

HARD-TO-REACH Standard Offer Program



Southwestern Electric Power Company

Texas Central Company

Texas North Company

2010 Program Year

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1. EXECUTIVE SUMMARY

AEP is offering the Hard-to-Reach Standard Offer Program (HTR SOP) through its Texas distribution companies which include AEP Texas Central Company (TCC), AEP Texas North Company (TNC) and Southwestern Electric Power Company (SWEPCO). The HTR SOP is open to a wide range of contractors, service companies, retail electric providers, and community action agencies referred to as Project Sponsors.

In its Standard Offer Programs (SOPs), AEP contracts with Project Sponsors to deliver certain levels of peak demand savings (measured in kilowatts, or kW) and/or annual energy savings (measured in kilowatt-hours, or kWh) by installing qualifying energy efficient measures at existing homes. AEP will pay a fixed price in the form of incentives for kW and kWh savings provided by the energy efficient measures installed.

The Public Utility Commission (PUC) of Texas has issued rules and requirements for the SOPs that are to be implemented by most electric utility companies serving Texas customers. Those rules and requirements are outlined in the Substantive Rule 25.181, also known as the Energy Efficiency Rule. The purpose of this manual is to identify and explain these program requirements and to serve as a reference for potential project sponsors.

Key changes to the program for 2010 include:

- Underserved counties have been re-defined for TNC and are noted in Chapter 3 and Appendix C
- Revised application forms
- Certificate of Insurance requirements have changed and are noted in Chapter 4.
- All installations must be submitted on an Invoice Report within 45 days of the installation.
- Air conditioning and heat pump deemed savings have been revised.
- Residential dwellings completed after January 1, 2008 do not qualify for the program.
- Multi-Family projects will continue to be allowed. A Work Schedule is required.
- CFL's are allowed in four or more lamp fixtures but not "Hollywood" style fixtures with 4 or more lamps found primarily in bathrooms.
- Failure to complete the prescriptive requirements will result in a total measure failure regardless of the CFM reading.

It is the Project Sponsor's responsibility to review the current year manual in its entirety prior to submitting an application.

Notice: AEP reserves the right to incorporate any or all changes resulting from PUC proceedings into AEP's 2010 programs as they are approved. Project sponsors will be provided with adequate notice of any changes affecting their projects.

2. PROGRAM DESIGN

2.1 Program Description

The primary objective of this program is to achieve cost-effective reduction of peak summer demand. This performance-based program offers incentive payments for “deemed” or “measured” energy savings generated by installing energy efficient measures.

Approved Project Sponsors are responsible for marketing their services to AEP homeowners, contracting with the homeowners, installing the measures, and reporting their work to AEP. AEP then inspects a randomly generated customer sample. Payment is made for the demand reductions and energy savings based on the percentage of installations that are approved by inspection as capable of delivering the reported savings.

Example:

For a Project Sponsor installing a new central air conditioner, the savings (and incentives) are based on the difference between a high-efficiency unit, e.g., 14 SEER (or higher) and a “baseline” unit as defined in the approved Deemed Savings.

AEP has designed the HTR SOP manual to provide Project Sponsors who contract with AEP with the specific requirements of the HTR SOP. By contracting with AEP, Project Sponsors agree that they have read the program manual and will comply with the requirements of the program in order to receive incentive payments for the installation of qualifying measures.

For a definition of “baseline” and other terms used in this Manual, please consult the Glossary, included as Appendix A.

2.2. Project Sponsor Eligibility

A Project Sponsor is any company, person, organization, group, or individual who contracts with AEP to provide energy savings under the HTR SOP. The following types of Project Sponsors are among those eligible to participate:

- Energy service companies
- Local contractors
- Retail electric providers
- National or local companies that provide energy-related products (e.g., insulation or HVAC)
- Product retailers, if they install the particular energy-efficient products sold as part of this program

Participants in the HTR SOP must meet minimum eligibility criteria and demonstrate their financial, technical, and managerial qualifications as part of the application process.

AEP also requires Project Sponsors and their subcontractors to carry all statutorily required insurance, as described in the SOP Agreement.

2.3. Project Sponsor Responsibilities

AEP requires that Project Sponsors use AEP's 3-part 2010 Host Customer Agreement and Acknowledgement (HCA), which will be provided to approved applicants. This form includes customer protection and PUCT required provisions and a provision allowing AEP and the statewide Measurement and Verification (M&V) auditor access to the host customer's residence.

Project Sponsor responsibilities include but are not limited to:

- Maintaining statutorily required insurance coverage and have insurance company send copies of all coverage's.
- Identifying potential project opportunities
- Developing project documentation in accordance with HTR SOP procedures and deadlines, including documentation for measure evaluation and selection according to HTR SOP guidelines
- Committing to register with the Better Business Bureau(s) servicing the potential work service area(s) of the Project Sponsor
- Conducting (or contracting for) the income verification procedures for individual customers and for multi-family property owners.
- Conducting pre- and post-installation blower door and carbon monoxide (CO) testing, wherever air infiltration control, duct sealing, or wall insulation measures are being considered or have been installed by the Project Sponsor.
- Evaluating and installing envelope, interior energy usage, and HVAC measures
- Distributing AEP approved customer education materials to all host customers
- Submitting periodic and timely invoices

2.4. Participant Eligibility

HTR Customers are residential customers served by the AEP distribution company with an annual household income at or below 200% of the federal poverty guidelines and who have properly completed a PUCT-approved income verification form, or who have been designated as HTR through another PUCT-approved verification methodology.

Examples of target populations include:

- Section 8 and Public Housing Authorities.
- Households denied weatherization or utility assistance program benefits because income exceeds 125% of federal poverty guidelines.
- Households on long waiting lists for weatherization services.
- Other target groups identified by contractors.

Target populations identified above whose incomes are verified by an appropriate social service agency or organization would require no additional income verification effort.

Commercial facilities or portions of buildings served through commercial accounts, and new construction (residential dwellings completed after January 1, 2008 or commercial) projects are not eligible to participate in this program. These facilities may be eligible to participate in one of AEP's other SOPs. (Please see www.AEPefficiency.com).

The 2010 U.S. Department of Health and Human Services Poverty Guidelines (federal poverty guidelines) are established separately for households of different sizes and are presented in the following table:

Table 1
2009 HTR Income Eligibility Guidelines*
April 1, 2009 through March 31, 2010

Household Size	2009 Eligibility Guideline		
	Annual Income	Monthly Income	Weekly Income
1	\$21,660	\$1,805	\$417
2	\$29,140	\$2,428	\$560
3	\$36,620	\$3,052	\$704
4	\$44,100	\$3,675	\$848
5	\$51,580	\$4,298	\$992
6	\$59,060	\$4,922	\$1,136
7	\$66,540	\$5,545	\$1,280
8	\$74,020	\$6,168	\$1,423
For each additional person, add	\$7,480	\$623	\$144

*Income guidelines are updated every April. Project Sponsors should use the updated guidelines when they become available. Please check our website for current guidelines.

All participants must be customers of the AEP distribution company; however, they do not need to be retail customers of AEP. The AEP distribution company for a given customer may be determined by the ESI ID number on the customer’s bill from its Retail Electric Provider.

--AEP Texas Central customers may be identified by ESI ID’s beginning with 100327894

--AEP Texas North customers may be identified by ESI ID’s beginning with 102040497

ESI ID’s are required to enter customers in the TCC and TNC programs.

--SWEPCO is located outside the Texas competitive retail market. SWEPCO will be clearly identified on all Customer electric bills, a copy of which must be submitted along with the incentive application.

Participants may include:

– **Residential customers**

- **Single Family properties** – Defined as residential dwellings consisting of two or less units (i.e., a duplex or less).
- **Mobile Home properties** – a manufactured home on a chassis with wheels so it can be moved to different locations. It is considered pier and beam floor construction, usually with the perimeter skirting from the floor to the ground.

– **Multi-Family properties** - Defined as residential buildings containing three or more dwelling units.

- **Individually metered multi-family properties.** These are considered separate residential accounts; each unit is counted as a residence. The common areas are considered commercial accounts, and are not eligible in the HTR SOP.
- **Master-metered multi-family buildings.** These are considered commercial facilities and are not eligible in the HTR SOP
- **Individually metered townhomes are considered multi-family.**

NOTE: All multi-family projects must be approved by AEP prior to installation. Pre-approval is done via the HTR SOP website. Project Sponsors must provide a work schedule for multi-family projects seven (7) days prior to measure installation.

2.5. Income Eligibility Verification Form

The PUCT has approved a form for the purpose of verifying the income eligibility of customers:
“Self Certification Form of Income Eligibility”

This form outlines the various methods by which participants may certify their eligibility. The procedure for verifying eligibility is based on “self-certification.” The Project Sponsor will present the form to the customer, and he/she will check appropriate boxes, provide other information where required, and sign the form. It is not the Project Sponsor’s responsibility to verify the information provided by the participants.

Copies of the income eligibility form for individual customers and property owners are included as Appendix E. With prior written permission from AEP, Project Sponsors may change the layout of either of these documents; however, no wording or the order of wording may be changed, and the font must remain clearly legible.

2.6. Energy Efficient Measure Eligibility

Any Commission-approved retrofit measure included in the statewide HTR SOP template, or any measure assigned a Deemed Savings value by the Commission and approved for the HTR SOP, is eligible under AEP’s HTR SOP. Tables 1 and 2 in this section provide examples of eligible and ineligible measures. Appendix G provides a listing of approved measures and their corresponding Deemed Savings Values. Only those approved measures installed in homes completed prior to January 1, 2008 are eligible. AEP will consider the permanent electric meter installation date as the home’s completion date.

Project sponsors may propose other energy-efficiency measures, provided they meet the following requirements:

- Must produce a measurable and verifiable electric demand reduction during the peak period or produce electricity consumption savings
- Must produce savings through an increase in energy efficiency or a substitution of another energy source for electricity (provided the substitution results in overall lower energy costs, lower energy consumption, and the installation of high efficiency equipment)
- Must exceed applicable current federal minimum efficiency standards
- Renewable energy measures meeting the requirements of the Commission’s Energy Efficiency Rule (Substantive Rule 25.181) may qualify for an incentive

As a general rule, measures involving “plug loads” (equipment or appliances that are plugged into standard electrical outlets) are not permitted. This restriction may be waived by the utility if the Project Sponsor provides the utility with reasonable assurance that the energy and/or demand savings associated with such measures are likely to persist over a 10-year period of time and that quantifiable energy and/or demand reduction meeting the requirements of the Commission’s Energy Efficiency Rule can indeed be achieved through the proposed measure(s).

If the Project Sponsor proposes measures for which Deemed Savings values have not been approved by the PUC, then the Project Sponsor must follow the International Performance

Measurement and Verification Protocol (IPMVP) adopted by the Commission. The M&V plan must be submitted to AEP within 24 hours of submitting the application.

If any of the baseline equipment at a project site has been removed prior to the execution of the HTR SOP Agreement, or if any of the proposed energy-efficient measures has been installed prior to the execution of the HTR SOP Agreement, the project or the affected portions thereof shall be disallowed.

AEP shall have final authority on whether any particular measure is eligible for incentives.

2.6.1. Testing

If air infiltration control, duct sealing and wall insulation will be considered, carbon monoxide (CO) and blower door tests must be conducted prior to the initial assessment to determine which of the required measures should be evaluated for energy savings potential. All CO tests must be conducted with the gas equipment on and operating. If, for example, the CO and blower door tests indicate that all measures should be considered for installation, then the Project Sponsor will evaluate the following measures in sequence as summarized below (i.e. Envelope Measures shall be considered before Interior Energy Usage Measures; Interior Energy Usage Measures shall be considered before HVAC Measures):

2.6.2. Envelope Measures:

(At least one of the three following measures must be installed in order for any other measure to be eligible for incentives.)

- Insulation measures (insulate the ceiling, floor, or all exterior walls)
- Air infiltration control measures (minimum of 10% air leakage reduction, as calculated by the difference between pre and post-installation blower door tests)
- HVAC duct integrity (repairs, replacements, and sealing with mastic or aerosol-based duct sealants)

2.6.3. Interior Energy Usage Measures

Lighting

- Hard-wired fixture replacements
- Compact fluorescents in hard-wired fixtures (minimum 3 hour daily usage). A hard-wired fixture is a fixture that is permanently installed in the residence. Examples of fixtures that are not hard-wired are table lamps and floor lamps.
- CFL's are allowed in four or more lamp fixtures but not "Hollywood" style fixtures with 4 or more lamps found primarily in bathrooms.

Water Heating

- Showerheads and aerators (as pre-approved by AEP)
- Pipe Insulation
- Water heater jackets

ENERGY STAR[®] rated home appliances

2.6.4. HVAC Measures

- Room Air Conditioners
- Split system HVAC (Complete coil and compressor replacement)
- Packaged unit HVAC (Installed to manufacturer’s specifications)

All measures eligible for SOP incentive funds must exceed applicable current federal minimum efficiency standards or meet the minimum measure qualification standards specified in the Deemed Savings List (Appendix G) or in the Measures Installation Standards. All energy and peak demand reductions must be measurable and verifiable.

If, in AEP’s sole judgment, any of the baseline equipment at a project site has been removed prior to the execution of the HTR SOP Small Project Master Agreement, or if any of the proposed energy efficient measures are installed prior to the execution of the HTR SOP Small Project Master Agreement and any applicable Host Customer Agreement(s), the project, or the affected portions thereof, will be disallowed.

Table 2

EXAMPLES OF ELIGIBLE MEASURES

Envelope Measures

- Insulation: ceiling, wall and floor
- ENERGY STAR®-quality windows
- Infiltration control
- Duct sealing

Cooling and Ventilation Measures/Projects

- High efficiency air conditioning replacements
- Variable speed drive applications for HVAC equipment
- Room air conditioners

Heating Measures/Projects

- Standard-efficiency heat pump to high-efficiency heat pump conversion

Electric Water Heating Measures

- Energy and water-efficient clothes washers
- Energy Efficient Dishwashers
- High efficiency gas water heater replacing electric resistance water heaters
- Heat pump water heaters
- Waste heat recovery units

Other Measures/Projects

- CFL’s installed in four or more lamp fixtures (except “Hollywood” style four or more lamps found primarily in bathrooms)
- Energy-efficient refrigerators

Renewable Energy Measures (All renewable measures subject to approval by PUC)

- Space conditioning (heating or cooling)
- Water heating
- PV or other distributed generation

*Note: Deemed Savings values have not been created for all of the measures listed

Table 3

EXAMPLES OF INELIGIBLE MEASURES

- Measures installed at new homes (residents completed after January 1, 2008)
- All exterior lighting measures
- Measures with an expected life of less than 10 years (except CFL's)
- Dwellings with a less than 10 year expected life (mobile homes, etc..)
- CFL fixtures that are "Hollywood" style with four or more lamps found primarily in bathrooms
- Cogeneration and self-generation projects
- Load shifting/load management measures
- Load reductions caused by building vacancies
- Measures that rely solely on customer behavior or require no capital investment
- Measures that decrease building plug loads, such as "Green Plugs" or computer inactivity time-out controls
- Measures for which incentives were received under another AEP program
- Repair and maintenance projects
- Multi-family Ducts in which a majority are not in an unconditioned space
- Energy-efficient gas measures when replacing non-electric technologies
- Measures that result in negative environmental or health effects

Any question as to a measure's eligibility for incentives shall be decided by AEP as the final authority.

2.7. Carbon Monoxide and Blower Door Testing

Prior to the installation of any air infiltration control, duct sealing, or wall insulation measure, a pre-installation blower door test is required, and a CO test shall also be conducted for each residence with combustion (e.g., natural gas or propane) equipment or appliances. Project Sponsors are required to measure and record pre- and post-installation CO readings and shall not install any air infiltration control, duct sealing, or wall insulation measure that would result in the ambient air CO level exceeding 9 parts per million (ppm) at project completion. Appendix D contains additional information on CO testing. All gas equipment must be on and operating when all test readings are taken. The Project Sponsor shall use the pre- and post-installation blower door air infiltration tests results to verify that the final air exchange rate of a household treated with air infiltration control, wall insulation, and/or duct sealing measures shall not be less than the standards set forth in the following Table 4:

Table 4
Minimum Final Ventilation Rate*
Per square foot of conditioned area

Shielding	Single Story	Two Story	Three or More Stories
Well Shielded	1.18	0.95	0.83
Normal	0.99	0.79	0.69
Exposed	0.89	0.71	0.62

Measured in cubic feet per minute at 50 Pascal per square foot of conditioned area.

Well Shielded is defined as urban areas with high buildings or sheltered areas, and building surrounded by trees, bermed earth, or higher terrain.

Normal is defined as buildings in a residential neighborhood or subdivision setting, with yard space between buildings. Eighty to ninety percent of houses fall into this category.

Exposed is defined as buildings in an open setting with few buildings or trees around and buildings on top of a hill or ocean front, exposed to winds.

Example: The minimum post-installation air exchange rate for an 1800 square foot, one-story home with normal shielding is 1782 CFM₅₀ (1800 x 0.99). In order to qualify for the air infiltration control deemed savings, there must be a minimum 10% reduction between the pre- and post-installation ventilation rate. Therefore, the pre-installation ventilation rate must be at least 1980 CFM₅₀ (1782 / 90%) in order to be considered for air infiltration control measures.

If the results of the pre-installation CO or air infiltration tests indicate that the installation of air infiltration control measures, duct sealing, or wall insulation may result in post-installation CO or CFM levels insufficient for program standards, the Project Sponsor shall exclude these measures from installation.

3. PROGRAM INCENTIVES

AEP shall pay Project Sponsors a fixed incentive per kW and kWh of savings. All payments will be based upon the verified demand and energy savings, rather than on the number of measures installed. The Demand (kW) payment is based on Peak Demand Savings, and the Energy (kWh) payment is based upon the first-year energy savings.

In an effort to provide a more comprehensive program, AEP will encourage projects which target counties or measures which have typically been underserved in the HTR SOP by varying its incentive levels. Table 4 identifies measures which are considered underserved for the 2010 HTR SOP and which will be paid at the rate for Underserved Measures. Counties defined as underserved for the 2010 HTR SOP are identified in Appendix C. For qualifying measures installed in underserved counties, the incentive rate shown in Table 5 for Underserved Counties will be paid until 1) the portion of the budget reserved for Underserved Counties or 2) the entire program budget has been exhausted. The Standard incentive rates shown in Table 5 will apply for all other installations. After the budget reserved for Underserved Counties has been exhausted, installations in those counties will be paid at either the Standard Rate or the Underserved Measures Rate, whichever is applicable.

Table 5

PROGRAM INCENTIVES

	kW	kWh
Incentives:		
Standard	\$360	\$0.11
Underserved Measures: HVAC	\$400	\$0.13
Underserved Counties	\$440	\$0.15

NOTE: AEP may modify its incentive payments during the program year if it is deemed necessary to meet its goals. At least 30 days notice will be provided to participating project sponsors before any such change is made.

All incentive payments will be subject to the limits set forth in this manual.

3.1. Incentive Example

A Project Sponsor installs 30 high-efficiency AC units. The units vary in size from 2.5 to 5 tons, and in SEER rating, from 14.0 to 18.0.

Using the deemed savings table for central air conditioners (Appendix F) and adding up the deemed kW and kWh savings for each of the units based on the varying tonnages and SEER ratings installed, the total kW savings is 25, and the kWh savings is 55,000. Using the incentive rate for Underserved Measures, the incentive payment is calculated as follows:

$$(25 \times \$400.00) + (55,000 \times \$0.13) = \$17,150$$

Note that in all cases, payment procedures specified in the HTR SOP Agreement supercede this and any other documents, and all payments are subject to the limits set forth in this chapter.

3.2. Limits on Incentive Payments

3.2.1. Load Factor Caps

For projects implemented under this SOP, a definite ratio (load factor cap) has been established between the kW and the kWh payment. To implement the load factor cap, the following table shows the maximum total payment allowed per kW savings. To determine the maximum combined demand and energy incentive payment (kW and kWh), multiply the kW savings by the dollar amount listed in Table 6.

Table 6

LOAD FACTOR CAPS

\$920.00

The following are examples of application of the load factor cap at TNC:

Example 1

A project saved 30 kW (peak demand) and 75,000 kWh (annual savings). Without adjustment, the incentive at the rate for Underserved Measures is calculated to be:

$$(30 \text{ kW} \times \$440.00) + (75,000 \text{ kWh} \times \$0.15) = \$24,450$$

Referring to the table above, the maximum allowable incentive for this project at TNC would be:

$$30 \text{ kW} \times \$920 = \$27,600$$

Since the maximum allowable incentive is greater than the actual calculated incentive, this project would not be subject to the load factor cap. The payment would be \$24,450.

Example 2:

A project saves 20 kW (peak demand) and 150,000 kWh (annual savings). Without adjustment, the incentive at the rate for Underserved Measures is calculated to be:

$$(20 \text{ kW} \times \$440.00) + (150,000 \text{ kWh} \times \$0.15) = \$31,300$$

Referring to the table above, the maximum allowable incentive for this project at TNC would be:

$$20 \text{ kW} \times \$920 = \$18,400$$

Because the maximum allowable incentive is less than the actual calculated incentive, this project would be subject to the load factor cap. The payment would be \$18,400.

3.2.2. Project Sponsor Limits

To ensure that funding will be available to multiple participants, AEP has set a maximum limit on incentives paid to any one Project Sponsor. Project Sponsors may not receive more than the Project Sponsor Limit for the program year, as noted in Table 7.

Table 7

PROJECT SPONSOR LIMITS

	SWEPSCO	TCC	TNC
HTR SOP Projects	\$100,000	\$125,000	\$50,000

These limits may be waived if AEP determines that such limits would prevent it from achieving its energy efficiency goal.

3.3. Incentive Budget for Underserved Counties

AEP has also set aside a maximum budget for incentives paid at the Underserved Counties rate. Table 8 shows Large and Small Project maximum budgets for Underserved Counties. Incentives for Underserved Counties are available on a first-come, first-served basis. The maximum budgets for Underserved Counties will be reduced as project sponsors add customers and installations in any of the counties designated as Underserved in Appendix C, until the maximum budget has been exhausted. Once exhausted, installations may still be reported for underserved counties but incentives will be paid at the applicable Standard or Underserved Measures rate. AEP reserves the right to transfer funds as needed to or from the standard and underserved incentive budgets.

Table 8

BUDGETS FOR UNDERSERVED COUNTIES		
SWEPCO	TCC	TNC
\$210,000	\$600,000	\$25,000

3.4. Program Release Dates and Funding

Table 9

PROGRAM RELEASE DATES AND FUNDING			
Release	SWEPCO	TCC	TNC
HTR SOP Projects – February 10, 2010	\$525,000	\$1,640,984	\$241,871

No Project Sponsor has unconditional entitlement or preferential rights to any HTR SOP incentive funds. Failure to comply with all program requirements may result in a project sponsor’s termination from the program.

3.5. Project Sponsor Budget Caps

AEP will review the Project Applications from Project Sponsors on a first-come, first-served basis and on merit of the Project Sponsor. All approved applicants will be eligible to reserve up to \$5,000 at a time for work on Single-Family properties and up to \$25,000 at a time for approved Multi-Family properties, until all HTR SOP incentive funds have been reserved. **Only one type of reservation may be open at a time.** Pre-Approval of Multi-Family projects is required to hold a Multi-Family budget reservation through the use of the Multi-Family Template. The Project Sponsor limits are set forth in Table 7 above.

As mentioned above, a Project Sponsor may reserve up to \$5,000 for Single-Family or \$25,000 for Multi-Family for a 30-day period. After the Project Sponsor has exhausted the reservation or when the 30-day period is up, the Project Sponsor may make another budget reservation request, depending on the amount invoiced.

4. PROGRAM PROCESS AND TIMELINE

4.1. Applications

AEP's Program website, www.aephtrsop.com, will be the key informational resource for the HTR SOP. Project Sponsors should check this website regularly for all program updates. The application forms, instructions, frequently-asked questions, and helper applications are accessible on the website.

All applications must be completed and submitted on-line. Interested contractors may fill out an application before the submittal date. They may enter the information, save, and return at a later time to make adjustments or changes.

All information **MUST** be entered in the application. If necessary, use the designation **N/A** for "not applicable". All information must be correct for serious consideration of the application.

AEP will not reimburse any Project Sponsor for any costs incurred by participating in the HTR SOP, including costs of preparing the Project Application, reviewing or executing the HTR SOP Agreement, or preparing and submitting implementation or performance reports.

A copy of the HTR SOP Agreement that will be executed by AEP and the Project Sponsor prior to project implementation is located on the website under *Downloads/Tools*.

4.1.1 Application Timeline

AEP will update its application web page for each component at the times shown in Table 10. On the application submittal day, at the time scheduled below, AEP will activate a "submit button." Project Sponsors can submit their applications when this button becomes active. Project Applications will be accepted at the following time:

Table 10

APPLICATION TIMELINE

October 26, 2009	Register and begin completing applications
February 10, 2010 @ 10:00 am, CST	Budget Reservations begin

Project Applications will be accepted until the funding has been committed, or until September 30, 2010, whichever comes first. In the event Budget Reservations are received after program funding has been committed, AEP will retain those for consideration to the extent that any additional funding becomes available during the program year. AEP will utilize its mail server's time stamp to determine the order of receipt. Confirmation of the receipt of the application will be sent via return e-mail.

4.1.2. Supplemental Documentation Requirements

All applicants wishing to install Duct Efficiency or Infiltration measures must submit a document stating the step-by-step process of your testing procedures, including the type of testing equipment you will be using. This document should be received within 24 hours of application submittal.

Testing Procedures must be submitted by e-mail to the appropriate Program Administrator within 24 hours of submitting the internet application.

4.2. Application Review Procedures

AEP will review the Project Applications on a first-come, first-served basis and on merit of Project Sponsor. To ensure a comprehensive program targeting all eligible customers and measures while achieving its demand and energy goals, AEP will award contracts based upon the Project Sponsor's qualifications and targeted counties and measures until all HTR SOP incentive funds have been reserved. Previous program participation does not guarantee acceptance.

4.2.1. Application Confidentiality

AEP's HTR SOP is subject to oversight by the PUC, which may request a copy of any HTR SOP materials that AEP receives. Sensitive information identified as such and submitted by the Project Sponsor will be treated confidentially to the fullest extent possible, and will not be provided directly to outside parties other than the PUC. AEP shall have no liability of any kind to any Project Sponsor or other party as a result of public disclosure of any submittals.

4.2.2. Application Evaluation

AEP may reject a Project Application if:

- The Project Application is received after the Project Application period has expired
- The Project Application is received after the HTR SOP has been fully subscribed
- The Project Sponsor fails to meet program eligibility requirements
- The Project Sponsor fails to respond to any request for additional information
- The Project Sponsor is found to have made material misrepresentations in the Project Application
- The Project Sponsor fails to comply with applicable federal, state and local laws and regulations
- Changes occur in laws or regulations directly affecting the HTR SOP
- The Project Application is found to be incomplete or insufficient
- The Project Sponsor has performed poorly in previous AEP programs
- AEP, in its sole judgment, determines that the Project Sponsor is incapable of fulfilling the terms and conditions of the HTR SOP Agreement
- The Project Sponsor fails to submit required insurance documentation.

AEP may request clarification of, or additional information about, any item submitted as part of the Project Application. Project Sponsors will have seven (7) business days to respond to such requests. If the clarification or additional information provided is not sufficiently responsive, AEP may, at its sole discretion, request additional information, or discontinue its evaluation of the submittal.

4.2.3. Project Sponsor Approval

AEP will notify each Project Sponsor of its application status within thirty (30) business days of the submittal of the application. AEP will establish a Budget Reservation for each applicant meeting Project Application requirements until all program funds have been reserved. AEP may establish a Budget Reservation less than the amount the Project Sponsor has requested.

Within seven (7) business days of the Project Application's pre-approved status notification via email, the Project Sponsor must provide AEP with the following, as directed in the pre-approved email:

- Two (2) signed copies of the HTR SOP Agreement
- Evidence of Insurance as required in the HTR SOP agreement. Certificates of Insurance (COI) must be mailed directly from the insurance agency to the attention of the appropriate

AEP program administrator. Failure to submit or maintain the required insurance will result in a lock out of the Project Sponsor from the database and possible dismissal from program participation. All COI's shall show the certificate holder as:

American Electric Power Company, Inc. and its Subsidiaries,
American Electric Power Service Corporation, as agent
[to the attention of the appropriate program administrator shown below]

- Any other documentation noted in the approval email

All documents and COI's must be mailed to the appropriate Program Administrator as listed below. *AEP is not responsible for documents not addressed to the attention of the appropriate Program Administrator:*

AEP Texas Central Company

Attn: Vee Strauss
2901 East Mockingbird Lane
Victoria, TX 77904
Phone: (361) 574-2252
sv Strauss@aep.com

AEP Texas North Company

Attn: Gary J. Throckmorton
910 Energy Drive
Abilene, TX 79602
Phone: (325) 674-7341
gjthrockmorton@aep.com

AEP Southwestern Electric Power

Attn: Paul E. Pratt, Jr.
428 Travis Street
Shreveport, LA 71101
Phone: (318) 673-3542
pepratt@aep.com

It is the sole responsibility of the Project Sponsor to ensure that AEP receives the required supplemental materials by close of business on the applicable due date. **Faxed submittals are not acceptable.**

Once a Project Sponsor's application has been approved and the Agreement executed, the AEP Program Administrator will allow the Project Sponsor to access the Implementation section of the appropriate RES website.

4.3. Marketing

Under PUC rules, AEP may only conduct informational activities to explain the program to energy efficiency service providers and vendors. As a result, AEP must rely upon the marketing capabilities of Project Sponsors for the success of the program to AEP's distribution customers. AEP will not directly market any energy efficiency-related product or service to its customers.

Project Sponsors may not use the AEP name or logo in any correspondence or promotional material; however, Project Sponsors are encouraged to use the one-page brochure provided by AEP and available on the program website. Any other marketing materials must be approved by AEP prior to their use. Examples of acceptable and non-acceptable phrases are in Appendix F. AEP reserves the right to terminate the contract of any Project Sponsor using marketing materials containing any unapproved reference to AEP.

Upon receipt of the countersigned contract and AEP approval of marketing materials, the Project Sponsor may begin marketing and installation activities.

AEP maintains an alphabetical listing of participating Project Sponsors on its main program website, www.aepefficiency.com. This site may be used for Project Sponsor verification by the prospective customer. AEP also strongly encourages Project Sponsors to register with the Better Business Bureau(s) in those areas in which work is planned.

Entering into an agreement with AEP as a Project Sponsor does not imply AEP's endorsement or approval of any company, product, or service.

4.4. Implementation

Project Sponsors may begin work upon the receipt of the "Approved" email notice from the database. All installations must be submitted on an Invoice Report within 45 days of the installation.

The **Host Customer Agreement and Acknowledgement (HCA)** is the primary agreement executed between the Host Customer and the Project Sponsor prior to measure installation. The PUC requires that HCAs contain certain consumer protection provisions and disclosures.

All Project Sponsors are required to use the AEP-provided HCA form. The HCA must be signed and dated by the Project Sponsor; the Host Customer; and if applicable, the subcontractor. HCA forms will be sent to Project Sponsors upon approval and contract execution. Additional forms will be provided to Project Sponsors when requested via e-mail.

The **Self Certification Form of Income Eligibility** is also required of the HTR SOP. These forms are to be used by customers to certify hard-to-reach eligibility. Such form must be submitted for every Host Customer with the invoice paperwork following measure installations.

4.4.1. Prescriptive Requirements for Infiltration Measures

To qualify for incentives, a minimum air leakage reduction of 10% of the pre-installation blower-door CFM reading is required. This measure must be completed, including the post-installation CFM reading, prior to starting the duct efficiency measure, if applicable. In addition to meeting the installation standard in Appendix G, unless contraindicated for health and safety reasons, the following interior leakage points shall be treated as part of this measure, **if applicable**:

- Attic access;
- All plumbing penetrations;
- Weather-stripping and a door sweep or threshold with door bottom weather-stripping on all exterior doors;
- Missing or broken window panes and other building envelope penetrations;
- Furnace closet door: For homes with gas space heating, louvered doors or open ceilings to gas space heater closets may not be sealed off to reduce air infiltration unless an outside air source is installed according to applicable building and safety codes. Any sealing of louvered doors and the installation of an outside air source must be inspected by appropriate local, county, or state governmental building inspectors.

Failure to complete the prescriptive requirements will result in a total measure failure regardless of the CFM reading.

4.4.2. Prescriptive Requirements for Duct Efficiency Measures

If both infiltration and duct efficiency measures are installed, infiltration measures must be done prior to performing duct efficiency measures. To qualify for incentives for duct efficiency

measures, in addition to meeting the installation standard in Appendix G, the following prescriptive requirements also apply, **if applicable**:

- Seal return air chase
- Seal plenum
- Seal all supply and return registers
- Check the condition of duct work in unconditioned space and seal or repair as necessary

Failure to complete the prescriptive requirements will result in a total measure failure regardless if it meets the CFM reading requirement.

4.4.3. Prior to Installation

1. Subcontractors must be approved by AEP prior to beginning installations.
2. Upon prior notice from the program manager, project sponsors may be required to submit daily work schedules, if AEP deems it necessary to review work in progress.
 - Multi-family projects will require pre-approval of the site and measures via the program website.
 - For multi-family projects, the Project Sponsor must submit a work schedule at least seven (7) days prior to beginning installations via the program website.
3. Host Customer must sign and date the HCA.

A CO test is required for all air infiltration installations where combustion appliances exist.

AEP will not consider payment for installations submitted without the proper pre-approvals.

4.4.4. Post –Installation

Each customer must sign and date the HCA upon completion of the project to verify the measures were installed as stated. The HCA provides AEP with permission to inspect the installation, which may be required before incentive payments are approved. **The customer copy of the completed and signed HCA must be provided to the customer.**

If a subcontractor was used, Project Sponsor must provide the customer with an **All Bills Paid Affidavit**. A copy of the document is available on the website.

A CO test is required for all air infiltration installations where combustion appliances exist.

4.5. Reporting

Reporting and invoicing will be done via the website. The Project Sponsor will then mail hard copies to the program administrator.

Installations must be recorded on the website database on a monthly basis and before the 30-day incentive reservation period ends.

The Project Sponsor may enter the data for each installation either individually or all at one time, as long as the installation is entered and submitted on the Invoice Report within 45 days of the installation date. The following information is required for each Project completed:

- Customer type (Mobile Home or Single Family)
- Customer name and address

- AEP ESI ID number (TCC and TNC)*
- Best day-time phone number
- County
- Type of Heating
- List of installed measures

*AEP Texas Central customers: ESI IDs begin with 100327894.

*AEP Texas North customers: ESI IDs begin with 102040497.

*SWEPCO is located outside the Texas competitive retail market. SWEPCO will be clearly identified on all Customer electric bills, a copy of which must be submitted along with the incentive application.

For apartment complexes, AEP will allow use of the office ESI ID and one HCA and Property Owner Income Eligibility Form signed by the appropriate authority of the apartment complex.

4.6. Invoicing

On or before the last day of the month, the Project Sponsor is required to submit an **Invoice Report**. All installations must be invoiced within 45 days of installation. To generate the **Invoice Report**, from the *Invoice Menu*:

- Select “Invoices”
- Select “Eligible Customer List”
- Click on “Select All” or select the customers that are to appear on this month’s invoice
- Put an invoice number in the box
- Click on “Submit Invoice”
- Review for accuracy then click on “Confirm”
- Print the Invoice Summary

Mail the Invoice Report and the AEP copy of the signed HCA forms for each customer and Income Eligibility forms to the appropriate AEP Program Administrator. This close out must be completed by the last day of the month.

Project Sponsors requesting payment for Deemed Savings Measures may request payment for 100% of eligible incentives based on deemed savings values for installed measures.

4.7. Invoice Review Procedures

4.7.1. Installation Inspections

All measures installed in the HTR SOP must conform to or exceed the standards listed in Appendix G – Deemed Savings. AEP will inspect a random sample of customer sites to determine if each measure has been installed properly and is capable of performing its intended function. If measures installed do not meet the inspection standards, they will not be eligible for incentives.

If AEP is unable to inspect measures installed at the customer’s location, those measures may be counted as failures.

4.7.2. Invoice Adjustments

After field inspections are completed, all installations will be evaluated on a measure-by-measure basis to calculate an adjustment factor for the incentive payment. This adjustment factor

will be the ratio of the incentive total for all measures that pass inspection to the total incentive for all measures tagged for inspection. **The adjustment factor will then be applied to the un-inspected sites.**

The algorithm for calculating the adjustment factor is described below:

$$\text{Adjustment Factor} = \frac{\text{Incentive total for measures that pass inspection}}{\text{Incentive total for all measures tagged for inspection}}$$

In instances where all measures pass inspection, the adjustment factor is 1.00. This assumes all figures on the Invoice Report are correct. If only 75% of the inspection sample passes inspection, the adjustment factor will be .75; only 75% of the invoice will be paid. If the Project Sponsor disagrees with the payment adjustment, the Project Sponsor may request that all information be reviewed again after the Project Sponsor provides additional clarifying information. If the Project Sponsor and AEP cannot agree on the adjustments after the review, the Project Sponsor and AEP must use the dispute resolution mechanisms that are specified in the program agreement.

4.7.3. Accurate and Timely Reporting

Accurate reporting is of key importance in calculating savings achieved. AEP may prohibit a project sponsor from submitting certain measures if problems occur repeatedly in accurately reporting of required information such as square footage and air conditioner size. All installations will be entered and submitted on the Invoice Report within 45 days of the installation date. Failure to adhere to the reporting requirements may be cause for termination of the contract.

4.7.4. Excessive Failures

AEP reserves the right to limit the measures a project sponsor is allowed to install or to terminate contracts due to excessive failures.

4.7.5. Payment of Invoice

Payment terms are net 45 days. Payment will be processed when the inspections are completed and the invoice has been adjusted.

AEP'S PAYMENT OF INCENTIVE PAYMENT(S) TO PROJECT SPONSOR IS EXPRESSLY AND SPECIFICALLY CONDITIONED UPON AEP RECEIVING ALL REQUIRED NOTICES, SUBMITTALS AND MATERIALS FROM PROJECT SPONSOR WITHIN THE APPLICABLE PERIOD SPECIFIED IN THIS MANUAL AND THE AGREEMENT. FAILURE BY PROJECT SPONSOR TO DELIVER ANY REQUIRED NOTICE, SUBMITTAL, OR MATERIAL WITHIN THE APPLICABLE PERIOD SPECIFIED IN THIS AGREEMENT SHALL BE DEEMED A MATERIAL BREACH OF THE AGREEMENT.

APPENDIX A

Glossary

- A -

Affiliate: As adopted by the PUCT, an Affiliate is:

- (A) a person who directly or indirectly owns or holds at least 5.0% of the voting securities of an energy efficiency service provider;
- (B) a person in a chain of successive ownership of at least 5.0% of the voting securities of an energy efficiency service provider;
- (C) a corporation that has at least 5.0% of its voting securities owned or controlled, directly or indirectly, by an energy efficiency service provider;
- (D) a corporation that has at least 5.0% of its voting securities owned or controlled, directly or indirectly, by:
 - (i) a person who directly or indirectly owns or controls at least 5.0% of the voting securities of an energy efficiency service provider; or
 - (ii) a person in a chain of successive ownership of at least 5.0% of the voting securities of an energy efficiency service provider; or
- (E) a person who is an officer or director of an energy efficiency service provider or of a corporation in a chain of successive ownership of at least 5.0% of the voting securities of an energy efficiency service provider;
- (F) a person who actually exercises substantial influence or control over the policies and actions of an energy efficiency service provider;
- (G) a person over which the energy efficiency service provider exercises the control described in subparagraph (F) of this paragraph;
- (H) a person who exercises common control over an energy efficiency service provider, where "exercising common control over an energy efficiency service provider" means having the power, either directly or indirectly, to direct or cause the direction of the management or policies of an energy efficiency service provider, without regard to whether that power is established through ownership or voting of securities or any other direct or indirect means; or
- (I) a person who, together with one or more persons with whom the person is related by ownership, marriage or blood relationship, or by action in concert, actually exercises substantial influence over the policies and actions of an energy efficiency service provider even though neither person may qualify as an affiliate individually.

- B -

Baseline: For purposes of determining estimated and measured energy savings for equipment replacement projects implemented under the SOP, the baseline is generally defined as the energy consumed by equipment with efficiency levels that meet the applicable current federal standards and reflects current market conditions. In certain limited circumstances, the baseline may be determined by the equipment or conditions currently in place. This is likely to occur only when federal energy efficiency standards do not apply, or when the existing equipment can be shown by the Project Sponsor to have a remaining service life of at least ten years. For determining estimated and measured savings for building shell improvements, the baseline is generally determined by the building's current condition, e.g., existing insulation r-values, air infiltration rates, etc.

Budget Reservation: The amount of incentive funds AEP sets aside during the project implementation phase for a given Project Sponsor who has submitted a successful application prior to AEP's complete commitment of funds through Budget Reservations to other Project Sponsors.

- D -

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

Demand Savings: A quantifiable reduction in the rate at which energy is delivered to or by a system at a given instance, or average over a designated period, usually expressed in kilowatts (kW) or megawatts (MW).

- E -

Energy-Efficiency Measures (EEM): Equipment, materials, and practices that when installed and used at a customer site result in a measurable and verifiable reduction in either purchased electric energy consumption, measured in kilowatt-hours (kWh), or peak demand, measured in kW, or both.

Energy Efficiency Project: An energy efficiency measure or combination of measures installed under an SOP Agreement or a market transformation contract that results in both a reduction in customers' electric energy consumption and peak demand, and energy costs.

Energy Efficiency Service Provider: A person who installs energy efficiency measures or performs other energy efficiency services.

Energy Savings: A quantifiable reduction in a customer's consumption of energy, or the amount by which energy consumption is reduced as a result of the installation of qualifying Energy-Efficiency Measures. Energy savings are determined by comparing the efficiency of the installed Measures to that of an appropriate Baseline.

Existing Equipment: The equipment that is installed at the host customer's site prior to the customer's participation in the SOP.

- H -

Host Customer or Customer: A residential distribution customer of AEP that owns or leases facilities at a Project Site or Sites and that has entered into a Host Customer Agreement with Project Sponsor for the installation of Measures as a part of Project.

- I -

Implementation Payment: The first of two incentive payments made to a Project Sponsor. The implementation payment is for 40% of the total estimated incentive amount as specified in the SOP Agreement. A Project Sponsor may submit an invoice for this payment following AEP's approval of the Project Sponsor's Project Implementation Report (PIR).

Incentive Payment: Payments made to an Energy Efficiency Service Provider based on the level of approved demand and energy savings (expressed as kW and kWh). Incentive rates are based on Commission approved avoided costs and incentive caps.

Inspection: Onsite examination of a project to verify that a measure has been installed and is capable of performing its intended function.

- M -

Measurement and Verification Plan: The Project Sponsor's specific plan for verifying measured savings estimates. The measurement and verification (M&V) plan should be consistent with the International Performance Measurement and Verification Protocol.

Measured Energy Savings: The Energy Savings derived during Performance Period, from the Measures installed at the Project Site as determined in accordance with the Measurement and Verification Plan set forth in Exhibit C of the SOP Agreement.

- P -

Peak Demand: The electrical demand at the time of the highest annual demand on the utility's system, measured in 15 minute intervals.

Peak Demand Reduction: Peak demand reduction on the utility system during the utility system's peak period, calculated as the maximum average demand reduction over a period of one hour during the peak period.

Peak Period: For the purposes of this program, the peak period is defined as the hours from 1 PM to 7 PM CDT weekdays, from June 1 through September 30 (federal holidays and weekends excluded).

Performance Period: The one-year period, for weather-dependent measures or shorter for non weather-dependent Measures, following the approval of a Project Sponsor's Project

Implementation Reports. It is during this period that measurement and verification is to take place.

Performance Payment: The second of two incentive payments made to a Project Sponsor under the terms of an SOP Agreement. The performance payment is based on the one-year measured energy savings documented in AEP's M&V Report and may be up to 60% of the total estimated incentive included in the SOP Agreement.

Program Manual: The complete set of AEP HTR SOP materials, including the program description, procedures and forms.

Project Application: The Project Application, comprising of a set of standard forms, is submitted by an organization wanting to participate in the SOP as a Project Sponsor.

Project Site: The location of a Host Customer's facilities where approved Measures will be installed and from which Peak Demand Savings or Energy Savings, or both, will be obtained. A single Project may include Measures installed at multiple Project Sites.

Project Sponsor: Any organization, group, or individual who contracts with AEP to provide Energy Savings or Peak Demand Savings, or both, under the SOP.

Prudent Electrical Practices: Those practices, methods, standards, and equipment commonly used in prudent electrical engineering and operations to operate electrical equipment lawfully and with safety, dependability, and efficiency and in accordance with the National Electrical Safety Code, the National Electrical Code, and any other applicable federal, state and local codes. In the event of a conflict, the applicable federal, state, or local code shall govern.

- R -

Renewable Demand Side Management (DSM) Technologies: Equipment that uses a renewable energy resource that, when installed at a customer site, reduces the customer's net purchases of energy (kWh), electrical demand (kW), or both.

- S -

SOP Agreement: A contract entered into by the Project Sponsor and AEP following the approval of the Project Sponsor's project application and AEP's design of a project-specific M&V plan. The SOP Agreement specifies the energy-efficiency measures to be installed, the expected energy savings, the expected total incentive payment, and the agreed-upon M&V approach.

APPENDIX B
Service Area Maps

AEP Texas Distribution Companies – Counties Served

AEP-Texas Central Company

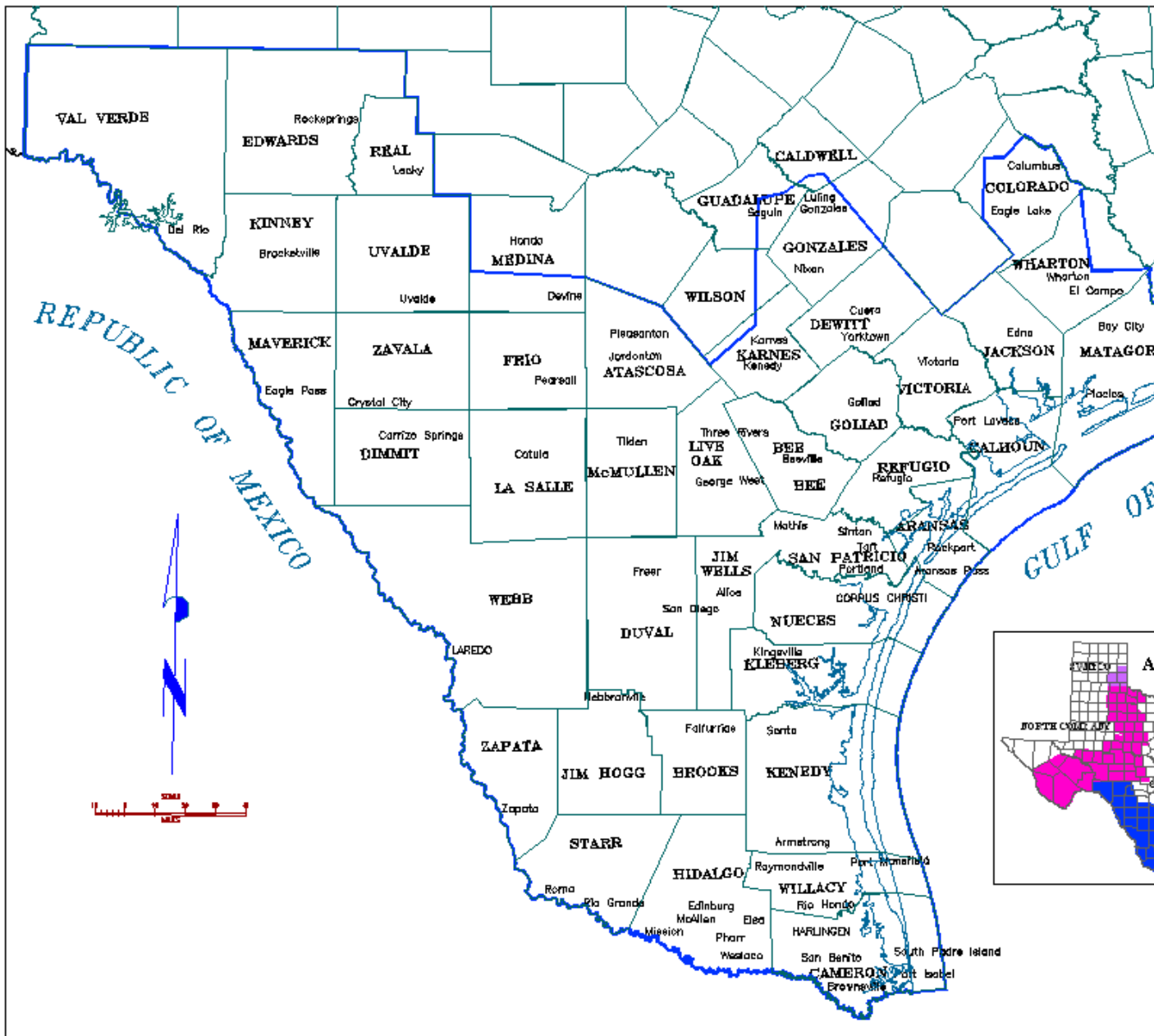
County	Zone	County	Zone
Aransas	4	Kinney	3
Atascosa	3	Kleberg	4
Bee	3	LaSalle	3
Brooks	4	Live Oak	3
Caldwell	3	Matagorda	3
Calhoun	4	Maverick	3
Cameron	4	Medina	3
Colorado	3	McMullen	3
DeWitt	3	Nueces	4
Dimmit	3	Real	2
Duval	4	Refugio	4
Edwards	2	San Patricio	4
Frio	3	Starr	4
Goliad	3	Uvalde	3
Gonzales	3	Val Verde	3
Guadalupe	3	Victoria	3
Hidalgo	4	Webb	4
Jackson	3	Wharton	3
Jim Hogg	3	Willacy	4
Jim Wells	4	Wilson	3
Karnes	3	Zavala	3
Kenedy	4	Zapata	4

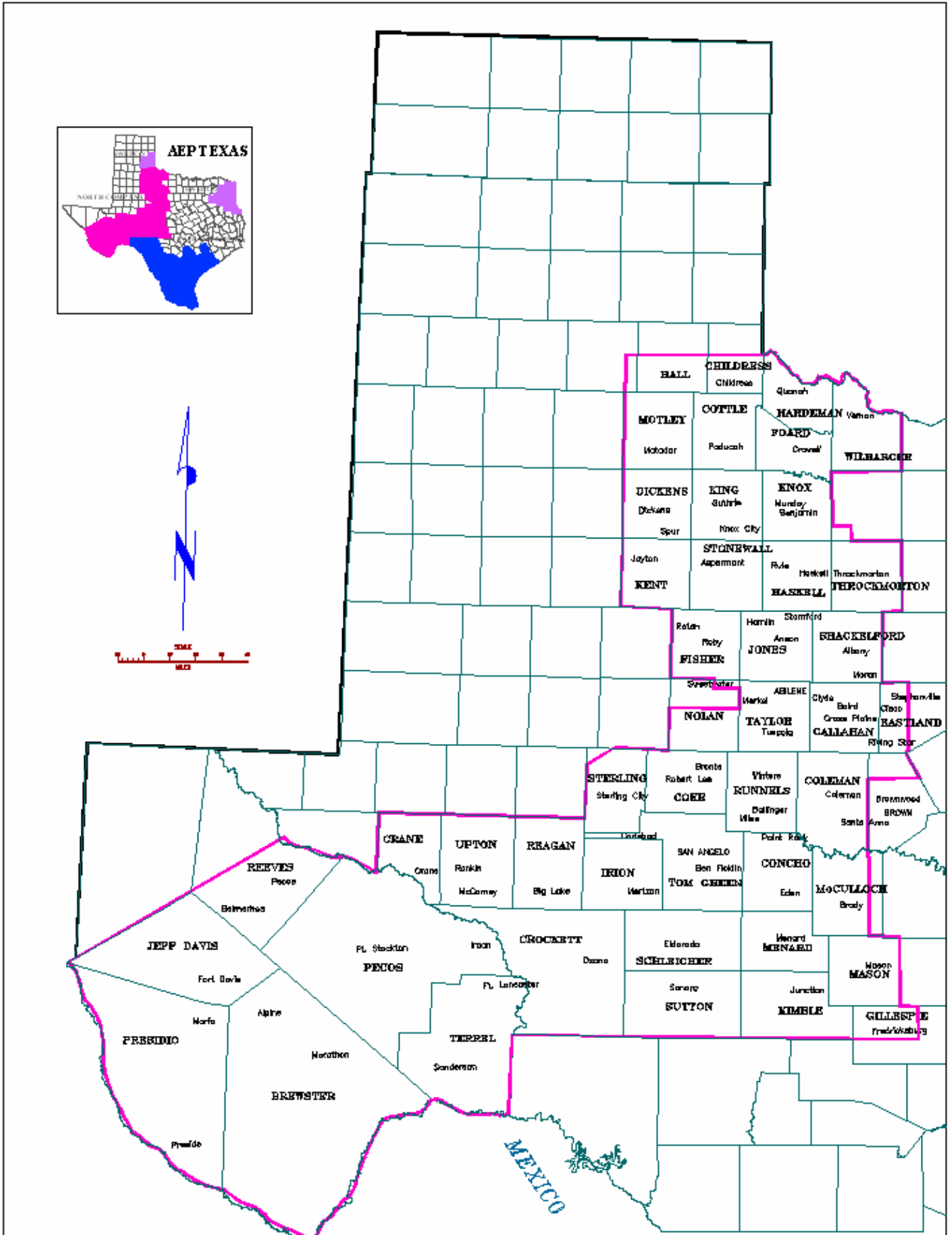
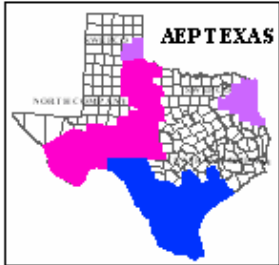
AEP-Texas North Company

County	Zone	County	Zone
Baylor	2	Kimble	2
Brewster	2	King	1
Briscoe	1	Knox	1
Brown	2	Mason	2
Callahan	2	McCullough	2
Childress	1	Menard	2
Coke	2	Motley	1
Coleman	2	Nolan	2
Concho	2	Pecos	2
Cottle	1	Presidio	2
Crane	2	Reagan	2
Crockett	2	Reeves	2
Dickens	1	Runnels	2
Eastland	2	Schleicher	2
Edwards	2	Shackelford	2
Fisher	2	Stephens	2
Foard	1	Sterling	2
Gillespie	2	Stonewall	1
Hall	1	Sutton	2
Hardeman	1	Taylor	2
Haskell	2	Throckmorton	2
Irion	2	Tom Green	2
Jeff Davis	2	Upton	2
Jones	2	Wheeler	1
Kent	1	Wilbarger	1

AEP-SWEPCO

County	Zone
Camp	2
Cass	2
Franklin	2
Hopkins	2
Marion	2
Morris	2
Red River	2
Shelby	2
Smith	2
Titus	2
Van Zandt	2
Wood	2





Appendix C Underserved Counties

AEP Texas Central Company's HTR SOP 2010 Underserved Counties

Atascosa	Gonzales	Real
Bee	Guadalupe	Refugio
Brooks	Jackson	Uvalde
Caldwell	Kenedy	Val Verde
Colorado	Kinney	Wharton
DeWitt	La Salle	Wilson
Dimmit	Live Oak	Zapata
Edwards	Maverick	Zavala
Frio	McMullen	
Goliad	Medina	

AEP Texas North Company's HTR SOP 2010 Underserved Counties

Baylor	Gillespie	Reagan
Brewster	Irion	Reeves
Brown	Jeff Davis	Runnels
Coke	Kimble	Schleicher
Coleman	Mason	Stephens
Concho	Menard	Sterling
Crane	Pecos	Sutton
Crockett	Presidio	Upton
Edwards		

AEP SWEPCO's HTR SOP 2010 Underserved Counties

Camp	Titus
Cass	Van Zandt
Franklin	Wood
Hopkins	
Marion	
Morris	
Red River	
Shelby	
Smith	

APPENDIX D

CARBON MONOXIDE TEST SPECIFICATIONS

Test Equipment

Carbon monoxide sensing device must have a range from 0-2000 ppm; accuracy +/- 5% of readout; and readout resolution = 1 ppm adjustable to 0.

Ambient Air Test

Conduct test at initial assessment. Every housing unit that has combustion equipment shall be tested. If more than 9 ppm CO is detected, air infiltration reduction measures shall not be installed until the CO problem has been corrected. Host customer should always be informed of the existence of high levels of CO and advised to take precautions until abatement can be performed.

No energy efficiency measure that could result in a decreased ventilation rate for that housing unit shall be installed if the installation of such measure would or could result in ambient air CO levels exceeding 9 ppm within the housing unit.

APPENDIX E FORMS

All Bills Paid Affidavit

Host Customer Agreement & Acknowledgement

Income Eligibility Verification Form

Property Owner Income Eligibility Verification Form

**AFFIDAVIT OF PAYMENT OF CONTRACTORS,
LABORERS, AND MATERIALMEN**

Date: _____
Affiant: _____
Host Customer: _____
Property: _____

Affiant on oath swears that the following statements are true:

1. Affiant is the seller and the installer of the high efficiency materials and equipment as described on the accompanying Host Customer Agreement.
2. Affiant has paid each of Affiant's contractors, laborers, and materialmen in full for all labor and materials provided to Affiant for the purchase and installation of the high efficiency measures. Affiant is not indebted to any person, firm, or corporation by reason of any such construction.
3. Affiant hereby warrants that no mechanics or materialmen's liens will be placed on Host Customer's property relating to the installation of high efficiency measures.

Affiant Signature

Affiant Name and Position

Acknowledgement

STATE OF TEXAS §

COUNTY OF _____ §

This instrument was acknowledged before me on the ____ day of _____, _____, by seller.

Notary Public, State of Texas

2010 HOST CUSTOMER AGREEMENT & ACKNOWLEDGEMENT

This Agreement is entered on this day _____ between the following two parties;

(Date)

_____, _____, _____, TX,
_____, and _____
(Host Customer/Title) (Street Address) (City) (State) (Zip Code) (Best
Daytime Phone Number)

_____, _____, _____, _____,
_____, and _____
(Project Sponsor) (Street Address) (City) (State) (Zip Code) (Phone
number)

Project Sponsor is participating in one of the following Standard Offer Programs ("SOP") developed by American Electric Power ("AEP"):

Check One: Hard-to-Reach SOP Residential SOP

Project Sponsor and Customer agree as follows:

1. Project Sponsor agrees to sell and install and Customer agrees to purchase the energy efficiency measures described on the **Bill of Sale** that will produce energy savings and/or peak demand savings that are qualified for the SOP.
2. Project Sponsor warrants that it will install all energy efficiency equipment or materials in a good and workman-like manner consistent with the prevailing standards for efficiency measure installation as practiced by qualified contractors in the area and inform Customer of any adverse environmental or health effects associated with the measures installed.
3. Customer has received a list of equipment to be installed (quantity, model #s and efficiency ratings): **(Refer to Bill of Sale)**
4. Project Sponsor will maintain, or will ensure subcontractor maintains, liability insurance to cover property damage.
5. Customer has received a written and oral disclosure of the financial arrangement between Project Sponsor and Customer. This includes an explanation of the total Customer payments, the total expected interest charged, all possible penalties for non-payment, and whether Customer's installment sales agreement may be sold: **(Refer to Bill of Sale)**.
6. Customer has received a written disclosure of all warranties, work activities and terms and conditions: **(Refer to Bill of Sale)**
7. If a subcontractor is used, Project Sponsor shall provide Customer an "All Bills Paid" affidavit guaranteeing that no mechanic's or materialmen's liens will be placed on Customer's property relating to the installation of energy efficiency measures pursuant to this Agreement.
Subcontractor: _____ Address _____
Phone #: _____ If a subcontractor is used, subcontractor must sign where indicated below.
8. Project Sponsor will provide a complaint procedure for Customer to address performance issues by the Project Sponsor or subcontractor.
9. In the event of non-performance by Project Sponsor or the subcontractor, Customer may make a complaint to the Office of Customer Protection of the Public Utility Commission of Texas (PUCT) at 1-888-782-8477 (TTY 1-800-735-2988) or the Office of the Attorney General's Consumer Protection Hotline at 1-800-621-0508.
10. Customer shall have the right to cancel this Agreement at any time and for any reason prior to midnight of the third business day following the date of this Agreement. Customer may

exercise this right of cancellation by providing Project Sponsor any written statement that is signed and dated by Customer and states Customer's intention to cancel this Agreement.

11. Customer acknowledges that Project Sponsor is receiving an incentive for the energy and peak demand savings derived from Customer's energy efficiency improvements and that such incentive is paid for through a ratepayer funded program, manufacturers or other entities. In addition, the Project Sponsor must measure and report to the utility the respective energy and demand savings.
12. Customer acknowledges that any review, inspection, or acceptance by AEP of Customer's premises or of the design, construction, installation, operation or maintenance of the energy efficiency equipment is solely for the information of AEP. In performing any such inspection or review or in accepting the installed equipment, AEP makes no representation or warranty whatsoever as to the economic or technical feasibility, capability, safety or reliability of the equipment, its installation by Project Sponsor or its compatibility with Customer's facilities.
13. Customer acknowledges that Project Sponsor is an independent contractor and is not part of, nor endorsed by the PUCT or by AEP, and that Project Sponsor is not authorized to make representations or incur obligations on behalf of AEP. Customer further acknowledges that AEP is not a party to Customer Agreement and that Project Sponsor and Customer are solely responsible for performance hereunder.
14. Customer acknowledges that AEP makes no warranty or representation regarding the qualifications of Project Sponsor, and that the Customer is solely responsible for the selection of Project Sponsor.
15. Customer acknowledges AEP will play no role in resolving any disputes that arise between Customer and Project Sponsor; however, Customer may register a complaint against Project Sponsor on the program website, aepefficiency.com.
16. Customer acknowledges they are a **residential** distribution customer of AEP.

AEP ESID number(s) for this project: _____(for SWEPCO TX customers list meter #s or account #s)

17. Customer agrees, upon three (3) days' prior oral notice, to provide AEP and the independent measurement and verification expert selected by the PUCT with full and complete access to Customer's property for any purpose related to the SOP. The right of access will be subject to Customer's reasonable access requirements and, unless otherwise agreed, must occur within the normal business hours of Customer.
18. Customer agrees to provide AEP with access to Customer's utility bills, project documentation, contractor invoices, and technical and cost information directly related to the project.
19. No energy efficiency service provider, manufacturer, or other business involved in providing your energy efficiency improvements may ask or require you, the Customer, to give up your rights under consumer protection statutes, waive performance warranties, or make false claims of energy savings and reductions in energy costs.

The parties have signed this Agreement as of the date first written above.

Project Sponsor: ► _____

Subcontractor:



(Date)

(Signature)

(Date)

(Signature)

▶ I have executed and been given a copy of the Host Customer Agreement.
▶ _____
Representative) (Date) (Signature - Customer or Authorized

▶ The measures described on this form have been installed to my satisfaction.
▶ _____
Representative) (Date) (Signature - Customer or Authorized

White-Customer Yellow-AEP Pink-Project Sponsor

Public Utility Commission of Texas
Self Certification Form of Income Eligibility for Full Incentive Energy Efficiency Services

This statement is made to verify my household income. The Public Utility Commission of Texas has authorized energy efficiency programs to reduce the utility bills of income eligible households. Contractors participating in the programs receive higher incentive payments when you are income eligible. The purpose of the higher payment is to enable the contractor to provide the improvements at very low cost or at no cost to you.

Name		
Street Address		Apartment Number
City		TX Zip Code
Area Code ()	Phone Number	Number of Persons in Household

I currently qualify in one of the following categories. Check the appropriate category box.

Category 1

I receive benefits from one or more of the programs listed below (check each box that

Food Stamps	Medical Assistance	Temporary Assistance to Needy Families
Supplemental Security Income	Children's Health Insurance Program	Qualified Medicare Beneficiary
Public Housing, Section 8 Housing, or Other Housing Authority Assistance		

applies):

Participating in this program will not affect your eligibility for other program benefits. If you checked one or more of the boxes in Category 1, please sign and date the form

Category 2

My total household income before taxes is at or below the amount shown in the table below as determined by completing the Income Calculation Worksheet at the bottom of this form. **(Do not check this box before completing the worksheet.)**

INCOME CALCULATION WORKSHEET

Step 1-Fill out the Income Calculation Worksheet.

*Instructions: **Do not** complete this worksheet if you checked any of the boxes in Category 1. To accurately determine your **household income** you must include the income of all persons residing in your home from all sources. To determine the amount of income in each category enter the amount(s) on the check or benefit statement.*

Amount per week / month / year (circle one)

Wages from full or part-time employment as shown on paystub or W-2 form: _____

Unemployment or Worker's Compensation _____

Social Security _____

Retirement Income _____

Child Support and/or Alimony _____

All other earnings _____

TOTAL HOUSEHOLD INCOME _____

(Add the amount entered on each line to figure your total household income.)


Step 2. Compare your total household income per week, month or year to the amount shown in the table below for the number of persons in your household. If your total household income is equal to or less than the amount shown in the table you are income eligible. Please check the box next to Category Two and sign and date the form.

2009 HTR Income Eligibility Guidelines*
April 1, 2009 through March 31, 2010

Household Size	2009 Eligibility Guideline		
	Annual Income	Monthly Income	Weekly Income
1	\$21,660	\$1,805	\$417
2	\$29,140	\$2,428	\$560
3	\$36,620	\$3,052	\$704
4	\$44,100	\$3,675	\$848
5	\$51,580	\$4,298	\$992
6	\$59,060	\$4,922	\$1,136
7	\$66,540	\$5,545	\$1,280
8	\$74,020	\$6,168	\$1,423
For each additional person, add	\$7,480	\$623	\$144

*Income guidelines are updated every April. Project Sponsors should use the updated guidelines when they become available. Please check our website for current guidelines.

Under penalty of perjury, I certify that the above declaration is true and correct. I understand that the information is subject to audit and investigation by the Public Utility Commission of Texas.

Sign Here Keep Copy for your records.		Customer Signature	Date	Contractor Signature	Date

The information provided on this form will be used solely for the purpose of determining whether your household is eligible for this program and will be kept confidential by the contractor and by the Public Utility Commission of Texas. It will not be sold or provided to any other party.

APPENDIX F

MARKETING MATERIAL: ACCEPTABLE AND UNACCEPTABLE

Information has sometimes been relayed to customers that is incorrect or misleading, giving the customer a misrepresentation of the responsibility of the Utility Company. Suggestions are offered here for correct verbiage that can be used. Statements in the second section are incorrect and must NOT be used.

Acceptable phrases:

"The local electric utility company has started an energy conservation program for their customers..."

"This program is offered at subsidized or no cost to the homeowner."

"The electric delivery companies are purchasing the energy savings we have provided you."

"The State of Texas has developed programs to assist qualified electric customers with installing energy saving improvements to help reduce consumption of energy..."

"Current State law requires local electric utilities to make funds available to independent contractors so that you have the opportunity to improve the energy efficiency of your home."

"The Utility Companies typically call about 10% of the customers we do work for to ensure we are following guidelines and proper upgrades have been done."

"...your only obligation may be to allow the utility to inspect our work."

"(Project sponsor) provides free upgrades to your home to lower costs on your electric bill."

"(Project sponsor) is not part of, or endorsed by the PUC or the local electric utility. We are an independent company that provides energy efficiency measures under the programs for electric utilities."

"These funds are provided by rate payers and are regulated by the Public Utility Commission."

"The State of Texas has developed programs to encourage energy service providers to offer energy conservation services to electric customers of investor-owned utilities."

These phrases, or anything similar, are NOT to be used:

"All costs are paid by your electric company."

"Would you like your utility company to pay for energy efficiency upgrades to your home at no cost to you?"

"It is free because we are paid by the utilities"

"We are getting paid but not from you, but by your utility company."

"(Project Sponsor) bills your electric utility for the work performed on your home."

APPENDIX G
DEEMED SAVINGS INSTALLATION AND EFFICIENCY STANDARDS

Deemed Savings, Installation & Efficiency Standards

**Residential and Small Commercial Standard Offer Program
Hard-To-Reach Standard Offer Program**

Prepared by:

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Austin, Texas 78746**

**Updated:
October, 2009**

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DEEMED SAVINGS

All Residential and Hard-To-Reach SOP Measures for Texas Programs

INTRODUCTION

This document contains all of the approved energy and peak demand deemed savings values established for energy efficiency programs in Texas. The figures correspond with the set of residential and small commercial sector deemed savings values approved by the Public Utility Commission of Texas in Project No. 22241. A more detailed description of the methodology used to calculate these savings is found in the Petitions, which may be found at: www.puc.state.tx.us/electric/projects/22241/22241.cfm.

For all envelope measures, e.g., ceiling insulation, ENERGY STAR[®] windows, etc., the presence of electric refrigerated air conditioning is assumed. Separate deemed savings values have been calculated for homes with electric air conditioning / gas heat, for electric air conditioning / electric resistance heat, and for heat pumps.

For climate-sensitive energy efficiency measures, separate calculations have been performed for four different regions of the state:

- Panhandle Region - using typical weather information for Amarillo or Oklahoma City (for windows only).
- North Region - using typical weather information for Dallas or Fort Worth.
- South Region - using typical weather information for Houston or San Antonio (for windows only).
- Valley Region - using typical weather information for Corpus Christi or Brownsville (for windows).

General Installation Standards

Equipment must exceed applicable federal energy standards adopted at the time the Project Sponsor submits the project application.

No used or reconditioned equipment shall be qualified for incentives. All equipment shall be new.

Project Sponsor must follow all state and local building codes. Project Sponsor shall be responsible for licenses, building permits and inspections. Any fees/payments for licenses, building permits, and inspections shall be paid by the Project Sponsor.

CENTRAL AIR CONDITIONER REPLACEMENT

Measure

Residential retrofit of an existing central air conditioning system with a new central air conditioning system in an existing building or the installation of a new central air conditioning system in a new residential construction. A new central air conditioning system includes an entire packaged unit, or a split system consisting of an indoor unit

with a matching remote condensing unit. Maximum cooling capacity per unit is 65,000 Btu/hour.

Baseline

In new construction, the baseline is assumed to be a new central air conditioning system with an ARI-listed SEER rating of 13.0. For retrofit installations, the baseline is assumed to be 12.44. This value incorporates an adjustment to the baseline SEER value to reflect the percentage of current non-program replacements that do not include the installation of an ARI-matched condensing unit and evaporator coil.

Installation & Efficiency Standard

Installation & Efficiency Standard

Air conditioning equipment shall be properly sized to dwelling based on ASHRAE or ACCA Manual J standards.

Manufacturer data sheets on installed air conditioning equipment or ARI reference numbers must be provided.

The central air conditioning equipment must meet the following standard:

- Minimum ARI-listed SEER rating of 14.00
- Minimum ARI-listed EER of 11.5
- Heat pumps must have a minimum ARI-listed HSPF rating of 8.2

Deemed Savings

Central Air Conditioner

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Demand Savings (kW) for 13.0 SEER New Construction Baseline - Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.13	0.15	0.18	0.23	0.30	0.31
2.0	0.17	0.21	0.24	0.31	0.41	0.42
2.5	0.21	0.26	0.30	0.39	0.51	0.52
3.0	0.25	0.31	0.36	0.46	0.61	0.63
3.5	0.30	0.36	0.42	0.54	0.71	0.73
4.0	0.34	0.41	0.48	0.62	0.81	0.83
5.0	0.42	0.51	0.60	0.77	1.01	1.04

Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	218	301	384	456	615	657
2.0	291	401	512	608	820	875
2.5	364	502	639	760	1,025	1,094
3.0	437	602	767	913	1,230	1,313
3.5	510	702	895	1,065	1,434	1,532
4.0	582	803	1,023	1,217	1,639	1,751
5.0	728	1,003	1,279	1,521	2,049	2,188

Central Air Conditioner

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Demand Savings (kW) for 12.44 SEER Retrofit Baseline - Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.22	0.25	0.30	0.37	0.38
2.0	0.26	0.29	0.33	0.40	0.49	0.51
2.5	0.32	0.37	0.41	0.50	0.62	0.63
3.0	0.38	0.44	0.49	0.60	0.74	0.76
3.5	0.45	0.51	0.58	0.70	0.86	0.88
4.0	0.51	0.59	0.66	0.79	0.99	1.01
5.0	0.64	0.73	0.82	0.99	1.23	1.26

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline- Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	323	405	488	560	719	761
2.0	430	540	650	747	959	1,014
2.5	538	675	813	934	1,198	1,268
3.0	645	810	976	1,121	1,438	1,521
3.5	753	945	1,138	1,308	1,677	1,775
4.0	860	1,081	1,301	1,494	1,917	2,029
5.0	1,075	1,351	1,626	1,868	2,396	2,536

Central Air Conditioner

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Demand Savings (kW) for 13 SEER New Construction Baseline - Zone 2

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.12	0.14	0.17	0.23	0.28	0.28
2.0	0.16	0.19	0.22	0.30	0.37	0.37
2.5	0.20	0.24	0.28	0.38	0.46	0.47
3.0	0.24	0.28	0.33	0.45	0.55	0.56
3.5	0.28	0.33	0.39	0.53	0.64	0.65
4.0	0.32	0.38	0.44	0.60	0.73	0.75
5.0	0.39	0.47	0.55	0.75	0.92	0.93

Energy Savings (kWh) for 13 SEER New Construction Baseline - Zone 2

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	319	441	562	667	910	968
2.0	426	587	749	889	1,214	1,291
2.5	532	734	936	1,111	1,517	1,613
3.0	639	881	1,124	1,334	1,821	1,936
3.5	745	1,028	1,311	1,556	2,124	2,259
4.0	852	1,175	1,498	1,778	2,427	2,581
5.0	1,065	1,469	1,873	2,223	3,034	3,227

Central Air Conditioner

Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data

Demand Savings (kW) for 12.44 SEER Retrofit Baseline - Zone 2

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.21	0.24	0.30	0.34	0.35
2.0	0.25	0.28	0.31	0.39	0.46	0.47

2.5	0.31	0.35	0.39	0.49	0.57	0.58
3.0	0.38	0.42	0.47	0.59	0.69	0.70
3.5	0.44	0.49	0.55	0.69	0.80	0.82
4.0	0.50	0.56	0.63	0.79	0.92	0.93
5.0	0.63	0.70	0.78	0.98	1.15	1.17

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 2

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	472	594	715	820	1,063	1,121
2.0	630	791	953	1,093	1,418	1,495
2.5	787	989	1,191	1,366	1,772	1,868
3.0	945	1,187	1,430	1,640	2,126	2,242
3.5	1,102	1,385	1,668	1,913	2,481	2,616
4.0	1,259	1,583	1,906	2,186	2,835	2,989
5.0	1,574	1,978	2,383	2,733	3,544	3,736

Central Air Conditioner

Climate Zone 3: South Region, Houston Weather Data

Demand Savings (kW) for 13.0 SEER New Construction Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.13	0.15	0.17	0.23	0.29	0.30
2.0	0.17	0.20	0.23	0.30	0.39	0.41
2.5	0.21	0.25	0.29	0.38	0.49	0.51
3.0	0.25	0.30	0.35	0.46	0.58	0.61
3.5	0.30	0.35	0.41	0.53	0.68	0.71
4.0	0.34	0.40	0.46	0.61	0.78	0.81
5.0	0.42	0.50	0.58	0.76	0.97	1.02

Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	361	506	650	758	1,042	1,118
2.0	481	674	867	1,011	1,389	1,490
2.5	601	843	1,084	1,264	1,737	1,863
3.0	722	1,011	1,301	1,517	2,084	2,235
3.5	842	1,180	1,518	1,770	2,431	2,608
4.0	962	1,348	1,734	2,023	2,778	2,980
5.0	1,203	1,685	2,168	2,528	3,473	3,725

Central Air Conditioner

Climate Zone 3: South Region, Houston Weather Data

Demand Savings (kW) for 12.44 SEER Retrofit Baseline- Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.22	0.24	0.29	0.36	0.37
2.0	0.26	0.29	0.32	0.39	0.48	0.50
2.5	0.32	0.36	0.40	0.49	0.60	0.62
3.0	0.39	0.44	0.48	0.59	0.72	0.74
3.5	0.45	0.51	0.56	0.69	0.84	0.87
4.0	0.52	0.58	0.64	0.79	0.96	0.99
5.0	0.65	0.73	0.80	0.98	1.20	1.24

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	522	667	811	919	1,203	1,278
2.0	696	889	1,082	1,226	1,604	1,705
2.5	870	1,111	1,352	1,532	2,005	2,131
3.0	1,043	1,333	1,623	1,839	2,406	2,557
3.5	1,217	1,555	1,893	2,145	2,807	2,983
4.0	1,391	1,777	2,163	2,452	3,208	3,409
5.0	1,739	2,222	2,704	3,065	4,009	4,261

Central Air Conditioner

Climate Zone 4: Valley Region Corpus Christi Weather Data

Demand Savings (kW) for 13.0 SEER New Construction Baseline- Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.13	0.15	0.18	0.23	0.30	0.31
2.0	0.17	0.20	0.24	0.31	0.40	0.41
2.5	0.21	0.25	0.30	0.38	0.50	0.52
3.0	0.25	0.30	0.36	0.46	0.60	0.62
3.5	0.30	0.36	0.42	0.54	0.70	0.72
4.0	0.34	0.41	0.47	0.61	0.80	0.82
5.0	0.42	0.51	0.59	0.77	1.00	1.03

Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	426	596	766	896	1,234	1,321
2.0	568	795	1,021	1,195	1,645	1,761
2.5	710	993	1,277	1,494	2,056	2,202
3.0	852	1,192	1,532	1,793	2,468	2,642
3.5	994	1,391	1,787	2,092	2,879	3,082
4.0	1,136	1,589	2,043	2,390	3,290	3,522
5.0	1,420	1,987	2,553	2,988	4,113	4,403

Central Air Conditioner

Climate Zone 4: Valley Region Corpus Christi Weather Data

Demand Savings (kW) for 12.44 SEER Retrofit Baseline - Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.22	0.24	0.30	0.37	0.38
2.0	0.26	0.29	0.33	0.40	0.49	0.50

2.5	0.32	0.36	0.41	0.49	0.61	0.63
3.0	0.39	0.44	0.49	0.59	0.73	0.75
3.5	0.45	0.51	0.57	0.69	0.85	0.88
4.0	0.52	0.58	0.65	0.79	0.97	1.00
5.0	0.64	0.73	0.82	0.99	1.22	1.25

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	618	788	958	1,089	1,426	1,513
2.0	824	1,051	1,277	1,451	1,901	2,017
2.5	1,030	1,313	1,597	1,814	2,377	2,522
3.0	1,236	1,576	1,916	2,177	2,852	3,026
3.5	1,442	1,839	2,236	2,540	3,327	3,530
4.0	1,648	2,102	2,555	2,903	3,803	4,035
5.0	2,060	2,627	3,194	3,628	4,753	5,043

HEAT PUMP REPLACEMENT

Measure

Residential retrofit of an existing central heat pump system with a new central heat pump system in an existing building or the installation of a new central heat pump system in a new residential construction. A new central heat pump system includes an entire packaged unit, or a split system consisting of an indoor unit with a matching remote condensing unit. Maximum cooling capacity per unit is 65,000 Btu/hour.

All measure installation standards and baseline data from the central air conditioner measure shall apply to the heat pump measure.

Baseline

In new construction, the baseline is assumed to be a new heat pump system with an ARI-listed SEER rating of 13.0 and an HSPF of 7.7. For retrofit installations, the baseline is assumed to be 12.44 SEER and 7.7 HSPF.. This value incorporates an adjustment to the baseline SEER value (cooling only) to reflect the percentage of current non-program replacements that do not include the installation of an ARI-matched condensing unit and evaporator coil.

Installation & Efficiency Standard

Equipment shall be properly sized to dwelling based on ASHRAE or ACCA Manual J standards.

Manufacturer data sheets on installed air conditioning equipment or ARI equivalent combined compressor and coil HSPF must be provided to the utility in the Implementation Report.

Heat pumps shall have a minimum SEER of 14.00 and an HSPF of 8.2.

Deemed Savings

Climate Zone 1: Panhandle Region

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Demand Savings (kW) 13.0 SEER New Construction Baseline- Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.12	0.16	0.20	0.20	0.23	0.32
2.0	0.16	0.22	0.27	0.27	0.31	0.42
2.5	0.21	0.27	0.33	0.34	0.39	0.53
3.0	0.25	0.32	0.40	0.41	0.46	0.63
3.5	0.29	0.38	0.47	0.48	0.54	0.74
4.0	0.33	0.43	0.53	0.54	0.62	0.85
5.0	0.41	0.54	0.66	0.68	0.77	1.06

Energy Savings (kWh) 13.0 SEER New Construction Baseline - Zone 1

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	204	293	383	500	541	650
2.0	273	391	510	667	722	867
2.5	341	489	638	834	902	1,084
3.0	409	587	765	1,001	1,083	1,301
3.5	477	685	893	1,167	1,263	1,518
4.0	545	783	1,020	1,334	1,444	1,734
5.0	682	978	1,275	1,668	1,805	2,168

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 1: Panhandle Region, Amarillo Weather Data

Demand Savings (kW) 12.44 SEER Retrofit Baseline- Zone 1

	SEER Range					
Size (tons)	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.23	0.26	0.27	0.30	0.38
2.0	0.25	0.30	0.35	0.36	0.40	0.51
2.5	0.31	0.38	0.44	0.45	0.49	0.64
3.0	0.38	0.45	0.53	0.54	0.59	0.76
3.5	0.44	0.53	0.62	0.63	0.69	0.89
4.0	0.50	0.60	0.70	0.72	0.79	1.02
5.0	0.63	0.75	0.88	0.90	0.99	1.27

Energy Savings (kWh) 12.44 SEER Retrofit Baseline - Zone 1

	SEER Range					
Size (tons)	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	306	396	485	602	643	752
2.0	409	527	646	803	858	1,003
2.5	511	659	808	1,004	1,072	1,254
3.0	613	791	969	1,205	1,287	1,505
3.5	715	923	1,131	1,405	1,501	1,756
4.0	817	1,055	1,292	1,606	1,716	2,006
5.0	1,022	1,318	1,615	2,008	2,145	2,508

Heat Pump – Energy Savings (Heating kWh Only), Climate Zone 1					
HSPF Range					
Size (tons)	8.2 - 8.3	8.4 - 8.5	8.6 - 8.7	8.8 - 8.9	9.0 - 9.1
1.5	269	365	460	554	648
2.0	358	486	613	739	864
2.5	448	608	767	924	1,080
3.0	537	730	920	1,109	1,295
3.5	627	851	1,073	1,293	1,511
4.0	717	973	1,226	1,478	1,727
4.5	806	1,094	1,380	1,663	1,943
5.0	896	1,216	1,533	1,848	2,159

Climate Zone 2: North Region

Heat Pump (Cooling Only – See Separate Heating Tables)
 Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data
 Demand Savings (kW) for 13.0 SEER New Construction Baseline - Zone 2

Size (tons)	SEER Range					
	14.0- 14.4	14.5- 14.9	15.0- 15.9	16.0- 16.9	17.0- 17.9	18+
1.5	0.13	0.16	0.19	0.20	0.20	0.28
2.0	0.17	0.21	0.25	0.26	0.27	0.38
2.5	0.21	0.26	0.31	0.33	0.34	0.47
3.0	0.25	0.31	0.38	0.39	0.41	0.57
3.5	0.29	0.37	0.44	0.46	0.48	0.66
4.0	0.33	0.42	0.50	0.52	0.54	0.75
5.0	0.42	0.52	0.63	0.65	0.68	0.94

Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 2

Size (tons)	SEER Range					
	14.0- 14.4	14.5- 14.9	15.0- 15.9	16.0- 16.9	17.0- 17.9	18+
1.5	307	432	558	763	809	956
2.0	409	577	744	1,017	1,079	1,275
2.5	511	721	931	1,271	1,349	1,594
3.0	613	865	1,117	1,526	1,619	1,912
3.5	716	1,009	1,303	1,780	1,889	2,231
4.0	818	1,153	1,489	2,034	2,159	2,550
5.0	1,022	1,442	1,861	2,543	2,698	3,187

Heat Pump (Cooling Only – See Separate Heating Tables)
 Climate Zone 2: North Region, Dallas / Ft. Worth Weather Data
 Demand Savings (kW) for 12.44 SEER Retrofit Baseline- Zone 2

Size (tons)	SEER Range					
	14.0- 14.4	14.5- 14.9	15.0- 15.9	16.0- 16.9	17.0- 17.9	18+
1.5	0.19	0.23	0.26	0.26	0.27	0.35
2.0	0.26	0.30	0.34	0.35	0.36	0.47
2.5	0.32	0.38	0.43	0.44	0.45	0.59
3.0	0.39	0.45	0.51	0.53	0.55	0.70
3.5	0.45	0.53	0.60	0.62	0.64	0.82
4.0	0.52	0.60	0.68	0.71	0.73	0.94

5.0	0.65	0.75	0.86	0.88	0.91	1.17
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Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 2

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	457	583	708	913	960	1,106
2.0	609	777	945	1,217	1,279	1,475
2.5	761	971	1,181	1,521	1,599	1,844
3.0	913	1,165	1,417	1,826	1,919	2,212
3.5	1,066	1,359	1,653	2,130	2,239	2,581
4.0	1,218	1,553	1,889	2,434	2,559	2,950
5.0	1,522	1,942	2,361	3,043	3,198	3,687

Heat Pump – Energy Savings (Heating kWh Only), Climate Zone 2						
Size (tons)	HSPF Range					
	8.2 - 8.3	8.4 - 8.5	8.6 - 8.7	8.8 - 8.9	9.0 - 9.1	
1.5	120	162	204	245	286	
2.0	160	216	272	327	381	
2.5	200	270	340	409	476	
3.0	239	324	408	490	572	
3.5	279	378	476	572	667	
4.0	319	432	544	654	762	
4.5	359	486	612	735	857	
5.0	399	540	680	817	953	

Climate Zone 3: South Region

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 3: South Region, Houston Weather Zone

Demand Savings (kW) for 13.0 SEER New Construction Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.12	0.16	0.19	0.20	0.22	0.30
2.0	0.17	0.21	0.26	0.27	0.29	0.40
2.5	0.21	0.27	0.32	0.33	0.37	0.51
3.0	0.25	0.32	0.39	0.40	0.44	0.61
3.5	0.29	0.37	0.45	0.47	0.51	0.71
4.0	0.33	0.42	0.52	0.53	0.59	0.81

5.0	0.41	0.53	0.65	0.67	0.73	1.01
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Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	337	488	638	875	931	1,099
2.0	450	650	850	1,166	1,241	1,466
2.5	562	813	1,063	1,458	1,551	1,832
3.0	675	975	1,275	1,749	1,861	2,199
3.5	787	1,138	1,488	2,041	2,171	2,565
4.0	900	1,300	1,700	2,332	2,481	2,931
5.0	1,125	1,625	2,125	2,915	3,102	3,664

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 3: South Region, Houston Weather Zone

Demand Savings (kW) for 12.44 SEER Retrofit Baseline- Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.19	0.23	0.26	0.27	0.29	0.37
2.0	0.25	0.30	0.35	0.36	0.38	0.49
2.5	0.32	0.38	0.43	0.44	0.48	0.62
3.0	0.38	0.45	0.52	0.53	0.57	0.74
3.5	0.45	0.53	0.61	0.62	0.67	0.86
4.0	0.51	0.60	0.70	0.71	0.76	0.99
5.0	0.64	0.75	0.87	0.89	0.96	1.23

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 3

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	495	645	795	1,032	1,088	1,257
2.0	660	860	1,060	1,376	1,451	1,676
2.5	825	1,075	1,325	1,720	1,813	2,095
3.0	990	1,290	1,590	2,064	2,176	2,513
3.5	1,155	1,505	1,855	2,408	2,539	2,932

4.0	1,320	1,720	2,120	2,752	2,901	3,351
5.0	1,650	2,150	2,650	3,440	3,627	4,189

Heat Pump – Energy Savings (Heating kWh Only), Climate Zone 3					
HSPF Range					
Size (tons)	8.2 - 8.3	8.4 - 8.5	8.6 - 8.7	8.8 - 8.9	9.0 - 9.1
1.5	69	93	117	141	164
2.0	92	124	156	187	218
2.5	115	155	195	234	273
3.0	138	186	234	281	327
3.5	161	217	273	328	382
4.0	184	248	312	375	436
4.5	207	279	351	422	491
5.0	230	310	390	468	546

Climate Zone 4: Valley Region

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 4: Valley Region, Corpus Christi Weather Data

Demand Savings (kW) for 13.0 SEER New Construction Baseline- Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	0.12	0.16	0.20	0.20	0.23	0.31
2.0	0.17	0.21	0.26	0.27	0.30	0.41
2.5	0.21	0.27	0.33	0.34	0.38	0.52
3.0	0.25	0.32	0.39	0.40	0.45	0.62
3.5	0.29	0.37	0.46	0.47	0.53	0.72
4.0	0.33	0.43	0.53	0.54	0.60	0.83
5.0	0.41	0.53	0.66	0.67	0.76	1.04

Energy Savings (kWh) for 13.0 SEER New Construction Baseline - Zone 4

Size (tons)	SEER Range					
	14.0-14.4	14.5-14.9	15.0-15.9	16.0-16.9	17.0-17.9	18+
1.5	399	575	752	1,031	1,099	1,299
2.0	532	767	1,002	1,375	1,465	1,731
2.5	665	959	1,253	1,718	1,831	2,164
3.0	798	1,151	1,503	2,062	2,197	2,597
3.5	931	1,342	1,754	2,406	2,564	3,030

4.0	1,064	1,534	2,004	2,749	2,930	3,463
5.0	1,330	1,918	2,505	3,437	3,662	4,329

Heat Pump (Cooling Only – See Separate Heating Tables)

Climate Zone 4: Valley Region, Corpus Christi Weather Data

Demand Savings (kW) for 12.44 SEER Retrofit Baseline- Zone 4

Size (tons)	SEER Range					
	14.0- 14.4	14.5- 14.9	15.0- 15.9	16.0- 16.9	17.0- 17.9	18+
1.5	0.19	0.23	0.26	0.27	0.29	0.38
2.0	0.25	0.30	0.35	0.36	0.39	0.50
2.5	0.32	0.38	0.44	0.45	0.49	0.63
3.0	0.38	0.45	0.53	0.54	0.58	0.75
3.5	0.44	0.53	0.61	0.62	0.68	0.88
4.0	0.51	0.60	0.70	0.71	0.78	1.00
5.0	0.63	0.75	0.88	0.89	0.97	1.25

Energy Savings (kWh) for 12.44 SEER Retrofit Baseline - Zone 4

Size (tons)	SEER Range					
	14.0- 14.4	14.5- 14.9	15.0- 15.9	16.0- 16.9	17.0- 17.9	18+
1.5	587	763	940	1,219	1,287	1,487
2.0	783	1,018	1,253	1,625	1,716	1,982
2.5	978	1,272	1,566	2,032	2,144	2,478
3.0	1,174	1,527	1,879	2,438	2,573	2,973
3.5	1,370	1,781	2,192	2,844	3,002	3,469
4.0	1,565	2,035	2,505	3,251	3,431	3,964
5.0	1,957	2,544	3,132	4,063	4,289	4,955

Heat Pump – Energy Savings (Heating kWh Only), Climate Zone 4					
HSPF Range					
Size (tons)	8.2 - 8.3	8.4 - 8.5	8.6 - 8.7	8.8 - 8.9	9.0 - 9.1
1.5	53	71	89	107	125
2.0	70	95	119	143	166
2.5	88	118	149	178	208
3.0	105	142	178	214	249
3.5	123	166	208	250	291
4.0	140	189	238	286	332
4.5	158	213	268	321	374
5.0	175	237	297	357	416

GROUND SOURCE HEAT PUMP

Measure

The following tables present the proposed deemed savings values for ground source heat pumps for each of the four climate zones. The deemed savings are dependent upon the energy efficiency rating (EER) of the equipment, and are presented as kWh and kW savings per ton installed. Deemed savings values are calculated based on replacement of an existing 13.0 SEER air source heat pump with minimum 8.0 HSPF. These values represent all demand and energy savings that may be assigned a ground source heat pump.

Baseline

Only ground source heat pumps that replace an existing air source heat pump, ground source heat pump system, or other combination of electric heating and cooling systems are eligible for these deemed savings. Deemed savings values are calculated based on replacement of an existing 13.0 SEER air source heat pump with minimum 8.0 HSPF.

Installation & Efficiency Standard

The ground source heat pump must meet a minimum ENERGY STAR[®] criteria of 14.0 EER (ISO/ARI 13256-1) in order to be eligible for these deemed savings. The deemed savings apply to units with a capacity of $\leq 65,000$ BTUs/Hr.

Deemed Savings

Climate Zone 1 – Panhandle Region

Ground Source Heat Pumps – Climate Zone 1		
Climate Zone 1 - with desuperheaters		
GSHP Efficiency	Energy savings [kWh/ton]	Demand savings [kW/ton]
Low (less than 17 EER)	1,083	0.46
High (17 EER and above)	1,309	0.51
Climate Zone 1 - without desuperheaters		
Low (less than 17 EER)	469	0.01
High (17 EER and above)	699	0.08

Climate Zone 2 – North Region

Ground Source Heat Pumps – Climate Zone 2		
Climate Zone 2 - with desuperheaters		
GSHP Efficiency	Energy savings [kWh/ton]	Demand savings [kW/ton]
Low (less than 17 EER)	1,114	0.50
High (17 EER and above)	1,353	0.57
Climate Zone 2 - without desuperheaters		
Low (less than 17 EER)	319	0.05
High (17 EER and above)	566	0.21

Climate Zone 3 – South Region

Ground Source Heat Pumps – Climate Zone 3		
Climate Zone 3 - with desuperheaters		
GSHP Efficiency	Energy savings [kWh/ton]	Demand savings [kW/ton]
Low (less than 17 EER)	1,030	0.52
High (17 EER and above)	1,114	0.50
Climate Zone 3 - without desuperheaters		
Low (less than 17 EER)	218	0.06
High (17 EER and above)	322	0.15

Climate Zone 4 – Valley Region

Ground Source Heat Pumps – Climate Zone 4		
Climate Zone 4 - with desuperheaters		
GSHP Efficiency	Energy savings [kWh/ton]	Demand savings [kW/ton]
Low (less than 17 EER)	1,015	0.49
High (17 EER and above)	1,164	0.53
Climate Zone 4 - without desuperheaters		
Low (less than 17 EER)	194	0.08
High (17 EER and above)	291	0.12

WINDOW AIR CONDITIONERS

Measure

The following deemed savings values would be applicable in calculating an incentive for a room air conditioner replaced with a higher efficiency room air conditioner in a dwelling occupied by a residential energy consumer. Deemed savings for window air conditioners are only applicable to customers under the “hard-to-reach” template.

Baseline

Baseline is assumed to be a new air conditioning unit with an EER rating that meets current NAECA standard. Current NAECA EER standard varies from 8.5 to 9.8 depending on the type and capacity of unit. Minimum cooling capacity is 5,000 Btu/hour, and the maximum is 25,000 Btu/hour.

Installation & Efficiency Standard

Units meeting current ENERGY STAR[®] specification qualify for incentive. This specification is 10% above the new NAECA standard for all categories.

Deemed Savings

Demand Savings (kW) – All Climate Zones

Window Air Conditioners – Demand Savings, All Climate Zones					
	Federal	10% Above	kW	15% Above	kW
Size (BTU/Hr)	Standard (EER)	Standard (EER)	Savings	Standard (EER)	Savings
Less than 6,000	9.7	10.7	0.054	11.2	0.078
6,000-7,999	9.7	10.7	0.058	11.2	0.083
8,000-13,999	9.8	10.8	0.111	11.3	0.160
14,000-19,999	9.7	10.7	0.150	11.2	0.215
20,000 and above	8.5	9.4	0.257	9.8	0.368

Energy Savings (kWh)

Climate Zone 1: Panhandle Region

Window Air Conditioners – Energy Savings, Climate Zone 1					
	Federal	10% Above	kWh	15% Above	kWh
Size (BTU/Hr)	Standard (EER)	Standard (EER)	Savings	Standard (EER)	Savings
Less than 6,000	9.7	10.7	51	11.2	73
6,000-7,999	9.7	10.7	54	11.2	78
8,000-13,999	9.8	10.8	104	11.3	149
14,000-19,999	9.7	10.7	140	11.2	201
20,000 and above	8.5	9.4	240	9.8	345

Climate Zone 2: North Region

Window Air Conditioners – Energy Savings, Climate Zone 2					
	Federal	10% Above	kWh	15% Above	kWh
Size (BTU/Hr)	Standard (EER)	Standard (EER)	Savings	Standard (EER)	Savings
Less than 6,000	9.7	10.7	68	11.2	97
6,000-7,999	9.7	10.7	73	11.2	104
8,000-13,999	9.8	10.8	139	11.3	199
14,000-19,999	9.7	10.7	187	11.2	269
20,000 and above	8.5	9.4	320	9.8	460

Climate Zone 3: South Region

Window Air Conditioners – Energy Savings, Climate Zone 3					
	Federal	10% Above	kWh	15% Above	kWh
Size (BTU/Hr)	Standard (EER)	Standard (EER)	Savings	Standard (EER)	Savings
Less than 6,000	9.7	10.7	93	11.2	134
6,000-7,999	9.7	10.7	100	11.2	143
8,000-13,999	9.8	10.8	191	11.3	274
14,000-19,999	9.7	10.7	257	11.2	369
20,000 and above	8.5	9.4	440	9.8	632

Climate Zone 4: Valley Region

Window Air Conditioners – Energy Savings, Climate Zone 4					
	Federal	10% Above	kWh	15% Above	kWh
Size (BTU/Hr)	Standard (EER)	Standard (EER)	Savings	Standard (EER)	Savings
Less than 6,000	9.7	10.7	98	11.2	140
6,000-7,999	9.7	10.7	104	11.2	150
8,000-13,999	9.8	10.8	200	11.3	287
14,000-19,999	9.7	10.7	269	11.2	386
20,000 and above	8.5	9.4	460	9.8	661

SPLIT SYSTEM AND SINGLE-PACKAGE AIR CONDITIONERS BETWEEN 65,000 BTU/H AND 240,000 BTU/H

Measure

The following deemed savings values could be used to calculate an incentive for replacing an existing central air conditioner with a premium efficiency central air conditioner through a standard offer program.

Baseline

Baseline is assumed to be a new central air conditioning system with an EER of 8.9 for units up to 135,000 Btu/h, and 8.5 for units between 135,000 Btu/h and 240,000 Btu/h.

Installation & Efficiency Standard

Minimum standard for units up to 135,000 Btu/h is 10.0 EER and 9.5 EER for units between 135,000 Btu/h and 240,000 Btu/h.

Deemed Savings

Units greater than 65,000 Btu/h and less than 135,000 Btu/h

For units greater than 65,000 Btu/h and less than 135,000 Btu/h							
Zone 1		Zone 2		Zone 3		Zone 4	
kW per	kWh per	kW per	kWh per	kW per	kWh per	kW per	kWh per
EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton
0.10	202	0.10	309	0.11	392	0.11	440

Units greater than 135,000 Btu/h and less than 240,000 Btu/h

For units greater than 135,000 Btu/h and less than 240,000 Btu/h							
Zone 1		Zone 2		Zone 3		Zone 4	
kW per	kWh per	kW per	kWh per	kW per	kWh per	kW per	kWh per
EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton	EER-Ton
0.12	151	0.12	242	0.12	284	0.12	324

Deemed Savings Example

New unit is a 10-ton package rooftop unit with an EER of 10.5 installed in Zone 2.
 Baseline EER is 8.9 for units less than 135,000 Btu/h.
 From the table above, select deemed savings values of 0.10 kW/ton and 309 kWh/ton.

$$\text{KW savings} = 0.10 * (\text{Unit EER} - \text{Baseline EER}) * \text{tons}$$

$$\text{KW savings} = 0.10 * (10.5 - 8.9) * 10 = 1.6 \text{ kW}$$

$$\text{KWh savings} = 309 * (\text{Unit EER} - \text{Baseline EER}) * \text{tons}$$

$$\text{KWh savings} = 309 * 1.6 * 10 = 4,944 \text{ kWh}$$

SPLIT SYSTEM AND SINGLE PACKAGE HEAT PUMP SYSTEMS BETWEEN 65,000 BTU/H AND 240,000 BTU/H

Measure

The following tables provide annual heating kWh energy savings. Additional cooling savings are based on the heat pump's EER, and are the same values as for an air conditioning system of the same cooling capacity and EER. Please refer to the Split System and Single-Package Air Conditioning System Measure for those values.

Only installations which replace an existing split system or single package heat pump system or other electric heating system are eligible to receive this annual heating savings component of the deemed energy savings.

Baseline

Baseline is assumed to be a new rooftop package or split system heat pump system. For units with cooling capacities between 65,000 Btu/h and 135,000 Btu/h, the baseline is a coefficient of performance (COP) of 3.0 (current ASHRAE 90.1 standard). For units with cooling capacities between 135,000 Btu/h and 240,000 Btu/h, the baseline is a coefficient of performance (COP) of 2.9 (current ASHRAE 90.1 standard).

Installation & Efficiency Standard

For units with cooling capacities between 65,000 Btu/h and 135,000 Btu/h, there are two efficiency levels for which deemed energy savings have been calculated:

- 3.2 is ASHRAE 90.1-1999 / Consortium for Energy Efficiency (CEE) Tier 1 Standard.
- 3.4 is ASHRAE 90.1-1999 / CEE Tier 2 Standard.

For units with cooling capacities between 135,000 Btu/h and 240,000 Btu/h, the two efficiency levels for which deemed energy savings have been calculated are as follows:

- 3.1 is ASHRAE 90.1-1999 / Consortium for Energy Efficiency (CEE) Tier 1 Standard.
- 3.3 is ASHRAE 90.1-1999 / CEE Tier 2 Standard.

Deemed Savings – Heating

Energy Savings

Units greater than 65,000 Btu/h and less than 135,000 Btu/h

Annual Heating Savings:

For units greater than 65,000 Btu/h and less than 135,000 Btu/h				
	Zone 1	Zone 2	Zone 3	Zone 4
COP	kWh per Ton	kWh per Ton	kWh per Ton	kWh per Ton
3.2	342	121	53	38
3.4	674	232	101	72

Ton = Cooling Ton

Units greater than 135,000 Btu/h and less than 240,000 Btu/h

Annual Heating Savings:

For units greater than 135,000 Btu/h and less than 240,000 Btu/h				
	Zone 1	Zone 2	Zone 3	Zone 4
COP	kWh per Ton	kWh per Ton	kWh per Ton	kWh per Ton
3.1	372	79	30	20
3.3	730	132	58	39

Ton = Cooling Ton

Demand Savings

For this measure, the deemed kW savings are based on the heat pump's EER, and are the same values as for a split system or single-package air conditioning system of the same capacity and EER. Please refer to the Split System and Single-Package Air Conditioning System Measure for those values.

CEILING INSULATION

Measure

Ceiling insulation savings are per square foot of treated ceiling area above a conditioned space. Ceiling insulation must be added only to homes with electric air conditioning or HTR homes with evaporative cooling systems to qualify for these deemed savings values.

Baseline

In existing construction, ceiling insulation levels vary greatly depending on the age of the home, type of insulation, and activity in the attic (such as using the attic for storage and HVAC equipment). Deemed savings tables are based on the current level of ceiling insulation in the home from R-0 to R-22. The current insulation level of each home will be determined and documented by the insulation installer. Degradation due to age and density of the existing insulation should be taken into account.

In the event that existing insulation is or has been removed, the existing R-value will be based upon the R-value of the existing insulation prior to removal.

Installation & Efficiency Standard

A ceiling insulation level of R-30 is recommended throughout Texas as prescribed by DOE. The combined R-values of the existing insulation and the insulation being added will total at least R-30. The R-value of the existing insulation can be no greater than R-22.

Deemed Savings

Climate Zone 1 - Panhandle Region
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Ceiling Insulation					
	kWh Savings	kWh Savings	kWh Savings	Summer Peak kW Savings	
Ceiling Insulation Base R-value	Gas Heat	Electric Heat	Heat Pump	Gas Heat & Electric Heat	Heat Pump
	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)
R-0	0.86	9.99	5.04	0.000973	0.000973
R-1 to R-4	0.52	6.43	3.14	0.000608	0.000622
R-5 to R-8	0.24	3.19	1.48	0.000297	0.000311
R-9 to R-14	0.11	1.67	0.76	0.000153	0.000153
R-15 to R-22	0.05	0.71	0.31	0.000068	0.000074

Climate Zone 2 - North Region					
Ceiling Insulation					
	kWh Savings	kWh Savings	kWh Savings	Summer Peak kW Savings	
Ceiling Insulation Base R-value	Gas Heat	Electric Heat	Heat Pump	Gas Heat & Electric Heat	Heat Pump
	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)
R-0	1.22	6.71	3.16	0.001027	0.001027
R-1 to R-4	0.79	4.32	2.07	0.000622	0.000662
R-5 to R-8	0.40	2.15	1.04	0.000297	0.000311
R-9 to R-14	0.21	1.13	0.54	0.000153	0.000162
R-15 to R-22	0.09	0.47	0.23	0.000074	0.000074

Climate Zone 3 - South Region					
Ceiling Insulation					
	kWh Savings	kWh Savings	kWh Savings	Summer Peak kW Savings	
Ceiling Insulation Base R-value	Gas Heat	Electric Heat	Heat Pump	Gas Heat & Electric Heat	Heat Pump
	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)
R-0	1.00	4.40	2.14	0.000973	0.000973
R-1 to R-4	0.64	2.81	1.40	0.000608	0.000622
R-5 to R-8	0.32	1.38	0.70	0.000297	0.000297
R-9 to R-14	0.17	0.72	0.36	0.000153	0.000153
R-15 to R-22	0.07	0.30	0.15	0.000074	0.000074

Climate Zone 4 - Valley Region

Ceiling Insulation					
	kWh Savings	kWh Savings	kWh Savings	Summer Peak kW Savings	
Ceiling Insulation Base R-value	Gas Heat	Electric Heat	Heat Pump	Gas Heat & Electric Heat	Heat Pump
	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)	(per sq. ft.)
R-0	1.30	3.64	2.10	0.001027	0.001027
R-1 to R-4	0.85	2.33	1.39	0.000622	0.000649
R-5 to R-8	0.44	1.15	0.70	0.000284	0.000297
R-9 to R-14	0.23	0.60	0.37	0.000135	0.000153
R-15 to R-22	0.10	0.25	0.15	0.000068	0.000074

WALL INSULATION

Measure

Wall insulation savings are per square foot of treated wall area (gross wall area less window and door area), and are based on R-0 increased to R-13. Wall insulation must be added only to homes with electric air conditioning or HTR homes with evaporative cooling systems to qualify for these deemed savings values.

Baseline

The baseline is considered to be a house with no wall insulation in the 4” wall cavity.

Installation & Efficiency Standard

The standard throughout Texas for adding wall insulation to an existing wall cavity is R-13, as prescribed by United States Department of Energy (DOE) and Texas Department of Housing and Community Affairs (TDHCA) programs. To qualify for the incentive, there must be no existing wall insulation.

Under the Hard-To-Reach template, wall insulation reduces the ventilation rate in the home and therefore a post-installation blower door test must be conducted. Results must comply with the Minimum Final Ventilation Rate table found in the Air Infiltration section of this document.

Deemed Savings

Climate Zone 1: Panhandle Region

Wall Insulation – Climate Zone 1				
Electric A/C Gas Heat kWh Savings	Electric A/C Electric Heat kWh Savings	Electric A/C Heat Pump kWh Savings	Summer Peak kW Savings per sq. ft.	
			Gas Heat &	Heat Pump

per sq. ft.	per sq. ft.	per sq. ft.	Electric Heat	
0.33586	11.014	6.496	0.0005892	0.0005892

Climate Zone 2: North Region

Wall Insulation – Climate Zone 2				
Electric A/C Gas Heat kWh Savings per sq. ft.	Electric A/C Electric Heat kWh Savings per sq. ft.	Electric A/C Heat Pump kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	
			Gas Heat & Electric Heat	Heat Pump
0.45875	7.043	2.990	0.0007576	0.0008418

Climate Zone 3: South Region

Wall Insulation – Climate Zone 3				
Electric A/C Gas Heat kWh Savings per sq. ft.	Electric A/C Electric Heat kWh Savings per sq. ft.	Electric A/C Heat Pump kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	
			Gas Heat & Electric Heat	Heat Pump
0.24242	4.529	1.726	0.0006734	0.0006734

Climate Zone 4: Valley Region

Wall Insulation – Climate Zone 4				
Electric A/C Gas Heat kWh Savings per sq. ft.	Electric A/C Electric Heat kWh Savings per sq. ft.	Electric A/C Heat Pump kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	
			Gas Heat & Electric Heat	Heat Pump
0.28199	3.273	1.310	0.0007576	0.0007576

FLOOR INSULATION

Measure

Floor insulation savings are per square foot of treated floor area above a non-conditioned space. Floor insulation must be added only to existing homes with electric air conditioning or HTR homes with evaporative cooling systems to qualify for these deemed savings values.

Baseline

The baseline is considered to be a house with pier and beam construction and no floor insulation against the floor of conditioned area.

Installation & Efficiency Standard

A floor insulation level of R-19 is recommended for site-built homes throughout Texas as prescribed by DOE and TDHCA programs. To qualify for the incentive, there must be no existing floor insulation. Batt insulation is recommended in most cases and must have the vapor barrier installed facing up and against the floor or conditioned area. Insulation should be attached or secured so that it remains in place for at least 10 years.

Typical floor construction depth of manufactured homes usually does not allow R-19 batt to be installed within the floor joists so R-15 loose-fill insulation is recommended by TDHCA.

A minimum of 24” clearance from bottom of the insulation to the ground is required by Occupational Safety and Health Association (OSHA).

Deemed Savings

Climate Zone 1: Panhandle Region

Floor Insulation - Climate Zone 1				
Electric A/C And Heating Type	Site Built Home		Manufactured Home	
	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.
Gas Heat	No Savings	0.000216	No Savings	0.000199
Electric Heat	5.00054	0.000216	4.98271	0.000199
Heat Pump	2.59838	0.000216	2.51197	0.000266

Climate Zone 2: North Region

Floor Insulation - Climate Zone 2				
Electric A/C And Heating Type	Site Built Home		Manufactured Home	
	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.
Gas Heat	0.06486	0.000270	0.03457	0.000266
Electric Heat	2.93189	0.000270	2.90027	0.000266
Heat Pump	1.11730	0.000270	1.09707	0.000266

Climate Zone 3: South Region

Floor Insulation - Climate Zone 3				
Electric A/C And Heating Type	Site Built Home		Manufactured Home	
	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.
Gas Heat	No Savings	0.000216	No Savings	0.000266
Electric Heat	1.70757	0.000216	1.65891	0.000266
Heat Pump	0.58324	0.000216	0.55718	0.000266

Climate Zone 4: Valley Region

Floor Insulation - Climate Zone 4				
Electric A/C And Heating Type	Site Built Home		Manufactured Home	
	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.	kWh Savings per sq. ft.	Summer Peak kW Savings per sq. ft.
Gas Heat	0.02378	0.000270	No Savings	0.000266
Electric Heat	1.16649	0.000270	1.12832	0.000266
Heat Pump	0.42757	0.000270	0.40359	0.000266

ENERGY STAR® WINDOWS

Measure

ENERGY STAR® windows savings are per square foot of window, inclusive of frame and sash. Windows must be installed only in homes with electric air conditioning or HTR homes with evaporative cooling systems to qualify for these deemed savings values.

Baseline

The baseline is a double-glazed (i.e., double-pane), clear window with an aluminum frame, with a U-factor of 0.87, a solar heat gain coefficient (SHGC) of 0.66, and air infiltration of 1 cfm/ft².

Installation & Efficiency Standard

For a window to qualify for these deemed savings, it must meet ENERGY STAR[®] criteria anywhere in the state, it must have a U-factor less than or equal to 0.40 and a Solar Heat Gain Coefficient (SHGC) less than or equal to 0.40.

Deemed Savings

ENERGY STAR [®] WINDOWS		
	kWh Savings per sq. ft.	kW Savings per sq. ft.
Climate Zone 1: Panhandle Region		
Installed in home with non-electric heating	2.68	0.0033
Installed in home with electric resistance heating	9.50	0.0033
Installed in home with heat pump	6.85	0.0033
Climate Zone 2: North Region		
Installed in home with non-electric heating	3.46	0.0028
Installed in home with electric resistance heating	6.88	0.0028
Installed in home with heat pump	5.27	0.0028
Climate Zone 3: South Region		
Installed in home with non-electric heating	3.81	0.0024
Installed in home with electric resistance heating	6.48	0.0024
Installed in home with heat pump	5.26	0.0024
Climate Zone 4: Valley Region		
Installed in home with non-electric heating	4.72	0.0027
Installed in home with electric resistance heating	6.06	0.0027
Installed in home with heat pump	5.35	0.0027

AIR INFILTRATION

Measure

This measure reduces air infiltration into the residence, using pre- and post-treatment blower door air pressure readings to confirm air leakage reduction. Homes treated for air infiltration reduction must have electric air conditioning to qualify for these deemed savings values.

Blower door air pressure measurements will also be used to ensure that air infiltration in a residence shall not be less than the standards set forth in the following table:

Minimum Final Ventilation Rate*

Shielding	Number of Stories		
	Single Story	Two Story	3 or More Stories
Well shielded	1.18	0.95	0.83
Normal	0.99	0.79	0.69
Exposed	0.89	0.71	0.62

* Measured in cubic feet per minute at 50 Pascal per square foot of conditioned area.

Well Shielded is defined as urban areas with high buildings or sheltered areas, and building surrounded by trees, bermed earth, or higher terrain.

Normal is defined as buildings in a residential neighborhood or subdivision setting, with yard space between buildings. 80-90% of houses fall in this category.

Exposed is defined as buildings in an open setting with few buildings or trees around and buildings on top of a hill or ocean front, exposed to winds.

As an example, the minimum post-installation air exchange rate for an 1800 square foot, one-story home with normal shielding is 1782 CFM₅₀ (1800 x 0.99). In order to qualify for the air infiltration control deemed savings, there must be a minimum 10% reduction between the pre- and post-installation ventilation rate. Therefore, the pre-installation ventilation rate must be at least 1960 CFM₅₀ (1782 x 110%) in order to be considered for air infiltration control measures.

Baseline

For residential dwellings, the winter/summer air change per hour (ACH) differential was derived from ESPRE model weather data for the Panhandle (Amarillo weather), North (Dallas weather), South (Houston weather), and Valley (Corpus Christi weather) climate zones. Electric air conditioning was assumed for all homes, with gas, electric or heat pump heating.

Air Infiltration Values (ACH)		
Region	Winter ACH	Summer ACH
Panhandle	1.25	0.96
North	0.94	0.49
South	0.86	0.54
Valley	0.95	0.94

Installation & Efficiency Standard

To qualify for an incentive, a minimum air leakage reduction of 10% of the pre-installation reading is required. Utilities may require competency testing of personnel who will perform the blower door tests.

Deemed Savings

The following formula shall be used to calculate deemed savings for infiltration efficiency improvements. The formula applies to Residential and Hard-to-Reach single family and multifamily dwellings, and to all building heights and shielding factors. Only structures with electric refrigerated air conditioning systems are eligible.

Deemed Savings: $CFM_{50} * V$

Where:

CFM_{50} = Air infiltration reduction in Cubic Feet per Minute at 50 Pascal

V = the corresponding value in the following table:

Region	KWh Impact per CFM_{50} Reduction			KW Impact per CFM_{50} Reduction
	Gas Heat	Resistance Heat	Heat Pump Heat	
Panhandle	0.1262	1.6673	0.7933	0.00024
North	0.1929	1.0565	0.5046	0.00019
South	0.2694	0.7945	0.4438	0.00026
Valley	0.6268	0.9732	0.7368	0.00043

SOLAR SCREENS

Measure

This measure is for customers with electric air conditioning or evaporative cooling under the Hard-To-Reach Program template. Solar screen must be installed on windows facing predominately east or west and receive significant direct sun exposure. Solar screens that block at least 65% of the solar heat gain qualify for deemed savings. Deemed savings are per square foot of window or door opening.

Baseline

The baseline prototype home modeled is similar to other deemed savings models and is 1,850 ft² with window area equal to 10.2% of the floor area. This proportion represents window area equal to approximately 14% of the wall area. The base SHGC is 0.75 representing the average from RESFEN¹ (0.76) and the NFRC² 900 (0.74) database for a

¹ Residential Fenestration software for calculating heating and cooling energy use in residential buildings.

² National Fenestration Research Council.

single pane, clear glass window with an aluminum frame. This includes a factor to represent statistically average solar gain reduction for a generic house from overhangs, trees, obstructions, adjacent buildings, insect screen, interior shades, dirt on glass pane, etc.

Installation & Efficiency Standard

To qualify for solar screen deemed savings, windows must be facing predominately east or west and receive significant direct sun exposure. Solar screen material must reduce solar heat gain by at least 65%.

Deemed Savings

Solar Screens				
Weather Zone	Electric AC Gas Heat Avg. kWh Savings per sq. ft.	Electric AC Electric Heat Avg. kWh Savings per sq. ft.	Electric AC Heat Pump Avg. kWh Savings per sq. ft.	Summer Peak Avg. kW Savings per sq. ft.
1	4.22938	0.45208	1.91859	0.000954
2	5.18338	2.08937	3.54039	0.002438
3	5.82998	3.78803	4.72758	0.001590
4	7.03837	6.23033	6.65677	0.002756

DUCT EFFICIENCY IMPROVEMENT

Measure

These deemed savings values are applicable to measures which seal leaks in supply and return ducts and repair or reinsulate ducts of existing homes and small commercial facilities that have central electric air conditioning or heat pumps. All treated sites must have a majority of the treated ducts and returns located in an unconditioned space. Alternatively, the utility may establish other requirements to ensure that savings result from the measure.

Administrator Comment: [UTILITY] will employ the following procedure to ensure that savings result from the duct efficiency measure:

1. *When a majority of the supply and return is in an unconditioned space, [UTILITY] may inspect for adequate treatment, or may conduct a standard (e.g., Duct Blaster™) leakage test to verify that the total duct leakage does not exceed the applicable maximum post-installation leakage rate taken from the following table. See following definitions of “conditioned space” and “majority.”*
2. *When a majority of ducts and returns are in a conditioned space (as defined herein), or it cannot be determined that a majority of ducts and*

returns are in an unconditioned space, the measure is not applicable, unless the Project Sponsor documents pre- and post-installation leakage-to-outside rates, via testing conducted and documented in accordance with one of the procedures laid out below. [UTILITY] may inspect for adequate treatment, or may conduct standard leakage-to-outside tests to verify that the leakage rate from unconditioned space does not exceed the applicable maximum post-installation rate taken from the following table. See the following definitions of “unconditioned space,” and “leakage-to-outside tests.”

Definitions:

Unconditioned space: space within a building that is not conditioned space.

See ASHRAE 90.2-2001 (Low-Rise Residential) or 90.1-1999 (Buildings

Except Residential Low Rise). The definitions set forth below assume the

structure meets the definition of a low-rise residential building as set forth in

the ASHRAE Standard 90.2-2001 Scope (Section 2). ASHRAE Standard 90.1-

1999 will be used for commercial applications.

Conditioned Space: cooled space, heated space, or indirectly conditioned space:

Cooled space: enclosed space within a building that is cooled by a cooling system whose sensible capacity exceeds 5 Btu/(h-ft²) or is capable of maintaining a space drybulb temperature of 90°F or less at design cooling conditions.

Heated space: enclosed space within a building that is heated by a heating system whose output capacity exceeds 10 Btu/(h-ft²) or is capable of maintaining a space drybulb temperature of 50°F or more at design heating conditions.

Indirectly conditioned space: enclosed space within a building that is not heated or cooled space, whose area-weighted heat transfer coefficient to heated or cooled space exceeds that to the outdoors or to unconditioned space, or through which air from heated or cooled space is transferred at a rate exceeding three air changes per hour (see heated space and cooled space).

Majority: For purposes of determining majority of treated ducts and returns, the proportion of surface area of plenums and ducts located in an unconditioned space shall exceed 50% of the total surface area of all ducts and plenums. Examples of systems in conditioned versus unconditioned space are provided below. These examples are not inclusive.

Single-family dwellings (defined as dwelling units in buildings with fewer than 3 dwelling units) can be treated without pre-qualification by [UTILITY]. Regardless of pre-qualification, [UTILITY] will not pay incentives for installations that do not meet the standards as described herein.

Multifamily units (defined as buildings with 3 or more dwelling units), must be pre-qualified for installation. Prior to beginning installation, Project Sponsor must contact [UTILITY] with a property description. [UTILITY] may pre-qualify, or may require [UTILITY's] site inspection in order to determine eligibility. Regardless of pre-qualification, [UTILITY] will not pay incentives for installations that do not meet the standards as described herein.

Examples of Systems in Conditioned and Unconditioned Spaces

The following examples are intended to illustrate some of the situations that will be found in the field. It is not all-inclusive.

Return/evaporator is in a closet with ceiling. The entire enclosure is considered conditioned space. This is a common installation in older homes in which central air was a post-construction retrofit, but is also utilized in new construction.

Duct is contained within, or consists of, a stud-cavity, joist cavity, or enclosed chase; evaporator is in the attic. The portion of the duct within the cavity is located within a conditioned space.

Return/evaporator in a sealed closet without ceiling that is left open to supply combustion air for a gas/propane furnace. The entire closet is considered unconditioned space.

Supply ducts are within a furr-down. This is considered indirectly conditioned space.

Supply ducts within an attic separated from the conditioned space by an insulated ceiling. This is considered an unconditioned space.

Supply ducts within an attic with finished floor, insulated roof and openings to the conditioned space. This is considered an indirectly conditioned space.

Return or supply ducts located in joist cavity in a floor over a crawlspace. If the floor under the ducts (the crawlspace ceiling) is insulated, the ducts are in a conditioned space. If the floor and walls of the crawlspace are insulated and sealed, the ducts are in a conditioned space. If the floor, walls and ceiling of the crawlspace are uninsulated, the ducts are located in an unconditioned space.

Baseline

This measure would be applicable if existing duct system has a leakage rate of greater than or equal to the appropriate values in the following table, as measured by a pre-retrofit duct pressurization test. The calibrated deemed savings model uses an average duct loss factor of 30%.

Installation & Efficiency Standard

Materials used should be long-lasting materials, e.g., mastics, tape-applied mastics, foil tape, and/or aerosol-based sealants, to reduce total leakage rates to less than 10% of total air handler fan flow, verified by post-retrofit duct pressurization test.

Under the Hard-To-Reach template, duct efficiency improvements reduce the ventilation rate in the home and therefore a post-installation blower door test must be conducted. Results must comply with the Minimum Final Ventilation Rate table found in the Air Infiltration section of this document.

Duct Improvement Air Flow Requirements

Measurements to determine whether the air-flow requirements are met must be performed in accordance with [UTILITY]-approved procedures. In applications where a majority of the ducts is in an unconditioned space, the most commonly-used acceptable test method is the Duct Blaster™ (or equivalent) total duct leakage test. Other tests may be accepted at [UTILITY's] sole option.

In applications where duct leakage to outside must be directly measured, the Project Sponsor may use one of several methods, including the blower door subtraction method, the combination duct blaster (or equivalent) and blower door, or the Delta Q method. Other tests may be accepted at [UTILITY's] sole option.

Prior to beginning any installations, the Project Sponsor must submit the intended method(s) and may be required to provide [UTILITY] with evidence of competency. Leakage rates indicated in the following table must be measured and reported at the average air distribution system operating pressure.

Air Flow Requirements for Duct Efficiency Measure		
AC Size (tons)	Minimum Pre-Installation Leakage Rate (CFM)	Maximum Post-Installation Leakage Rate (CFM)
1.5	120	60
2.0	160	80
2.5	200	100
3.0	240	120
3.5	280	140
4.0	320	160
4.5	360	180
5.0	400	200

Deemed Savings

Duct Efficiency Improvement				
Weather Zone	Electric AC Gas Heat Avg. kWh Savings per sq. ft. of conditioned space	Electric AC Electric Heat Avg. kWh Savings per sq. ft. of conditioned space	Electric AC Heat Pump Avg. kWh Savings per sq. ft. of conditioned space	Summer Peak Avg. kW Savings per sq. ft. of conditioned space
1	0.42092	3.73605	1.97773	0.000486
2	0.71800	2.57573	1.39989	0.000486
3	0.74378	1.80968	1.13027	0.000486
4	0.96962	1.67277	1.23428	0.000486

WATER HEATER REPLACEMENTS – HIGH EFFICIENCY AND FUEL SUBSTITUTION

Measure

Water heating values are on a per-unit basis. Deemed savings variables include tank volume and installed-unit energy factor as rated in the Gas Appliance Manufacturers Association Directory of Certified Water Heating Products. The following table presents the energy savings for high efficiency electric water heaters meeting the required standards (based on tank size and final Energy Factor (EF)).

Baseline

The baseline for electric and gas water heaters is the DOE energy efficiency standard (10 CFR Part 430). The method for calculating standards compliance is:

Electric: $0.93 - 0.00132 * \text{volume}$

Gas: $0.62 - 0.0019 * \text{volume}$

Efficiency Standard

The efficiency threshold for new water heaters is 4% above baseline.

Deemed Savings

Energy Savings - Electric Water Heater Replacements

Electric Water Heater Replacements - Energy Savings			
Approximate Volume (gal) ->	80	50	30
Baseline (DOE Standard) EF	0.82	0.86	0.89
Minimum EF for Incentive Qualification	kWh Savings	kWh Savings	kWh Savings
0.86	150	NAP	NAP
0.87	190	NAP	NAP
0.88	229	NAP	NAP
0.89	267	NAP	NAP
0.90	304	138	NAP
0.91	341	175	NAP
0.92	377	210	NAP
0.93	411	245	143
0.94	446	280	177
0.95	479	313	210

Energy Savings - Gas Water Heater Replacements

The following table presents the energy savings for high efficiency gas water heaters replacing an electric unit.

Gas Water Heater Replacements - Energy Savings			
Approximate Volume (gal) ER->	80	52	30
Approximate Volume (gal) Gas->	50	40	30
Federal Standard EF	0.53	0.54	0.56
4% Improvement	0.55	0.56	0.57
Annual Therms	163	160	157
Gas equivalent kWh	1,554	1,526	1,499
kWh Savings (Base less gas equivalent)	2,070	1,932	1,856

Demand Savings

The following table presents the demand savings for high efficiency electric or fuel-substitution units.

Electric Water Heater Replacements - Demand Savings			
Approximate Volume (gal)->	80	50	30
Standard EF	0.82	0.86	0.89
Minimum EF for Incentive Qualification			
0.86	0.01	NAP	NAP
0.87	0.02	NAP	NAP
0.88	0.02	NAP	NAP
0.89	0.02	NAP	NAP
0.9	0.03	0.01	NAP
0.91	0.03	0.02	NAP
0.92	0.03	0.02	NAP
0.93	0.04	0.02	0.01
0.94	0.04	0.02	0.02
0.95	0.04	0.03	0.02
All Gas Units Meeting the Gas Standards (above)	0.42	0.42	0.42

WATER HEATER JACKETS

Measure

Water heater jackets must have an R-value of at least R-6.7 and must be installed on electric water heaters. These estimates apply to all weather regions.

Baseline

Baseline is assumed to be the post-1991, storage-type, electric resistance water heater, with no water heater jacket.

Installation & Efficiency Standard

Water heater jackets must have an R-value of at least R-6.7 and must be installed on electric water heaters. Manufacturer’s instructions of the water heater jacket and the water heater itself should be followed. Thermostat and heating element access panels must be left uncovered.

Deemed Savings

Water Heater Jacket	
KWh Savings per home	Peak kW Savings per home
100	0.010

WATER HEATER PIPE INSULATION

Measure

Water heater pipe insulation must have a minimum thickness of 3/4". Water heaters plumbed with heat traps are not eligible to receive incentives for this measure. The pipe insulation must be installed in a home with electric water heating in order to qualify for an incentive.

Baseline

Baseline is assumed to be the typical electric water heater with no heat traps and no insulation on water heater pipes.

Installation & Efficiency Standard

Water heater pipe insulation must have a minimum thickness of 3/4". All hot and cold vertical lengths of pipe should be insulated, plus the initial length of horizontal hot and cold water pipe, up to three feet from the transition, or until wall penetration, whichever is less.

Deemed Savings

Water Heater Pipe Insulation	
KWh Savings per home	Peak kW Savings per home
40	0.004

LOW-FLOW SHOWERHEADS

Measure

Low-flow showerheads are only eligible in the Hard-To-Reach SOP. Showerhead savings are per household and for retrofit installations only.

The retrofit low-flow showerhead installation must have a rated flow of no more than 2.0 gallons per minute (gpm) and removal of the existing showerhead with a rated flow of no less than 2.5 gpm.³ The source of the heated water flowing through the showerhead must be an electric water heater. These estimates apply to all weather regions.

Baseline

The baseline average flow rate of existing stock of showerheads is assumed to be 2.5 gpm.

Installation & Efficiency Standard

The incentive is for residential, retrofit-only installation of existing showerhead(s) with a pre-installation flow rate of no less than 2.5 gpm. Existing showerheads that have been defaced so as to make the flow rating illegible are not eligible for replacement.

Replacement showerheads shall have a rated flow of no more than 2.0 gpm. Only showerheads that are not easily modified to increase flow rate shall be allowed.

All showerheads removed shall be collected by Project Sponsor and submitted to the utility with each project implementation report.

The showerhead must be installed in a home with electric water heating in order to qualify for an incentive.

Deemed Savings

Low Flow Showerheads	
KWh Savings per home	Peak kW Savings per home
186	0.022

Deemed savings were calculated assuming that all showerheads in a home were retrofit with low-flow showerheads. Therefore, all showerheads in a home must be replaced in order to be eligible for the full deemed savings incentive.

³ All flow rate requirements listed here are the rated flow of the showerhead measured at 80 pounds per square inch of pressure (psi).

If all showerheads in a home are not replaced, then the following table should be used to calculate the deemed savings for energy and peak demand savings:

kWh savings	Showerheads per Household			
	One	Two	Three	Four
One Showerhead	186	70	51	40
Two Showerheads		186	102	80
Three Showerheads			186	120
Four Showerheads				186

kW savings	Showerheads per Household			
	One	Two	Three	Four
One Showerhead	0.022	0.008	0.006	0.005
Two Showerheads		0.022	0.012	0.010
Three Showerheads			0.022	0.015
Four Showerheads				0.022

As examples, if a Project Sponsor retrofits one showerhead in a household with two showerheads, the deemed savings would be 70 kWh and 0.008 kW. If a Project Sponsor retrofits two showerheads in a household with four showerheads, the deemed savings would be 80 kWh and 0.010 kW.

FAUCET AERATORS

Measure

Faucet aerator savings are only eligible in the Hard-To-Reach SOP. Faucet aerator savings are per household and for retrofit installations only. The incentive is for residential, retrofit-only installation of a faucet aerator with a rated flow of no more than 1.5 gallons per minute (gpm). The source of the heated water flowing through the faucet must be an electric water heater. These estimates apply to all weather regions.

Baseline

The baseline is assumed to be 2.5 gpm.

Installation & Efficiency Standard

The incentive is for residential, retrofit-only installation of existing faucet aerator(s) with a pre-installation flow rate of no less than 2.5 gpm. Aerators that have been defaced so as to make the flow rating illegible are not eligible for replacement.

A faucet aerator installed in a retrofit situation must have a labeled maximum flow rate of 1.5 gpm at 80 psi. The aerator must be installed in a home with electric water heating in order to qualify for an incentive.

All aerators removed shall be collected by Project Sponsor and submitted to the utility with each project implementation report.

Deemed Savings

Faucet Aerators	
KWh Savings per home	Peak kW Savings per home
48	0.0067

ENERGY STAR[®] REFRIGERATORS

Measure

Retrofit replacement of an existing refrigerator in a residential or small commercial application. Existing unit must be a working unit with a remaining service life of 10 years or more.

Baseline

The baseline for refrigerators is the equivalent of the DOE minimum efficiency standards for refrigerators. Current standards have been in effect since July 1, 2001.

For an individual refrigerator retrofit program, the savings calculations are based on the following assumptions:

- Application: Residential and small commercial
- Existing Unit Types: 50% are 22 cu. ft. top-mounted freezers with auto defrost, 50% are 23.5 cu. ft. side-by-side models with auto defrost. Unit ages are between five and fifteen years.
- Baseline Consumption: Original AHAM test data, adjusted for age and other operating conditions, using methodology developed by PNNL.

For a multi-family projects, the savings calculations are based on the following assumptions:

- Application: Multi-family projects
- Existing Unit Types: 50% are 15 cu. ft. TF with auto defrost, 50% are 18.5 cu. ft. TF with auto defrost. Unit ages are between five and fifteen years.
- Baseline Consumption: Original Association of Home Appliance Manufacturers (AHAM) test data, adjusted for age and other operating conditions, using methodology developed by Pacific Northwest National Labs.

Refrigerators

Installation & Efficiency Standard

Refrigerators must meet current ENERGY STAR® standards.

All Project Sponsor-installed refrigerators must be connected to an adequately sized electrical receptacle and be grounded in accordance to the National Electric Code (NEC). All refrigerators shall replace refrigerators currently in use, and all replaced refrigerators shall be dismantled in an environmentally-safe manner, in accordance with applicable federal, state, and local regulations. Project Sponsor shall provide documentation of proper disposal of refrigerators according to all local, state and federal laws. The Project Sponsor shall not sell, trade, give away, export across state or international borders any turned-in refrigerator.

ENERGY STAR® standards for 2001 are set at 10% more efficient than applicable DOE standard for 2001.

Deemed Savings

ENERGY STAR® Refrigerators					
Replace on Burnout kWh Savings	Replace on Burnout Peak kW Savings	Multifamily Retrofit kWh Savings	Multifamily Retrofit Peak kW Savings	Single Family Retrofit kWh Savings	Single Family Retrofit Peak kW Savings
61	0.008	728	0.099	866	0.118

From the Refrigerator Energy Savings Program Analysis, developed by Battelle Labs, the peak monthly load index (ratio of peak monthly consumption to average monthly consumption) is 1.12. The average of the hourly load indices for 1300 – 1900 hours is 1.06. This produces an average load index for peak hours during August (peak month) of 1.19.

Average demand savings is calculated as:

Single Family Applications

$$(866 / 8760) * 1.19 = 0.118 \text{ kW}$$

Multifamily Applications

$$(728 / 8760) * 1.19 = 0.099 \text{ kW}$$

ENERGY STAR® DISHWASHERS

Measure

Purchase ENERGY STAR® dishwasher in a “new construction” or “replacement on burnout” situation. To be eligible, the source of the water for the dishwasher must be an electric water heater.

Baseline

Department of Energy (DOE) minimum efficiency standard for dishwashers.

Type	Energy Factor, EF (load/kWh)	Unit Energy Consumption (kWh/cycle)	Annual energy consumption (kWh) ^{(1) (2)}	Assumed demand (kW)
Standard, top loading (capacity > 1.6 cu ft.)	0.46	2.18	700	1.3

(1) Assumes annual usage of 322 cycles (Source: DOE test procedure)

(2) Annual energy consumption = Annual cycles / Energy factor

Approximately 80% of the energy used during a dishwashing cycle is used by the water heater to raise the temperature of the incoming water. DOE test procedure for dishwashers includes this energy, and assumes electrically-heated hot water.

Installation & Efficiency Standard

According to ENERGY STAR[®] requirement, eligible dishwashers should have an Energy Factor 0.575 or greater, effective 1/1/2001.

Deemed Savings

ENERGY STAR [®] Dishwashers			
w/ Electric Water Heating		w/out Electric Water Heating	
kWh Savings	Peak kW Savings	kWh Savings	Peak kW Savings
142	0.012	37	0.0032

ENERGY STAR[®] CLOTHES WASHERS

Measure

Purchase Energy Star[®] or CEE-qualifying clothes washer in a “new construction” or “replacement on burnout” situation.

Baseline

Department of Energy (DOE) minimum efficiency standard for clothes washer, effective 1/2004.

Modified Energy Factor, MEF (lbs./kWh)	Unit Energy Consumption (kWh/cycle)	Annual energy consumption (kWh) ⁽¹⁾ ⁽²⁾
1.04	2.84	1115

- (1) Assume standard size capacity of 2.96 cu. ft., and annual usage of 392 cycles.
- (2) Annual energy consumption includes energy consumed to heat the water (with electric water heating) and to dry the clothes (with an electric dryer).

Installation & Efficiency Standard

Effective 1/1/2004, the ENERGY STAR[®] standard for clothes washers is a minimum Modified Energy Factor (MEF) of 1.42. The Consortium for Energy Efficiency (CEE) has developed additional specifications for models which exceed ENERGY STAR[®] specifications.

ENERGY STAR[®] / CEE Clothes Washer Specifications and Deemed Savings

Units With Electric Water Heaters

Model	Modified Energy Factor	Annual kWh	KWh Savings	KW Savings
2004 Baseline	1.04	1115		
2004 ENERGY STAR [®]	1.42	817	298	0.036
CEE Tier 3	1.60	725	390	0.047
CEE Tier 4A	1.80	644	471	0.057
CEE Tier 4B	1.80	644	471	0.057

Notes:

Modified Energy Factor = MEF = Cubic feet of laundry that can be washed and dried per kWh

392 washer cycles per year (normalized for 2.96 cu.ft. tub volume). Source: DOE

KW demand savings based on 0.00012 peak kW per annual kWh of energy savings. Source: Bonneville Power Administration's ELCON Study.

Units With Gas Water Heaters

Model	MEF	Adjusted MEF*	Annual kWh	KWh Savings	KW Savings
2004 Baseline	1.04	1.75	662		
2004 ENERGY STAR [®]	1.42	1.92	604	59	0.007
CEE Tier 3	1.60	2.16	537	125	0.015
CEE Tier 4A	1.80	2.45	474	188	0.023
CEE Tier 4B	1.80	2.45	474	188	0.023

Notes:

*Adjusted MEF based on CEE's kWh/cycle values for clothes washers with gas water heaters. Source:

COMPACT FLUORESCENT LAMPS

Measure

Compact fluorescent lamps (CFLs) must be installed in a location that gets a daily usage of at least 3 hours per day. Deemed values were calculated based on an average daily usage of 4 hours per day. CFL incentives are for customers under the Hard-To-Reach Program template only.

Baseline

Standard incandescent lamps, with wattages of 40, 60, 75, or 100 watts.

Installation & Efficiency Standard

The ENERGY STAR[®] CFL specification includes:

- Starting time of approximately one second
- Efficiency level for lamps of 15 watts or more is 60 lumens/watt
- Efficiency level for lamps of less than 15 watts is 45 lumens/watt

The fixture wattage rating dictates the maximum CFL wattage installed. If there is no fixture wattage rating shown on the fixture, the fixture wattage shall be assumed to be 60 watts. For example, when replacing an incandescent lamp in a fixture rated for 60 watts, the maximum CFL wattage that may be installed is 21 watts.

“Hollywood-style” incandescent fixtures with four or more lamps may not be retrofitted with screw-in CFLs. These fixtures may be retrofitted with hard-wired fluorescent fixtures only. The addition of a disk device to a screw-in CFL to prevent its removal does not qualify it as a hard-wired fixture.

To compensate for the fact that the life of this measure is less than 10 years, the incentive amounts paid are based on 75% of the following deemed savings.

Deemed Savings

Compact Fluorescent Lamps					
Measure CFL (Watt)	Measure CFL (Range of Watts)	Comparable Incandescent Light (Watt)	Daily usage (Hrs./Day)	Annual Energy Savings (kWh)	Demand Savings (kW)
15	14-18	40	4	36.5	0.006
20	19-21	60	4	58.3	0.009
23	22-25	75	4	75.8	0.012
27	26-28	100	4	106.5	0.016

WATER HEATING REPLACEMENTS - SOLAR WATER HEATING

Measure

Solar water heating deemed savings values are calculated based on the Solar Rating and Certification Corporation's (SRCC) test for solar water heaters (test OG-300).

Installation & Efficiency Standard

Only solar water heaters meeting the SRCC OG-300 standard (based on tank size and final Solar Energy Factor-SEF) qualify for these deemed savings estimates.

Deemed Savings

The following table presents the energy savings for solar water heaters based on tank size and final Solar Energy Factor (SEF).

Demand Savings

Solar Water Heating Demand Savings	kW
	0.42

Energy Savings

Water Heating Replacements – Solar Water Heating Energy Savings			
Approximate Volume (gal) ->	80	50	30
Baseline (DOE Standard) EF	0.82	0.86	0.89
SRCC OG-300 Solar Energy Factor	kWh Savings	kWh Savings	kWh Savings
1.0	637	471	368
1.1	909	743	640
1.2	1,135	969	866
1.3	1,326	1,160	1,057
1.4	1,490	1,324	1,221
1.5	1,633	1,467	1,364
1.6	1,757	1,591	1,488
1.7	1,867	1,701	1,598
1.8	1,965	1,799	1,696
1.9	2,052	1,886	1,783
2.0	2,131	1,965	1,862
2.1	2,202	2,036	1,933
2.2	2,266	2,100	1,997
2.3	2,325	2,159	2,056
2.4	2,379	2,213	2,110
2.5	2,429	2,263	2,160
2.6	2,475	2,309	2,206
2.7	2,518	2,352	2,249
2.8	2,557	2,391	2,288
2.9	2,594	2,428	2,325
3.0	2,628	2,462	2,359
3.1	2,660	2,494	2,391
3.2	2,691	2,525	2,422
3.3	2,719	2,553	2,450
3.4	2,745	2,579	2,476
3.5	2,771	2,605	2,502
3.6	2,794	2,628	2,525
3.7	2,817	2,651	2,548
3.8	2,838	2,672	2,569
3.9	2,858	2,692	2,589
4.0	2,877	2,711	2,608
4.1	2,895	2,729	2,626
4.2	2,913	2,747	2,644
4.3	2,929	2,763	2,660
4.4	2,945	2,779	2,676
4.5	2,960	2,794	2,691
4.6	2,975	2,809	2,706
4.7	2,988	2,822	2,719
4.8	3,002	2,836	2,733
4.9	3,014	2,848	2,745
5.0	3,027	2,861	2,758

SOLAR ELECTRIC (PHOTOVOLTAIC) ENERGY SYSTEMS

Measure

Solar electric (photovoltaic) energy systems deemed savings values are calculated based on the system's rated watts DC_{STC} ⁴. Only photovoltaic systems that result in net reductions of the customer's purchased energy and peak demand qualify for these deemed savings estimates. These deemed savings values apply to all customer classes and all weather regions in Texas.

Installation & Efficiency Standard

The installation must also meet the following requirements in order to be eligible for these deemed savings values:

1. The system shall be installed by a licensed electrical contractor or, in the case of a residential installation by the homeowner, with the approval of the electrical inspector in accordance with the National Electric Code (NEC 690, "Solar Photovoltaic Systems") or local building codes.
2. If the system is utility interactive the inverter shall be listed by national testing laboratory (see, for example, UL 1741, "Static Inverters and Charge Controllers for Use in Photovoltaic Power Systems") and meet the requirements of the Institute of Electrical and Electronics Engineers (IEEE) Standard 929-2000 "Recommended Practice for Utility Interface of Photovoltaic (PV) Systems".
3. The array azimuth shall be within +/- 20 degrees of south; the tilt angle shall be between 0 (horizontal) and latitude + 15 degrees.
4. The estimated annual energy generation from the PV system shall not exceed the customer's annual energy consumption.

Deemed Savings

Energy Savings

The following formula calculates the energy savings for solar electric photovoltaic energy systems based on the rated watts DC_{STC} .

$$\text{Deemed Energy Savings (kWh)} = 1.60 * \text{watts } DC_{STC} \text{ installed}$$

Demand Savings

The following formula calculates the demand savings for solar electric photovoltaic energy systems based on the rated watts DC_{STC} .

$$\text{Deemed Demand Savings (kW)} = 0.83 * \text{kW } DC_{STC} \text{ installed}$$

⁴ Watts DC_{STC} refers to the system's factory rated output at standard test conditions, which assumes 1,000 w/m^2 of solar radiation and 25 degree Celsius cell operating temperature.