



MEMORANDUM

TO: Low Income Consumer Advisory Task Force

FROM: Denise Kuehn, Director Energy Efficiency Services

DATE: March 23, 2015

SUBJECT: Evaluation of Austin Energy's (AE) Weatherization Assistance Program

The following report is the finalized study commissioned by Austin Energy and completed by GDS and Associates providing an update to the 2012 study on weatherization programs.

The main objective of this study was to collect and report information on weatherization programs offered by other municipal utilities and government agencies and to compare their key indicators to AE's program.

The study included comprehensive data on the weatherization programs operated by twenty-nine different utilities and municipal agencies. This report includes key findings and recommendations.

WEATHERIZATION ASSISTANCE PROGRAM

Evaluation of Austin Energy's ARRA-
Supported Weatherization Assistance
Program (WAP)

FINAL REPORT

Prepared for:

AUSTIN ENERGY

January 30, 2015

WEATHERIZATION ASSISTANCE PROGRAM

Evaluation of Austin Energy's ARRA-Supported Weatherization Assistance Program (WAP)

Prepared for



January 30, 2015

On Behalf of



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1 EXECUTIVE SUMMARY

GDS Associates, Inc. (GDS) conducted research and developed best practices for Austin Energy's (AE) Weatherization Assistance Program (WAP). The main objective of this study was to collect and report information on WAP programs offered by other municipal utilities and government agencies and to compare key indicators for those programs to AE's WAP program. The survey and research results highlight the fact that weatherization efforts across the nation have slowed down since the expiration of American Reinvestment and Recovery Act (ARRA) Stimulus Funds. However, Austin Energy's three-year (2010-2012) emphasis on weatherization established good control processes and procedures for use in future AE WAP programs. Additionally, working within the confines of ARRA Federal Guidelines and standards opened the door for future leveraging of funds between utilities and federal, state and local agencies looking to improve communities through home weatherization.

The study team collected comprehensive data on the WAP programs operated by 29 different utilities or municipal agencies, including 9 municipal utilities, 11 municipal government agencies, 6 state government organizations and 4 other electric providers. The tasks performed by GDS and the key findings and recommendations from our research activities are presented in this evaluation report.

Task 1: Conduct Research on Weatherization Programs of Other Utilities and Government Agencies

GDS conducted research on residential weatherization programs using both primary in-depth interviews with program managers and secondary research using an extensive search of available online weatherization program material. Ten in-depth interviews were conducted with the following:

- Joe Guerrero, Austin Energy Low-Income Weatherization Program manager
- One interview with the program administrator for two Texas IOUs
- Two interviews for electric cooperative program managers
- Six representatives from municipal utilities outside of Texas

Secondary research was completed on weatherization programs for 19 other organizations, including nine in Texas. The key findings from the survey and secondary research are discussed below.

Key Findings from Task 1

Eligible Measures

Most programs surveyed offered similar weatherization measures for their members, including: insulation, duct sealing and repair, weather-stripping, water saving measures and CFL lighting.

Program Cost to Participants

All programs (except the program offered by the Orlando Utilities Commission) provided 100% of the funds needed for the low-income weatherization measures installed. The Orlando Utilities Commission provides a sliding scale of reimbursement based upon household income levels.

Annual Weatherization Budgets

The utilities interviewed for the survey ranged from very small to very large with annual budgets ranging from \$30,000 at Bluebonnet Electric Cooperative in Texas to \$12,000,000 per year at the Los Angeles Department of Water and Power (LADWP) in California. Austin Energy's current year annual budget of \$3,700,000 was the third largest overall budget of all 10 programs reviewed.

Program Cost per Participant

The program cost per participant was larger for utilities offering more expensive measures, such as HVAC repair or replacement. Also, the cost per participant varied based upon the measure delivery approach. Two of the surveyed utilities focus on low cost measures in efforts to serve as many homes as possible. The average cost per home for these utilities is between \$506 and \$536. Other programs utilize a longer term process which allows installation of larger projects, such as energy star windows and HVAC repairs or replacement. Austin Energy average cost is \$3,000 per participating home, which is in a similar range to Gainesville Regional Utilities (Florida) average of \$3,800 and Pedernales Electric Cooperative average of \$3,500 per home.

Direct Install or Rebate

All programs surveyed utilized a direct install approach for low-income weatherization measure installation. Most programs used in-house staff for program management and conducting energy audits or assessments. Installation of recommended energy efficiency measures was done exclusively by third party contractors except for LADWP where a staff of 40 employees handled all direct installed measure installations.

Measures of Program Success / Average Energy Saved per Home

According to survey respondents, the top two measures of program success for the programs reviewed were (1) the number of homes served and (2) the full expenditure of program budget.

Several of the program managers noted that the average energy saved per home has become less important in recent program years than when the programs first began. Three of the utilities reviewed do not actively track the annual kWh saved by their programs. For utilities that reported average energy saved per home, the Orlando Utilities Commission had the lowest reported savings of 554 kWh per year per home and Gainesville Regional Utilities had the highest savings of 1,752 kWh per home per year.

Leveraging of Weatherization Funding

All utilities served benefited from the influx of stimulus funds from the American Recovery and Reinvestment Act of 2009 (ARRA). Home weatherization activity and budgets increased greatly during the 2009-2012 time period. Once the ARRA monies expired in 2012, funds for weatherization greatly decreased. As such, several utilities have sought other partners to leverage funding for weatherization programs. Utilities included in this study use a variety of leveraging agencies to support and fund weatherization work, including national, state and local organizations and community action agencies.

Implementation Strategies

Most utilities surveyed are using some type of electronic data collection device and interface to store pre and post characteristics of weatherized homes. Austin Energy's use of Salesforce.com to store data is most likely a practice other utilities may migrate to in the future, as most utilities are using internally developed software to store collected data.

Data collected varies between utilities and while most collect pre and post billing history, there is not consistency among the utilities in collecting pre and post blower door and duct blaster test results.

Most programs reviewed had extensive application processes and income verification guidelines similar to AE. Gainesville Regional Utilities (GRU) has a somewhat unique application, approval and post inspection process that works to build participant ownership in the overall weatherization process. The process involves an application process, a home assessment, work to scheduled and completed and a

final post-inspection like most other programs. After the home assessment, the homeowner is responsible for selecting a vendor and submitting the cost estimates directly to the utility. This aspect of the program gives the participant ownership in the process and has received good feedback from participants.

Task 2: Develop a Benchmarking Analysis for the AE WAP Program

A key objective of this study is to provide a benchmarking analysis that compares the characteristics of AE's WAP Program to similar WAP programs in the region. To benchmark AE's WAP performance, GDS reviewed the AE Weatherization program performance against other programs in Texas and nearby states where metric data were available. GDS also included data from six utilities outside of Texas in the benchmarking analysis, using data obtained from past program impact evaluation studies. The detailed results of the benchmarking analysis can be found in Table 4-3.

Key Findings from Task 2

The currently available benchmarking data comes from several key time periods: (1) projects evaluated in 2009 and earlier were pre-ARRA, (2) programs evaluated from 2010-2011 were ARRA programs and (3) programs listed with a date utilize current data. As more current data for annual energy savings and program cost per participant become available, GDS and AE will have a better database where performance data is all of the same vintage. For ARRA vintage programs (2009 to 2012), the cost and energy savings numbers are higher than data from more recent program activity, as most utilities are not installing the same number of higher cost measures (as they did during the ARRA era), such as HVAC replacement. The benchmarking analysis shows that AE's current program ranked 13 out of 18 with respect to highest program spending per participant (with a rank of "18" being the highest spending per participant) and AE's ARRA spending ranked 16 out of 18. However, Austin returned the fifth highest annual kWh saving out of the seven utilities that reported this metric for the ARRA period. GDS will continue to make follow-up contacts with the utilities where this data is missing in order to provide a more complete benchmarking analysis to AE. Table 1-1 below provides AE's ranking on each metric in the benchmarking analysis:

Table 1-1: Comparison of Program Costs per Participant for Each Utility

Utility	Program Cost per Participant	Ranking
City of Tallahassee Utilities	\$506	1
JEA	\$536	2
Xcel Energy, Colorado (2010)	\$593	3
Thetford, Vermont (2011)	\$863	4
New Hampshire Utilities (2006)	\$1,449	5
Orlando Utilities Commission	\$1,500	6
Sacramento Municipal Utility District (SMUD)	\$1,800	7
Interstate Power and Light Company, Iowa (2011)	\$2,049	8
PECO, Pennsylvania (2008)	\$2,190	9
Black Hills Energy, Iowa (2009)	\$2,299	10
MidAmerican Energy, Iowa (2009)	\$2,931	11
Pedernales Electric Cooperative	\$3,500	12

Utility	Program Cost per Participant	Ranking
Austin Energy - Current¹	\$3,000	13
Gainesville Regional Utilities	\$3,800	14
Los Angeles Department of Water and Power (LADWP)	\$5,000	15
Austin Energy - ARRA	\$5,093	16
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	\$6,000	17
Arkansas WAP	\$6,904	18
Alabama ARRA (2008-2011)	\$7,110	19

Table 1-2: Comparison of Annual Energy Savings per Participant for Each Utility

Utility	Energy Savings per Participant	Ranking
PECO, Pennsylvania (2008)	2,172	1
Gainesville Regional Utilities	1,752	2
Xcel Energy, Colorado (2010)	1,711	3
Pedernales Electric Cooperative	1,331	4
Austin Energy - ARRA	1,200	5
Wisconsin WAP (2011)	1,115	6
Interstate Power and Light Company, Iowa (2011)	1,004	7
Sacramento Municipal Utility District (SMUD)	1,000	8
MidAmerican Energy, Iowa (2009)	998	9
New Hampshire Utilities (2006)	872	10
Orlando Utilities Commission	554	11

Future Benchmarking Analysis: At the present time, no existing comprehensive regional or nationwide database was available to GDS to benchmark AE's WAP against similar programs at other utilities. However, several significant studies and evaluations of Weatherization Programs are currently in process with results expected later in 2015. Specifically, the National Retrospective Evaluation of the WAP and the ARRA Evaluation are both expected to be released in the spring of 2015. Also, the Statewide Evaluation Program of Energy Efficiency Activities report will be released in March of 2015. Finally, the City of Houston Weatherization program is currently being evaluated by the Houston Advanced Research Center and hopefully these results will be public later in 2015. GDS recommends that AE update the benchmarking analysis when these three studies become available later in 2015.

Task 3: Conduct Literature Search of Weatherization Program Best Practices

The ARRA grant provided \$5.0 Billion to fund WAP efforts for numerous states and municipalities from 2008-2012. As a result, over 600,000 homes nationwide were weatherized during this period. This increase in weatherization effort provided opportunity for the weatherization process to be streamlined and for many best practices to be developed. GDS reviewed many National/Statewide Studies to identify current weatherization program best practices.

¹ Includes measure cost and installation only, no administrative cost

Table 5-1, Table 5-2 and Table 5-3 highlights the best practices GDS found in this research.

Key findings relating to WAP best practices include:

- Build quality control into the WAP design and implementation process. The U.S. Department of Energy's (DOE) WAP has introduced a comprehensive Quality Work Plan (QWP) that establishes a benchmark for quality home energy upgrades. DOE is encouraging utilities to follow this, or develop their own QWPs, to better insure quality installations. Austin Energy has already implemented many of these best practices.
- Offer a range of weatherization and insulation measures to program participants. Austin Energy currently offers and installs similar weatherization measures as offered by WAP programs of other utilities. GDS recommends that AE continue to offer this wide variety of measures to ensure that needs of the customers are met and to ensure that the WAP program is comprehensive.
- Partnerships with local and national agencies or businesses help facilitate more home repairs and weatherization participants. GDS recommends that AE continue to seek and maintain look to leverage this type of support going forward to stretch budget funding such that more homes may be weatherized in their service area.

Task 4: Prepare Draft and Final Reports

A summary of findings and recommendations based upon the impact and process evaluations can be found in Section 6 Findings and Recommendations. The most important findings and recommendations are listed below:

Based on the best practices review and specifically other measures that are installed by other weatherization programs, GDS commends AE on running an exemplary program. The following were identified as best practices in the research review of other regional and statewide WAP Program. It is recommended that AE consider each of the practices for possible inclusion in future WAP Program design efforts.

Expand on the current home sealing practices

Perform an air leakage test before and after performing the air sealing measures. Air leaks are capable of costing 10-25% more on home energy heating and cooling bills.

- 1) Caulking all building envelop penetrations – plumbing lines, fans & vents, cooling lines, electrical, fireplaces & chimneys, duct work, recessed lighting fixtures
- 2) Caulking around doors and windows
- 3) Electrical receptacle gaskets to decrease infiltration

Develop process controls and procedures around the DOE Quality Work Plan Framework

- 1) The QWP defines how home energy upgrade work should be done
- 2) It also provides a prescription for communication, training, and the inspection of work throughout the WAP network
- 3) Helps establish more consistent quality installation procedures among many installation partners

Identify Possible Community/Regional/State Levering Partners to Stretch WAP funding

- 1) More homes weatherized

- 2) Less organization vulnerability to reductions in any single Weatherization funding source
- 3) Getting new partners increases the number of stakeholders with a vested interest in the Program who can advocate for the Program

2 PROGRAM OVERVIEW

The City of Austin and AE contracted with the Texas Department of Housing and Community Affairs (TDHCA) on November 19, 2009 to implement a \$2.9 million American Recovery and Reinvestment Act (ARRA) grant to fund a WAP within the city limits of Austin. The contract period spanned September 1, 2009 to August 21, 2011. Because AE's implementation of the program was so successful, the utility received additional funding on three separate occasions in the amounts of \$2.1 million, \$200,000 and \$1 million, for total funds of \$9.2 million. This allowed the utility to nearly double the number of units receiving this enhanced free weatherization.

Under the Federal Weatherization Program which ended April 30, 2012, AE weatherized 1,886 homes, 77% more than the original goal of 1,064 homes. The homes were occupied by 4,529 people of whom 645 (% of Total) were elderly, 572 (% of Total) had disabilities and 758 (% of Total) were children under the age of 5. On average, each of the homes will save about 1,200 kilowatt-hours annually in energy costs due to the improvements.

Table 2-1 below shows the number of customers receiving free weatherization since FY2006.

Table 2-1: Customer Assistance Program Customers Receiving Free Weatherization

Fiscal Year	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012
Homes Receiving Weatherization	720	632	505	538	*456	*1044	*715
*In FY 2010 127 of the 456 homes received weatherization through the use of ARRA funds. *In FY 2011 all homes received weatherization through the use of ARRA funds. *In FY 2012 the 715 homes used both ARRA and AE funds.							

2.1 OBJECTIVE

The objective of the WAP Program was to reduce the energy burden and energy costs for low-income families, particularly for the elderly, people with disabilities, and children, by improving the energy efficiency of their homes while ensuring their health and safety.

Prior to 2009, Austin Energy's goals were to reach the maximum number of low-income households and to educate and create jobs for local contractors. The goal was to service a minimum of 450 households per year of the contract. Austin Energy sought to partner with 10 individual contractors or companies for the initial assessment to determine the scope of the weatherization work to be performed on each dwelling. The goal was to partner with an additional 24 contractors or companies to perform the actual installation of the materials required to weatherize the dwellings. It was desired that another 10 contractors or companies would conduct the final inspections to verify the scope of the weatherization was satisfactorily performed on each dwelling.

Austin's current goals is to service a minimum of 327 home per year.

2.2 ELIGIBILITY

Austin Energy determined participant eligibility by household income levels and a set of priority provisions to target high-need customers. According to the federal guidelines for WAP programs, eligible

participants must be at or below 200% of the Federal Poverty Income Guidelines. Table 2-2 outlines the household income limits for eligibility.

Table 2-2: Program Year 2014 Income Limits from DOE – Effective November 6, 2013²

Persons in Family	200% of Federal Poverty Income Guidelines
1	≤ \$22,980
2	≤ \$31,020
3	≤ \$39,060
4	≤ \$47,100
5	≤ \$55,140
6	≤ \$63,180
7	≤ \$71,220
8	≤ \$79,260

For the ARRA period, eligibility was established based on household income levels, priority was given to households that met the following criteria:

- Roughly equivalent to extremely low- to very low-income households (i.e., 0-60% of the area median family income).
- Households with small children under the age of 6.
- Households with an elderly resident over the age of 60.
- Households with a disabled resident.
- Households that expend more than 11% of their household income for energy.
- Households with high residential energy use over \$1,000 per year.

Austin Energy prioritized program delivery by:

- Targeting areas based on demographic data.
- Targeting areas of dense poverty populations by zip code.
- Targeting households based on energy consumption.
- Coordinating with existing low-income outreach efforts.
- Prioritizing by zip code.
- Targeting households with higher energy burdens.
- Prioritizing by current applications.
- Setting aside 20% of funds for non-targeted areas.

Current eligibility requirements includes:

Perquisites

- Must be an Austin Energy customer.
- Must meet the income requirement of 200% or less of the United States Department of Health and Human Services poverty guidelines for your household for the current year.

² <http://www.liheapch.acf.hhs.gov/profiles/povertytables/FY2014/popstate.htm>

General Requirements

- Customer must live in the house to be weatherized.
- Customer must live in a single-family home, duplex, triplex, or a building with no more than four residential units.
- Customer home's appraised value must be less than \$200,000 (excluding land value).
- Customer must provide income and disability documentation for everyone 18 years and older in the home.
- Both owners and renters can apply.
- If customers rent, they must provide a copy of your lease/rental agreement.
- Customer must have lived in your rental home for at least three months.
- Customer's landlord must agree to the work and sign an Austin Energy Rental Release form.

2.3 MEASURES

During the ARRA period, the maximum allowed expenditure per home was \$6,500. The current maximum allowed expenditure is \$5,500 per home. Table 2-3 contains a list of the efficiency measures eligible for installation currently being used at AE.

Table 2-3: List of Eligible Measures

ARRA Measures	Current Measures
Insulation – Attic	Insulation – Attic
Insulation – Wall	Insulation – Wall
Insulation – Floor	Insulation – Floor
Duct System – Repair or Replacement	Duct System – Repair or Replacement
weather-stripping / Air Infiltration	Weatherstripping / Air Infiltration
HVAC – Repair or Replacement	Lighting – Installation of CFLs
Refrigerator Replacement – ARRA	Solar Screens
Lighting – Installation of CFLs	Gas Stove Replacement – Texas Gas Services
Solar Screens	Low-Flow Water Saving Devices
Gas Stove Replacement – Texas Gas Services	

3 RESEARCH ON WEATHERIZATION PROGRAMS OF OTHER UTILITIES AND GOVERNMENT AGENCIES

The following sections contain GDS's findings from the following task:

Task 1: Conduct Research on Weatherization Programs of Other Utilities and Government Agencies

GDS conducted research on weatherization programs using both primary interviews with program managers and secondary research using an extensive search of available online weatherization program material. Direct interviews were conducted with Joe Guerrero, AE Low-Income Weatherization Program manager, and 9 representatives from other utilities. Three interviews were conducted with program managers/administrators from Texas utilities and six interviews were conducted with municipal electric organization outside of Texas. In regards to secondary research, weatherization programs from 19 other organization, including 9 in Texas, were reviewed.

3.1 SUMMARY OF FINDINGS AND RECOMMENDATIONS

Through the review of many southwestern, state and national WAPs it became clear that AE's program designers spent a great deal of time identifying measures that best serve the needs of their target market. A summary of practices from secondary research are identified and are presented in this section.

Based on the best practices review and specifically other measures that are installed by other weatherization programs, GDS commends AE on running an exemplary program and recommends that AE continue to include the following individual measures to maintain a best practice WAP Program.

Expand on the Current Home Sealing Practices

Perform an air leakage test before and after performing the air sealing measures. Air leaks are responsible for 10-25% more cost of home energy heating and cooling bills.

- 1) Caulking all building envelop penetrations – plumbing lines, fans & vents, cooling lines, electrical, fireplaces & chimneys, duct work, recessed lighting fixtures.
- 2) Caulking around doors and windows
- 3) Electrical receptacle gaskets to decrease infiltration

Implement a Whole Building Approach Such as Weatherization Plus

Weatherization Plus³ describes the evolution of the WAP from its traditional focus on heating and cooling energy conservation to an expanded focus on whole-house energy usage. The whole-house approach incorporates advanced technologies and addresses the comprehensive energy usage in low-income homes, as well as related health and safety improvements.

The goal of Weatherization Plus is to achieve significantly greater energy cost savings for more low-income households and to increase the program's contribution to the economic and environmental health and sustainability of the nation's communities.⁴

³ <http://www.waptac.org/WAP-Basics/Weatherization-Plus.aspx>

⁴ Loc. cit.

Improving a building's insulation system is one of the fastest and most cost-effective ways to reduce energy waste. Checking insulation to these areas to the home are critical: attic, floors, and walls. The best insulation system will provide maximum thermal performance, and act as a shell to the surrounding weather.

Steps in the Whole House Approach

- Energy audits to evaluate the building envelop to determine the quality of the construction. All possible air leakage areas are examined and documented.
- Perform an infrared scan of the interior walls. The scan will detect hot or cold spots which could point to air infiltration, duct leaks, or poor insulation levels or installation.
- A blower door test will pinpoint areas of infiltration and show a clear picture of what the home needs for energy improvements.
- These steps identify problem areas particularly in older houses. Holes in foundations, gaps in insulation, open chimney runs, lack of insulation around recessed lighting, and other areas needing improvement are commonly discovered.

Improving the home's shell will have additional benefits to inhabitants. These advantages include:

- Decreased drafts
- Increased comfort with a constant temperature throughout the building
- Better indoor air quality
- Reduced infiltration of outside air pollutants
- Reduced moisture condensation within the building walls and roof

Add LED Lighting to the eligible measure list

- Increased saving contribution over CFL bulb distribution

3.2 PRIMARY RESEARCH

GDS conducted a survey with the AE Program Manager for the Low-Income Weatherization Program. Additionally, interviews were conducted with the program managers/administrators of Low-Income Weatherization programs at the following utilities.

- Texas WAPs:
 - Pedernales Electric Cooperative
 - Bluebonnet Electric Cooperative
 - The Texas Association of Community Action Agencies – Program administrator for Oncor and American Electric Power (AEP) Texas
- Other Utility Weatherization Programs
 - Orlando Utilities Commission (Florida)
 - City of Tallahassee Electric Department (Florida)
 - Jacksonville Electric Authority (Florida)
 - Gainesville Regional Utilities (Florida)
 - Sacramento Municipal Utility District (California)
 - Los Angeles Department of Water and Power (California)

3.2.1 Primary Research Findings

Table 3-1 below provides a summary of the key information collected for AE and the nine other utilities that completed the Low-Income Weatherization Survey. A copy of the Program Manager Survey Instrument and a full table of all survey responses can be found in Appendix A. Table 3-1 is a brief summary of the findings for each key item.

Table 3-1: Key Survey Responses

KEY SURVEY QUESTIONS								
	1	3	4	6	16	33	34	10
Utility	What are the program's Eligible measures?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	Does the program use a direct install or a rebate approach?	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Do you leverage funds for your program with any national, state or local agencies?
AE	Insulation – Attic Insulation – Wall Insulation – Floor Duct System – Repair Duct System – Sealing weather-stripping HVAC – Repair or Replacement Refrigerator Replacement Gas Stove Replacement Lighting – Installation of CFLs	Yes	\$3,700,000M 1,200 homes	\$3,000 per home	Direct Install	Full expenditure of funds	Not Provided	No
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	Must save electricity Air Duct infiltration Insulation Water savings measures Heat Pump Central A/C Window A/C Units Refrigerator	Yes	\$6,000,000 1,000 Homes	\$6,000 for AEP and Oncor	Direct Install	Funds expended corrected Meeting facility goals kWh saved	Utilities - Only get credit for deemed savings,	Federal DOE, Advocacy wise - i.e. - Texas Rate Payer Organization, Texas Legal Services, Nationally - National Community Action Foundation (Energy Spin-off)
Bluebonnet Electric Cooperative	Funds are channeled through Action Committee Boards and Measures decided by Action Boards	Yes	\$30,000 for Community Boards	Not Available	Direct Install	Members Served	Not Tracked	CAB take funds from Bluebonnet and leverage federal funds also.

KEY SURVEY QUESTIONS								
	1	3	4	6	16	33	34	10
Utility	What are the program's Eligible measures?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	Does the program use a direct install or a rebate approach?	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Do you leverage funds for your program with any national, state or local agencies?
Pedernales Electric Cooperative	Air Infiltration Central A/C 14 SEER or greater HP 14 SEER or greater Window Unit EER 10% greater than standard Duct Improvement Ceiling Insulation Wall Insulation Floor Insulation ES Windows Solar Screens Water Heater Replacement Water Heater Pipe Insulation Water Heater Jacket Faucet Aerators Low-Flow Showerheads CFL ES Refrigerators	Aggregate money coming in through agencies In contract with TCHDA to provide funds 2014 – Max \$4,991 Min \$1590	\$100,000 – 2014 \$203,980 – 2013	\$3,500 per Participant	Direct Install	Participation – number of homes weatherization	1,331 kWh per Home	No

KEY SURVEY QUESTIONS								
	1	3	4	6	16	33	34	10
Utility	What are the program's Eligible measures?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	Does the program use a direct install or a rebate approach?	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Do you leverage funds for your program with any national, state or local agencies?
Gainesville Regional Utilities	HVAC Improvement Insulation - ceiling attic, floor, not walls Water heaters gas or electric weather-stripping or caulking Duct system repair Thermostats 10 CFLs	Yes	2015 - \$469,050 - 2015 123.5 homes \$456,000 - 2014 133 homes	2015 - \$3,800 average 2014 - \$3,600 average	Direct Install	Energy Reduction Customer Satisfaction kWh reductions in past as focus	Average 1,752 kWh reduction per home	No, but have in past
Orlando Utilities Commission	Ceiling insulation Window foam Duct sealing repair Toilet, plumbing, irrigation repair Health and Safety Measures Showerhead Aerators caulking weather-stripping Air filters Minor plumbing Fix toilets - minor repair Pipe insulation	Income based: Eligibility - \$40,000 or less, 85% of total cost not to exceed \$2000. Mid-Term 40k-60 - 50% Higher > 60K - Rebate applicable to each measure	\$750,000 500 Homes	\$1,500 per home	Direct Install	Energy Savings, In-House M&V, \$0.15 Cost per kWh Saved - Pressure pan test to replace duct blaster	554 kWh saved per household	Grant projects in previous years, i.e. - ARRA, Right now - City Energy Project www.cityenergyproject.org

KEY SURVEY QUESTIONS								
	1	3	4	6	16	33	34	10
Utility	What are the program's Eligible measures?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	Does the program use a direct install or a rebate approach?	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Do you leverage funds for your program with any national, state or local agencies?
City of Tallahassee Utilities	weather-stripping - Doors, Windows, caulking gaps infiltration areas Health and Safety as needed Change air filter Water efficiency measures - Aerators, Low-Flow Showerheads Water heater temp set-back Water heater insulation CFL Refrigerator Thermometer	Yes	\$712,500 1,425 Homes	\$506 per home	Direct Install	Number of homes served Number of homes taking advantage of all each programs	Not Provided	When opportunity arises, past Fire Prevention Grant
Sacramento Municipal Utility District (SMUD)	Insulation Attic sealing Infiltration weather-stripping sealing Pipe wrap Minor home repair Lighting - ceiling fan, cfl, ceiling fans Refrigerators Water measures - low flow shower, faucets, Water heater wrap HVAC repair and replacement as needed	Yes	\$1,800,000 1000 Homes	\$1,800 per home	Direct Install	Number of customers served MW and GWh # refrigerators installed	1,000 kWh per home	Yes, Local Agencies - Community Based Organization - add Federal dollars - they pay for additional measures + other measures not covered (dishwasher, LI Solar)

KEY SURVEY QUESTIONS								
	1	3	4	6	16	33	34	10
Utility	What are the program's Eligible measures?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	Does the program use a direct install or a rebate approach?	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Do you leverage funds for your program with any national, state or local agencies?
Los Angeles Department of Water and Power (LADWP)	Home Energy Improvement Program - Most of outreach to low-income customers Eligibility requirements - targeting marketing Measures - weather-stripping, Insulation, Window A/C, CFL, Low-Faucet, Water Heater Blanket, WH Pipe Wrap, attic insulation, Pre-blower door test, smoke and carbon monoxide alarms, toilet replacement, door and window repair and caulking	Yes	\$12,000,000 - 2013/2014 2,400 Homes	\$5,000 per home	Direct Install	Number of homes served	Not Provided	Not currently
JEA⁵	6 CFL LED Night HVAC Filter Low-Flow Showerhead Toilet Flapper Aerator Health and Safety Thermometer Refrigerator Coil Brush 5 feet of pipe insulation weather-stripping Insulation	Yes	\$540,000 1,007 Homes	\$536 per home		Full expenditure of funds Insulation Goals Met	19% savings for insulation only programs No other savings captures	Not now, before with ARRA (900 Insulation jobs with ARRA)

⁵ Jacksonville Electric Authority

3.2.1.1 Eligible Measures

Most programs surveyed offered similar weatherization for their members, including: insulation, duct sealing and repair, weather-stripping, water savings measures and CFL lighting. Fifty percent of the ten programs, including AE, offered more costly repair or replacements of HVAC units. Five of the programs offered water heating improvements including blanket wraps, water pipe insulation and water heater replacement. Some electric utilities partnered with other utility organization to offer gas stove replacement or repair or water system repairs, such as replacing leaking flappers.

3.2.1.2 Program Cost to Participants

All programs except the Orlando Utility Commission provided 100% of the funds needed for the low-income weatherization measures installed. The Orlando Utility Commission provides reimbursement based upon income levels, with household include of \$40,000 or less receiving 85% of total cost not to exceed \$2000, Mid-income of \$40k-\$60k receiving 50% of total cost and incomes higher than 60K receiving any applicable for each measure installed.

3.2.1.3 Annual Weatherization Budgets

The utilities interviewed for the survey ranged from very small to very large with budgets ranging from \$30,000 at Bluebonnet Electric Cooperative in Texas to \$12,000,000 per year at the Los Angeles Department of Power and Light in California. Austin's current year budget of \$3,700,000 was the third largest overall budget of all 10 programs reviewed.

3.2.1.4 Program Cost per Participant

The program cost per participant was larger for utilities offering more expensive measures, such as HVAC repair or replacement. The City of Tallahassee Utilities and JEA focus on low cost measures in efforts to serve as many homes as possible. They limit the measures to basic energy efficiency upgrades and the average home visit is 1 hour for Tallahassee and 2 hours for JEA customers. Both of these utilities use a Neighbor Reach approach and do door to door visits installing energy efficiency measures in as many homes as possible in targeted neighborhood. The average cost per home for Tallahassee is \$506 and \$536 for JEA.

Other programs utilize a longer term process which allows installation of larger projects, such as energy star windows and HVAC repairs or replacement. Austin Energy averages \$3,000 per home, which is in a similar range to Gainesville Regional Utilities average of \$3,800 and Pedernales Electric Cooperative average of \$3,500 per home.

3.2.1.5 Direct Install or Rebate

All programs survey utilized a direct install approach for low-income weatherization measure installation. Most programs used staff for program management possible conducting of energy audits or assessments. Installation of recommended measures was exclusively done by third party contractors in all cases expect for LADWP where a staff of 40 employees handled all direct installed measure installations.

3.2.1.6 Measures of Program Success / Average Energy Saved per Home

The top two measures of program success for the programs reviewed with number of homes served and full expenditure of program budget. The number of homes served was often mentioned as number that held interest to either utility executive management or city commissioners. The number is a directly quantifiable measure of families impacted by the program. The goal of full budget expenditure was

important to many, as most of the utilities allocated funds for low-income program out of either their general funds or through a collected tariff surcharge. Monies designated from a surcharge have to be accounted for completely and, in the case of Oncor and AEP Texas, overages and underspending amounts must be explained and justified.

Several of the program managers noted that the Average Energy Saved per home has become less important in recent program years than when the programs first begun. Three of the utilities review don't actively track the kWh saved by the programs. For utilities that reported average energy saved per home, the Orlando Utilities Commission had the lowest reported savings of 554 kWh per year per home and Gainesville Regional Utilities had the highest savings of 1,752 kWh per year.

3.2.1.7 Leveraging of Weatherization Funding

All utilities served benefited from the influx of stimulus funds from the American Recovery and Reinvestment Act of 2009 (ARRA). Home weatherization increased greatly from 2009-2012. In the case of AE, weatherization prior to ARRA was 500 to 700 homes per year versus 1,044 homes in 2011. Once the ARRA monies expired in 2012, funds for weatherization were greatly decreased. As such, several utilities have sought other partners to leverage funding for weatherization programs. Specifically, the Texas Association of Community Action Agencies which serves as program administrator for the Oncor, AEP Texas and Pedernales Electric Cooperative weatherization programs, utilizes funds from each of these utilities combined with funds from Federal DOE, the Texas Rate Payer Organization, Texas Legal Services and the National Community Action Foundation to weatherize homes in their service territories. Use of leverage funds allows more homes in more communities to received weatherization services. Four out of the 10 programs survey are using some type of leveraging in their current weatherization efforts.

3.2.1.8 Implementation Strategies

Most utilities surveyed are using some type of electronic data collection device and interface to store pre and post characteristics of weatherized homes. One utility noted in the past they took notes on paper and transferred them later to Excel, but recently implemented a system to collect data using mobile tablets. Austin Energy's use of Salesforce.com to store data is most likely a practice other utilities may migrate to in the future, as most utilities are using internally developed software to store collected data.

Data collected varies between utilities and while most collect pre and post billing history, there is not consistency amongst the utilities in collecting pre and post blower door and duct blaster test results. Austin collects post-blower door results. Two utilities, LADWP and Bluebonnet Electric Cooperative only collect pre-blower door results. The Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas and Pedernales Electric Cooperative and SMUD collect both pre and post blower door test results. The Orlando Utilities Board will be adding pre-blower test for all homes and will do post-blower door test on 20% of homes.

Most programs reviewed had extensive application processes and income verification guidelines similar to AE. Gainesville Regional Utilities (GRU) has a somewhat unique application, approval and post inspection that works to build ownership in the overall weatherization process. As with other utilities, a pre-inspection is complete for each applicant's home. The pre-inspection report focuses on measures eligible for cost reimbursement from GRU and recommends measures for the homeowner to consider. The homeowner is provided a list of pre-approved contractors and is then responsible for setting up and getting estimates from these vendors to submit to GRU for approval. GRU customers are actively

engaged in the vendor review and become very involved in the equipment selection process. Once estimates are received and submitted to GRU, work is authorized and the homeowners are issued vouchers to pay the vendor. Once the measures are installed to the satisfaction of the homeowner, the vouchers are given to the contractors for redemption by the utility. Afterwards, a post-inspection visit is scheduled to verify all measures were installed and functioning properly. The overall cycle time is 3 months, with 1 month for initial application and obtaining of estimates, 1 month for getting the actual work done and 1 month for the follow up post inspection.

3.2.2 Texas Weatherization Assistance Programs

The following tables contain general information collected for each Texas Utility that was surveyed based upon information found online. Bluebonnet Electric Cooperative had not information available online.

Pedernales Electric Cooperative	
http://www.pec.coop/Home/LocalInvolvement/HowWereHelping/iqw.aspx	
Program Description	<p>Pedernales Electric Cooperative allocated \$160,000 of unclaimed funds in 2012 to provide weatherization measures for some income-qualified PEC members. The Texas Association of Community Action Agencies (TACAA), which operates weatherization programs in Texas that supplement federal DOE and Health and Human Services weatherization efforts, agreed to partner with PEC to provide these services. After determining PEC members' eligibility based on a household income at or below 200% of the federal poverty guidelines, TACAA will conduct a preliminary energy audit. This audit will review the home's energy efficiency; identify air leaks, inefficient appliances, and other areas that need attention; and determine if the structure will benefit from being weatherized.</p> <p>PEC turns over unredeemed capital credit checks and other uncashed payments to members to the state unclaimed property fund. Under state law, a portion of that money is permitted to be used by PEC for energy efficiency programs, including weatherization measures that will reduce the energy consumption and energy costs for its income-qualified members.</p>
Program Eligibility	Not Listed
Qualifying Measures	<p>Weatherization work may include caulking; weather-stripping; ceiling, wall, and floor insulation; patching holes in the building envelope; duct work; and tune up, repair or replacement of inefficient heating and cooling systems. In addition, TACAA will offer basic on-site energy education to program participants.</p>
Program Steps	Members who are interested in participating in the income qualified weatherization program can contact their local provider.

Oncor – Texas	
http://www.takealoadofftexas.com/index.aspx?id=low-income-home-weatherization#	
Program Description	<p>Oncor provides incentives to Service Providers for implementing energy-saving measures in qualifying homes. Qualified low-income residential consumers have an annual household income at or below 200% above the federal poverty guidelines. This program is designed to help offset energy-saving measures at low or no cost for single-family, mobile and multi-family homes.</p>

Oncor – Texas

Oncor implemented the Targeted Weatherization Low-Income SOP Program to comply with the Public Utility Regulatory Act (PURA) §39.905(f). The act requires that annual expenditures for the targeted low-income energy efficiency programs of each unbundled transmission and distribution utility are not less than 10% of the transmission and distribution utility's energy efficiency budget for the year.

Program Eligibility

- All homes must have Oncor as their [electric delivery provider](#), and consumers who rent their homes can participate provided they have permission from their landlords.
- This program is available to homeowners with an annual household income at or below 200% of the federal poverty guidelines shown here:

Size of Family Unit	Annual Income	Monthly Income	Weekly Income
1	\$23,340	\$1,945	\$449
2	\$31,460	\$2,622	\$605
3	\$39,580	\$3,298	\$761
4	\$47,700	\$3,975	\$917
5	\$55,820	\$4,652	\$1,073
6	\$63,940	\$5,328	\$1,229
7	\$72,060	\$6,005	\$1,385
8	\$80,180	\$6,682	\$1,541

Qualifying Measures

These are the most common weatherization measures provided at low or no cost to the customer:

- Insulation – Installing the appropriate amount of insulation in your home will not only help reduce your cooling and heating costs but also make your home more comfortable.
- Duct Sealing – Properly sealing your air conditioning ducts will reduce the amount of cooling and heating required to keep your home comfortable. This saves energy and lowers cooling and heating costs. Service providers must perform an [air leakage](#) test before and after performing the duct sealing measures.
- Caulking and Weatherstripping – Caulking around windows and other openings and weatherstripping doors in your home can significantly reduce air leakage. This helps cut cooling and heating costs. Service providers must perform an [air leakage test](#) before and after performing the air sealing measures.
- Compact Fluorescent Lighting – Installing compact fluorescent lamp is a quick and easy way to help reduce the amount of energy your home consumes.
- Water-saving Devices – Low-flow showerheads and faucet aerators can reduce the amount of water your home has to heat, which reduces the amount of energy consumed by your water heater.

Other Qualifying Measures

These additional measures may be provided by the Service Provider at a cost to the customer:

- High-efficiency central air conditioner or room air conditioner
- Floor insulation
- Solar screens
- ENERGY STAR® appliances
- Energy-efficient windows

Program Steps

Not Listed

3.2.3 Other Utility Weatherization Assistance Programs

The following tables contain general information collected for the non-Texas utilities that were surveyed based upon information found online.

Orlando Utilities Commission	
http://www.ouc.com/about-ouc/news/2010/05/11/ouc-city-of-orlando-partner-up-for-power	
Program Description The OUC energy audit determines the appropriate measures to be initiated based on the existing condition of the home and the funds available. Services provided may include: <ol style="list-style-type: none"> 1. Roof Replacement 2. Exterior Window and Door Replacements 3. Attic Insulation 4. Hot Water Heater Replacement 5. Caulk Windows 6. Caulk/Weatherstrip Doors 7. Plumbing Repairs 8. Air Conditioner/Heater Service or Replacement 9. Toilet Replacement (low-flow) 10. Energy Light Bulb Replacement 	
Program Eligibility <ul style="list-style-type: none"> • Property must be located within the City limits of Orlando • The property must be owner-occupied. Owners are required to provide a copy of their deed. Mortgage and property taxes must be current and copies of mortgage statements and proof of paid taxes will be required. • Homeowner must have a current home insurance policy on the residence. • The resident's income must be within the limits specified by HUD. Homeowners will need to provide income information for all members of the household. Self-employed applicants must provide profit and loss statements and/or a signed copy of their last year's tax return. 	
Qualifying Measures Not Listed	
Program Steps Not Listed	

City of Tallahassee, Florida					
http://www.needhelp-payingbills.com/html/leon_county_assistance_program.html http://www.floridacommunitydevelopment.org/wap/about.cfm					
Program Description The WAP will provide homeowners with free energy saving updates to their home. There is no cost to the homeowner. For example, applicants can receive additional insulation, cooling system repairs, and more. It is also run by the community action agency.					
Program Eligibility Grants are allocated based on a formula combining population and weather data and average \$2,744 spent on each home. An energy audit and testing must be performed on each home. The house data is entered into a computer program and a printout is provided. The print out must be evaluated to determine the measures that will be provided. Preference is given to owner occupied, elderly, disabled, and families with children 12 and under.					
<table border="1"> <tr> <td>Number of People in Household</td><td>125%</td></tr> <tr> <td>1</td><td>\$11,963</td></tr> </table>		Number of People in Household	125%	1	\$11,963
Number of People in Household	125%				
1	\$11,963				

City of Tallahassee, Florida			
	2	\$16,038	
	3	\$20,113	
	4	\$24,188	
	5	\$28,263	
	6	\$32,338	
	7	\$36,413	
	8	\$40,488	
	Each additional member add	\$4,075	
Qualifying Measures The types of measures include insulation, weather stripping, water heater wraps and reduction of air infiltration. Furnaces and air conditioning systems may be repaired			
Program Steps Not Listed			

Jacksonville Electric Authority	
http://www.aeafl.com/services/weatherization/	
Program Description JEA's weatherization initiative includes adding attic insulation, conducting a full duct seal on a functioning non-metallic duct system as well as several other energy-saving measures. Alternative Energy Applications is the premiere service-provider of insulation and duct seal for this program. The other energy-saving measures mentioned above are conducted by a 3 rd party affiliate. Jacksonville Electric Authority has recognized that not everyone may be in the financial position to make energy efficient upgrades to their homes. JEA has established special income-based weatherization programs to help. These programs offer an array of zero-cost energy-reducing solutions for those chosen to participate in their programs. Some of these upgrades include: installation of attic insulation, repairing loose or broken duct work, duct sealing and several other services that effectively reduce the amount of energy lost in a participant's home.	
Program Eligibility Eligibility for this program is determined by a 3 rd party affiliate and is income-driven. Residents who live within a selected group of census tracts may be eligible for this program. To find out if you are eligible, residents can contact JEA to ask about their Neighborhood Energy Efficiency Program.	
Qualifying Measures Not Listed	
Program Steps Not Listed	

Gainesville Regional Utilities Commission	
http://www.utilitybillassistance.com/html/florida_utility_bill_assistanc.html	
Program Description This program will provide assistance to Florida residents to help them lower their utility bills. The program will, among other things : <ul style="list-style-type: none"> • Replace and/or repair or old or inefficient heating and cooling units • Address air infiltration by using weather stripping, thresholds, caulking, minor repairs to walls, ceilings and floors, and door and window replacement • Install floor and/or attic 	

Gainesville Regional Utilities Commission

- Repair and/or replace inefficient or old water heaters to save energy and assist with lowering utility bills

There are several goals to the program. The weatherization funds are meant to help reduce greenhouse gas emissions while also lowering energy costs and utility bills for low-income families

Program Eligibility

Assistance will be available to families making up to 200% of the federal poverty level, or about \$44,000 a year for a family of four. This is an increase from previous years.

Qualifying Measures

Not Listed

Program Steps

Not Listed

Sacramento Municipal Utility District

<http://www.hud.gov/local/shared/working/r9/cpd/lowincome.pdf>

<https://www.smud.org/en/residential/customer-service/rate-information/low-income-assistance.htm>

Program Description

Sacramento Municipal Utility District provides a no-cost weatherization program for income eligible households. The incomes of all residents in your home must be 175% of federal poverty guidelines as standard program participants and 200% of federal poverty guidelines as seniors over 60 and/or disabled customers.

Qualified, pre-screened contractors make weatherization repairs and improvements to your home. By making a few improvements—adding weather-stripping around doors, insulating attics and repairing furnaces— low-income customers can achieve significant savings and increase the comfort of their homes. Contractors also can also teach you how to lower your overall energy costs and consumption.

Qualified customers that participate in EAPR will have discounts of 38% on all electricity usage, with a maximum discount cap of \$52 per month. The maximum discount includes the reduction to the system infrastructure fixed charge. For customers with wells, the cap is increased to \$64 per month.

Persons in Household	Monthly Income	Annual Income
1 to 2	\$2,622	\$31,460
3	\$3,298	\$39,580
4	\$3,975	\$47,700
5	\$4,652	\$55,820
6	\$5,328	\$63,940
Additional members (each)	\$677	\$8,120

Program Eligibility

Not Listed

Qualifying Measures

Not Listed

Program Steps

Not Listed

Los Angeles Department of Water and Power	
https://www.ladwp.com/cs/idcplg?IdcService=GET_FILE&dDocName=OPLADWP059461&RevisionSelectionMethod=LatestReleased	
Program Description	<p>LADWP's new Home Energy Improvement Program (HEIP) offers free energy efficient upgrades for residential customers and their families, designed to reduce their energy bills by making their homes more energy efficient. Through the program, an assessment of a customer's home will be performed by a trained technician to identify the most appropriate and effective improvements available. The program builds upon the success of a grant-funded home weatherization program, which was instituted by LADWP for a limited period.</p> <p>LADWP is offering residential customers the opportunity to improve the energy and water performance in their homes, which can improve their comfort level and potentially reduce their energy and water cost through the Home Energy Improvement Program (HEIP). The program is free to eligible customers.</p> <p>An assessment of homes is performed by a trained technicians to assist customers in identifying the most appropriate and effective improvements for their home. During the assessment, the trained technicians will identify the areas in a home where cost-effective energy efficient upgrades and repairs should be made. The home report is then forwarded to repair technicians to complete the work. The final step in the process is and after a quality assurance review to ensure that the work has been performed properly.</p>
Program Eligibility	Not Listed
Qualifying Measures	Not Listed
Program Steps	Interested customers must send LADWP a completed Home Energy Improvement Program Application.

3.3 SECONDARY RESEARCH

GDS also did an extensive review of available material for to identify WAP Program best practices at the following utilities:

- Texas WAPs:
 - CPS Energy
 - City of Arlington
 - Alamo Area Council of Governments (AACOG)
 - Dallas County Health & Human Services
 - City of El Paso
 - City of Garland
 - Bryan Texas Utilities
 - A Cooler House Houston (Houston/Dallas/Fort Worth)
- Other Utility Weatherization Programs
 - Arkansas – The WAP
 - Memphis, Light, Gas & Water Division (MLGW)
 - Nashville Electric Service
 - Lafayette (LA) Utilities System
 - Oklahoma Weatherization Program
 - Washington State Low-Income Energy Efficiency Programs
 - California Low-Income Energy Efficiency Programs
 - Seattle City Light
 - Maryland Green & Heathy Homes Initiative

- Bonneville Power Administration (BPA)

3.3.1 Texas Weatherization Assistance Programs

This section contains program information for weatherization programs that was found on publically available web sources. Many of the programs, such as the City of Arlington, the AACOG, the City of Dallas, the City of El Paso and the A Cooler House Houston for Houston/Dallas/Fort Worth are operated as municipal programs and not by a direct electric or gas utility. As such, program budget information and participation data was not available for most of these programs.

CPS Energy																													
http://www.cpsenergysavers.com/start-saving/weatherization-casa-verde																													
Program Description Casa Verde is CPS Energy's residential WAP. It is designed to help families in need to reduce their monthly utility bills. Eligible homeowners or renters may receive FREE weatherization measures designed to improve the energy efficiency of their homes. These weatherization measures can help reduce energy bills, especially during the hot summer months.																													
Casa Verde was introduced in 2009 and was funded primarily by federal and state stimulus grants. That grant-funded program closed in February 2012. During this phase of the program, CPS Energy weatherized 3,320 local homes. The Casa Verde program is now administered by CPS Energy and uses funds from our Save for Tomorrow Energy Plan, or STEP. These energy savings are helping families lower their monthly energy bills while helping CPS Energy reduce the demand for electricity. This helps both control costs and get the most for our energy dollars. Casa Verde uses local energy auditors to determine the energy efficiency needs of a home and local contractors to perform the installations and complete the work.																													
Program Eligibility Participants must meet the financial eligibility requirements outlined in the following chart:																													
	<table border="1"> <thead> <tr> <th>Household Size</th><th>Monthly Income</th><th>Annual Income</th></tr> </thead> <tbody> <tr> <td>1</td><td>\$1,945</td><td>\$23,340</td></tr> <tr> <td>2</td><td>\$2,622</td><td>\$31,460</td></tr> <tr> <td>3</td><td>\$3,298</td><td>\$39,580</td></tr> <tr> <td>4</td><td>\$3,975</td><td>\$47,700</td></tr> <tr> <td>5</td><td>\$4,652</td><td>\$55,820</td></tr> <tr> <td>6</td><td>\$5,328</td><td>\$63,940</td></tr> <tr> <td>7</td><td>\$6,005</td><td>\$72,060</td></tr> <tr> <td>8</td><td>\$6,682</td><td>\$80,180</td></tr> </tbody> </table>	Household Size	Monthly Income	Annual Income	1	\$1,945	\$23,340	2	\$2,622	\$31,460	3	\$3,298	\$39,580	4	\$3,975	\$47,700	5	\$4,652	\$55,820	6	\$5,328	\$63,940	7	\$6,005	\$72,060	8	\$6,682	\$80,180	
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7	\$6,005	\$72,060																											
8	\$6,682	\$80,180																											
Participating homes must meet certain requirements regarding structural integrity																													
Qualifying Measures Not Listed																													
Program Steps <ol style="list-style-type: none"> 1. Income eligibility is determined. 2. A CPS Energy contractor will conduct an energy evaluation of your home. The contractor will be looking to make sure the home is structurally sound and that it would benefit from weatherization measures. They will also be making an assessment of what measure would make the biggest difference toward energy savings. Casa Verde is not a home repair program. 3. Free installation of weatherization measures for qualified homes. Eligible homes may receive any or all of the following energy-saving upgrades: attic insulation, wall insulation, weather-stripping and caulking, 																													

CPS Energy

replacement of incandescent light bulbs with CFLs, and duct sealing.

4. Final Inspection: CPS Energy will hold a post-inspection to verify the installation of the weatherization measures and to ensure quality of workmanship. A customer satisfaction survey is conducted at the time of final inspection.
5. Customer must be available throughout the weatherization process. Casa Verde staff and contractors will require scheduled access to the home during normal working hours, and possibly on weekends as required. A customer or designated representative 18 years of age or older must be on the premises at all times while contractors and/or CPS Energy employees are working. This will ensure timely completion of the weatherization and the inspection process.

City of Arlington

www.arlingtonhousing.us

Program Description

The WAP is designed to help low-income households control their energy costs through weatherization of their home and through consumer education.

Program Eligibility

- Energy audits include a review of a home's energy efficiency, identifying where air leaks may be occurring, inefficient appliances, etc.
- Installation of weatherization measures to increase energy efficiency of a home including; Caulking, weather-stripping, adding ceiling, wall, and floor insulation, patching holes in the building envelope, duct work, and tune-up, repair or replacement of energy inefficient heating and cooling systems
- Weatherization measures installed must meet specific energy-saving goals.

Household Size Maximum Income

1
2
3
4
5
6

Maximum Income Limits

\$21,600
\$29,140
\$36,620
\$44,100
\$51,580
\$59,060

Income limits are based upon 200% of the Federal

Poverty Income Guidelines.

Qualifying Measure

Not Listed

Program Steps

Priority is given to:

- Households with children under the age of 6
- Households with an elderly resident
- Households with a disabled resident
- Households with the highest energy cost and lowest income; and
- Households with the highest residential energy use.

Note: These guidelines are fairly consistent across all programs

Alamo Area Council of Governments

<http://www.aacog.com/index.aspx?NID=120>

Program Description

The AACOG WAP is designed to help low-income families, particularly with elderly and handicapped residents, overcome the high cost of energy through the installation of energy conservation measures at no cost to the applicant. Although the program does not address major home repairs, it can help lower the amount of energy used in a home by enhancing the structure's thermal boundary. Like a Styrofoam cup, the house will stay warmer in the winter and cooler in the summer. The less energy it takes to heat or cool the house, the more money is saved.

Qualification for Weatherization Services is a three step process. The applicant's total household income must meet federal income eligibility requirements. The 2014 Federal Poverty Level is used to identify the funding source your household qualifies for. The person completing the application (The Applicant) must be a U.S. Citizen or show proof of eligible Resident Alien Status to receive federal benefits. Lastly, the home itself must qualify in terms of structural soundness (no major roof repairs, plumbing leaks, foundation problems, faulty electrical wiring or similar structural issues).

Program Edibility

Not Listed

Qualifying Measures

- Submitted application packets with required support documents are reviewed and program eligibility is determined.
- Assessment and Energy Audit of the home
- Installation of approved weatherization measures (e.g., attic / wall insulation, replacement or repair of heating and air conditioning equipment, etc.)
- A final inspection to assure work quality completeness and customer satisfaction

Program Steps

Not Listed

Dallas County Health & Human Services

<http://www.dallascounty.org/department/hhs/weatherization.html>

Program Description

Dallas County Health and Human Services' WAP provides assistance to income eligible households by weatherizing their homes, conserving energy and reducing high utility costs in the process. Eligible applications will be considered for assessments.

Program Edibility

Not Listed

Qualifying Measures

- Dwelling assessment and audit before any work begins.
- As part of the WAP Program: DCHHS equips homes with weather stripping, caulking, insulation, repaired or new doors and windows, solar screens, repair or retrofit heating and cooling units and duct work.
- Clients who need rehabilitation services will be referred to another agency that may be able to provide assistance.

Program Steps

Not Listed

City of El Paso

<http://www.projectbravo.org/language/english/weatherization-assistance-program>

Program Description

Project BRAVO, Inc., El Paso's anti-poverty Community Action Program, is now accepting applications from qualified residents for its WAP. This program is funded under the ARRA and the DOE and administered by the State of Texas to provide home weatherization services to the elderly, disabled and low-income families of El Paso.

Weatherization of a home permanently reduces utility bills by increasing energy efficiency. The program is being offered free to residents who qualify. Newer properties generally do not qualify for the service.

The goal is to help clients realize savings of 25-30% on their energy bills (gas and electric combined) during peak months (winter/summer) after weatherization.

Program Eligibility

Not Listed

Qualifying Measures

- Home weatherization is based on an energy assessment of properties that qualify under the program,
- Eligible homes will be assessed to determine if repairs or replacement of: insulation, weather-stripping, and heating and cooling systems are needed.

Program Steps

Not Listed

Residents of El Paso are urged to call Project BRAVO at 562-4100 and ask for the Weatherization Hotline to determine if they qualify for the service.

City of Garland

<http://www.garlandpower-light.org/pdfs/EEForms/2014-2015%20Wholehouse%20Weatherization%20Application.pdf>

Program Description

Program provides bill credits for installation of specified energy efficiency measures. The program is not specifically targeted to Low-Income Customers, but can be use by them if warranted.

Program Eligibility

Not Listed

Qualifying Measures

- Ceiling Insulation (existing and new insulation must be at least R-30)
- ENERGY STAR Windows/Doors
- Window Solar Screens/Film
- Duct Replacement
- Duct Sealing
- Weather-stripping of doors, caulking windows, sealing plumbing penetrations

Program Steps

Not Listed

Bryan Texas Utilities

<http://www.btutilities.com/smarthome-programs/>

Program Description

The purpose of the BTU SmartHOME Program is to educate customers and encourage energy efficiency improvements that help customers reduce their energy cost and improve the comfort of their home while at the same time reducing BTU's need to build or purchase additional generation. Any generation reduced has the added benefit of reducing CO2 emissions. According to the EPA, saving 1,000 kilowatt-hours (kWh) is equivalent to reducing CO2 emissions from 79.1 gallons of gasoline consumed or the carbon sequestered by 18.1 tree

Bryan Texas Utilities

seedlings grown for 10 years.

Program Eligibility

The BTU SmartHOME Program is available to any owner of an existing single- or multi-family dwelling within the BTU service territory which is billed on a residential rate. The program is not specifically target to Low-Income customers. Tenants should contact their landlords about participation in the program. Incentive payments will only be paid to the property owner.

Qualifying Measures

The BTU SmartHOME Program offers incentives to customers adopting any of these three approved energy efficiency measures and meets program guidelines. These measures are intended to improve the building envelope.

- Attic/ Wall Insulation
- Energy Star Windows
- Solar Screens

Program Steps

1. Customer completes the BTU [SmartHOME Application](#) for each energy efficiency measure and submits photos of pre-work condition prior to work being done.
2. BTU contacts customer to acknowledge receipt of application and photos and, if needed, request additional information.
3. Customer has work completed and submits contractor invoice(s) and all improvement specifications to BTU within 60 days of approved application. After 60 days, the customer must reapply for approval.
4. BTU schedules and completes a post-work inspection, if required.
5. BTU calculates incentive payment and submits payment to customer.

Incentive Rates

- The incentive rate for all three measures is based on BTU's cost for new peaking generation. Incentive payments will be a minimum of 10%, not to exceed 25%, of the total installed cost per customer project. The total annual incentive payment to any one customer cannot exceed 20% of BTU's annual program budget. This incentive program is subject to the availability of funds and may be terminated at any time without advance notice.

A Cooler House Houston (Dallas/Fort Worth area also)

<http://acoolerhousehouston.com/weatherization-assistance>

Program Description

The US DOE established a program designed to assist low income home owners increase the energy efficiency of their homes; that program is called the WAP. This program provides funding for the installation of energy efficient equipment and repairs that insure the health and safety of the home owners.

Program Eligibility

- All homes must be in an area served by retail competition (no coops or municipalities.) Consumers who rent their homes can participate provided they have permission from their landlords.
- This program is available to homeowners with an annual household income at or below 200% of the federal poverty guidelines shown here:

Size of Family	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

A Cooler House Houston (Dallas/Fort Worth area also)

5	\$51,580	\$4,298	\$992
6	\$59,060	\$4,921	\$1,136
7	\$66,540	\$5,545	\$1,280
8	\$74,020	\$6,168	\$1,423

Qualifying Measures

These are the most common weatherization measures provided at low or no cost to the customer:

- Insulation – Installing the appropriate amount of insulation in your home will not only help reduce your cooling and heating costs but also make your home more comfortable.
- Duct Sealing – Properly sealing your air conditioning ducts will reduce the amount of cooling and heating required to keep your home comfortable. This saves energy and lowers cooling and heating costs. Service providers must perform an air leakage test before and after performing the duct sealing measures.
- Caulking and weather-stripping – Caulking around windows and other openings and weather-stripping doors in your home can significantly reduce air leakage. This helps cut cooling and heating costs. Service providers must perform an air leakage test before and after performing the air sealing measures.
- Compact Fluorescent Lighting – Installing compact fluorescent lamp is a quick and easy way to help reduce the amount of energy your home consumes.
- Water-saving Devices – Low-flow shower heads and faucet aerators can reduce the amount of water your home has to heat, which reduces the amount of energy consumed by your water heater.

Other Qualifying Measures

These additional measures may be provided by the Service Provider at a cost to the customer:

- High-efficiency central air conditioner or room air conditioner
- Floor insulation
- Solar screens
- ENERGY STAR® appliances
- Energy-efficient windows

Program Steps

Not List

3.3.2 Other Utility Weatherization Assistance Programs

This section contains program information for weatherization programs outside of Texas that was found on publically available web sources

Arkansas – The Weatherization Assistance Program

<http://www.arkansasenergy.org/residential/arkansas-weatherization-assistance-program.aspx>

Program Description

The Arkansas Weatherization Program (AWP) was developed to help reduce energy usage in homes that are severely energy inefficient. The program is available to all Arkansans, regardless of their income or type of home. The program helps customers of participating utility companies find ways to reduce their daily energy usage. Advanced diagnostic technology, such as a computerized energy audit, is used to determine the energy conservation needs of a home.

The WAP annually provides grant funds to community action agencies, local governments, Indian tribes and non-profit agencies to provide specific program services for low-income families of Arkansas. These entities provide program services throughout the state.

The WAP annually provides grant funds to community action agencies, local governments, Indian tribes and non-profit agencies to provide specific program services for low-income families of Arkansas. These entities provide program services throughout the state.

Program Eligibility

Households with incomes that do not exceed 200% of Poverty Guidelines as determined by the DOE may be eligible for the WAP. In addition, those households with a member receiving SSI are categorically eligible.

Due to limited funding, priority points are awarded to households with members who are elderly, handicapped, and children under 7 years of age, or Native Americans.

Qualifying Measures

The actual conservation work completed is dependent on the specific needs of the home. However, typical work includes:

- Air sealing
- Attic and/or sidewall insulation
- Weather-stripping
- Minor repairs associated with the weatherization work

All work receives a thorough Quality Control inspection by the local agency's Quality Assurance Auditor.

Program Steps

Not Listed

Funding and Associated Cost

Weatherization services vary depending on the specific needs of the home and DOE approved conservation measures. An average grant of \$6,904 is awarded for each home for installed energy efficiency measures. No client contribution is required.

In addition to using funds provided by DOE WAP, Office of Community Services (OCS) leverages funds from the Low Income Home Energy Assistance Program (LIHEAP) in order to address all the retrofit needs of the home. Low Income Home Energy Assistance Program is a separate program administered by OCS. Sub grantees are encouraged to leverage with the utility-funded AWP. If the home has both electric and gas utilities an agency could receive an additional \$1,058 to \$2,116 toward retrofitting the home.

Memphis, Light, Gas & Water Division

<http://www.mlgw.com/residential/energysmartmemphis>

Program Description

EnergySmart Memphis is a year-long energy education and home improvement initiative designed to help Memphians save money on their energy costs. EnergySmart Memphis is a partnership between MLGW, City and County government agencies, Community Development Center (CDCs) and non-profit organizations, and the Tennessee Valley Authority. Through this program, an estimated 3000 MLGW customers will receive in-depth energy conservation training. Eligible customers will have weatherization improvements made to their home through this initiative. A series of Energy Education Workshops will be conducted city and county-wide at area libraries. The initiative includes weatherization kits for qualified homeowners to receive minor and major home repairs.

Memphis, Light, Gas & Water Division

Program Eligibility

Not Listed

Qualifying Measures

Not Listed

Program Steps

Not Listed

Nashville Electric Service

http://www.needhelppayingbills.com/html/nashville_electric_service_ass.html
Program Description

The federal government's WAP is paid for by the DOE. The state of Tennessee is provided funds and grants to pay for the weatherization of the homes of low income families, disabled, and the elderly. Weatherization is a free program that will install energy conserving updates to a Nashville Electric Service customer's home. Some examples of the improvements can be, but are not limited to, storm windows, insulation, CFL bulbs, caulking, window sealing, and other related conservation type activities to reduce home energy bills and to also increase home energy efficiency.

Nashville Electric customers can apply for this program by contacting their local community action agency. Those locations accept applications and also organize work crews that will actually improve a customer's home. When you apply, you will need to meet a number of low-income eligibility guidelines, which can be based on established Federal government poverty guidelines. All services and work done from the weatherization program is offered at no cost to qualified families.

Program Eligibility

Not Listed

Qualifying Measures

Not Listed

Program Steps

Not Listed

Lafayette Utilities System

<http://www.icantpaymybill.com/liheap-louisiana>
Program Description

Not Listed

Program Eligibility

If there are more than 6 persons living in your home, you will need to adjust the maximum allowed income to reflect the total number of people living in the home. The state median income for the 2012 LIHEAP season was \$66,109. 60% of \$66,109 is \$39,665. If there are six persons in your household, you can earn 132% of \$39,665 or \$52,358. For each additional family member you are allowed a 3% increase. For instance, a family of seven can earn 135% of \$39,665 or \$53,548.

Before applying for the LIHEAP customers must meet the following income guidelines. Income is reported as gross income before deductions.

Family Size	60% of State Median Income
1	\$20,626
2	\$26,972

Lafayette Utilities System			
	3	\$33,319	
	4	\$39,665	
	5	\$46,012	
	6	\$52,358	
Qualifying Measures Not listed			
Program Steps Not Listed			

Oklahoma Weatherization Program																			
http://wxprogram.blogspot.com/2007/10/oklahoma-recognizes-weatherization-day.html http://www.benefits.gov/benefits/benefit-details/1875																			
Program Description Weatherization Assistance encompasses a wide variety of cost-effective energy efficiency measures including heating and cooling systems, electrical system, and energy-consuming appliances. Weatherization service providers check major energy systems to ensure occupant safety.																			
Program Eligibility <ul style="list-style-type: none"> In order to qualify for this benefit program, you must be a resident of the state of Oklahoma. In order to qualify, you must have an annual household income (before taxes) that is below the following amounts: <table> <tr> <th>Household Size</th><th>Maximum Income Level (Per Year)</th></tr> <tr><td>1</td><td>\$23,340</td></tr> <tr><td>2</td><td>\$31,460</td></tr> <tr><td>3</td><td>\$39,580</td></tr> <tr><td>4</td><td>\$47,700</td></tr> <tr><td>5</td><td>\$55,820</td></tr> <tr><td>6</td><td>\$63,940</td></tr> <tr><td>7</td><td>\$72,060</td></tr> <tr><td>8</td><td>\$80,180</td></tr> </table>		Household Size	Maximum Income Level (Per Year)	1	\$23,340	2	\$31,460	3	\$39,580	4	\$47,700	5	\$55,820	6	\$63,940	7	\$72,060	8	\$80,180
Household Size	Maximum Income Level (Per Year)																		
1	\$23,340																		
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4	\$47,700																		
5	\$55,820																		
6	\$63,940																		
7	\$72,060																		
8	\$80,180																		
Qualifying Measures <ul style="list-style-type: none"> Specific services include the installation of energy-efficient measures such as: attic insulation, caulking and weather stripping, air sealing and heating and cooling adjustments. An energy audit is conducted on each home to determine energy conserving measures that will be installed. 																			
Program Steps Not Listed																			

Washington State Low-Income Energy Efficiency Programs
http://www.commerce.wa.gov/Programs/services/weatherization/Pages/default.aspx http://www.needhelp-payingbills.com/html/washington liheap and weatheri.html
Program Description Weatherization is adding insulation, sealing cracks, and making other changes that reduce heat loss, save customers money on heating bills and make homes or apartments healthier. The federal government and Washington State offer weatherization programs, which Commerce runs, for qualified low-income households.

Washington State Low-Income Energy Efficiency Programs

A federal government grant is offered to Washington every year and the funds are used to help pay heating bills and provide weatherization services across the state. The goal of LIHEAP is to help keep people who are most at risk safe and warm during the winter, and weatherization will try to ensure homes are more energy efficient and help people save money. Weatherization focuses low-income families with young children, elderly members, and individuals with disabilities, as they are considered the most vulnerable to a medical condition or serious health risks associated with improperly heated homes.

Energy conservation measures taken on a home may or may not include weatherization measures such as caulking and sealing cracks and holes in a building structure, weather-stripping of doors and windows, repair, replacement, or tune-up of non-functional heating systems, insulating attics, walls and under floors. Some safety and health issues can be made to, such as incidental repairs necessary to protect the weatherization material.

Program Eligibility

This program focuses on low-income families and the elderly, people with disabilities, and children. Eligibility is also based on total household income levels. Assistance can improve the energy efficiency of homes while ensuring the occupants health and safety. It can help Washington state residents overcome the high cost of energy by making homes more energy efficient.

Qualifying Measures

Not Listed

Program Steps

Not Listed

California Low-Income Energy Efficiency Programs

<http://www.cpuc.ca.gov/PUC/energy/Low+Income/liee.htm>

<http://www.csd.ca.gov/Services/ResidentialEnergyEfficiencyServices.aspx>

Program Description

The Energy Savings Assistance Program provides no-cost weatherization services to low-income households who meet the California Alternate Rates for Energy (CARE) income guidelines. This program is designed to increase the energy efficiency of homes which are owned or occupied by low-income persons, to reduce their total residential expenditures such as heating and cooling bills, and to improve the health and safety of families. Weatherization services can help a family, struggling to make ends meet, reduce their energy consumption by up to 35%, and save them more than \$400 on their heating and cooling bills in the first year alone.

Program Eligibility

Income limits are effective June 1, 2014, through May 31, 2015.

Household Size	Income Eligibility Upper Limit
1	\$31,460
2	\$31,460
3	\$39,580
4	\$47,700
5	\$55,820
6	\$63,940
7	\$72,060
8	\$80,180
Each Additional Person	\$8,120

California Low-Income Energy Efficiency Programs

Qualifying Measures

Weatherization services can help a family, struggling to make ends meet, reduce their energy consumption by up to 35%, and save them more than \$400 on their heating and cooling bills in the first year alone.

Program Steps

Not Listed

Investor Owned / Program Administrator Utility Programs

Program	Administrator	Description
Low-Income Energy Efficiency Partnership Programs	Investor Owned Utilities: Pacific Gas & Electric Company, Southern California Edison, Southern California Gas, San Diego Gas & Electric	No-cost weatherization program for income eligible (175% of federal poverty guidelines or 200% for seniors over 60 and/or disabled customers) households. Qualified, pre-screened contractors make weatherization repairs and improvements (e.g., adding weather-stripping around doors, insulating attics and repairing furnaces). Contractors also educate customers on ways to lower overall energy costs and consumption.
Community Partnership Programs	Investor owned utilities partnered with cities and counties	Collaborative program designed to enhance local government s' economic redevelopment efforts by delivering energy efficiency programs to residents and business owners that have been especially difficult to reach through traditional energy efficiency programs. By using existing energy efficiency programs and local governments' communication channels, the two entities strive to help residents and business owners savings money on energy bills through various services including direct installation of energy efficiency equipment, energy audits, energy efficiency seminars, special financial incentives of energy efficient equipment, etc.
WAP	CA Department of Community Services and Development (Note: Services are delivered by county community service agencies)	Provides funding for energy audits and the direct installation of energy efficiency measures. Measures may include insulation, weather-stripping, caulking or other improvements to increase energy efficiency and lower the resident's fuel bills. Program also includes cost of repair or replacement of heating or cooling equipment to improve health and safety.

Seattle City Light

<http://www.seattle.gov/housing/homewise/>

Program Description

Weatherization grants (and low interest home improvement loans) to insulate single family homes with low-income households as well as apartment buildings that qualify. After an initial energy analysis, an energy conservation package is installed.

Program Eligibility

For owner-occupied homes:

Gas/Oil Heated Homes		Electric Heated Homes	
Number or People	Monthly Household Income	Number or People	Monthly Household Income
1	< \$2164	1	< \$3729
2	< \$2830	2	< \$4263
3	< \$3496	3	< \$4796

	4	< \$4161	4	< \$5325	
	5+	Call for info	5+	Call for info	
Qualifying Measures Energy audits, insulation in attic, walls, water pipes, floors at crawlspace, and crawlspace (including ground cover); venting of bathrooms/kitchens; pipe wrapping to avoid freezing; air sealing; weather-stripping of exterior doors; window caulking; duct insulation; furnace repair, tune-up/replacement; combustion appliance safety; energy conservation-related repairs; and partial payment for other measures that add value by energy conservation benefits.					
Program Steps Not Listed					

Maryland Green & Healthy Homes Initiative					
http://www.greenandhealthyhomes.org/get-help/maryland-direct-services/energy-efficiency-and-weatherization-services					
Program Description Under grants provided by the US DOE, the State of Maryland Energy Administration and the City of Baltimore, the Hazard Reduction Team will perform the following services: Full scale Energy Audits including but not limited to: <ul style="list-style-type: none"> • Visual Inspection • A blower door test to determine structural air leakage • Thermographic & Infrared Imaging to determine structural energy loss • Duct testing for forced air HVAC systems where applicable • Carbon Monoxide and combustible gas leakage detection • HVAC system capacity and performance calculations . 					
Program Eligibility Services are provided free of charge to qualifying families living in low income neighborhoods					
Qualifying Measures <ul style="list-style-type: none"> • Insulation – blown and rolled • Weather-stripping • Foam insulation • Caulking to seal structural air leakages • Replacement or installation of gutters/downspouts • Replacement windows (Energy Star) • Cool Roofs 					
Energy Retrofit/Energy Efficiency Interventions <ul style="list-style-type: none"> • Installation of water heater insulation blankets • Insulation of exposed hot water feed pipes • Installation of CFL light bulbs • Mastic to seal leakages found in exposed forced air duct systems • Replacement of air filters for forced air HVAC systems • Installation of programmable thermostat • Furnace cleaning and repair Furnace and hot water heater replacement • Dryer and bathroom venting Installation of low flow showerheads • Plumbing repair • Installation of Energy Star appliances (where applicable) • Furnace and hot water heater replacement (where applicable) 					
Program Steps					

Maryland Green & Healthy Homes Initiative

Not Listed

Bonneville Power Administration

http://www.bpa.gov/EE/Policy/IManual/Documents/FINAL_October_2014_Implementation_Manual.pdf

Program Description

Not Listed

Program Eligibility

All weatherization measures must be installed according to the 2014 BPA Residential Weatherization Specifications in the Document Library and follow the Specification, Requirements and Documentation requirements as listed under Weatherization (Standard Income) above.

To be eligible, homes must have an electric heating system as the primary system (see definitions); or homes must have one of the following as an existing heating system:

1. A permanently-installed electric heating system with either (a) no other functioning non-electric heating system or (b) a wood stove, pellet stove, fireplace, fireplace insert (wood or pellet) or wood furnace
2. A electric heat pump system integrated with a non-electric heating system (e.g., natural gas, propane, or wood supplementary/backup system)
3. A wood stove or pellet stove with no other non-electric space heating system, accompanied by the current usage of plug-in electric space
4. A electric heat system and a separate functional or non-functional, non-electric space heating system (i.e. oil, natural gas, or wood furnace) with the entire non-electric space heating system decommissioned, removed, all penetrations sealed, and all fuel (electric, gas, oil) connections to the decommissioned heating system disconnected. System equipment includes furnace, air-handler, fuel lines, fuel tanks (abated in compliance with local code). If, however, construction limitations prevent the removal of the entire non-electric system (or other portions of the space heating equipment), then the remainder of the system must be decommissioned, removed, all penetrations sealed, and all fuel (electric, gas, oil) connections to the decommissioned heating system disconnected.

Low-income household eligibility is defined in the Federal WAP as 200% of the poverty income levels. Approved statewide eligibility definitions substitute for federally established low income levels, if provided.

All low-income weatherization funds must generate reportable, cost-effective savings in the customer's service territory. Customers may run low-income weatherization programs themselves or through contractors, but must, at all times, retain responsibility for and control over the program.

Funds may be used for repair work (i.e. health and safety or to ensure efficacy of measure) directly associated with the installation of cost-effective weatherization measures, but repair costs must be reported separately. Customers may combine funding sources within a residence, but may not combine funding from multiple BPA sources for the same measure.

The table below summarizes eligible measures, which must be individually reported to BPA.

Qualifying Measures

Low-Income Measures eligible for funding include:

Single-Family

- Attic insulation (up to R49)
- Floor insulation (up to R30)
- Wall insulation (up to R11)
- Prime window or patio door replacement*
- Exterior insulated doors
- Whole House Air Sealing and Testing

Bonneville Power Administration

- Prescriptive Air Sealing
- PTCS or Prescriptive duct sealing for heat pumps or electric forced air furnaces
- Ductless Heat Pumps (zonal or EFAF⁶)

Multi-Family

- Attic Insulation (up to R49)
- Floor Insulation (up to R30)
- Wall Insulation (up to R11)
- Prime window (Class 30 only) or patio door replacement (Class 35 only)*Single-Family

Mobile Homes

- Attic insulation (up to R30)
- Floor insulation (up to R22)
- Prime window or patio door replacement* Prime window or patio door replacement*
- Whole House Air Sealing and Testing
- PTCS or Prescriptive duct sealing for homes with heat pumps or electric forced air furnaces
- Ductless Heat Pumps (zonal or EFAF)

Program Steps

Not Listed

⁶ Electric Forced Air Furnaces

4 BENCHMARKING ANALYSIS FOR THE AE WAP PROGRAM

The following section contains GDS's findings from the following task:

Task 2: Develop a Benchmarking Analysis for the AE WAP Program

Historically, benchmarking energy efficiency program performance against similar programs in the nation has been difficult due to non-standard reporting guidelines and uncertain program classification specifications. The Lawrence Berkeley National Laboratory (LBNL) is in the process of developing a common terminology to assist analysis of energy-efficiency programs on a multi-state basis. From an August 2013 report related to this topic, LBNL stated:

In order to compile and analyze information about energy efficiency programs across the country, it is necessary to have a common categorization of program types as well as definitions of the metrics that define program performance and characteristics. As part of an effort to analyze the cost per unit of savings for utility-customer funded, end-use energy efficiency programs, LBNL developed a program typology with standardized program categories, as well as metrics and associated definitions that describe program characteristics, costs and impacts. These definitions and naming conventions facilitate meta-analysis of program results and could simplify the analyses and use of such information by a wide range of entities engaged in reporting and assessing the impacts of energy efficiency.⁷

The process of benchmarking energy efficiency program performance will become much more transparent once a common framework is adopted for energy efficiency program savings and cost reporting is developed.

At the present time, no regional or nationwide database is available to benchmark AE's WAP against other utilities. However, several significant studies and evaluations of Weatherization Programs are currently in process with results expected in 2015. Specifically, the National Retrospective Evaluation of the WAP and the ARRA Evaluation are both expected to be released in spring of 2015.⁸ Also, the Statewide Evaluation Program of Energy Efficiency Activities report will be released in March of 2015. Finally, the City of Houston Weatherization program is currently being evaluated by the Houston Advanced Research Center⁹ and hopefully these results will be public in 2015.

To benchmark AE's WAP performance at this time, GDS reviewed the Weatherization program performance against other Texas programs where metric data was available. Additionally, GDS compared Austin's results against 6 other utilities based upon results from past evaluation studies. AE's WAP program results from the ARRA era and comparisons to other programs are discussed below.

Prior to ARRA funding, Austin Energy offered free weatherization services to qualifying low-income, elderly and physically/mentally disabled customers. The program provides up to \$1,500 in home improvements including installation of attic insulation, sealing and repair of ducts, solar screen installations, weather stripping around entry doors, and minor home repairs necessary to improve the effectiveness of the efficiency improvements.

⁷ Energy Efficiency Program Typology and Data Metrics: Enabling Multi-State Analyses Through the Use of Common Terminology, LBNL-6370E, August 28, 2013, <http://emp.lbl.gov/sites/all/files/lbnl-6370e.pdf>

⁸ Email correspondence with Joel Eisenberg and Bruce Toon – December 2015

⁹ http://www.harc.edu/work/COH_Weatherization_Program_Evaluation

In FY 2010, AE received a grant of nearly \$5.9 million from American Recovery and Reinvestment Act (ARRA) funds that allowed for the weatherization of 1,064 homes and apartments for low-income, elderly, and disabled customers within AE's service area. Under this program, each dwelling received, on average, about \$5,000 worth of improvements including new energy efficient appliances and air conditioning and heating equipment.

Austin Energy's implementation of the program was so successful; the utility received additional funding on three separate occasions in the amounts of \$2.1 million, \$200,000 and \$1 million, for total funds of \$9.2 million. This allowed the utility to nearly double the number of units receiving this enhanced free weatherization.

Under the Federal Weatherization Program which ended April 30, 2012, AE weatherized 1,886 homes, 77% more than the original goal of 1,064 homes. The homes were occupied by 4,529 people of whom 645 were elderly, 572 had disabilities and 758 were children under the age of 5. On average, each of the homes will save about 1,200 kilowatt-hours annually in energy costs due to the improvements.

4.1 TEXAS DEPARTMENT OF HOUSING AND COMMUNITY AFFAIRS PROGRAM DATA

The TDHCA administers a residential WAP which is funded by the U.S. DOE and U.S. Health and Human Services' LIHEAP. These federally-funded programs are administered through TDHCA's Community Affairs Division.

TDHCA administers WAP through a network of Sub-recipients. WAP allocates funding to serve all 254 counties to help households control energy costs through the installation of weatherization measures and its energy conservation education. The sub-recipients consist of Community Action Agencies (CAAs), nonprofit entities and units of local government. Austin Energy manages the WAP allocation for the City of Austin.

The TDHCA filed a Weatherization Report in the State of Texas on March 14, 2014. This report contains state required filings regarding the weatherization efforts within the State of Texas. TDHCA reported program units served, energy savings, energy cost saved and program expenditures for the most complete data available, January 1, 2012 to December 31, 2012. ¹⁰

Table 4-1 shows TDHCA reported savings by utility for CY2012.

Table 4-1: TDHCA Reported Savings by Utility for CY2012

Utility	Table 5: Dwellings Weatherized through TDHCA's WAP in CY 2012	Table 9: Energy Saved (kWh) through TDHCA's WAP and ARRA WAP, CY 2012	Table 12: Household Savings through TDHCA's WAP and ARRA WAP, CY 2012
Alamo Area Council of Governments	590	5,274,335	\$585,451
Big Bend Community Action Committee, Inc.	60	536,373	\$59,537
Brazos Valley Community Action Agency, Inc.	198	1,770,031	\$196,473

¹⁰ Weatherization in the State of Texas A Report to Meet the Requirements of Rider 14, Prepared by the Community Affairs Division TDHCA, March 14, 2014

Utility	Table 5: Dwellings Weatherized through TDHCA's WAP in CY 2012	Table 9: Energy Saved (kWh) through TDHCA's WAP and ARRA WAP, CY 2012	Table 12: Household Savings through TDHCA's WAP and ARRA WAP, CY 2012
Cameron and Willacy Counties Community Projects, Inc.	97	867,136	\$96,252
Combined Community Action, Inc.	199	1,778,970	\$197,466
Community Action Committee of Victoria, Texas	329	2,941,112	\$326,463
Community Action Corporation of South Texas	686	6,132,531	\$680,711
Community Services, Inc.	863	7,714,832	\$856,346
Concho Valley Community Action Agency	172	1,537,603	\$170,674
Dallas County Department of Health and Human Services	677	6,052,075	\$671,780
Economic Opportunities Advancement Corporation of PR XI	262	2,342,162	\$259,980
El Paso Community Action Program, Project Bravo, Inc.	371	3,316,573	\$368,140
Fort Worth, City of, Department of Housing	477	4,264,165	\$473,322
Greater East Texas Community Action Program (GETCAP)	291	2,601,409	\$288,756
Hill Country Community Action Association, Inc.	172	1,537,603	\$170,674
Lubbock, City of	50	446,978	\$49,615
Neighborhood Centers Inc./Sheltering Arms Senior Services	3,030	27,086,837	\$3,006,639
Nueces County Community Action Agency	245	2,190,190	\$243,111
Panhandle Community Services	89	795,620	\$88,314
Programs for Human Services, Inc.	568	5,077,664	\$563,621
Rolling Plains Management Corporation	239	2,136,552	\$237,157
South Plains Community Action Association, Inc.	278	2,485,195	\$275,857
Texoma Council of Governments	168	1,501,844	\$166,705
Travis County	893	7,983,018	\$886,115
Tri-County Community Action, Inc.	76	679,406	\$75,414
West Texas Opportunities, Inc.	173	1,546,542	\$171,666

Utility	Table 5: Dwellings Weatherized through TDHCA's WAP in CY 2012	Table 9: Energy Saved (kWh) through TDHCA's WAP and ARRA WAP, CY 2012	Table 12: Household Savings through TDHCA's WAP and ARRA WAP, CY 2012
City of Arlington*	66	590,010	\$65,491
City of Austin - AE*	553	4,943,571	\$548,736
City of Beaumont*	0	0	\$0
City of Brownsville*	0	0	\$0
City of Corpus Christi*	0	0	\$0
City of Dallas*	0	0	\$0
City of El Paso*	0	0	\$0
City of Houston*	515	4,603,868	\$511,029
City of Laredo*	23	205,610	\$22,823
City of Odessa*	0	0	\$0
City of San Antonio*	211	1,886,245	\$209,373
Grand Total	12,621	112,826,060	\$12,523,691
*The 11 cities indicated above administered only the ARRA WAP. All other contractors administered both ARRA WAP and WAP. By CY 2012, many of the ARRA contracts had entered the ramp down or closeout process. The total amount of funds expended by the TDHCA WAP programs was \$48,576,311.99. The distribution of the program funds expended by program can be seen in the following table.			

TDHCA estimated 112,826,061 kilowatt hours (kWhs) were saved in 2012. Energy savings were calculated by multiplying the number of dwelling units by the DOE calculation for average energy saved through weatherization per dwelling.¹¹ This equates to heating and cooling saving equivalents of 8,940 kWh per home and is not a verified energy savings figure. This number is much higher than the 1,200 kWh savings estimates from AE, as Austin only includes electricity savings and not energy savings equivalents in its internal reporting.

The TDHCA report contained program specific information for several low-income weatherization programs in the state. Table 4-2 compares AE's performance to these other programs.

¹¹ Calculations are taken from a Weatherization Assistance Technical Memorandum prepared by Oak Ridge National Laboratory. Document Number: ORNL/TM-2010/66.

Table 4-2: Comparison of AE's Performance to Low-Income Weatherization Programs in Other States

Utility	Program	Table 7: Customers Served by Utilities Participating in SB 712, CY 2012	Table 8: Total Program Funds Expended by Utilities Participating in SB 712, CY 2012	Table 10: Energy Saved (kWh) by Utilities Participating in SB 712, CY 2012	Cost per Unit Served	Cost per kWh Saved	Saving per Unit Served
Oncor Electric Company	Targeted Weatherization Low-Income Standard Offer Program	1,267	\$5,482,762	1,103,000	\$4,327	\$4.971	871
Texas - New Mexico Power Company	Low Income Weatherization	111	\$388,070	257,000	\$3,496	\$1.510	2,315
Xcel Energy (SPS)	Low Income Weatherization	149	\$306,000	379,000	\$2,054	\$0.807	2,544
AE	Free Weatherization Program - Complete ARRA Funding Period	1,886	\$9,604,809	2,263,200	\$5,093	\$4.244	1,200

4.2 NATIONWIDE EVALUATION STUDIES

GDS conducted a review of other utility and government weatherization programs, industry studies and other research to collect information to allow comparisons to be made to AE's weatherization programs. GDS will collect the following information (where available) for weatherization programs at other utilities and government agencies:

- Program costs per participant
- Energy savings per participant
- Measures offered
- Average cycle time from program start to finish
- Are education and outreach included in the program?
- Describe the oversight and governance for each program (committees, etc.)
- Is the program mandated by a regulatory authority or is it voluntary?
- How does the program handle structural repairs?
- Describe the program delivery approach (outsourced vs internal staffing and the number of staff)
- Does the program use a direct install or a rebate approach?
- What percent of the program budget for the latest fiscal year was spent? Need to collect budget as well as actual spending for latest completed fiscal year
- What are the total dollar savings to the utility and the participant?
- What is the utility investment in dollars for the latest completed fiscal year?

- Describe partnerships that each program has established

These questions were part of the information collected from the primary research direct surveys with Program Managers. The results below present the information found in other sources found during the secondary research process.

Impact and Evaluation reports provide information on how effective energy efficiency programs are at meeting their goals and targets for performance. GDS reviewed Weatherization Impact Evaluation studies for the following utilities to benchmark AE's WAP performance.

- Massachusetts (2014)
- Thetford, Vermont (2011)
- Xcel Energy, Colorado (2010)
- Interstate Power and Light Company, Iowa (2011)
- MidAmerican Energy, Iowa (2009)
- Black Hills Energy, Iowa (2009)
- PECO, Pennsylvania (2008)
- New Hampshire Utilities (2006)

Table 4-3 and Table 4-4 below contains a comparison of program cost and energy savings per participant for each utility reviewed in the study.

Table 4-3: Comparison of Program Costs per Participant for Each Utility

Utility	Program Cost per Participant	Ranking
City of Tallahassee Utilities	\$506	1
JEA	\$536	2
Xcel Energy, Colorado (2010)	\$593	3
Thetford, Vermont (2011)	\$863	4
New Hampshire Utilities (2006)	\$1,449	5
Orlando Utilities Commission	\$1,500	6
Sacramento Municipal Utility District (SMUD)	\$1,800	7
Interstate Power and Light Company, Iowa (2011)	\$2,049	8
PECO, Pennsylvania (2008)	\$2,190	9
Black Hills Energy, Iowa (2009)	\$2,299	10
MidAmerican Energy, Iowa (2009)	\$2,931	11
Pedernales Electric Cooperative	\$3,500	12
Austin Energy - Current	\$3,000	13
Gainesville Regional Utilities	\$3,800	14
Los Angeles Department of Water and Power (LADWP)	\$5,000	15
Austin Energy - ARRA	\$5,093	16
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	\$6,000	17

Utility	Program Cost per Participant	Ranking
Arkansas WAP	\$6,904	18
Alabama ARRA (2008-2011)	\$7,110	19
Wisconsin WAP (2011)		
Bluebonnet Electric Cooperative		

Table 4-4: Comparison of Energy Savings per Participant for Each Utility

Utility	Energy Savings per Participant	Ranking
PECO, Pennsylvania (2008)	2,172	1
Gainesville Regional Utilities	1,752	2
Xcel Energy, Colorado (2010)	1,711	3
Pedernales Electric Cooperative	1,331	4
Austin Energy - ARRA	1,200	5
Wisconsin WAP (2011)	1,115	6
Interstate Power and Light Company, Iowa (2011)	1,004	7
Sacramento Municipal Utility District (SMUD)	1,000	8
MidAmerican Energy, Iowa (2009)	998	9
New Hampshire Utilities (2006)	872	10
Orlando Utilities Commission	554	11
Thetford, Vermont (2011)		
Black Hills Energy, Iowa (2009)		
Arkansas WAP		
Alabama ARRA (2008-2011)		
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas		
Bluebonnet Electric Cooperative		
City of Tallahassee Utilities		
Los Angeles Department of Water and Power (LADWP)		
JEA		

Below is a sample of the weatherization measures by each program:

- 1) **Austin Energy:** Attic insulation, Solar screens, CFL/LED replacements, Water conservation efforts (aerators/showerhead replacement faucets and commodes), CO/Smoke detectors/alarm, Air infiltration, Duct sealing, repair/replacement, HVAC Replacement (ARRA), Window A/C (Post-ARRA)
- 2) **Rocky Mountain Power (Idaho):** Infiltration controls, pipe insulation, CFLs, double glass window replacement, thermal door replacement, ceiling insulation, attic ventilation, floor insulation, furnace repair, duct sealing and insulation, water heater wrap, water heater replacement, storm windows, wall insulation, furnace replacement, refrigerator replacement, heat exchanger (report includes frequency of measure installations for 2007-09)

- 3) **Washington State:** most frequently installed were insulation and air sealing; also lighting, appliance, and hot water efficiency measures
- 4) **Massachusetts:** Air sealing to reduce infiltration, attic insulation, sidewall insulation, floor insulation, pipe and/or duct insulation, limited energy related repairs
- 5) **Xcel Energy, Colorado:** Ceiling insulation, wall insulation , furnace, refrigerator replacements, CFLs
- 6) **Nevada:** Blower door test, duct sealing, shell sealing, caulking kit, weather-strip kit, CFL retrofit, low-flow shower head, solar screen, refrigerator replacement, attic insulation
- 7) **Arkansas:** Air sealing, attic and/or sidewall insulation, weather-stripping, minor repairs associated with the weatherization work
- 8) **California:** Sealing holes and cracks around windows, doors, and pipes, ensuring proper levels of insulation, fixing or replacing windows, putting an insulated blanket around water heater, making sure heating and air conditioning systems are working properly
- 9) **Pacific Gas & Electric:** CFLs, refrigerator replacement, weather-stripping, low-flow showerheads, caulking, faucet aerators, attic insulation, duct testing and sealing, switch & outlet gaskets, door replacements, glass replacement, window replacement, combustion air ventilation, minor repairs

A comprehensive list of measures offered by the utilities and reviewed in the secondary research section is included in Appendix B.

What is the average cycle time from program start to finish?

- 1) **Washington State:** from energy audit for final project inspection: 140 days

Are education and outreach included in the program?

- 2) **Rocky Mountain Power (Idaho):** The agencies aim to educate their clients about energy use in their homes. The agency staff interviewed explained that most of the energy education occurs during the initial audit. Auditors give residents the Rocky Mountain Power booklet and explain what actions they can take to reduce energy use. When the crew returns to complete the work, crew members discuss their work plan for the home with the resident.
- 3) **Washington State:** Yes, delivers energy conservation education.
- 4) **Thetford, Vermont:** Yes, 50 community volunteers were recruited, educated, and trained on importance of home weatherization. A packet of weatherization information was developed, including energy saving tips, list of energy programs, list of weatherization contractors, a home heating efficiency worksheet, list of Efficiency Vermont incentives for home weatherization, and two case studies. Every home in Thetford received these packets-- some were hand delivered, some were mailed. Also had a day-long energy expo that provided homeowners with an opportunity to meet and learn more from weatherization program directors and contractors, homeowners who had received services, workshops, demonstrations, and skits.
- 5) **Xcel Energy, Colorado:** Yes, program provides customer education, which focuses on ways to reduce energy use in the home. This education consists of client assessment, distribution of conservation education materials, measure-specific energy education, and energy saving tips.

6) **Nevada:** Yes, program aims to increase awareness of low-cost ways to conserve energy.

How does the program handle structural repairs?

7) **Nevada:** The program offers minor home repairs.

8) **Arkansas:** Minor repairs associated with weatherization work are offered.

Describe the program delivery approach (outsourced vs internal staffing and the number of staff.

9) **Massachusetts:** The program is funded by an annual grant from the US DOE, and administered by a network of local agencies.

10) **Washington State:** Some local agencies conduct weatherization work, but 85-90% of the work is performed by local subcontractors.

11) **Arkansas:** A network of Community Action Agencies use crews or local private-sector weatherization contractors to complete work at no cost to occupants.

Does the program use a direct install or a rebate approach?

12) **Rocky Mountain Power:** In the Idaho program, the agencies send invoices directly to Rocky Mountain Power for processing and payment. Rocky Mountain Power does not provide any up-front funding, but pays rebates after the work has been completed and it has received an invoice.

What are the total dollar savings to the utility and the participant?

13) **Washington State:** Program estimated to save weatherized households \$1.4 million per year in energy costs.

14) **Arkansas:** Total annual Energy savings for program participants for PY 2009-10 was \$2,409,458.

Describe partnerships that each program has established.

15) **Washington State:** Agencies cooperated and partnered with utilities, government entities (cities, counties, housing authorities), non-profit housing, elderly, and community organizations

5 WEATHERIZATION PROGRAM BEST PRACTICES

The ARRA grant provided \$5.0 Billion to fund WAP efforts for numerous states and municipalities from 2008-2012. As a result, over 600,000 homes nationwide were weatherized during this period. This increase in weatherization effort provided opportunity for the weatherization process to be streamlined and for many best practices to be developed. GDS reviewed many National and Statewide Studies to identify current weatherization program best practices. Several of these studies were discussed in more detail in the 2012 study. Following are the main points from each of these reports.

5.1 RECENT BEST PRACTICES / EVALUATION FINDINGS

5.1.1 National Weatherization Assistance Program Evaluation – Preliminary Findings

The National WAP Evaluation results and report should be published in the spring 2015. A June 13, 2013 presentation at the National Energy and Utility Affordability Conference (NEUAC)¹² provided some preliminary findings. The key findings are based upon initial data review and feedback from the auditor team and include the following:

Benefits – The WAP program...

- Transforms poorly performing and unsafe homes
- Results in cost-effective energy savings
- Furnishes non-energy benefits to clients
- Delivers non-energy benefits to the rest of society

The WAP program could be improved by...

- Continuing to invest in management tools, quality control, and training
- Findings ways to target homes and services that result in the highest level of benefits to clients

In regards to installation, the report notes the following opportunities for improvement:

- Increased use of blower door when air sealing
- Respect for clients' homes (booties, covering furniture)
- Crew member safety
- Increased assessment of HVAC contractors
- Explain CFLs when installing
- Client education

The report recommends the following regarding final inspection:

- Increased client education
- Explain measures installed
- Reinforce client action plan
- Improved testing quality
- Increased assessment of installation quality

¹² National Weatherization Assistance Program Evaluation, David Carroll and Jackie Berger, APPRISE, NEUAC Conference Presentation, June 10, 2013

- Reduced use of auditor to conduct final inspection – additional perspective

5.1.2 US DOE –WAP Quality Work Plan

The U.S. DOE's WAP has introduced a comprehensive QWP¹³ that establishes a benchmark for quality home energy upgrades. This plan defines what is required when federal dollars are used to purchase weatherization services and leverages the resources developed through the Guidelines for Home Energy Professionals project.

This QWP not only defines how home energy upgrade work should be done, but it also provides a prescription for communication, training, and the inspection of work throughout the WAP network. The plan is aimed to address three critical questions:

- What does quality work look like?
- How should workers be trained?
- How should home energy upgrade work be verified?

The Issues raised by the entire WAP network led to the QWP are as follows:

- Inconsistent expectations at all levels of monitoring
- No way to establish the value of an experienced crews
- No way to place value on high-quality training
- Inconsistent methods of inspection across the network
- No national standards for work quality
- No portable and nationally recognized credentials for experienced WAP workers

The QWP has four requirements to ensure quality installations:

1) Quality Guidelines and Standards

- All WAP measures installed must Meet the minimum outcomes and specifications for work outlined in the Standard Work Specifications for Home Energy Upgrades (SWS).

2) Communication of Guidelines and Standards

- Grantees must provide sub-grantees with technical requirements for field work (audits/testing, installation, inspections), and confirm receipt of those requirements.
- The technical requirements must be clearly communicated and the specifications against which the work will be inspected must be referenced in sub-grantee contracts.
- Contractors hired by the sub-grantee must have contracts that include the same flow---down requirements. The work of the contractor must be consistent with the Grantee standards and field guides.

3) Inspection and Monitoring of Work Against Guidelines and Standards

- Every DOE WAP unit reported as a completed unit must receive a quality control inspection ensuring that all work meets the minimum specifications outlined in the SWS.

4) Provide Training to Implement and Maintain Guidelines/Standards

¹³ http://energy.gov/sites/prod/files/2014/07/f17/QWP%20Update_ACI2014.pdf

- Beginning in Program Year 2014, grantee Training Plans must include comprehensive training for all WAP workers that is aligned with the NREL Job Task Analysis (JTA) for the position in which the worker is employed.

5.1.3 The Changing Landscape of Low-Income Weatherization

At the 2014 Affordable Comfort Inc. (ACI) Conference themed, “Creating a Better America” in Detroit, NASCSP Energy Service Director Bob Scott and EOS Project Coordinator, Madiana Mustapha, presented information on the “Changing Landscape of Low-Income Weatherization.”¹⁴ Upcoming future developments were discussed, including web-based weatherization solutions and process improvements driven by the QWP. Additionally, the trend toward leveraging strategies to take advantage of today’s opportunities for leveraging weatherization resources was reviewed.

The presentation focuses on three upcoming developments for 2015 that should be considered by weatherization program developers.

Development of Web-Based Weatherization Assistant Tools

- Multifamily Tool for Energy Audits (MulTEA)
- Health and Safety Audit Tool
- National Energy Audit Tool (NEAT) – Single-family
- Manufactured Home Energy Audit (MHEA)

Noted Increased Emphasis on Multi-Family Weatherization

- Standard Work Specifications for Multifamily Energy Upgrades
- Multifamily Job Task Analyses (JTA)
- Multifamily Tool for Energy Audits (MulTEA)
- Technical Guidelines for Multifamily Building Energy Audits
 - The Technical Guidelines tell the energy auditor what the data-gathering and energy-auditing process should entail.
 - The guidelines facilitate uniformity in multifamily energy audit methods, to lead to more accurate predictions of energy and cost savings.

Use of DOE QWP Guidelines

- Based on Guidelines for Home Energy Professionals initiative
- Intent to demonstrate quality and accountability of WAP
- Help ensure long term sustainability of WAP as a leader and foundation of the home performance industry

Additionally, the presentation discusses the on-going trend of “Leveraging.” Leveraging is defined as “using the current resources of the program and its organization to attract complementary resources while offering value to partners or investors.”

¹⁴<http://www.affordablecomfort.org/events/2014-aci-national-home-performance-conference-trade-show/session/changing-landscape-low>

Leveraging allows utilities to partner with other organizations, such as non-profits, multifamily property owners and managers, foundations, and mission based lenders to provide weatherization services to more homes in a given community. The benefits of leveraging include:

- More homes weatherized
- Less organization vulnerability to reductions in any single Weatherization funding source
- Increasing the number of stakeholders with a vested interest in the Program who can advocate for the Program

ALMOST HALF OF THE WAP FUNDING FOR 2013 CAME FROM LEVERAGED SOURCES:

- 40 states leveraged utility rate payer programs
- \$332.6 M - utility rate payer programs
- 42 states transferred some LIHEAP
- \$308.6 M - LIHEAP transfers
- States Used State Tax Revenues
- \$710 M Leveraged in 49 States

5.1.4 Weatherization Best Practice Field Guides

As mentioned previously, The U.S. DOE's WAP has introduced a comprehensive QWP (QWP) to be used as guidance for all future WAP installations. Along with the issue of the QWP, many utilities have either created or updated their weatherization field guides to include best practices as collected through the ARRA funding years. Specifically, the follow utilities have recently released new or updated Weatherization Field Guides:

- Bonneville Power Administration - Residential Weatherization Best Practices Field Guide - April 2014 Version 1.0¹⁵
- Minnesota - Weatherization Manual – Updated July 2014¹⁶
- Missouri Weatherization Field Guide – Updated May 2014¹⁷
- Iowa Weatherization Program, Weatherization General Appendix, 2013¹⁸
- 2013-2014 Wisconsin WAP Manual¹⁹

Copies of these Field guides can be found at the links in the footnotes for each program.

5.1.5 Blower Door Test Practices and Guidelines

Several utilities and municipal weatherization programs reviewed by GDS required that service providers perform an air leakage test before and after performing the air sealing measures. Specifically, Oncor and the A Cooler House Programs for Houston, Dallas and Fort Worth area doing both require pre- and post-air leakage tests. A pre and post-blower door test to measure infiltration is seen as a gauge of the effectiveness of the weatherization work done by service providers.

¹⁵ http://www.bpa.gov/EE/Sectors/Residential/Documents/v4FINAL_Wx_Field_Guide_03_31_14.pdf

¹⁶ <http://mn.gov/commerce/energy/service-providers/For-WAP-Providers/Weatherization-Manual.jsp>

¹⁷ http://wx.srmi.biz/mo/MO_SWS_WxFg_052914.pdf

¹⁸ http://www.waptac.org/data/files/website_docs/technical_tools/best_practices_field_guides-standards/2013-appendix-wap_iowa.pdf

¹⁹ <http://homeenergyplus.wi.gov/docview.asp?docid=24606>

5.1.6 Iowa Weatherization Program - Weatherization Cost Limits and Allowances

The Iowa Weatherization Program²⁰ has implemented cost limits and allowances to ensure that implementation partners are aware of upper project costs boundaries before installation begin. The Iowa cost and allowance limits are discussed below.

Average Expenditure per Completed Unit Limit

The Average Expenditure per Unit Limit applies to homes charged as completions to the DOE Contract. The Average Expenditure per Unit Limit does not apply to homes charged as completions to the HEAP Contract. The average limit is updated annually by DOE. The DCAA notifies agencies at the beginning of each program year as to what the updated Expenditure per Unit Limit is.

Total Cost of Home (based on estimated cost using DOE, HEAP, Utility, ECIP funds)

Work on homes requires DCAA prior approval when estimated cost is more than: \$10,000. The estimated cost includes health and safety, energy efficiency, and repair work using DOE, HEAP, Utility, and ECIP funds.

Support Allowance (per home)

- Completed Home: 35% of the sum of DOE, HEAP, Utility, and ECIP expenditures for health and safety, labor, and materials.
- Incomplete Home: \$200

Expenditure Limits

The following expenditure limits are in effect for the current program year. All limits include the costs for labor and materials.

- Heating System Repair - All systems except boilers
 - Limit of \$1,000 (per dwelling, excluding ductwork)
 - Heating System Repair – Boilers and Heat Pumps
 - Limit of \$2,000 (per dwelling)
- ECIP
 - Agencies may use ECIP funds for furnace repair/replacement. The ECIP allowance per furnace repair/replacement is:
 - \$1,500 - When furnace repair/replacement is done in conjunction with weatherization.
 - \$3,000 - When furnace repair/replacement is not done in conjunction with weatherization
- Water Heater Repair
 - Limit of \$300 (includes associated plumbing)

General Health and Safety Repairs

General health and safety repairs are defined as “Repairs necessary (1) for installation of weatherization measures and (2) to eliminate health and safety problems in the home.” General health and safety repairs are limited to: plumbing repairs, electrical repairs, Energy Star-rated dehumidifiers, sump pumps, gutters and downspouts, banking and grading, minor asbestos removal, pest removal, and mold/mildew cleanup. The cost limit for general health and safety repairs is \$1,500 per home.

²⁰ http://www.waptac.org/data/files/website_docs/technical_tools/best_practices_field_guides-standards/2013-appendix-wap_iowa.pdf

5.2 NATIONAL / STATEWIDE WEATHERIZATION ASSISTANCE STUDIES

5.2.1 Modeled Cost-Effectiveness of Weatherization in Low-Income Urban Housing Stock

In this Princeton Engineering thesis paper²¹, weatherization cost-effectiveness was evaluated in six urban areas of the U.S. The central cities of these metropolitan areas were Milwaukee, Detroit, Philadelphia, Orlando, Seattle, and Los Angeles-Long Beach. The Home Energy Saver (HES) energy modeling software, coupled with data from the American Housing Survey, determined the energy use in low-income urban housing stocks in six urban areas in varying climate zones in the U.S. Based on this analysis, the research conclusions were:

- Most weatherization treatments examined are profitable.
 - Almost all treatments in the cities examined were NPV-positive (Net Present Value) over either a 7 or 15 year period.
- Regional variations in energy prices significantly affect the cost-effectiveness of weatherization retrofits.
 - Differences in energy prices can outweigh differences in energy savings in a cost-effectiveness analysis. Although retrofits saved less energy in Orlando than in Detroit, because Orlando had the most expensive and Detroit had the least expensive energy prices, Orlando's low-income housing stock was among the most profitable to retrofit, as measured by NPV, and Detroit's was among the least profitable.
- Weatherization strategies aimed at energy savings, carbon savings, and cost-effectiveness may not lead to the same conclusion.
 - Because average energy consumption, carbon intensity of energy consumed, and energy prices all vary geographically and largely independently, energy savings, carbon savings, and cost-effectiveness are not necessarily aligned. Weatherization strategies that seek to minimize residential energy use may not be the same strategies that seek to minimize residential carbon emissions.
 - There are different ways to consider cost-effectiveness, including net present value or by abatement cost for energy or carbon.
 - Policy-makers need to recognize these differences and decide the priorities of their weatherization programs.

5.2.2 Weatherization Plus Reports

Program Objective: The goal of a Weatherization Plus Program is to achieve significantly greater energy cost savings for more low-income households and to increase the Program's contribution to the economic and environmental health and sustainability of the community.

Measures: Measures typical of a Weatherization Plus Program include:

- Air Sealing and Attic Prep
- Attic Insulation
- Dense-Packed Sidewall Insulation
- Duct Sealing/Duct Repair
- Basements and Crawl Spaces

²¹ http://efm.princeton.edu/pubs/Bradshaw_Thesis%20FINAL.pdf

Program Design: There are three pieces to the overall Weatherization Plus strategy:

- 1) Increase Flexibility
- 2) Advance Technological Capabilities
- 3) Expand Resources

Best Practices: The Weatherization Plus Program is designed as a flexible whole home approach to efficiency retrofits, offering comprehensive improvements and emerging technologies, that leverages resources – contractors, education, training, and funding – from existing programs or activities. <http://www.waptac.org/WAP-Basics/Weatherization-Plus.aspx>

As the Recovery Act comes to an end and the Weatherization moves into the next generation of providing efficiency and renewable energy improvements for millions of families across the country, the time has come to identify a new strategic roadmap to guide Weatherization through 2015 and beyond.

A Weatherization Plus 2015 strategy will:

- Ensure Weatherization is positioned to leverage necessary resources to meet the needs of our clients that are beyond the Weatherization scope.
- Position the Weatherization Grantee and Sub-grantee networks to improve services to the existing market and to expand to markets beyond those income-eligible households.
- Clearly convey the short and long-term benefits of the Weatherization and the impact it makes on the local, regional, state, and national levels.
- Institute consistent delivery of quality Weatherization services to the households we serve.

5.2.3 Itron Study of Electricity Savings from Investor Owned Utilities in Texas

The Public Utility Commission of Texas funded a study performed by Itron, Inc. to estimate energy efficiency potential in Texas in order to answer the Texas Legislature's questions regarding energy efficiency goals and policies. Itron gathered and analyzed utility, ERCOT, and market data on energy and peak consumption, utility-reported program savings, baseline equipment characteristics, energy efficiency measure costs and savings, and the market penetration of energy efficiency measures.

Itron estimated the breakdown of residential consumption by end use for the nine utility areas (AEP Central, AEP North, AEP SWEPCO, CenterPoint, El Paso, Entergy, Oncor, TNMP, Xcel) combined in Texas.²²

Itron noted that consumer groups in Texas believe that direct weatherization programs are the most successful programs because they offer a comprehensive approach and reach the highest percentage of their target market. Partnering with consumer groups is favorable because of this already existing positive view of weatherization programs. It is also of note that environmental groups have a positive view of ENERGY STAR Programs as a means to promote energy efficiency.

Measures reviewed in the study include: central air conditioner upgrades, programmable thermostats, ceiling fans, whole house fans, attic venting, proper refrigerant charging and air flow, high efficiency room air conditioner, variable speed furnace fan, duct repair, window film, solar screens, double pane

²² Itron, Inc. "Assessment of the Feasible and Achievable Levels of Electricity Savings from Investor Owned Utilities in Texas: 2009-2018" December 23, 2008.

and Low-E Windows, ceiling insulation, wall insulation, CFLs, Super T-8 Lamps, heat pump water heating, high efficiency water heater, solar water heater, low-flow showerhead, pipe wrap, faucet aerators, Energy Star Refrigerators, Early replacement refrigerators, high efficiency freezers, energy star dishwashers, energy star clothes washers, high efficiency clothes dryers, high efficiency pool motor and pumps, and in-house home energy displays.

5.2.4 Florida's Weatherization Program reports: Expanding Resources

Two case examples of the successful implementation of efficiency resources in Florida were related to weatherization efforts.

Case Study: In one example, the Weatherization program was able to partner with local and national non-profits to obtain materials for projects. The Framing Hope Program has matched Home Depot with the St. Johns Housing Partnership, which provides home repairs and weatherization services to more than 250 homes each year. The St. Johns Housing Partnership was also able to collaborate with a local business in order to help identify the families in need and get product donations to them. These efforts with local and national charities also help to promote positive marketing throughout the community and increase awareness.²³

Case Study: In the second example, a disabled client was able to receive weatherization even though the case was outside of DOE grant limits. This was possible because of corporate donations by Home Depot, Jeldwyn Mfg., and the ADRC (AGING & DISABILITY RESOURCE CENTER) Home Touch Program. Again, the outreach and collaboration with additional programs and businesses led to positive awareness and publicity in the community.²⁴

Best Practices: Partnering with community agencies helps to identify potential participants while partnering with local businesses provides an opportunity for leveraging available resources (e.g., materials, services, and donations) to meet the needs of the community. The partnership with local entities helps to promote the program and the benefits of efficiency improvements in general.

5.2.5 National Weatherization Training and Technical Assistance Plan

Skills & Training: At a Weatherization Plus conference, a Senior Policy Advisor for the Office of Energy Efficiency and Renewable Energy (DOE) stressed the importance of a skilled and properly trained workforce in implementing the best weatherization measures. The training and skill set of workers are key to sustainable building practices, and resources should be appropriately used to improve worker quality.

The American Recovery and Reinvestment Act (ARRA) used 20% of funds to increase the WAP training program. Investing in training is a key factor in weatherization programs because:

- Demonstrating high quality work is important to customers and to stakeholders.
- After ARRA are expended, the investment in high quality workers will allow the continuation of Weatherization Programs and will allow workers to transition into other work fields.²⁵

²³ "Weatherization Assistance Available at Pie in the Sky." The Newsletter of the St. Johns Housing Partnership. Vo 7, No. 2. Fall 2010.

²⁴ Kent, Christine. "A Story of Survival" October 21, 2009. Retrieved from:

http://www.waptac.org/data/files/website_docs/recovery_act/success_stories/fl/christine%20kent.pdf

²⁵ Hughes, Julie. "Opening Ceremony". Weatherization Plus Health Regional Conference. September 13, 2011

In order to improve the quality of work, a program must aim to

- Create solid work specifications,
- Define worker tasks
- Train and certify workers.²⁶

The U.S. DOE's WAP for Low-Income Persons tasked the Weatherization Trainers Consortium to develop a set of core competencies for the various staff positions of the Weatherization Program. By defining and setting expectations for various roles, a program will be better able to execute program tasks and accomplish goals. Core competencies include:

- Identify specialized skills and knowledge that are required to run an effective weatherization program
- Assist state and local weatherization agencies to hire staff with a strong potential to perform well and prosper in the program
- Serve as a foundation in establishing standardized curricula to ensure the consistent delivery of high-quality weatherization services nationwide
- Put upward pressure on salaries to reduce staff turnover

Best Practices: Training is essential to a successful weatherization program as it ensures that quality work is conducted as part of the program and promotes better building practices outside of the program. It is recommended that to achieve high quality in work a program must **(1)** create solid work expectations, **(2)** define worker tasks, and **(3)** train and certify workers.

5.2.6 National Energy Efficiency Best Practices Report

Quantum Consulting completed December 2004 *National Energy Efficiency Best Practices Study*, aiming to develop a comprehensive and comparative understanding of energy efficiency program efforts throughout the United States. According to a single-family program review conducted as part of this study, a strong weatherization program can be achieved by implementing and considering the following best practices:

Program Management – Quality Control and Verification:

- Use a verification method capable of confirming measure and installation quality.
- Select an appropriate percentage of properties for inspection and verification.
- Write clear specifications for measure installation using “contractor-friendly” language and train contractors on what is expected.
- Pre-screen installers who have been trained for and are committed to high-quality installation.
- Create processes for tracking complaints and failure by measure and by contractor.
- Require that installers honor the warranties that come from product manufacturers.

Program Implementation – Participation Process:

- Develop a network of local installers who are committed to high-quality standards.

²⁶ Johnson, Claire. US DOE “National Weatherization Training and Technical Assistance Plan” Weatherization Assistance Program. December 2009.

- Balance simplicity and risk management through offering “one-stop-shopping” for customers.
- Establish systems that fund loans and issue rebates in shortest possible time.
- Control for free-ridership through periodic market studies, consumer surveys and by tying popular measures to those more cost-effective measures that are less likely to be installed.
- Offer a mix of services and measures attractive to homeowners.
- Provide low-interest loans or financing as an additional, high leverage tool.

Program Design:

- Offer an attractive mix of eligible measures and integrated program services that include potential program drivers, but tie rebates for the most popular measures to those less likely to be considered and installed.
- Use a whole-building approach to achieve maximum energy savings.²⁷

5.2.7 US Department of Energy Weatherization Best Practices²⁸

Program Design: The U.S. DOE Weatherization Program targets low-income families and emphasizes improving both energy efficiency and safety. For typical low-income homes, weatherization programs are able to generate energy savings of approximately 35% of total electric and gas consumption and improve health and safety by eliminating energy-related hazards. Their process involves matching professionally trained crews with advanced technology in order to best determine which measures are appropriate for families.²⁹

Measures: Typical measures include:

- Installing insulation.
- Sealing ducts.
- Tuning and repairing heating and cooling systems.
- Mitigating air infiltration.
- Reducing electric base load consumption.

The professionally trained crews also perform health and safety tests, such as:

- Testing heating units and appliances for combustion safety, carbon monoxide, and gas leaks; assessing moisture damage;
- Checking electrical system safety;
- Replacing unsafe heating and cooling systems; and
- Installing smoke and carbon monoxide detectors.

Best Practices: Successful weatherization programs focus not only on typical measures but offer other home-safety improvements as well. Additionally, successful programs ensure that well qualified and trained professionals are available to install the most appropriate and advanced technologies to improve the efficiency of the home.

²⁷ National Energy Efficiency Best Practices Study . “Volume R4 – Residential Single-Family Comprehensive Weatherization Best Practices Report” Quantum Consulting, December 2004.

²⁸ <http://www.waptac.org/WAP-Basics/Weatherization-Plus.aspx>

²⁹ EERE Information Center. “Weatherization and Intergovernmental Program” DOE/GO-102010-3060. June 2010.

5.2.8 Recommendations Based on Best Practice Reviews

Economic Opportunity Studies, Inc. established a collection of recommended tasks which will allow for the successful integration of Energy Efficiency and WAPs. These tasks were determined by evaluation practices used by local and regional utilities in Massachusetts, Washington State, Wisconsin, Kentucky, New York City, Texas, New Hampshire, West Virginia, and California. A summary of the lessons learned – with recommended “Do’s” and “Do Not’s” – is provided in the following tables. Where GDS felt the recommendation applied to AE, either in support of current practices or as new practices to implement, GDS include an “AE” in the right hand column next to the recommendation.

GDS also compiled a table based on the studies summarized in the previous sections. For AE specific recommendations based on these findings, please see Table 5-4, Table 5-5, and Table 5-6 on the following pages.

Table 5-1: Weatherization Best Practices Recommendations – Program “Do’s”³⁰

Do's	What?	Why?	Where?
Structure			
	Choose a single model of utility-to-agency and programs statewide.		MA, WA, TX
	Consider one of three success models: <ul style="list-style-type: none"> Utility \$ to one lead local agency w/ subcontracts Utilities \$ to each local w/ identical program and state agency oversight Utilities to state WAP agency 		MA, NYC TX, OH TX, OH
Audit & Diagnostics			
AE	Adopt unified, statewide audit for government & utility that standardizes most measures and tests.	High cost of performing multiple tasks/or different audits in one home; multiple testing or cost standards.	MA
AE	Make that standardized audit broader than NEAT for measures and similar cost/benefit or ROI.	Confusion and differences in PUC registration or legislation. Multiple tests inhibit smart mix of funds.	WA
	Ensure discretion for some crew investment decisions.	Need choice of investments in various sources or DOE, also choice of various standard audits to adapt to buildings, conditions.	WA, MA
AE	Allow groupings of buildings to be eligible and all units to get treatment if ROI is positive for all together (i.e., not only unit-by-unit).	Indirect cost savings and or group efficiencies are a legitimate goal; community scale impact.	MA, NY
Goals & Results Measurement			
AE	Make all utility investments “fuel-blind.”		MA, WA, MV, KY, TX
AE	Include as program goals: <ol style="list-style-type: none"> 1) Sustainability/affordability/safety and protection (i.e., goals of client, not just those of utility). 2) The positive consumer added to the energy benefits. 3) The positive community impacts added to the energy benefits. 	Fits WAP & LIHEAP goals and allowable expenditures. Reduces system’s collection, bad debt and customer service costs.	WA, MA
Costs			
	Use (at least) expected retail costs as the standard.		WI
	Assure information-sharing with utility on program cost and customer fuel costs and bills.		MA, TX
	Include competitive salaries for crews and managers – and/or performance incentives (may be difference from CAA Pay system). Consider a salary survey.		WI, MA, TX
Management & Quality			
	Have a plan for managing growth & checking quality. Ensure utility information sharing on costs, important data on effectiveness, and value. Do not allow the utility investment, costs, or benefits to be a utility “trade	Partners must agree on changed rules and on form of reports, evaluation studies.	MA, WV, WA, VA

³⁰ Power, Meg. “Introduction to: Best Practices in WAP/ Utility Energy Efficiency Programs or: Lessons Learned the Long Way” Economic Opportunity Studies. December 2002.

Do's	What?	Why?	Where?
	secret.”		
AE	Build Quality Control into WAP control. Use program and utility procedures together.		MA, WA
AE	State program involvement builds support in WAP network and outside.		TX, IL, OH
	In implementation phase, include frequent, close communication among locals. Meet, write, include an attorney in the group, make adjustments as needed.		MA, NY
AE	Ensure regulators are involved in oversight/enforcement.		MA, TX, OH
AE	Conduct training for and provide follow-up contacts for multi-family building management staff. Cost effective element of utility programs.		TX, NY
Eligibility			
AE	Consider usage level as a factor along with income.	High usage closely related to high burden and high savings. Allowances for family special needs, provides authentic estimate of burden. Targeting most “in need” of investment requires significant sample size – i.e., large pool of possible homes.	IN, ME, OH
AE	Have flexible method of calculating incomes. Use deductions (Rx?, child care?). Use at least max federal eligibility level.		MA, ME, NY
AE	Allow groups/blocks/neighborhoods not just individual unit.	Economy of scale, overall higher benefit-to-cost ratio.	NY
Timing/Schedules			
	Include ramp-up period.	Training, hiring & equipment – utilities cannot anticipate as well as the WAP partner. You need time – plan for it. Get goals low enough for start-up of utility program; raise.	MA, WA, IN
AE	Use (and train) contractors for faster build-up.	Make adjustments simpler, deploys energy technology to private sector.	MA, PA
	Establish a bonus payment system for crew/contractor managers who meet or exceed goals.	Use utility funds.	TX
Installed Measures-Utility Programs			
AE	Be sure utility program is fuel blind.		MA, WI
AE	Include appliance replacement.	Major source of savings of gas and/or electricity.	All
AE	Include combustion air safety tests & repairs.	If not done, liability or walk-away policies are problems. DOE cannot cover these alone.	CA
	Include administration and direct costs in plan.	Utility partners must see “real” cost; an honest comparison to their own overhead will demonstrate the efficiencies in local agencies.	MA, WV, WA, VA

Table 5-2: Weatherization Best Practices Recommendations – Program “Do Nots”³¹

Do Not's	What?	Why?	Where?
Costs, Benefits/Results			
AE	Accept measures and/or expenditure ceilings per unit.	Short term cost orientation will yield poor results on energy savings test. Also, it skews DOE investments to accommodate utility accounting.	KY, WV, TX, WA
AE	Agree to traditional utility cost test of success (TRC, avoided costs, performance-based, etc.)	Low usage, like that of most of the poor, obviously predicts lower savings potential in plus and money. Residential sector savings are marginal anyway in utility programs. Many benefits accrue to the client, utility and community. All are a return on the investment.	All
	Allow inclusion of utility costs for “soft” elements of their work.	When calculating costs, utilities will allocate a portion of their PR, billing, and mailing costs if they can.	MA, NH, WA
	Accept utility reports of any costs without an agreed method of audited, shared accounts.	Your costs/investments will be documented. Require similar standards for all items included in utility reports to PUC/stockholders.	MA
	Forget cost of appliance disposal.	Utility must help cover.	TX
Measures			
AE	Require sharing with WAP per each unit.	Limits utility funds overall and by unit. Needs vary – some may need one utility measure. (WAP-Plus may permit/support only units).	KY, WA, OR
	Exempt utility from administrative cost share.	It's false costing; public money would have to support private – could be political issue too as well as DOE rules issue.	KY
	Require customer lease or payment on appliances.	High cost of collection information/billing even if customer can pay eventually is not cost-effective.	TX
AE	Use only NEAT or a checklist.	Added modules or selection tools are essential for mobile homes, large multi-family, appliance replacement.	WA, TX, OH
AE	Limit to heating and cooling measures.	Baseload offers big savings. Audit all options and then choose.	CA, TX, MA, OH, KY
Eligibility			
	Prioritize payment-troubled customers.	Use payment record as a warning sign weatherization may be needed. But just because these are the source of a problem the utility cares about does not assure they will be the best WAP candidate. Also, this will exclude those who sacrifice to make payments.	NY
AE	Forget high users as priority.	Utility collections problems clients may not be related to max energy savings.	MA, NY, ME, PA
AE	Promise too many completions.	Utilities fuel the need to serve the max. numbers of customers even if that limits savings per home. Could be it uses many contractors and gets low return.	CA, KY
AE	Restrict to DOE eligibility or to individual units only. Allow whole building or block.	Big efficiencies in administrative overhead, etc. covers the near-poor better, just assure ROI of whole project.	NY
Management			

³¹ Power, Meg. “Introduction to: Best Practices in WAP/ Utility Energy Efficiency Programs or: Lessons Learned the Long Way” Economic Opportunity Studies. December 2002.

Do Not's	What?	Why?	Where?
	Start a new state governing entity to new programs.	Big delays, long-lead times can mean failure.	CA, WA
AE	Sunset the program.	There's no incentive for utility to get it right.	MA
Information			
	Allow limits on shared utility data regarding all program costs (marketing, collections, purchases, etc.) and all benefits (customer service, etc.)	The expectation is that many more will be served; high users, LIHEAP participants, not only payment troubled should be provided by utility to agency for outreach along with stepped-up utility communications to these customers.	WA, MA
	Allow limits on shared utility data regarding participants.	The more restrictions on utility money, the more they should help outreach. Info-sharing/privacy policies should be in the Act, Order and/or rules, this avoids excuses.	MA
	Do not provide all other agency leveraging & other federal reports to utility.	They may not understand your program constraints and rules and/or decide how to run your job better.	WA, KY
	Do not take all the responsibility for getting info & doing outreach to find homes; utility info & communications work must be built in and paid for.		KY, WV, CO, WI

Table 5-3: Recommendations Based on Best Practice Reviews

Category	Details	GDS Recommendation	Source
Measures	<p>The following measures are installed in WAP Programs:</p> <ul style="list-style-type: none"> • Arlington: caulking; weather-stripping; insulation & repairs – ceiling, wall, floor; duct work; HVAC tune-up or repair • Dallas: caulking, weather-stripping, insulation, repair/new doors & windows, solar screens, duct repair, HVAC tune-up or retrofit • Oncor/Cooler House: insulation, duct sealing, caulking & weather-stripping, CFLs, water-saving devices, HVAC upgrades, solar screens, ENERGY STAR® appliances, window replacement • Princeton Study: Programmable Thermostats 	AE currently installs most, if not all, of these recommend measures. GDS recommends that AE continue to offer this wide variety of weatherization measures to ensure that the needs of their customers are met.	Arlington, Dallas, Oncor, Cooler House, Princeton
Eligibility Preferences	<p>The following households are given priority for participation:</p> <ul style="list-style-type: none"> • With children under 6 • With elderly residents • With disabled residents • With highest energy cost & lowest income • With highest residential energy use 	AE currently has a similar framework in place for targeting WAP participants. GDS recommends that AE continue to service these low-income households with the greatest need first.	Arlington, AACOG
Program Processes	The typical program follows the following procedures: home audit, installation of measures, final inspection.	GDS recommends AE continue to follow these three simple steps of program implementation.	AACOG
Program Goals	Project goal for participants to realize savings of 25-30% on their energy bills (gas & electric) during peak months.	GDS recommends that AE adopt this type of program goal that focuses on achieving a set level of energy savings per home weatherized. This will help to leverage the fixed costs of weatherizing each home by maximizing the savings for each project.	El Paso
Partnerships	Partner with local and/or national business (e.g., Home Depot) to help facilitate home repairs and weatherization services to WAP participants.	GDS recommends that AE look to leverage this type of support going forward as a way to help subsidize the costs of the WAP Program in the absence of DOE ARRA funds.	Florida
Training	Training is essential to a successful weatherization program as it ensures that quality work is conducted as part of the program and promotes better building practices outside of the program as well. It is recommended that to achieve high quality in work a program must (a) create solid work expectations, (2) define worker tasks, and (3) train and certify workers.	GDS recommends that AE work with their contractors to establish clear program guidelines and expectations – especially if program goals shift in the next iteration of AE's WAP Program. GDS also recommends that AE conduct regular training sessions to ensure that their partnering contractors are up to date on the latest in weatherization best practices.	National Plan

6 FINDINGS AND RECOMMENDATIONS

Based on the best practices review and specifically other measures that are installed by other weatherization programs, GDS commends AE on running an exemplary program. The following were identified as best practices in the research review of other regional and statewide WAP Program. It is recommended that AE consider each of the practices for possible inclusion in future WAP Program design efforts.

Expand on the current home sealing practices

Perform an air leakage test before and after performing the air sealing measures. Air leaks are capable of costing 10-25% more on home energy heating and cooling bills.

- 1) Caulking all building envelop penetrations – plumbing lines, fans & vents, cooling lines, electrical, fireplaces & chimneys, duct work, recessed lighting fixtures
- 2) Caulking around doors and windows
- 3) Electrical receptacle gaskets to decrease infiltration

Develop process controls and procedures around the DOE QWP Framework

- 1) The QWP defines how home energy upgrade work should be done
- 2) It also provides a prescription for communication, training, and the inspection of work throughout the WAP network
- 3) Helps establish more consistent quality installation procedures among many installation partners

Identify Possible Community/Regional/State Levering Partners to Stretch WAP funding

- 1) More homes weatherized
- 2) Less organization vulnerability to reductions in any single Weatherization funding source
- 3) Getting new partners increases the number of stakeholders with a vested interest in the Program who can advocate for the Program

APPENDIX A: PROGRAM MANAGER SURVEY INSTRUMENT AND SURVEY RESPONSES

Austin Energy Low-Income Weatherization Survey

Name of Electric Utility: _____

Date: _____

Interviewers: _____

Name: _____

Program: _____

Title: _____

Phone: _____

Email: _____

Hello, my name is Jeff Davis and I am working on a survey of residential low-income energy efficiency programs for Austin Energy in Austin Texas. My firm, GDS Associates, has been retained by Austin Energy to conduct this survey. Austin Energy is primarily interested in the program design and funding sources for Low-Income Energy Efficiency (Weatherization / Insulation) Programs conducted by other utilities. Austin Energy is interested in the program you are running currently. Let me start by asking about your program scope.

I. Program Scope and Goals

1. What is the program's scope (e.g., eligible measures, eligible participants)?
2. What are the program incentives?
3. Does your utility pay all costs for program participants? Please explain.
4. What is the program's annual budget for 2015 or the current fiscal period?
5. What is the utility investment in dollars for the latest completed fiscal year?
6. What is the program cost per participant for the latest historical year?
7. How would you describe the major goals of the program? (Short, Intermediate, and Long Term)
8. Is the program mandated by a regulatory authority or is it voluntary?
9. What are the funding sources for your program?
10. Do you leverage funds for your program with any national, state, or local agencies?
11. Does your program piggy-back in any way on any other program?
12. What percent of the program budget for the latest fiscal year was spent? (need to collect budget as well as actual spending for latest completed fiscal year)
13. What ties does your program have to other energy efficiency programs offered by federal, state or local government agencies (US EPA Energy Star Programs, Federal WAP, local CAPs, etc.)

II. Program Implementation

14. Describe the program delivery approach (outsourced vs. internal staffing) and the number of staff?
15. What is the average cycle time from start to finish for a project?
16. Does the program use a direct install or a rebate approach?
17. Describe any partnerships that each program has established.
18. Can you identify any specific program barriers and bottlenecks?
19. What have been the most successful aspects of the program to date?

III. Data Tracking & Reporting

20. What data is currently collected?
21. Pre-/Post-installation billing history
22. Baseline – blower door test results, etc.
23. Measures installed
24. Home characteristics (building envelope, appliance saturations, heating and cooling fuels, etc.)
25. Number of people in home?
26. Where is the data stored?
27. Do you use software from a vendor for data storage? If so, who?
28. How is the data used?
29. Are there any current QA/QC procedures in place? If so, please describe.

IV. Program Progress

30. Describe the oversight and governance for each program (committees, etc.).
31. What are your metrics of success for this program?
32. What is the energy saved per participant average you are seeing in the program?
33. Have the total dollars saving for the utility and participants been determined? If so, what are the total dollar savings to the utility and the participant?
34. How is the program performing given these metrics?

V. Program Marketing and Resource

35. Please describe the marketing efforts.
36. How many touch-points/interactions with customers does your program have?
37. Please describe the education and outreach efforts of this program.
38. Are these efforts productive (please site examples)?

VI. Conclusions

39. What do you think are the greatest strengths of the program Initiative?
40. What are the major weaknesses?
41. What improvements can be made to address these weaknesses?

Program Delivery Survey Questions: Numbers 1 – 12

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
UTILITY	What is the program's scope (e.g., eligible measures, eligible participants)?	What are the program incentives?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	How would you describe the major goals of the program? (Short, Intermediate and Long Term)	Is the program mandated by a regulatory authority or is it voluntary?	What are the funding sources for your program?	Do you leverage funds for your program with any national, state or local agencies?	Does your program piggy-back in anyway on any other program.	What percent of the program budget for the latest fiscal year was spent? Need to collect budget as well as actual spending for latest completed fiscal year.	What ties does your program have to other energy efficiency programs offered by federal, state or local government agencies (US EPA Energy Star Programs, Federal WAP, local CAPs, etc.)
Austin Energy	Must be at or below 200% of poverty guidelines Cannot exceed 2000 sq. ft., less than \$250k value of home Not doing Multi-family and mobile homes at this time, but have done in the past	100% free program to the customer – LI, Non LI goes through Home Performance	Yes	Budget of \$3.7M, 1200 homes, \$3000 per home	Budget of \$3.7M, 1200 homes, \$3000 per home	Intermediate – Budget of \$3.7M, 1200 homes, \$3000 per home Removal of ARRA – no refrigerator, no HVAC, limited minor repairs (infiltration related) Health and Safety – Texas Gas Service for Gas issues to repair AE will do minor work with resemble cost				Texas Gas Services – Partner on Gas issues Cooperative agreement with Austin Water Utility - faucet replacement issues, showerheads, aerators, commode repair and replacement, minor plumbing 6 member collation – All non-profit, Austin Urban League, Meals on Wheels, Habitat for Humanity – HRC Austin Based – Housing Repair Coalition, recipients of Rehab funds, refer homes beyond scope to HRC.		Texas Gas Services – Partner on Gas issues Cooperative agreement with Austin Water Utility - faucet replacement issues, showerheads, aerators, commode repair and replacement, minor plumbing 6 member collation – All non-profit, Austin Urban League, Meals on Wheels, Habitat for Humanity – HRC Austin Based – Housing Repair Coalition, recipients of Rehab funds, refer homes beyond scope to HRC.

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
UTILITY	What is the program's scope (e.g., eligible measures, eligible participants)?	What are the program incentives?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	How would you describe the major goals of the program? (Short, Intermediate and Long Term)	Is the program mandated by a regulatory authority or is it voluntary?	What are the funding sources for your program?	Do you leverage funds for your program with any national, state or local agencies?	Does your program piggy-back in anyway on any other program.	What percent of the program budget for the latest fiscal year was spent? Need to collect budget as well as actual spending for latest completed fiscal year.	What ties does your program have to other energy efficiency programs offered by federal, state or local government agencies (US EPA Energy Star Programs, Federal WAP, local CAPs, etc.)
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	<p>Membership made up of Community Service Block grant awardees. DOE Weatherization fund recipient. Work with approximately 38 out of 42 agencies who receive block grants. In the past 30 weatherization agencies, see TCHCA website. They work with 14 out of the 30. Run Oncor's Low-Income Weatherization Program and Texas AEP. Worked in past with Entergy. Serve as Program Administrator for WAP in Texas.</p> <p>Standards are set by PUC energy efficiency guidelines. Eligibility 200% of federal poverty guide, as specified by DOE. Piggy Back with LIEEP (125%).</p> <p>Measures - must save electricity, air duct infiltration, insulation, water savings measures, Heat Pump, Central A/C, Window Units, Refrigerator. Do dishwasher, clothes dryer.</p>	Customers do not pay for any measures	All cost paid by TACAA	\$6,000,000 across all different agencies. Homes to weatherize - 1000	\$6500 for AEP and Oncor, PEC \$4000 limits (less appliances), \$344 Savings per Power Point	Short Term - Bring down utility spending, intermediate - energy saving habits, long - community service block goal self sufficiency	For IOUs - Mandated, 10% of EE budget on Low-Income Program; voluntary for other utilities	Utility Companies, Designated Federal Funds in State	Federal DOE, Advocacy wise - i.e. - Texas Rate Payer Organization, Texas Legal Services, Nationally - National Community Action Foundation (Energy Spin-off)	None	97-99% spent on IOU programs, 100% expected for PEC	

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
UTILITY	What is the program's scope (e.g., eligible measures, eligible participants)?	What are the program incentives?	Does your utility pay all costs for program participants?	What is the program's annual budget for 2015 or the current fiscal period?	What is the program cost per participant for the latest historical year?	How would you describe the major goals of the program? (Short, Intermediate and Long Term)	Is the program mandated by a regulatory authority or is it voluntary?	What are the funding sources for your program?	Do you leverage funds for your program with any national, state or local agencies?	Does your program piggy-back in anyway on any other program.	What percent of the program budget for the latest fiscal year was spent? Need to collect budget as well as actual spending for latest completed fiscal year.	What ties does your program have to other energy efficiency programs offered by federal, state or local government agencies (US EPA Energy Star Programs, Federal WAP, local CAPs, etc.)
Bluebonnet Electric Cooperative	Support Action Committee Boards, Commit money to them. Measures decided by Action Boards	\$35,000 per year Energy Audit (90% commercial) Residential use less now because of online billing consumption data available, Mobile Apps, Online Tools, audits done by designated auditor for 3rd Party verification, meets USDA Funding requirements	Depends upon Action Board.	\$35,000 per year for Energy Auditors, \$30,000 for Community Boards	??	Community Boards - One stop shop, they are known in the community, Council of Governments - Burleson, County	Volunteer	Received funding from SHEAT Funds, unpaid capital credit, unpaid collections, refunds- Econ Development , Energy Efficiency. \$10,000	CAB take funds from Bluebonnet and leverage federal funds also.	See above. Texas Weatherization Program - referrals	Require reports from CABs that include number of members	
Pedernales Electric Cooperative	Low-Income – 200% below federal poverty level Measures – Air Infiltration, Central A/C 14 SEER or greater, HP 14 SEER or greater, Window Unit EER 10% greater than standard, Duct Improvement, Ceiling Insulation, Wall Insulation, Floor Insulation, ES Windows, Solar Screens, Water Heater Replacement, Water Heater Pipe Insulation, Water Heater Jacket, Faucet Aerators, Low-Flow Showerheads, CFL, ES Refrigerators	Aggregate money coming in through agencies In contract with TCHDA to provide funds 2014 – Max \$4,991 Min \$1590	Participant does not pay anything	\$100,000 – 2014, \$203,980 – 2013, remaining \$180,049 \$100,000 – Admin 33%, material and labor, program support cost	13 – 2014 average - \$3500 per participant	EE Program Goal – 20% of growth off-set by EE and DSM	Voluntary	Funded by unclaimed funds	No	TACAA – Texas Associate Community Action Agency	100% in 2014	State - TACAA

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
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Gainesville Regional Utilities	LEEP - Low-Income Energy Efficiency Program Making improvement to LI homes - lower energy consumption, not only electric Eligibility- Res Electric Customer, own and live in home, single family dwelling 1997 or newer or mobile home, originally 1993 because those home were saturated and when energy code was created. Receive assistance one time. HUD Low Income, 80% of median income - established by HUD (family income, average income) - family of 4 - 49,450 verified by 3rd party assistance authority Measures - HVAC Improvement, replace, repair or service, install insulation - ceiling attic, floor, not walls; water heaters gas or electric, weatherstripping or caulking, duct system repair, thermostats, 10 CFLs	Free to participant, estimates from various contractors - know guidelines, submit estimates to GRU, voucher authorized for each voucher, voucher is given to vendor is complete and then sent to GRU for payment. Contractors know average and bid accordingly. Contractors bid against each other.		2015 - \$469,050, 123.5 homes, \$3800 average, 2014 \$456,000 133 homes, \$3600	\$3800 on average	See Above - providing safe reliable homes with energy reduction, rehab low-income homes	Voluntary	General Budget, No surcharge	No. 2009 EWC ECB Budget	No. Last year offered incentive rebates through other EE programs. Borrowed money from other programs to stretch budget.	Spent more than budgeted, \$486k vs \$456	

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
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Orlando Utilities Commission	Edibility - \$40,000 or less, 85% of total not to exceed \$2000. Mid-Term 40k-60 - 50%, Higher > 60K - Rebate applicable to each measure, access to utility contractor. Measures - Ceiling insulation, window foam, duct sealing repair, toilet, plumbing, irrigation repair, H & S, Electric and Water Utility, Showerhead, Aerators, caulking, weather-stripping, air filters, minor plumbing, fix toilets - minor repair, pipe insulation	See	See	500 Homes, \$750,000	2014 - \$705 per participant, 1/2 of 2015 budget, 209 participants, 90 lower income	Make available to any customer a turn-key retro-fit program for weatherization to lower utility cost	Volunteer	Ratepayer - come through general funds	Grant projects year, i.e. - ARRA, Right now - City Energy Project www.cityenergyproject.org	None	Last years - 24% lower than budget, spent 76%	
City of Tallahassee Utilities	Neighborhood Reach program - Small team imbedded in neighborhood, 3 installers - contractors, 3 utility employees (2 auditors, 1 Coordinator), set very specific arrival appointments. First energy auditor does audit. Doing this for 4 years. 6-7 house per day. 1 hour per home. Measures - weather-stripping - Doors, Windows, caulking gaps infiltration areas; Health and Safety as needed, change air filter, water efficiency measures - aerators, Low-Flow Showerheads, water heater temperature, water heater insulation, CFL, REACH Customers - Direct Install. Refrigerator Thermometer	All cost covered by utility		\$400,000 for installation service +	Participants - 6/7 homes per day, 5 days a week. 5700 homes since 2011, 1425 per year; \$500 per home all-in cost, don't manage towards cost per home	6300 MWh Savings per year, Customer Satisfaction, Networking with other department services	Voluntary	General Revenue from Utility	When opportunity arises, past Fire Prevention Grant	Works with other City Services groups to help revitalize neighborhoods, i.e. street lights, road repair	100%	See above

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
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Sacramento Municipal Utility District (SMUD)	Eligibility - SMUD, 200% of Federal Poverty Guides, EAPR - Energy Assist Program Rate, Measures - insulation, attic sealing, infiltration, weather-strip sealing, pipe wrap, minor home repair, lighting - fan, CFL, ceiling fans, refrigerators, water measures - water heater wrap, low flow shower , faucets, HVAC repair and replacement as needed	No cost to customers		\$1,800,000 - Weatherization, Total Customers - 550,000 residential	1000 per year, Average Cost - \$1400 per customers	Reduce energy burden on LI customers, Measures with Energy Savings, Bills more affordable, reduce energy, house more comfortable	Voluntary	Built into rates, general funds	Yes, Local Agencies - Community Based Organization - add Federal dollars - they pay for additional measures + other measures not covered (dishwasher, LI Solar)	CAP, Other District Budget - mainly outreach / marketing	105%	See above
Los Angeles Department of Water and Power (LADWP)	Home Energy Improvement Program - Most of outreach to low-income customers Eligibility requirements - targeting marketing Measures - weather-stripping, Insulation, Window A/C, CFL, Low-Faucet, Water Heater Blanket, WH Pipe Wrap, attic insulation, Pre-blower door test, smoke and carbon monoxide alarms, toilet replacement, door and window repair and caulking	No Cost to customers		2013/2014 - \$12,000,000	Participant - 200 per month average; \$1000 on average, No Max, Insulation jobs \$2500	To serve residential customer - education to be more efficient, lower bills	Voluntary	Part of Energy Efficiency Budget, Surcharge on Customer Bills	Not currently	None	Can't answer	

Question #	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11	#12
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JEA	Door to Door Direct install, education: measures - 6 CFLs, LED Night, HVAC Filter, Low-Flow SH, Toilet Flapper, Aerator, Health and Safety Thermometer, RF Coil Brass, 5 feet of pipe insulation, up to 2 tube of caulk for weather-stripping, two exterior door weather-stripping. Separate component for insulation - Choose neighborhood by consumption high winter peak consumption, must be consumption eligible, if no insulation or less than 4 inches - if meet both criteria they are legible for free attic insulation, budget for 125 homes; Eligibility - program since 2008 - partner with City Neighborhood and Housing to determine which neighborhoods would, income criteria 150% of poverty guidelines in ARRA era, 21 census tracks with 50% of population below poverty. Focus in on these communities. Do everyone in neighborhood if they are in census range. Door to door everyone eligible. 7th year - 16 of 21 census tracks complete. Need new way to identify customers. - Possible Census Block information from US Census.	All free to customer. Also have other programs with Rebate, which are open to Low-Income programs.	Conservation Fee on rates - all fee goes back to community for energy efficiency programs	\$540,000, \$125,000 for insulation included	1007 participants per year, \$450 per home, labor and material \$125,000 for insulation	Help customer to become more aware of how to manage utility bills. Really an educational program.	Voluntary	Conservation Fund	Not now, before with ARRA (900 Insulation jobs with ARRA)	Partner with Local CAP, Past partner with DuPont Foundation	100%	

Program Implementation Survey Questions: Numbers 13 - 18

Question #	#13	#14	#15	#16	#17	#18
UTILITY	Describe the program delivery approach (outsourced vs internal staffing) and the number of staff?	What is the average cycle time from start to finish for a project?	Does the program use a direct install or a rebate approach?	Describe any other partnerships that each program has established.	Can you identify any specific program barriers and bottlenecks?	What have been the most successful aspects of the program to date?
Austin Energy	<p>Austin Energy manages the program, 3 FT and 2 temps</p> <p>Contract out weatherization work and final inspection</p> <p>Process to get service</p> <p>a. Submit application – mailed to customer</p> <p>b. Referral from HRC partner</p> <p>c. Utility Assistant Program – AE CAP – 43,000 eligible customers</p> <p>Next Steps</p> <p>Verify Income, Assign to a contractor, Joint Assessment between AE and Contractor to determine SOW, Contractor perform work, 3rd party contractor to validate work done properly, if done properly contractor paid and marked as complete</p>		Direct Install	See Above	<p>Number of contractors are HVAC companies, during peak HVAC time they push jobs to back of heap, as they are not as profitable. This causes delays in completion of work. Contractual requirement – complete work in 10 working days. Unrealized in 2014. Contract now changes to 20 working days.</p> <p>Refining process to transferring clients from CAP database to the AE Waiting list, new process</p>	<p>Ability to install attic insulation that previously had little or no insulation. Good customer feedback on this measure.</p> <p>3-4 – Transition from previous program an effort \$1.5M collected from Customer Benefit Fund – Surcharge on bills Other money from AE operating budget</p>
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	<p>1 Program Manager (75%), 1 additional staff (75%), sometimes assistant (50%), most agencies hire subcontractors - agency staff does audit and works with sub-contractors to install measures</p>	<p>Application to Complete - many are complete within a month. up to 1 year, lengthily waiting list, agencies have significant service territory, ARRA cycle time much faster</p>	Direct Install		<p>Rural areas have trouble getting ES equipment, windows transported, equipment delays; changing rules on program</p>	
Bluebonnet Electric Cooperative	<p>Wesley - Program Manager Energy Programs, Alternative Energy; Action Grants - Econ Development Department, work shared</p>		Direct Install - Most		<p>Started this process with CAB two years ago, as efforts were being duplicated between Bluebonnet and CAB, seems to be working well thus far</p>	
Pedernales Electric Cooperative	<p>Outsources to TACAA, receive invoice form TACAA</p> <p>1 employee at Coop only</p>	No Idea	Direct Install	TACAA	<p>TACAA – Can't proceed in 2015, not enough participation</p> <p>Reach out to another consultant to implement program in 2015</p>	<p>Weak performance, not much participation, not good link from TACCA back to Weatherization Member System Program</p>

Question #	#13	#14	#15	#16	#17	#18
UTILITY	Describe the program delivery approach (outsourced vs internal staffing) and the number of staff?	What is the average cycle time from start to finish for a project?	Does the program use a direct install or a rebate approach?	Describe any other partnerships that each program has established.	Can you identify any specific program barriers and bottlenecks?	What have been the most successful aspects of the program to date?
Gainesville Regional Utilities	All internal except for installing measurement. 3 on staff, 4 during ARRA, now 3 FT. Pre and Post inspection. Schedule pre-inspection - document all equipment, age, size, provide list of recommendation, post inspection - go back out do a customer walk-through with education about all new equipment. They do a post blower door test as a requirement for all home. Require duct system 25cfm airtightness test, 15 Pascal.	3-4 months, once pre-inspection is complete, it takes 30 days to get estimates, 30 days to complete work, 30 days for post inspection.	Direct Install	Licenses HVAC contractors, Contractors, Handy man, Insulators, Assistance Agencies, Duct Testers	Ensuring applicants meet income requirements, provide all documentation needed, home ownership, applicants don't produce estimates in timely manner. Reaching applicants with disconnected phone numbers. Trying to schedule post-inspection. Leave customer with dignity, they are making most of decision.	Helping customer that really need services. Send cards and food. Helps renovate community
Orlando Utilities Commission	Internally Management, work done by contractor (5 auditors (internal) 2 staff (internal), 1 contractor (external))	2-3 weeks	Direct Install	No	Income documentation difficult and time consuming, auditors have mobile office for copies	Good customer feedback
City of Tallahassee Utilities	See above - 3 contractors, 3 staff, 1 office support - management	45 - 60 minutes	Direct Install	See above	Would be great to get more homes per day, but there are tradeoffs, i.e. - can't do as much in home, 6 homes per day vs 8 homes per day, guarantee appointment, operational inefficiencies	High Customer Satisfaction, less by material, more by professionalism of field staff
Sacramento Municipal Utility District (SMUD)	All internal except for installation of measure, Staff - 3 FT auditors, 1 Office Support, 1 PM, Contractors - Minimum of 3	6-8 weeks - Customer first contact - invoices	Direct Install	No	Demand far outweighs what is able to supply, always run out of funds by end of the year	Achieving energy savings and making difference in people's life
Los Angeles Department of Water and Power (LADWP)	Submit application that was targeted to low-income customers in mail, enter info into LADPW database, contacted by schedulers, energy audit complete focusing on offering, auditors work for DWP, Staff - 4 office staff, 40 people, everything done by DWP staff.	4 months	Direct Install		Language barriers, trust issues, don't remember they replied	Good response from mailings, high customer satisfaction and response from customers, training for union members
JEA	Door to Door, Out Sourced - Implementation Contractor - 1 internal , 3.5 outsourced	2 hours visit in home	Direct Install		Trust in low-income areas because of past bill delinquencies in the beginning. Doing better now. Now partnering with Community Development Block programs.	

Data Tracking Survey Questions: Numbers 19 – 28

Question #	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28
UTILITY	What data is currently collected?	Pre-/post installation billing history	Baseline – Blower Door test results , etc.	Measures installed	Home characteristics (building envelope, appliance saturations, heating and cooling fuels, etc.)	Number of people in home	Where is this data stored?	Do you use software from a vendor for data storage? If so, who?	How is this data used?	Are there any current QA/QC procedures in place? If so, please describe.
Austin Energy	Joint-assessment Attic insulation, orientation of home for solar screen, carbon-monoxide and gas leak testing, No longer do pre blower door or duct blaster test		Post Blower Door only				Goes into the assessment form and then scanned into Salesforce.com		Determine scope and measures to be installed	3rd Party final inspector who reviews work done by contractors – inspects every home Internal QA/QC – random sample, contractors need some improvement, don't know goal of how many homes to check
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas		Agencies get pre-billing history to determine energy burden for waiting list ranking	Pre- and Post-Blower Door and Duct Blaster Test	Energy Audit for every unit, Central A/C - Run Manual J, follow ASHRE 62.2 Air-flow - sometimes have to install extra fans, Historical Commission - pre-1974 send information to Historical Society for approval	Audit - National Energy Audit Tool - NEAT, Mobile Home Energy Audit		Data Storage requirements - Report Homes weatherized to TDCHA			Yes, Federal Program, 1 person doing final expectation - Quality Control Inspection Certification (QCI) THCDA has not incorporated Quality Work Standards in Rules
Bluebonnet Electric Cooperative			Previous process included at least Pre blower door test							Texas Weatherization Program - Certified Contactor List, QC procedure from Texas WAP

Question #	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28
UTILITY	What data is currently collected?	Pre-/post installation billing history	Baseline – Blower Door test results , etc.	Measures installed	Home characteristics (building envelope, appliance saturations, heating and cooling fuels, etc.)	Number of people in home	Where is this data stored?	Do you use software from a vendor for data storage? If so, who?	How is this data used?	Are there any current QA/QC procedures in place? If so, please describe.
Pedernales Electric Cooperative	NEAT Audit, kWh and kW reduction on Invoice	pre-/post-installation billing history –	Baseline – Blower Door test results , etc.	measures installed	home characteristics (building envelope, appliance saturations, heating and cooling fuels, etc.)	number of people in home	N/A	N/A	N/A	TACAA procedure – inspect 10% of weatherized homes
Gainesville Regional Utilities	See above	Pre and post billing collected	Post duct testing, no blower door test	Measures recommend	Yes, during pre-inspection		Paper collection and then enter in spreadsheet. Using Tablets to collect data now.	Internally design	Determine if there are any barriers, future changes in needed, any value in reduction in energy, review billing history	See Above
Orlando Utilities Commission	Automated tool	Collected Toilet GPFlush, R-values, Stripping condition, aerators or not, a/c coil condition	Will be adding pre-blower door, will check 20% blower door				Oracle Database - Managed Internally, just procured automated vendor to store information on the cloud			20% random selection verification - now, sliding scale for new contractors, 100% , 50, 20%, right vendor in place is key
City of Tallahassee Utilities	Don't collect measures				Demographics in Utility Database.		IPADs and Tablets for Contractors linked back to office			Previously - 5%, now 100% because of team in home at same time, QC from Supervisor, Weather-strip creating a solid seal
Sacramento Municipal Utility District (SMUD)	Too much	Pre and post billing	Pre and post required for Attic Seal last couple of year, safely test for gas homes	Dates installed, paid, etc.	Housing ownership		Internal Database and 10 year paper trail			10% checked by internal auditors

Question #	#19	#20	#21	#22	#23	#24	#25	#26	#27	#28
UTILITY	What data is currently collected?	Pre-/post installation billing history	Baseline – Blower Door test results , etc.	Measures installed	Home characteristics (building envelope, appliance saturations, heating and cooling fuels, etc.)	Number of people in home	Where is this data stored?	Do you use software from a vendor for data storage? If so, who?	How is this data used?	Are there any current QA/QC procedures in place? If so, please describe.
Los Angeles Department of Water and Power (LADWP)	Checklist of measures offered - review list, Hazard Standards	Billing History not collected	Pre-blower door test results				Database Updated, Use IPADs to enter data	Internal, one external		Crews have a lead to ensure that things checks all measures where installed correctly. No quality guide that they know of.
JEA		Don't track savings, measures not major energy savers. Do review pre and post	Insulation - 19% savings - 20-23% Savings, no blower door testing Insulation, inoperable HVAC, not thermostat, duct sealing				Stored in an Excel spread			Crew supervisor personally goes to home after work is done to review work for 12% of homes, JEA field inspector goes to different home additional 5-10% of homes, Annual invoicing review by program manager, telephone survey to determine customer satisfaction; insulation - done by one contractor and all checked by crew supervisor

Program Progress Questions: Numbers 29 –33

Question #	#29	#30	#31	#32	#33
UTILITY	Describe the oversight and governance for each program (committees, etc.).	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Have the total dollars saving for the utility and participant been determined? If so, what are the total dollar savings to the utility and the participant?	How is the program performing given these metrics?
Austin Energy	In need of improvement. Heavy political overtones associated with program. Seven city oversight committees involved in WAP. Low-income advisory task force.	See Below	Goals of program – Full expenditure of funds.		Number of homes weatherized Full Expenditure of the Funds Cost per home, Averaging (\$4000) Maximum of \$5500 per home Initially struggles – 4Q14, but first part of 15 and last month of 14 was stronger Increase expenditures – extra repairs not expected Almost all homes get same measures- \$1500 insulation job in 2012 now \$2300
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	Governed by Board of Directors, as agencies are. Governing Entity for Muni	Funds expended corrected, meeting faculty goals - kWh saved	Utilities - Only get credit for deemed savings,	\$1.65 benefits for every \$1.00 spent	
Bluebonnet Electric Cooperative		Metrics - Members served (better now with CAB), 70,000 members	Not Tracked		
Pedernales Electric Cooperative	Staff oversight, Manager, Manager VP	Participation – number of homes weatherization	2014 – 38,042 kWh through November Deemed Energy Savings 23.96 kW reduction	Not done for 2014, every year do cost effective analysis 2013 – Participant - Utility – Levelized Cost of energy savings – \$0.17 2013	Participant Test BCR – 1.92, PACT - .54 , Rate Payer Impact - .33, TRC - .54, Societal – 0.55
Gainesville Regional Utilities	All internal, take results to city commission for budget purposes, show results to council for more funds, also executive of GRU	Energy Reduction, Customer Satisfaction, kWh reductions in past as focus	average 1,752 kWh reduction per home	No, not getting any for utility, but customer is seeing \$263 per year savings	Yes, meeting expectation of executive staff and commission
Orlando Utilities Commission	Board of Commissioner to improve program and budget. Regular Annual update. Now in year 3. Mayor oversight.	Energy Savings, In-House M&V, \$0.15 Cost per kWh Saved - Pressure pan test to replace duct blaster	115,786 kWh Saved, 209 Participants, 554 kWh saved per household		Cost per kWh Saved, trying to go lower

Question #	#29	#30	#31	#32	#33
UTILITY	Describe the oversight and governance for each program (committees, etc.).	What are your metrics of success for this program?	What is the energy saved per participant average you are seeing in the program?	Have the total dollars saving for the utility and participant been determined? If so, what are the total dollar savings to the utility and the participant?	How is the program performing given these metrics?
City of Tallahassee Utilities	Internal Director, City Manager, Commissioner - Now less governance from City	Number of homes served, number of homes taking advantage of all each programs, weatherization is foot in the door, enrollment and participation		Not completed	
Sacramento Municipal Utility District (SMUD)	Approved by management, independent of city, state review	number of customers served, MW and GWh, # refrigerator installed	1000 per year homes, Refrigerator - 600, Overall Goal GWh - 1 MW - 0.5, 1000 kWh per home	No, doing impact and evaluation study this year	Always succeed
Los Angeles Department of Water and Power (LADWP)	Overall - Hipe Team to oversee process, issues, clarifications; Board of Water and Power Commissioners for funding and program management	Number of homes served - 250 per month, portfolio business plan - efficiency solution group for metrics	not readily available		Would like to ramp up more.
JEA	Steering committee over Customer Solutions	Do we spent 100% and 1007 jobs, 125 insulation jobs, customer satisfaction goals	Insulation - 19% for insulation only programs		100% for 6 years

Program Marketing Questions: Numbers 34 – 37

Question #	#34	#35	#36	#37
UTILITY	Please describe the marketing efforts.	How many touch-points / interactions with customer does your program have?	Please describe the education and outreach efforts of this program?	Are these efforts productive (please site examples)?
Austin Energy	ARRA – No marketing Going Forward - Focus and targeted to high-poverty density areas		Being developed	With exception of staffing levels. Most likely need to add temp staffing to meet PY15 goals. Meeting more to clarify own position. Documentation of work flows shared with internal and external stakeholders. Being received well.
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	Marketing done by local agencies, most are working with waiting list, 80-90% get recommendation from Utility bill assistance program		None	
Bluebonnet Electric Cooperative	Website, Education online, bill stuffers, use own energy data for review purposes - 1/2 of members using web presence	Monthly Energy Magazine, Texas Co-op Power , Social Media		Mobile Apps in low-income communities, only access mobile and not internet in some low-income communities
Pedernales Electric Cooperative	Website	Only Website, MAP agency	No education, some counties make person require energy audit classes to receive funds from county	Nope
Gainesville Regional Utilities	Direct mail, radio, community events, signage, news story Targeted mail - marketing company to identify low-income		Required to participate in walk-through of home during pre-inspection, educational material including Q&A, refrigerator tips, filter whistle	Yes. Program does not slow-down.
Orlando Utilities Commission	Evolving process - Marketing group reviews tracking reports and identifies measures behind target and markets to underperforming measures. Working on Segmentation scheme.	Multi-Channel, News Letter, Web-Site, Customer choose how they want to be communicated with online, bill insert, text messaging coming notification coming. Alerts and analytic test - Data Rapper.		Yes, they have been successful. Have piloted targeting marketing efforts. Will use targeting marketing in future.
City of Tallahassee Utilities	Truck wrapped in Neighborhood Reach program. Targeting Marketing to a specific neighborhood, not mass marketing. Kick-off event in community. Stay in community for 1 month. Preps the Buzz. Trying to get Buzz going.			

Question #	#34	#35	#36	#37
UTILITY	Please describe the marketing efforts.	How many touch-points / interactions with customer does your program have?	Please describe the education and outreach efforts of this program?	Are these efforts productive (please site examples)?
Sacramento Municipal Utility District (SMUD)	Don't do marketing because demand is too great, before - direct mail, outreach in community, community based organizations market program for SMUD			Yes
Los Angeles Department of Water and Power (LADWP)	Customer targeting - Low-Income Rate (household income) , Lifeline Senior Citizen Rate (age, disabled) Direct Mail Targeting marketing , 10,000 at a time, Website, Public Group Education, Word of Mouth, Bill Inserts		Bill Inserts, Bulk of outreach in mailers	Yes, good response to mailer, 10,000 3 or 4 per year
JEA	Not marketed because of Census Target neighborhoods.	Post Card and 2 door hangers	Schools, Community Groups Education, 2 hours in home for installation	3 -6 months in one neighborhood, 48-50% participation, 50% not covered

Conclusion Questions: Numbers 38 – 40

Question #	#38	#39	#40
UTILITY	What do you think are the greatest strengths of the program Initiative?	What are the major weaknesses?	What improvements can be made to address these weaknesses?
Austin Energy	Ability to provide EE measures to LI households that otherwise could not afford it.	Lack of functioning database to track progress, cost factors, communication between all parties, reminders, integration of forms into each step.	Full Implementation of Salesforce.com. Ability to track projects and measures installed.
Texas Association of Community Action Agencies, Program Administrator for Oncor and AEP Texas	Really helps save energy for those that need it the most. Touching stories - buy prescriptions because of lower bill		
Bluebonnet Electric Cooperative	Using Existing Avenues, Not recreating the wheel		
Pedernales Electric Cooperative	People reached benefit greatly, but not many reached	Not enough participation, agency bottlenecks	Reduced red tape associated with program
Gainesville Regional Utilities	Able to help LI customers, reduce in number of disconnects, less collectables, home up to safety	LI Renters - How to capture	
Orlando Utilities Commission			
City of Tallahassee Utilities			
Sacramento Municipal Utility District (SMUD)			
Los Angeles Department of Water and Power (LADWP)	Offer at no-cost to customers, provide service to all level of Residential Customers		
JEA		Lack of funds, How to expand program to cover all of service program	

APPENDIX B: WEATHERIZATION MEASURES USED BY DIFFERENT UTILITIES

WEATHERIZATION MEASURES INSTALLED - DECEMBER 2014

					Dallas County													
	Austin Energy		CPS Energy	City of Arlington	Alamor Area Council of Governments	Dallas County Health & Human Services	City of El Paso	City of Garland	Bryan Texas Utilities	Oncor- Texas	A Cooler House Houston	Pedernales Electric Cooperative	Oklahoma Weatherizatio n Program	Sacramento Municipal Utility District	Jacksonville Electric Authority	City of Tallahasee, Florida	Gainesville Regional Utilities Commission	Orlando Utilities Commission
Measure	Austin Energy	CPS Energy	City of Arlington	Alamor Area Council of Governments	Dallas County Health & Human Services	City of El Paso	City of Garland	Bryan Texas Utilities	Oncor- Texas	A Cooler House Houston	Pedernales Electric Cooperative	Oklahoma Weatherizatio n Program	Sacramento Municipal Utility District	Jacksonville Electric Authority	City of Tallahasee, Florida	Gainesville Regional Utilities Commission	Orlando Utilities Commission	W
Attic Insulation	X	X		X	X	X		X	X	X		X	X	X	X	X	X	
Wall Insulation		X	X	X	X	X		X	X	X	X				X			
Ceiling Insulation			X		X	X	X		X	X	X				X			
Floor Insulation			X		X	X			X	X	X				X	X		
Solar Screens	X				X		X	X	X	X								
CFL Replacements	X	X							X	X							X	
LED Replacements	X																X	
Faucet Aerators	X								X	X								
Showerhead Replacement Faucets	X								X	X								
Commode Conservation	X																X	
CO/Smoke Detectors/Alarms	X																	
Air Infiltration	X																	
Duct Sealing Repair/Replacement	X	X	X		X		X		X	X	X	X		X	X			
Window A/C	X																	
Weather-Stripping		X	X		X	X	X		X	X	X	X	X		X	X	X	
Caulking		X	X		X		X		X	X	X	X				X	X	
Patching Holes in Building Envelope			X								X					X		
Tune-up/Repair/Replacement of Inefficient Heating/Cooling Systems			X	X	X	X			X	X	X	X	X		X	X	X	
Repair/Replace Windows					X		X	X	X	X						X	X	
Repair/Replace Doors					X		X									X	X	
Sealing Plumbing Penetrations							X											
Energy Star Appliances									X	X								
Water Heater Wraps															X			
Repair/Replace Water Heater																X	X	
Roof Replacement																	X	
Plumbing Repairs																	X	
Pipe Insulation																		