual, near real-time energy-usage data.

Notable/replicable program components include:

- The program implementer would meet with prospective customers to identify their potential for reducing electrical energy loads during program hours.
- Program administration costs were much lower than originally estimated.
- Customer satisfaction surveys were conducted by the program implementer.

Commercial Load Management Standard Offer Program– Oncor Electric Delivery, TX

The Commercial Load Management SOP offered by Oncor Electric Delivery, LLC targeted commercial customers with demand higher than 700 kW. The objective of the program was to assist businesses with reducing their peak demand in order to help meet the state energy efficiency goals.

Oncor paid the program incentives to the service providers who worked with local commercial and manufacturing facilities to reduce their peak demand. In order to qualify for the program, the customer must have had an Internal Data Records (IDR) meter. Oncor would verify the savings by reviewing data recorded on IDRs and calculating the amount of demand savings achieved through the curtailment during the summer peak season. The minimum savings requirement for the program was 100 kW.

Notable/replicable program components include:

- Service providers would undergo an application process and enter into a standard contract with Oncor.

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Appendix F. Acronyms

A/C	air conditioner
ACEEE	American Council for an Energy Efficient Economy
AE	Austin Energy
AIA	American Institute of Architects
AMI	advance metering infrastructure
AMP	Assisted Multifamily Building Program
APPA	American Public Power Association
APS	Arizona Public Service
ARRA	American Recovery and Reinvestment Act
ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers
BOC	Building Operator Certification
BPA	Bonneville Power Administration
BPI	Building Performance Institute
BPUB	Brownsville Public Utilities Board
BTU	Bryan Texas Utilities
C&I	Commercial and Industrial
CDFI	community development financial institutions
CEA	Clean Energy Ambassadors
CEE	Consortium for Energy Efficiency
CFL	compact fluorescent lamp
CHP	combined heat and power
COP	coefficient of performance
CPEP	Chemical Products Efficiency Program
DLC	direct load control
DOE	Department of Energy
DOE-ITP	Department of Energy – Industrial Technologies Program
DR	demand response
DSM	demand-side management
DX	direct expansion
ECSC	Electric Cooperatives of South Carolina
EE	Energy Efficiency
EECBG	Energy Efficiency and Conservation Block Grant

EEPR	Energy Efficiency Plan and Report
EER	energy efficiency ratio
EERE	Office of Energy Efficiency and Renewable Energy
EERS	Energy Efficiency Resource Standards
EESP	energy efficiency service provider
EFLH	equivalent full load hours
EIA	US Energy Information Administration
EISA	Energy Independence and Securities Act
EM&V	evaluation, measurement, and verification
EPA	Environment Protection Agency
ERCOT	Electric Reliability Council of Texas
ESCO	energy service companies
ESNH	ENERGY STAR® New Homes
EUL	energy use intensity
EUMMOT	Electric Utility Marketing Managers of Texas
FAQs	frequently asked questions
FELPS	Floresville Electric Light and Power System
FERC	Federal Energy Regulatory Commission
FTE	full-time employee
FY	fiscal year
GEO	Governor's Energy Office
GHG	greenhouse gas
GPS	global positioning system
GUS	Georgetown Utility System
GVEA	Golden Valley Electric Association
GWh	gigawatt hours
HB	House Bill
HEAP	Home Energy Assistance Program
HEC	in-Home Energy Consultation
HERS	Home Energy Rating System
Hp	horsepower
HPwES	Home Performance with ENERGY STAR®
HTR	hard-to-reach

HVAC	heating, ventilation, and air conditioning
ICC	International Codes Council
ICLEI	Local Governments for Sustainability
IDR	Internal Data Records
IECC	International Energy Conservation Code
IHDS	in-home displays
IOU	investor-owned utility
IPMVP	International Performance Measurement and Verification Protocol
IT	information technology
ITP	Industrial Technologies Program
kW	kilowatt
kW/ton	kilowatts per ton
LCR	load control receiver
LED	light emitting diode
LIPA	Long Island Power Authority
LIWAP	Low Income Weatherization Assistance Program
LPD	Lighting Power Density
M&V	Measurement and verification
MEAN	Municipal Energy Agency of Nebraska
MEERP	Multifamily Energy Efficiency Rebate Program
MichCon	Michigan Consolidated Gas Co.
MOU	municipally-owned utility
MPCA	Minnesota Pollution Control Agency
MTP	Market Transformation Program
MW	megawatt
MWh	megawatt hours
N/A	not applicable
NAICS	North American Industry Classification System
NBI	New Buildings Institute
NBU	New Braunfels Utilities
NEEA	Northwest Energy Efficiency Alliance
NERC	North American Electric Reliability Corporation
NJBPU	New Jersey Board of Public Utilities

NOx	nitrogen oxide
NPV	net present value
NYSERDA	New York State Energy Research and Development Authority
O&M	operation and maintenance
OBF	on-bill financing
PCT	participant cost test or programmable communicating thermostat
PECI	Portland Energy Conservation, Inc
PG&E	Pacific Gas and Electric
PM	Portfolio Manager
POP	point-of-purchase
PRPA	Platte River Power Authority
PTE	part-time employee
PUCT	Public Utility Commission of Texas
PV	photovoltaic
QA/QC	quality assurance/quality control
QECB	qualified energy conservation bonds
QZAB	qualified zone academy bond
R&D	research and development
RCx	retro-commissioning
RDEE	Rapid Deployment Energy Efficiency
REDLG	Rural Economic Development Loan and Grant
REEP	Refinance Energy Efficiency Program
REP	retail electricity provider
RES	residential
RESNET	Residential Energy Services Network
RETAP	Retiree Environmental Technical Assistance Program
RFP	request for proposal
RIM	ratepayer impact measure
ROI	return on investment
SAE	Statistically Adjusted Engineering
SAVE	System Adjustment and Verified Efficiency
SB	Senate Bill
SBC	system benefits charge

SCORE	School/University Programs
SCT	Social Cost Test
SECO	State Energy Conservation Office
SEER	seasonal energy efficiency ratio
SEP	State Energy Program
SIC	Standard Industrial Classification
SOP	Standard Offer Program
SRP	Salt River Project
STEP	Save for Tomorrow Energy Plan
SWEPCO	Southwestern Electric Power Co.
TPA	Technical Assistance Plan
TATI	Technical Assistance and Technology Incentives
TDHCA	Texas Department of Housing and Community Affairs
TECA	Training, Education, Certification, and Awareness
TOU	time-of-use
TPPA	Texas Public Power Association
TRC	total resource cost
UCT	utility cost test
USDA	United States Department of Agriculture
VCU	Velocity Credit Union
VFD	variable frequency drive
WAP	Weatherization Assistance Program
YES	Your Energy Savings