STATE OF ARKANSAS
ARKANSAS PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION FOR APPROVAL OF THE ARKANSAS WEATHERIZATION PROGRAM SUBMITTED BY ENTERGY ARKANSAS, INC., SOUTHWESTERN ELECTRIC POWER COMPANY, OKLAHOMA GAS AND ELECTRIC COMPANY, THE EMPIRE DISTRICT ELECTRIC COMPANY, CENTERPOINT ENERGY ARKANSAS GAS, SOURCE GAS COMPANY AND ARKANSAS OKLAHOMA GAS CORPORATION	)	DOCKET NO. 07-079-TF
IN THE MATTER OF THE ARKANSAS WEATHERIZATION PROGRAM	)	DOCKET NO. 08-065-RP

ARKANSAS WEATHERIZATION PROGRAM

Annual Report – 2015
filed by

Central Arkansas Development Council, Inc.
May 1, 2016

ARKANSAS WEATHERIZATION PROGRAM
Annual Report - 2015

PART 1. NARRATIVE REPORT

1.0 EXECUTIVE SUMMARY

Historical Background

To bring sustainable energy practices to the state and reduce electricity, natural gas, and/or other fuel consumption, the Commission opened Docket 06-004-R, directing the utilities to propose "Quick-Start" energy efficiency programs to begin saving energy in the state as quickly as possible, with a further mandate to file a slate of more comprehensive energy efficiency programs later. Through a productive collaborative process, the electric and gas utilities, along with the Arkansas Community Action Agencies Association, Inc. (ACAAA), proposed the Arkansas Weatherization Program (AWP). The AWP targets severely energy-inefficient homes in Arkansas, is open to all residential customers of participating utilities, and is "piggy-backed" onto the federally-funded U.S. Department of Energy's Weatherization Assistance Program ("DOE WAP") for low-income Americans.

On September 19, 2007, the PSC approved the AWP in Order No. 4, at 11, in Docket No. 07-079-TF, as a Quick Start program which began on October 1, 2007. On July 1, 2009, pursuant to the Rules for Conservation and Energy Efficiency Programs ("CEE Rules") and as required by the Commission, the utilities filed a set of Comprehensive Energy Efficiency programs to be implemented in 2010. In its "roadmap order" of February 3, 2010, the Commission approved the AWP, along with several other programs, "for continued and expanded program implementation for 18 months beginning on January 1, 2010, and continuing through June 2011." In a subsequent order on June 30, 2011 (Order No. 20 in 07-079-TF), the Commission approved the AWP for the remainder of 2011 through 2013.

In Docket No. 13-002-U, Order No. 7, at 80-82, the Commission approved an extension of the AWP through 2014, while directing the utilities and program administrators to participate in a "weatherization collaborative" that would develop "uniform whole house program offerings for all residential customers, including those in severely energy inefficient homes, for implementation by January, 2015." Such a program design was to be submitted to the Commission by April 1, 2014, for implementation beginning January 1, 2015. Upon the request of the Parties Working Collaboratively ("PWC"), the Commission in Order No. 15 at 5-6, approved extension of the filing date for the uniform weatherization program until October 1, 2014 and the utilities' three-year program portfolio filing date until June 1, 2015. The uniform weatherization program was approved in PSC Docket 13-002-U, Order No. 22 at page 11, on December 9, 2014[1]. This weatherization program became part of the utilities three-year plan

[1] On December 10, 2014, the PSC issued Order No. 23 in Docket No. 13-002-U, clarifying Order No. 22 and stating that the AWP should continue implementation through program year 2015. Order No. 23 also stated: "Order No. 15 [in the same Docket] extended the time for the filing of the utilities' three-year plans and portfolios from June 1,

which was filed June 1, 2015. The weatherization program was implemented beginning January 2016.

There were no significant changes to implementation of the AWP in 2015.

The participating "AWP Utilities" are Arkansas Oklahoma Gas Corporation ("AOG"), SourceGas Arkansas, CenterPoint Energy Arkansas Gas, Empire Electric District Company, Entergy Arkansas, Inc., Oklahoma Gas & Electric Company ("OG&E"),[2] and Southwestern Electric Power Company. Through a Weatherization Services Agreement with the AWP Utilities, the AWP administrator and coordinator for 2015 was Central Arkansas Development Council, Inc. ("CADC"), of Benton, Arkansas. Together with the implementing agencies, this group is known as the "Weatherization Network."

AWP assistance is available to customers of AWP Utilities whose homes are severely energy inefficient. To qualify for the AWP, the customer's home must meet certain specified criteria related to age of the home and energy inefficiency. Through a computerized energy audit of the home and advanced diagnostic technology, appropriate energy-efficiency measures are determined that can provide cost-effective energy savings. The Weatherization Network provider installs the approved measures in the home. Part of the cost of the audit and installation is covered by the customer's AWP Utility, and the balance is the responsibility (co-payment) of the customer. Customers eligible for the DOE WAP have their co-payment covered by that federal program.

Major Accomplishments

From January 1, 2015, through December 31, 2015, the Weatherization Network conducted AWP home energy audits and installed energy efficiency measures in 93 homes, representing 12% of production targets. AWP customers largely continued to be low-income ratepayers, primarily due to the required co-pays.

According to the utilities' independent evaluator ADM & Associates ("ADM"), who calculated savings estimates from utility contractor Frontier Associates, annual energy savings from homes treated in this period are 223,564 kilowatt-hours (kWh) (including savings from electric co-ops and municipals) and 23,068 gas therms (including savings of propane). Lifetime equivalent savings are 3,178,465 kWh and 307,482 therms. These savings represent electric peak demand savings of 111 kilowatts (KW) and peak gas demand savings of 594 therms.

In 2015, AWP Utilities expended $187,857 on AWP weatherization and energy efficiency projects through CADC.[3] All but 11 customers had co-payments made on customers' behalf by

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2014, to June 1, 2015. Order No. 15 also approved extension of existing EE program portfolios through Program Year 2015."

[2] OG&E and AOG operate a complementary joint weatherization program for their residential customers who are not eligible for the DOE WAP co-pay.

[3] In addition, utilities had internal administration, marketing, EM&V and other costs. Differences between utility payments to CADC and CADC actual expenses for the AWP are primarily due to timing issues and balances, either

the federally-funded DOE WAP. Total non-utility payments, including WAP and private customer payments, equaled $824,558. The AWP Utilities paid a percentage of total costs, with the share depending on whether the customer had only one participating utility (gas or electric), two participating utilities (both gas and electric), or lived in an all-electric house.

There were no company co-payments from propane dealers, electric co-ops, or municipals, which do not participate in the AWP. However, using data from Frontier Associates, ADM calculated lifetime savings of 23,579 gas therms (propane) in homes with an AWP electric utility but no AWP natural gas utility and 338,720 lifetime kWh from electric co-ops and municipals.

Progress Achieved vs. Goals and Objectives

The unduplicated number of houses is an important metric in measuring success of the AWP. As noted above, in 2015, 93 AWP homes had energy audits and 87 homes had energy efficiency measures installed.

In 2015, a program goal was to complete a total of 1,920 "projects" (i.e., audits and installation of measures in a "whole-house" approach). In a house with service from two AWP utilities, or with electric heat ("all-electric"), the work at one house is counted as two "projects." In 2015, the actual number of AWP projects completed was 157, or 8% of the target.

Summary of 2015 AWP Utility savings goals:

- 291,045annual therms (normal weather conditions)
- 6.6 therms per day per home (peak gas demand conditions)
- 2,239,030 annual kWh (normal weather conditions)
- 0.6 average kW per home (peak electric demand conditions)

Summary of 2015 AWP Utility savings results:

- 22,349 annual therms (normal weather conditions)
- 586 therms per home (peak gas demand conditions)
- 216,529 annual kWh (normal weather conditions)
- 94 kW per home (peak electric demand conditions)

Savings, Participation Levels, Prior Year Comparisons, and Trends

For 2015, since the goal for the number of homes to be served was the same as that for 2014, savings estimates were kept the same as for 2014. Savings estimates for 2014 were based on results from 2013 which had been evaluated and verified by ADM through an impact evaluation.

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positive or negative, both at the start of 2015 and at the end of the year. These differences are noted in the Reconciliation Table in the Workbook.

Highlights

See "Major Accomplishments" above.

What's Working and What's Not

A true strength of the AWP has been the collaborative effort and coordination among the seven AWP Utilities, the Weatherization Network providers, CADC as the network administrator, ACAAA, (originally) the Department of Human Services Office of Community Services ("DHS/OCS") as an external monitor, and AWP Utilities' contractor Frontier Associates. While coordination among all of these parties has been a challenge, planning, assessing progress, and responding to and overcoming identified obstacles in a collaborative fashion has set the foundation for achievement of substantial energy savings. This year saw the continuation of AEO overseeing all external monitoring. As mentioned in 2014, the AWP Collaborative process developed into the Parties Working Collaboratively ("PWC"), which in turn developed the Uniform Weatherization Program approved by the Commission in Docket 13-002-U, Order No. 22, at 11.

Communications and collaboration by the AWP Utilities and the Weatherization Network continued to improve throughout 2015. As noted above, the AWP has been replaced with a statewide uniform weatherization program which began in 2016. The uniform weatherization program serves all residential customers, with the utilities paying up to an average of $3000 per home, which has reduced the amount of co-pay needed and could result in potentially higher participation rates.

Planned Changes to Program or Budget

There are no anticipated changes as the current program ended on December 31, 2015.

Training Achievements

During 2015, external training sessions for the Weatherization Network were held in various locations around the state. A total of 67 trainees attended 14 training sessions.[4] Certificates were awarded in almost all of the courses, with 49 certificates awarded to trainees. Training sessions averaged over 15 hours in length, resulting in 81 person-hours in training.

Some of the classes covered skills and applications specific to weatherization (*e.g.*, auditing, insulation, air infiltration) or installation of equipment (*e.g.*, HVAC), while other classes dealt with related topics of health and safety issues (*e.g.*, lead, mold).

In addition to these sessions, internal training sessions covered the departure of ACAAA from the program; 2015 goals; coordination of the AWP and WAP; software; the TRM; EM&V

[4] The total number of attendees is a duplicated count. In other words, some of the same people may have attended more than one of these sessions.

issues; Commission Orders; and a unified statewide weatherization program, among other topics. See the workbook for a detailed listing of sessions and participation levels.

Summary of EM&V Activities Completed

- The Weatherization Network maintains financial and operational data for each AWP home. Relevant data were provided to the AWP Utilities' contractor Frontier Associates for calculating deemed savings and tracking. Utility-specific data were provided to each AWP Utility.

- The utilities contracted with ADM to conduct an evaluation of AWP activities in 2015. See attached Evaluation Report.

- Commission-approved deemed savings included in the Arkansas TRM were used by ADM to estimate energy savings and demand savings for both natural gas and electricity for each AWP utility. Where data were not included in the TRM for some specific measures delivered through the AWP, the DOE WAP National Energy Audit Tool (NEAT) or Mobile Home Energy Audit (MHEA) software were used to estimate savings.

- CADC is reporting AWP EM&V data consistent with rules and procedures established by the Commission.

- In addition to providing data on energy and demand savings, productivity, program costs, and other quantitative data, as part of the annual reporting process, to assess customer satisfaction with the AWP, the Weatherization Network providers surveyed each household that received AWP services during 2015. (See Appendices C and D.) Results were overwhelmingly positive.

- CADC staff were interviewed by ADM personnel for their evaluation report of the AWP.

Planning and Goal-Setting Process

The AWP is a collaborative effort among the seven AWP Utilities, the six Weatherization Network providers, CADC as the network administrator, the Arkansas Energy Office (AEO) as an external monitor, and the AWP Utilities' contractor Frontier Associates. The AWP Collaborative has remained intact since the inception of the AWP as a "quick-start" program. The work group met periodically to assess progress and address barriers with conference calls, e-mail exchanges, and other contact added, as needed.

Process for Estimating Long-Term, Cost-Effective EE Savings

Estimated energy savings and estimated demand savings for AWP-installed measures resulted from use of Commission-approved deemed savings estimates developed by Frontier Associates. These estimates were developed on a measure basis and were aggregated by Frontier for each home weatherized by the Network, based on a determination of their cost-effectiveness during a whole-house audit, and taking into account interactivity of measures. Once energy and demand savings estimates were determined for each utility for program year 2014, an average of these estimates was applied to each home projected to be treated in 2015. For 2015, given the same budgets and projected participation levels as in 2014, projected energy and demand savings projections were held constant. Measure lifetimes for each measure installed were based on measure lifetimes included in the Arkansas TRM as determined by ADM.

Table 1 Net Verified Savings by Electric Utility

Electric Utility	*# of Homes*	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*
AEP-SWEPCO	13	23.12	43,922.09	693,639.06
EAI	68	69.30	155,489.33	2,146,105.97
OG&E	0	-	-	-
Non-IOU	13	18.37	24,152.96	338,719.81
Total	94	110.78	223,564.39	3,178,464.84

Table 2 Net Verified Savings by Gas Utility

Gas Utility	*# of Homes*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*
AOG	0	-	-	-
CenterPoint	76	554.85	21,461.16	283,903.33
Black Hills	0	-	-	-
Non-IOU	18	38.82	1,606.89	23,579.04
Total	94	593.67	23,068.05	307,482.37

2.0 PROGRAM IMPACTS

The AWP is designed to have a high probability of providing aggregate ratepayer benefits to the majority of utility customers. The AWP:

- Encourages and enables utility customers to make the most efficient use of utility capacity and energy and discourage inefficient and wasteful use of energy;

- Achieves energy efficiency improvements to severely energy-inefficient homes;
- Achieves meaningful energy and demand savings of both electricity and natural gas that potentially contribute to:
    - Reduced energy costs for owners of severely energy-inefficient homes;
    - Improved affordability of energy for all ratepayers through:
        1. Downward pressure on energy prices
        2. Avoided system capacity costs
        3. Reduced collections costs and bad debt write-offs
        4. Improved customer retention
    - Energy security benefits;
    - Environmental benefits;
    - Economic development/competitiveness benefits;
    - Permanent peak electric and gas demand reductions; and
    - Long-term changes in customer behavior, attitudes, awareness, and knowledge of energy efficiency and energy efficiency technology.
- Enables the AWP Utilities to implement a weatherization program in an efficient manner; and
- Provides a comprehensive, consistent, quality-controlled, weatherization program serving severely energy-inefficient homes in utility service territories.

Further:

- The AWP Utilities individually conduct benefit/cost analyses of the AWP based on deemed savings estimates provided by Frontier Associates and evaluated by ADM Associates, compared to each utility's avoided energy and demand costs. The Utilities' analyses, and ADM's evaluation report, show that the AWP provides aggregate ratepayer benefits to utility customers.
- National and international research studies show that weatherizing severely energy inefficient homes provides considerable benefits to society in addition to energy and demand savings.

2.1.1 Program Budget, Savings & Participants

Table 3 – Program Budget, Savings, & Participants – 2015 Electric Utilities

	Cost			Savings (kWh)			Participants		
Electric Utility Name	**Budget**	**Actual**	**%**	**Plan**	**Evaluated**	**%**	**Plan**	**Actual**	**%**
Entergy	$ 1,051,392	$ 210,243	20%	1,693,982	444,779	26%	768	177	23%
SWEPCO	$ 417,000	$ 36,324	9%	433,780	47,714	11%	300	29	10%
OG&E	$ 80,771	$ 32,999	41%	100,822	54,516	54%	59	35	59%
Empire	$ 6,047	$ 2,116	35%	10,446	3,240	31%	5	1	20%
			-			-			-
Regulatory	$ -	$ -							
	$ 1,555,210	**$ 281,682**	18%	**2,239,030**	**550,249**	25%	**1,132**	**242**	21%

Table 4 – Program Budget, Savings, & Participants – 2015 Natural Gas Utilities

	Cost			Savings (Therms)			Participants		
Natural Gas Utility Name	**Budget**	**Actual**	**%**	**Plan**	**Evaluated**	**%**	**Plan**	**Actual**	**%**
CenterPoint	$ 655,960	$ 174,394	27%	245,595	49,858	20%	620	177	29%
SourceGas	$ 120,000	$ 24,068	20%	35,161	7,829	22%	113	23	20%
AOG	$ 58,190	$ 23,068	40%	10,289	6,100	59%	55	36	65%
			-			-			-
Regulatory	$ -	$ -							
	$ 834,150	**$ 221,530**	27%	**291,045**	**63,787**	22%	**788**	**236**	30%

2.2 PROGRAM INFORMATION

2.2.1 Program Description

See the program description in Appendix B.

2.2.2 Program Highlights

- For program year 2015, 93 homes were weatherized, which was 5% of the overall production goal for the year.
- Annual evaluated savings from homes treated in this period were 223,564 kilowatt-hours (kWh) and 23,068 natural gas therms for AWP utilities.
- These savings represent electric peak KWs of 111per home and peak gas demand of 594x.xx therms per home, on average.
- In 2015, payments by AWP Utilities for audits and weatherization through the AWP totaled $167,857**.**
- All but 11 of the co-payments were made on customers' behalf by the federally-funded DOE WAP. Non-utility co-payments for 2015 totaled $24,377.
- There were no co-payments from propane dealers or electric co-ops and municipals, which do not participate in the AWP. However, ADM calculated additional annual savings of 1649 gas therms (propane) in

homes with an AWP electric utility but no AWP natural gas utility and 23,344 kWh from electric co-ops and municipals.

2.2.3 Description of Participants

Participants in the AWP are residential customers of AWP Utilities living in severely energy-inefficient homes built before 1997 that meet three of seven efficiency criteria. There are no income eligibility criteria to participate. However, those participants eligible for the DOE WAP will have their required co-payments made by the WAP.

2.2.4 Program Events & Training

In 2015, a total of 41 members of the Weatherization Network and AWP Collaborative participated in program events and training. In addition, the Weatherization Network and AWP Collaborative held several meetings to coordinate reporting and filing efforts regarding the AWP; and to assess AWP progress.

- Weatherization Network personnel and contractors participated in 20 training sessions encompassing over 1165 person-hours.
- Training included topics such as duct sealing, grant guidance, ECOS, HVAC, advanced CAZ and mobile home weatherization tactics.
- Network Agencies and CADC participated in PWC meetings throughout the year.

2.2.5 Savings

According to ADM, evaluating data from Frontier Associates, annual savings to AWP utilities from homes treated in 2015 were 223,564 kilowatt-hours (kWh) and 23,068 natural gas therms. These savings represent electric peak KWs of 111 per home and peak natural gas demand of 594 per home.

2.2.6 Challenges & Opportunities

The AWP ceased to operate December 31, 2015. There are no opportunities for improvement to report.[5]

[5] The Core weatherization program filed on October 1, 2014 was approved in PSC docket 13-002-U, Order No. 22, at page 11, on December 9, 2014. The Commission issued Order No. 23 in Docket 13-002-U, clarifying Order No. 22 and stating that the AWP should continue implementation through program year 2015. Order No. 23 also stated: "Order No. 15 [in the same Docket] extended the time for the filing of the utilities' three-year plans and portfolios from June 1, 2014, to June 1, 2015. Order No. 15 also approved extension of existing EE program portfolios through Program Year 2015."

2.2.7 Planned or Proposed Changes to Program and/or Budget

The AWP design has morphed into a statewide core weatherization program offered by all seven Investor Owned Utilities. 2015 was the last year for the AWP in its current incarnation.

3.0 SUPPLEMENTAL REQUIREMENTS

3.1 Staffing

CADC employs two staff assigned to the AWP. Jointly, these staff spend less than 10% of their time monthly on the AWP.

3.2 Stakeholder Activities

Since the design of the AWP is a coordinated, statewide program, input from many stakeholders is an integral component of the program. Regular meetings are held to present and resolve problems, share information, and train implementers. See the detailed report on training activities in the Workbook.

3.3 Information Provided to Consumers to Promote EE

During the auditor's initial visit to the AWP customer household, the network provides information on ways to save energy beyond the weatherization measures to be installed. Depending on the agency, this can be done verbally during the walk-through or through written materials that the auditor provides to the client. An example of the type of material provided is included as Attachment E.

4.0 APPENDICES

A ADM Independent Evaluator Report
B. AWP Program Description
C. Results of Customer Satisfaction Survey
D. Customer service response form
E Information provided to AWP customers

Appendix A

ADM Independent Evaluation Report

Evaluation of 2015 Arkansas Weatherization Program

Submitted to:

Central Arkansas Development Council
Arkansas Oklahoma Gas Corporation
CenterPoint Energy Arkansas
Oklahoma Gas and Electric
Southwestern Electric Power Company
Empire District Electric Company
Entergy Arkansas, Inc.
Black Hills Energy

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Additionally, we would like to thank participating customers of the aforementioned utilities, the Central Arkansas Development Council (CADC) and participating community action agencies, and Frontier Associates staff for their cooperation and assistance throughout the evaluation.

We would also like to thank Independent Evaluation Monitor staff for their active involvement in providing thorough answers and clarification to the evaluation team when higher-level questions arose during the EM&V effort.

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1. Executive Summary

The purpose of this report is to provide a summary of the methodology and results for the evaluation of the 2015 Arkansas Weatherization Program (AWP). This evaluation was conducted by ADM Associates (referred to in this report as "the Evaluators"). This report provides the results of both the impact evaluation and limited process evaluation activities for 2015, the final year of program operation.

As there have been few significant modifications to overall program structure and delivery since the prior program year, and this is the final year of operation for the AWP, the process findings are mainly focused on assessing program performance characteristics, any changes in program delivery, and the program's responsiveness to prior evaluation recommendations. A comprehensive process evaluation can be found in the 2012 Arkansas Weatherization Program Evaluation Report.

1.1 Summary of Arkansas Weatherization Program

Program design and structure in 2015 remained fairly consistent with the 2014 program year. The following provides a review of program design characteristics and operational procedures, noting any specific updates for 2015.

The primary change for the 2015 program year was that administration of the program, including coordination of implementation activity and allocation of funding to participating agencies, transitioned to the Central Arkansas Development Council (CADC) from the Arkansas Community Action Agencies Association (ACAAA). As CADC had already been closely involved in program implementation and coordination of agencies in prior years, the effects of this transition were fairly minimal.

In 2015, the Arkansas Weatherization Program (AWP) provided residential energy audits and energy efficiency measure installations to homes whose residents are customers of one or more of the following investor owned utilities (IOUs):

- American Electric Power – Southwestern Electric Power Company (AEP-SWEPCO);
- Entergy Arkansas, Inc. (EAI); and
- CenterPoint Energy (CenterPoint).

The following IOUs are sponsoring utilities for the AWP and have achieved savings through the program in past years but did not have any customers participate in the program during 2015:

- Empire District Electric Company (EDEC).
- Oklahoma Gas and Electric (OG&E);

- Black Hills Energy;[6] and
- Arkansas Oklahoma Gas Corporation (AOG).

The program is offered in conjunction with the Department of Energy (DOE) Weatherization Assistance Program (WAP), which provides federal assistance to fund the customer co-payment in the AWP for income-qualified households. In Arkansas, the WAP is administered by the Arkansas Energy Office (AEO). If the customer meets the eligibility requirements of the WAP, the weatherization project can be funded by both the WAP and the AWP in order to fully cover the project cost and eliminate the cost to the customer.[7] Customers who are not eligible for the WAP are required to provide their own co-pay in order to participate in the AWP and receive the audit and associated measures.

Rather than an income requirement, eligibility for the AWP is based on a set of criteria regarding customer residence energy efficiency. In order to qualify, customer homes must meet specific criteria indicating that the residence is severely energy-inefficient. There were no modifications to these criteria for the 2015 program year.

Local community action agencies work with customers to enroll in the program and determine AWP and WAP eligibility. In 2015, qualifying AWP projects were completed by the following agencies:

- Central Arkansas Development Council (CADC);
- Crowley's Ridge Development Council (CRDC); and
- Pine Bluff Jefferson County Economic Opportunities Commission, Inc. (PBJCEOC).

After the customer is approved and the in-home audit is performed, optimal energy efficiency measures for AWP (and WAP, for eligible customers) are identified through the use of National Energy Audit Tool (NEAT) or Mobile Home Energy Audit (MHEA) software. The measures implemented in participating homes during 2015 include:

- Ceiling, floor and wall insulation;
- Air infiltration reduction;
- Window replacement and storm window installation;
- Heating and air conditioning replacement;

6 Formerly Source Gas Arkansas (SGA).
7 Eligibility for the Weatherization Assistance Program (WAP) is based on income thresholds, which increase with the number of residents in the home. A description of the WAP, along with the associated income requirements, can be found here: http://www.benefits.gov/benefits/benefit-details/1843.

- Water heater insulation jackets and pipe wrap;
- Refrigerator replacement;
- CFL retrofits; and
- Smart thermostats.[8]

The local agencies conduct onsite audits and install the necessary measures using their internal crews or subcontractors. Audit and installation crews record all relevant measure input data and report it to the Central Arkansas Development Council (CADC), who aggregates the information from each agency. Batches of data are then sent to Frontier Associates, the program database provider that manages the EnerTrek software tool. EnerTrek incorporates the onsite data into TRM savings formulas (and NEAT/MHEA values for measures not included in the TRM) to calculate *ex ante* savings for each measure. The resulting savings are made accessible to program utilities and EM&V contractors, who use EnerTrek database exports to conduct measure implementation and savings verification activities.

identifies core program stages and includes key activities performed throughout the program process. The activities and stages shown for 2015 are fairly consistent with those of 2014 and prior years, with modifications to include additional details and clarifications regarding program procedures, and to reflect CADC's role as the program administrator.

Table 1-1 Key Activities and Program Stages, 2015 Program Year

Program Stage	*Key Activities*
Program Design Planning	• Utilities set budgets and savings goals for the program year. • Frontier Associates and the participating agencies make any necessary modifications to data collection procedures or program delivery based on TRM changes or other program design changes. • Agencies plan their program activity based on expected WAP funding levels and planned AWP funding.
Training and Implementation Planning	• Community action agencies, contractors, and other program operations staff attend program-relevant training sessions (primarily for new contractor staff) • CADC and local agencies discuss implementation and program updates (primarily to comply with TRM changes).
Program Promotion	• Agencies market the program to local customers who may provide a private co-pay. • Agencies enroll customers from the WAP wait list. • Utilities answer customer inquiries about the AWP or refer customers to their respective agencies.
Program Participation	• Customers apply for the AWP and home eligibility is determined. • WAP eligibility is determined. • Participants receive in-home audits and measures are identified.

[8] A complete list of all eligible program measures can be found in ACAAA Docket no. 07-079-TF, Attachment A (AWP Modified Program Design and Description).

Program Stage	*Key Activities*
	• Contractors install measures that are either stipulated based on NEAT or MHEA software or are agreed upon with the customer (depending on whether or not WAP funds are used for the co-pay).
Data Processing and Monitoring	• Measure costs and participant tracking data are collected by each agency and reported to CADC. • CADC provides periodic cost and participation updates to the utilities. • Frontier Associates receives implementation data from CADC and calculates *ex ante* savings • Frontier Associates sends savings data in batches to the utilities. • Utilities, CADC, and Frontier Associates have periodic discussions regarding program participation levels and other topics.

Starting in 2016, the Arkansas IOUs will be implementing individual and joint weatherization programs that comply with the Consistent Weatherization Approach developed by the Arkansas Parties Working Collaboratively (PWC). The Consistent Weatherization Approach will replace the AWP as the statewide weatherization offering implemented by the Arkansas IOUs, and thus the 2015 program year marks the final year of operation for the AWP.

1.2 Evaluation Objectives

The evaluation of the 2015 Arkansas Weatherization Program (AWP) consisted of a program savings impact analysis and a limited process evaluation. These evaluation objectives were primarily focused on savings analysis and verification, as well as program updates and tracking of prior evaluation findings. Specifically, the evaluation activities conducted for the 2015 program year include:

- Review of deemed savings calculations: The Evaluators used the Arkansas Technical Reference Manual, Version 5.0 (TRM) to verify savings calculations for each implemented measure type in order to ensure that *ex ante* measure savings were properly calculated according to TRM protocols.[9]

- Tracking database and documentation review: The Evaluators conducted a comparative assessment of the AWP tracking database in order to evaluate tracking data modifications and improvements since the 2014 program year.

- On-site field verification: The Evaluators scheduled and conducted site visits to participant homes in order to verify complete and proper measure installation, to conduct post-implementation measurements, and to verify home characteristics such as heating and water heating fuel type.

[9] Although EnerTrek calculated savings for the AWP in 2015 using protocols in TRM 4.0, the Evaluators referenced TRM 5.0 for verification purposes as it was the most current version of the TRM at the time of evaluation.

- Program staff interviews: Interviews were conducted with program staff. These interviews provided insight into any recent program changes for 2015, updates in specific program processes, and perspectives on closing out the AWP and moving forward with the Consistent Weatherization Approach.

- Participant surveys: Telephone surveys were conducted with a sample of program participants in order to collect data regarding customer satisfaction, participant characteristics, and to identify any issues with program operation or delivery from the customer perspective.

1.3 Summary of Findings

1.3.1 Field Verification Results

The Evaluators conducted onsite verification visits to 13 participant homes. These site visits were conducted in order to verify complete and proper measure installation, to conduct post-implementation measurements, and to verify home characteristics such as heating and water heating fuel type.

Specific notes regarding the onsite and telephone verification findings include:

- **Contact Information:** All residences were located at the addresses provided within the tracking data. Additionally, a high percentage of telephone numbers were found to be accurate, which is an improvement over the 2014 program year. In total, only 4 out of the 54 telephone numbers (7%) dialed by the Evaluators were found to be disconnected or incorrect during the site visit scheduling process.

- **Air Infiltration:** The Evaluators conducted blower door testing in nine participant homes for the 2015 program year. Of these homes, the CFM_{50} value measured during the verification visit was within 10% of the reported value for four homes. The Evaluated CFM_{50} value was more than 10% greater than the Reported CFM50 value for four homes. Overall, the Evaluated CFM_{50} value was greater than the Reported CFM_{50} value for six of the nine homes.
- **Attic Insulation:** All reported instances of attic insulation were verified. There were no significant differences between reported pre-installation R values and evaluated pre-installation R values. There were no significant differences between reported square footage and evaluated square footage.
- **Water Heater Jacket and Pipe Wrap:** The Evaluators were able to verify all but one instance of water heater jackets. In this case, the Evaluators found that silver bubble wrap had been used to wrap the water heater, rather than standard insulation jackets. The agency responsible for this work reported that the silver bubble wrap is no longer being used. All reported instances of water heater pipe

wrap were verified, but in at least two cases the pipe wrap was installed on the pressure release valve line. The agency responsible for this work reported that the water heater pipe wrap had been installed on the proper lines during the initial inspection of the home.

- **Central Air Conditioner Replacement:** All but one reported instance of central air conditioning replacement were verified. One customer did not appear to have had a new unit installed, and their existing unit was not functioning at the time of the site visit.
- **CFLs:** All reported instances of CFL installation were verified, in quantities that matched or closely matched program tracking data. All verified CFLs matched the wattage and lumen range reported in the EnerTrek tracking data.
- **Gas Heat Replacement:** All reported instances of gas heat replacement were verified.
- **Window Replacement:** All reported instances of window replacement were verified.
- **Smart Thermostat:** All reported instances of smart thermostat installation were verified.
- **Refrigerator Replacement:** All reported instances of refrigerator replacement were verified.
- **Window Air Conditioner:** All reported instances of window air conditioners were verified.
- **Wall Insulation:** All reported instances of wall insulation were verified.
- **Direct Vent Heater:** All reported instances of direct vent heater installation were verified.

The results of the verification activity suggest that measures are for the most part installed in the quantities reported in program tracking data. However, the Evaluators found that the quality of work conducted in the two sampled homes serviced by PBJCEOC was fairly poor. This includes the instances of silver bubble wrap and pipe insulation on pressure relief valves mentioned above. Overall, issues identified within these homes include:

- It appeared that silver bubble wrap was used as water heater insulation, rather than standard insulation jackets;
- Plenum sealing was done with tape that did not effectively stick to surfaces;
- Caulk was used in gaps that were too large, where foam sealing should have been used;
- Water heater pipe insulation was added to the pressure release line; and

- One customer indicated that the contractor had damaged paint/trim in the home.

These findings were submitted to CADC and PBJCEOC staff responded, indicating that the silver water heater wrap is no longer being used and that the water heater pipe insulation had been added to the proper lines when the home was inspected. However it may be beneficial to conduct further training with PBJCEOC staff in order to ensure that they are complying with industry quality standards, and that they are providing adequate customer service to participants.

1.3.2 Summary of Ex Post Net Savings

For measures implemented through the 2015 program, savings verification was performed according to methodologies described in TRM V5.0. The following table identifies the sections in the TRM that were used for verification of measure-level savings under the AWP:[10]

Table 1-2 TRM Sections by Measure Type

Measure	*TRM Version*	*Section in TRM*
Air Infiltration	5.0	2.2.9
Ceiling Insulation	5.0	2.2.2
Central AC Replacement	5.0	2.1.6
ENERGY STAR® Windows	5.0	2.2.7
Floor Insulation	5.0	2.2.4
Gas Furnace Replacement	5.0	2.1.3
Heat Pump Replacement	5.0	2.1.8
Lighting Efficiency	5.0	2.5.1
ENERGY STAR® Refrigerator	5.0	2.4.3
Smart Thermostat	5.0	2.1.12
Storm Windows	5.0	Appendix H
Direct Vent Heaters	5.0	2.1.1
Wall Insulation	5.0	2.2.3
Water Heater Jackets	5.0	2.3.2
Water Heater Pipe Insulation	5.0	2.3.3
Window AC	5.0	2.1.10

and Table 1-4 present *ex post* net savings for electric utilities and gas utilities, respectively. presents the *ex post* net savings by measure, including measure-level realization rates (RR). The net-to-gross ratio for the AWP is 1, meaning that net savings are equal to gross savings.

[10] The savings for storm windows were calculated through NEAT/MHEA, and these measures do not have an associated savings algorithm section in the TRM. However, Appendix H in TRM V5.0 specifies that NEAT/MHEA peak savings for storm windows should be multiplied by a deemed demand factor. This approach was used for the 2015 evaluation.

Table 1-3 Ex Post Net Savings by Electric Utility

Electric Utility	*# of Homes*	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*
AEP-SWEPCO	13	23.12	43,922.09	693,639.06
EAI	68	69.30	155,489.33	2,146,105.97
OG&E	0	-	-	-
Non-IOU	13	18.37	24,152.96	338,719.81
Total	94	110.78	223,564.39	3,178,464.84

Table 1-4 Ex Post Net Savings by Gas Utility

Gas Utility	*# of Homes*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*
AOG	0	-	-	-
CenterPoint	76	554.85	21,461.16	283,903.33
Black Hills	0	-	-	-
Non-IOU	18	38.82	1,606.89	23,579.04
Total	94	593.67	23,068.05	307,482.37

Table 1-5 Ex Post Net Savings by Measure Type – Overall

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*
Air Infiltration	42.63	93,953.88	1,033,492.63	470.42	15,608.29	171,691.19
Ceiling Insulation	44.86	66,225.09	1,324,501.86	78.29	4,548.53	90,970.65
Central AC Replacement	4.19	4,351.15	82,671.92	-	-	-
Direct Vent Heater	-	-	-	17.73	1,161.06	14,678.90
Duct Sealing Installation	-	-	-	-	-	-
Floor Insulation	0.04	676.16	13,523.24	(0.09)	8.73	174.56
Gas Central Replacement	-	-	-	9.36	603.44	11,321.70
Heat Pump Replacement	0.55	2,875.80	46,012.78	-	-	-
Refrigerator Replacement	0.64	4,368.84	56,566.98	-	-	-
Residential Lighting	3.97	27,054.29	213,511.46	-	(0.31)	(2.35)
Smart Thermostat	-	7,043.15	77,474.61	-	397.11	4,368.21
Storm Windows	0.01	28.30	566.00	0.90	29.20	584.00
Wall Insulation	0.54	521.73	10,434.56	-	194.52	3,890.50
Water Heater Insulation	-	-	-	0.03	18.64	242.32
Water Heater Pipe Insulation	0.02	394.75	4,342.25	0.12	59.12	768.58
Window AC	0.77	637.73	6,696.16	-	-	-
Window Replacement	12.55	15,433.52	308,670.38	16.92	439.71	8,794.12
Total	110.78	223,564.39	3,178,464.84	593.67	23,068.05	307,482.37

Table 1-6 presents annual therms and kWh realization rates by measure category. These realization rates are presented at the program level, and individual utility realization rates may vary from those presented in this table.

Table 1-6 Gas and Electric Realization Rates by Measure Type

Measure	*kWh Realization Rate*	*kW Realization Rate*	*Therms Realization Rate*	*Peak Therms Realization Rate*
Air Infiltration	100%	100%	100%	100%
Ceiling Insulation	101%	149%	102%	101%
Central AC Replacement	71%	161%	-	-
Direct Vent Heater	-	-	162%	162%
Duct Sealing Installation	-	-	-	-
Floor Insulation	75%	68%	100%	-
Gas Central Replacement	-	-	107%	108%
Heat Pump Replacement	49%	52%	-	-
Refrigerator Replacement	178%	178%	-	-
Residential Lighting	110%	118%	230%	-
Smart Thermostat	1909%	-	129%	-
Storm Windows	100%	125%	100%	146%
Wall Insulation	104%	131%	107%	0%
Water Heater Insulation	0%	0%	100%	100%
Water Heater Pipe Insulation	96%	98%	100%	102%
Window AC	148%	100%	-	-
Window Replacement	100%	100%	100%	100%
Overall	103%	118%	103%	101%

1.3.3 Summary of Savings Verification Findings

Ex post savings were calculated through TRM verification of EnerTrek inputs and *ex ante* savings values. Any instances of discrepancies between *ex ante* and *ex post* savings were due to one of three issues:

- Difference in TRM: EnerTrek calculated measure savings in 2015 using TRM 4.0, and the Evaluators conducted savings verification using TRM 5.0. There were differences in input assumptions, measure parameters, and savings equations between the two TRM versions for some measures.
- Calculation Error: Any difference in interpretation of TRM protocols, mathematical errors, or data entry errors may cause *ex ante* savings to be higher or lower than *ex post* (verified) savings.
- On-site Verification Issues: Measures that were unable to be verified during verification visits at participant's homes received zero savings.

The realization rate for most measures was close to 100%, and the Evaluators found that the majority of discrepancies between *ex ante* and *ex post* savings were due to differences between TRM V4.0 and TRM V5.0 rather than due to calculation errors.

The following list identifies measure categories where there were significant differences between *ex ante* and *ex post* savings, and specifies whether this was due to differences in TRM versions or due to calculation errors:

- Ceiling Insulation
    - Difference in TRM: High overall electric and gas realization rates were due to differences in TRM versions. TRM V5.0 provides deemed saving tables for both R-38 and R-49 and allows for linear interpolation for insulation that is between the two R-values. TRM V4.0 only provides a deemed savings table for R-38 insulation.
- Floor Insulation
    - Calculation Error: Low overall electric realization rates are due to differences in TRM versions. Deemed savings in TRM V5.0 included negative energy savings values depending on weather zone and HVAC equipment configuration. The simulation procedures used for this measure in TRM V5.0 identified negative electric savings, likely caused by the floor insulation acting as a barrier to ground cooling effects. This would cause the home temperature to be higher during cooling months, likely resulting in increased air conditioner usage. The *ex ante* savings calculation did not allow for homes to receive negative energy savings for floor insulation while realized savings incorporated this increased energy usage.
- Wall Insulation
    - Difference in TRM: High overall electric and gas realization rates were due to differences in TRM versions. TRM V5.0 provides deemed saving tables for both R-13 and R-23 and allows for linear interpolation for insulation that is between the two R-values. TRM V4.0 only provides a deemed savings table for R-13 insulation.
- Residential Lighting
    - Difference in TRM/Calculation Error: High overall electric and gas realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. CFL annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. Additionally, the interactive effects factor to account for gas heating penalties was updated in TRM V5.0.
- Refrigerator Replacement

  - Difference in TRM/Calculation Error: High overall electric realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. Refrigerator annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. ADM also assigned TRM V5.0 refrigerator types based on the model number of the efficient refrigerator provided in the tracking data.

- Central AC Replacement
  - Difference in TRM: The low kWh realization rate and high kW realization rate is due to differences in TRM versions. TRM V4.0 provides a deemed savings table while TRM V5.0 provides a savings algorithm requiring additional measure specific inputs.
- Direct Vent Heater
  - Calculation Error: High overall electric realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. Direct vent heater annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. In addition, in cases where existing unit exceeded the age of eligibility that can be claimed as early retirement according to Section 1.8 of TRM V5.0, replacement on burnout methodology was used.
- Gas Central Replacement
  - Difference in TRM/Calculation Error: High overall gas realization rates were due to differences in TRM versions and possible EnerTrek calculation issues. Gas Central Replacement annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. In addition, in cases where existing unit exceeded the age of eligibility that can be claimed as early retirement according to section 1.8 of TRM V5.0, replacement on burnout methodology was used. Finally, heating load value and equivalent full hours were updated in TRM V5.0.
- Heat Pump Replacement
  - Difference in TRM/Calculation Error: The low electric realization rates are due to differences in TRM versions. TRM V4.0 provides a deemed savings table while TRM V5.0 provides a savings algorithm requiring additional measure specific inputs.
- Smart Thermostat

  - Difference in TRM: The high electric and gas realization rates are due to differences in TRM versions. Smart Thermostats were added for TRM V5.0. Previous evaluations relied on NEAT savings values.

- Storm Windows
  - Difference in TRM: The high peak savings realization rates are due to differences in TRM versions. TRM V5.0 provides updated multipliers used estimating peak demand reductions.
- Water Heater Pipe Insulation
  - Difference in TRM/On-site Verification Issues: The low electric realization rates are due to an adjustment made by the Evaluators based on on-site verification of this measure. This is described in more detail in Section 2.6. The high peak gas realization rates are due to updates to TRM V5.0.
- Water Heater Tank Wrap
  - On-site Verification Issues: The 0% electric realization rate is due to an adjustment made by the Evaluators based on on-site verification of this measure. This is described in more detail in Section 2.6.
- Window AC
  - Difference in TRM: The high overall electric realization rates are due to differences in TRM versions. The room adjustment factor was updated for TRM V5.0 causing an increase in savings.

Detailed savings verification findings can be found in Sections 2.8 and 2.9 of this report.

1.3.4 Responsiveness to Prior Year Recommendations

Table 1-7 summarizes the status of issues and recommendations identified in the 2014 process evaluation and impact evaluation of the Arkansas Weatherization Program. Some issues such as tracking data errors have been addressed, but several of the issues have persisted through the 2015 program year.

Table 1-7 Status of Recommendations from 2014 Program Year

Issue	***Consequences***	***Recommendation***	***Program Response***	***Status of Issue***
Many AWP operational and performance issues are related to WAP operations and WAP requirements for community action agencies.	Restricts agency participation in AWP May create inconsistencies in data collection, leading to potential errors for the AWP	CADC should continue to make efforts to work with the AEO in developing a mutually beneficial working relationship, and maintain consistency between the two programs where feasible.	There does not appear to have been an improvement in agency activity or improved cooperation between WAP and AWP mechanisms.	Persists
There were minor tracking data errors such as missing *ex ante* savings, calculation errors, and other missing fields in some cases.	Potentially lost savings Skewed measure-level realization rates	Resolve these tracking data issues for the 2015 program year.	Most tracking issues have been resolved, only minor issues remain	Resolved
Some utilities provide or link to program documents that are out-of-date. Most of the participating agencies do not discuss the AWP on their websites, and frame weatherization as an income-qualified service.	Customers may gain inaccurate information regarding service providers and other details. May reduce program interest from private co-pay customers.	The utilities should review their website materials and provide links to updated program documentation if possible. The agencies should provide information regarding the AWP on their websites, and explain that the program does not have an income level requirement.	No longer relevant for most utilities, and AWP marketing has ceased due to program ending after 2015.	Reviewed and Rejected/No Longer Applicable
Some data are not available due to being only in hardcopy form or decentralized from the CADC.	Potential lost data Potential delays in data transfer if additional data are needed	Agencies should maintain electronic records of all collected audit, implementation, and verification data.	Sufficient electronic data exist to satisfy TRM requirements, but some data remain in hard copy only	Partially Addressed

Issue	*Consequences*	*Recommendation*	*Program Response*	*Status of Issue*
Periodic program activity updates to the utilities do not include measure level cost data or measure counts.	Limits utility ability to plan for annual reporting Limits utility awareness of program performance	Include more details in the periodic reports that are sent to utilities, including measure counts/descriptions, customer names, etc.	The level of detail in monthly and quarterly reports to the utilities from CADC and other agencies has not increased. Measure counts and specific participant information have not been included.	Persists
The reported air infiltration leakage rates appear skewed downward, based on the Evaluators' site visits.	Possible issues with measure implementation or data collection Possible discrepancies between implementation and verification that will lead to skewed realization rates.	1: Include itemized air infiltration measures in the tracking data so that the Evaluators are able to verify individual measure elements 2: Include any field notes related to the blower door test in the tracking data so that the Evaluators may more accurately recreate the testing conditions 3: Discuss air infiltration testing procedures with the Evaluators in order to ensure that the testing methodologies are consistent among agencies, their contractors, and the Evaluators.	There has been no change in the level of detail of air infiltration measures, and no clarification of methodologies	Persists

1.3.5 Summary of Conclusions and Recommendations

After reviewing the Arkansas Weatherization Program for 2015, the Evaluators highlight the following conclusions:

Minimal Effects from CADC Transition: The transition from ACAAA to CADC as the program administrator does not appear to have mitigated the AWP's operational or performance issues. It appears that CADC made efforts to work with the AEO and increase agency involvement with the program, but any beneficial effects of these efforts were for the most part overshadowed by the program's decreased activity overall.

Quality of Work Issues: The Evaluators visited two participating homes that received weatherization services from PBJCEOC during 2015. The Evaluators identified issues with the quality of work performed, and one of the homeowners indicated that the agency contractors had chipped paint in their home and had not been considerate of the home in general. The Evaluators found that silver bubble wrap had been used as water heater tank insulation in one home and that water heater pipe wrap was not correctly in place at the time of the visit. It is unclear whether these quality of work issues are limited to this agency or are indicative of a larger problem, and agency staff responded to the findings indicating that the silver bubble wrap is no longer being used and that the pipe wrap had been installed properly. However it may be beneficial to conduct further training with agency staff in order to ensure that they are complying with industry quality standards, and that they are providing adequate customer service to participants.

Minor Improvements in Data Accuracy: Tracking data errors have been for the most part resolved in 2015, and the current version of the tracking database within EnerTrek contains the necessary information to comply with TRM V4.0 requirements. Overall Frontier Associates has been very responsive to data requests and provided the utilities with fairly accurate batches of data throughout the program year. There were fewer tracking data issues in 2015 as compared to 2014.

Continued WAP Reliance Issues: As with prior years, program staff acknowledged the challenges that have emerged and persisted due to the AWP's relationship with the Weatherization Assistance Program (WAP). Ideally, this arrangement would use utility funds to efficiently leverage federal funding and substantially increase the number of weatherization projects that the agencies are able to perform. However, the AWP's inherent link to the WAP has continued to result in performance issues due to federal funding reductions. Additionally, the participating agencies were directed to prioritize LIHEAP funding over AWP funding when implementing weatherization projects, which is a key barrier to AWP program activity.

Decreasing Program Activity: The number of participants and the resulting savings levels for the AWP have steadily decreased since the 2011 program year. A major contributing factor to this decline in program activity is likely the fact that the program was winding down in 2015 and the IOUs were already focusing efforts on the Consistent

Weatherization Approach. However other issues including variable agency engagement in weatherization services, inconsistent availability of WAP funding, and insufficient interest from private co-pay customers have historically limited the program's performance.

Upcoming Consistent Weatherization Approach: The new weatherization framework developed by the utilities and other stakeholders has established statewide weatherization procedures and services, and will be implemented beginning in 2016. Utility staff reported that they anticipate that this Consistent Weatherization Approach will be a more effective method of meeting the state's weatherization needs. Additionally, utility staff noted that the collaborative relationship among utilities has improved during the development of the new framework and that the core framework will hopefully lead to a more coordinated approach to weatherization in the state.

Although 2015 marks the final year of operation for the AWP as it currently stands, the Evaluators provide the following recommendations that the utilities or agencies may consider when moving forward with weatherization services under the Consistent Weatherization Approach framework:

Mitigate Quality of Work Issues: The quality of work issues identified by the Evaluators during on-site verifications during 2015 suggest that additional training or verification may be needed for contractors in the Pine Bluff region. Overall, the Evaluators suggest that additional quality assurance and training be conducted with any new contractors who are brought onto the IOUs' Consistent Weatherization Approach offerings.

Record and Report Air Infiltration Details: As with prior years, the Evaluators identified discrepancies between reported air infiltration leakage rates and verified air infiltration leakage rates. Although only nine homes received blower door testing as part of the 2015 evaluation, the majority of these homes showed verified infiltration rates that were higher than reported infiltration rates. Moving forward, the Evaluators recommend that the IOUs and contractors collect and report the itemized air infiltration measures that are installed. As it is very difficult to reliably replicate blower door results during a site visit, having this additional information will allow program staff or their EM&V contractors to verify that the work was performed properly.

Table 1-8 Recommendations from 2015 Program Year Evaluation

Issue	Consequences	Recommendation
The Evaluators identified significant issues with the quality of work in two homes during the on-site verification efforts	Some measures were not eligible for savings Negatively affects customer satisfaction	Contractors joining Consistent Weatherization Approach offerings, namely in the Pine Bluff area, should receive additional training and undergo quality control procedures that ensure sufficient customer service and installation of measures.
The reported air infiltration leakage rates appear skewed downward, based on the Evaluators' site visits.	Possible issues with measure implementation or data collection Possible discrepancies between implementation and verification that will lead to skewed realization rates.	Record and report itemized air infiltration measures in the tracking data so that it is possible to verify individual measure elements. Also, Include any field notes related to the blower door test in the tracking data so that testing conditions can be more accurately replicated.

1.4 Report Organization

The report is organized as follows:

- Chapter 2 presents the impact findings and discusses the methods used for, and the results obtained from, estimating gross and net savings for the program;
- Chapter 3 presents the results of the process evaluation tasks and additional program findings; and
- Chapter 4 presents key conclusions and recommendations from the evaluation of the program.
- Appendix A presents the participant survey instrument.

2. Impact Evaluation Findings

This chapter presents the results of the measure verification and savings calculations for the Arkansas Weatherization Program (AWP) in the 2015 program year.

2.1 Glossary of Terms

As a first step to detailing the evaluation methodologies, the Evaluators provide a glossary of terms to follow:

- *Ex Ante Savings* – Energy savings as determined and reported by program implementers/sponsoring utilities prior to evaluation by EM&V contractor
- *Ex Post Gross Savings* – Energy savings as determined by the EM&V contractor through engineering analysis, statistical analysis, and/or onsite verification
    - *Gross Realization Rate* – Ratio of *Ex Post* Gross Savings / *Ex Ante* Savings
- *Ex Post Net Savings* – *Ex Post* Gross savings x Net-to-Gross Ratio
    - *Net-to-Gross Ratio (NTGR)* = (1 – Free-Ridership % + Spillover %), also defined as *Ex Post* Net Savings / *Ex Post* Gross Savings[11]

2.2 Summary of Ex Ante Savings

The Arkansas Weatherization Program is designed to use both electric and gas utility funds to assist customers with the cost of the in-home audit and energy efficient measures. presents the overall *ex ante* savings by measure. These values are based on the claimed savings values within the EnerTrek software tool. Exports of these data were provided to the Evaluators for analysis and verification purposes.

[11] The net-to-gross ratio for the AWP in 2015 is 1, thus 100% of gross savings are counted as net savings.

Table 2-1 Ex Ante Savings by Measure Type – Overall

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*
Air Infiltration	42.48	93,780.49	15,543.67	468.42
Ceiling Insulation	30.14	65,457.60	4,481.13	77.22
Central AC Replacement	2.60	6,140.00	-	-
Direct Vent Heater	-	-	716.63	10.92
Duct Sealing Installation	-	-	-	-
Floor Insulation	0.07	896.54	8.73	-
Gas Central Replacement	-	-	562.92	8.69
Heat Pump Replacement	1.07	5,881.00	-	-
Refrigerator Replacement	0.36	2,451.06	-	-
Residential Lighting	3.36	24,679.10	(0.13)	-
Smart Thermostat	-	369.00	307.38	-
Storm Windows	0.01	28.30	29.20	0.62
Wall Insulation	0.41	502.17	182.37	3.24
Water Heater Insulation	0.01	68.00	18.64	0.03
Water Heater Pipe Insulation	0.02	413.21	59.09	0.12
Window AC	0.77	429.49	-	-
Window Replacement	12.55	15,433.52	439.70	16.92
Total	93.85	216,529.48	22,349.33	586.19

2.2.1 Ex Ante Savings for Electric Utilities

The electric utilities with participating homes in the AWP during 2015 were AEP-SWEPCO and EAI. presents the *ex ante* savings of the electric IOUs for the 2015 program year.

Table 2-2 Ex Ante Savings by Electric Utility

Electric Utility	*# of Homes*	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*
AEP-SWEPCO	13	19.03	43,301.99
EAI	68	59.64	149,883.95
OG&E	0	-	-
Non-IOU	13	15.18	23,343.54
Total	94	93.85	216,529.48

and Table 2-4 summarize the *ex ante* savings by measure for the two electric utilities that had participating homes during 2015. The "Non-IOU" category refers to savings that were achieved as a result of program services, but were not attributable to the investor-owned utilities (IOUs) that fund the Arkansas Weatherization Program.

Table 2-3 Ex Ante Savings by Measure Type – AEP-SWEPCO

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*
Air Infiltration	6.44	11,866.75
Ceiling Insulation	7.10	17,619.29
Central AC Replacement	0.92	2,330.00
Direct Vent Heater	-	-
Duct Sealing Installation	-	-
Floor Insulation	-	-
Gas Central Replacement	-	-
Heat Pump Replacement	0.40	2,108.00
Refrigerator Replacement	0.05	322.99
Residential Lighting	0.59	3,926.66
Smart Thermostat	-	96.00
Storm Windows	-	-
Wall Insulation	-	-
Water Heater Insulation	-	-
Water Heater Pipe Insulation	0.00	75.88
Window AC	-	-
Window Replacement	3.53	4,956.42
Total	19.03	43,301.99

Table 2-4 Ex Ante Savings by Measure Type - EAI

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*
Air Infiltration	27.91	71,936.77
Ceiling Insulation	18.64	41,858.33
Central AC Replacement	1.22	2,645.00
Direct Vent Heater	-	-
Duct Sealing Installation	-	-
Floor Insulation	0.07	896.54
Gas Central Replacement	-	-
Heat Pump Replacement	0.67	3,773.00
Refrigerator Replacement	0.29	1,960.06
Residential Lighting	2.21	16,620.58
Smart Thermostat	-	203.00
Storm Windows	0.00	13.00
Wall Insulation	0.41	502.17
Water Heater Insulation	0.01	68.00
Water Heater Pipe Insulation	0.02	314.98
Window AC	0.77	429.49
Window Replacement	7.44	8,663.03
Total	59.64	149,883.95

presents the *ex ante* electric savings that were not associated with any IOU. These *ex ante* savings are attributable to municipal utilities, co-op utilities, or other energy providers. These savings are not attributed to any specific program sponsoring utility, and are provided for reference only.

Table 2-5 Ex Ante Savings by Measure Type – Non-IOU (Electric)

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*
Air Infiltration	8.13	9,976.98
Ceiling Insulation	4.40	5,979.97
Central AC Replacement	0.46	1,165.00
Direct Vent Heater	-	-
Duct Sealing Installation	-	-
Floor Insulation	-	-
Gas Central Replacement	-	-
Refrigerator Replacement	-	-
Residential Lighting	0.02	168.01
Smart Thermostat	0.57	4,131.85
Storm Windows	-	70.00
Wall Insulation	0.01	15.30
Water Heater Insulation	-	-
Water Heater Pipe Insulation	-	-
Window AC	0.00	22.36
Window Replacement	-	-
Total	15.18	23,343.54

2.2.2 Ex Ante Savings for Gas Utilities

The only IOU with participating homes during 2015 was CenterPoint. presents the *ex ante* savings of each IOU for the 2015 program year.

Table 2-6 Ex Ante Savings by Gas Utility

Gas Utility	*# of Homes*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*
AOG	0	-	-
CenterPoint	76	547.99	20,700.42
Black Hills	0	-	-
Non-IOU	18	38.20	1,648.90
Total	94	586.19	22,349.33

Table 2-7 summarizes the *ex ante* savings by measure CenterPoint, the only gas IOU with participating homes in 2015.

Table 2-7 Ex Ante Savings by Measure Type – CenterPoint

Measure	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*
Air Infiltration	442.52	14,656.74
Ceiling Insulation	67.46	3,921.32
Central AC Replacement	-	-
Direct Vent Heater	9.77	641.63
Duct Sealing Installation	-	-
Floor Insulation	-	8.73
Gas Central Replacement	8.69	562.92
Refrigerator Replacement	-	-
Residential Lighting	-	-
Smart Thermostat	-	(0.12)
Storm Windows	-	226.38
Wall Insulation	0.62	26.30
Water Heater Insulation	3.24	182.37
Water Heater Pipe Insulation	0.03	18.64
Window AC	0.11	55.56
Window Replacement	-	-
Total	547.99	20,700.42

presents the *ex ante* gas savings that were not associated with any AWP IOU. The "non-IOU" *ex ante* gas savings may represent propane customers or other types of customers that do not receive gas service from an IOU. Therefore, is a reflection of the non-IOU *ex ante* gas savings that are claimed within the tracking system, and these savings are not applicable to any specific service provider.

Table 2-8 Ex Ante Savings Values by Measure Type – Non-IOU (Gas)

Measure	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*
Air Infiltration	468.42	15,543.67
Ceiling Insulation	77.22	4,481.13
Central AC Replacement	-	-
Direct Vent Heater	10.92	716.63
Duct Sealing Installation	-	-
Floor Insulation	-	8.73
Gas Central Replacement	8.69	562.92
Refrigerator Replacement	-	-
Residential Lighting	-	-
Smart Thermostat	-	(0.13)
Storm Windows	-	307.38
Wall Insulation	0.62	29.20
Water Heater Insulation	3.24	182.37
Water Heater Pipe Insulation	0.03	18.64
Window AC	0.12	59.09
Window Replacement	-	-
Total	586.19	22,349.33

2.3 Gross Savings Calculation Methodology

For measures implemented through the 2015 program, savings verification was performed according to methodologies described in TRM V5.0. identifies the sections in the TRM that were used for verification of measure-level savings under the AWP.[12]

[12] The savings for storm windows were calculated through NEAT/MHEA, and these measures do not have an associated savings algorithm section in the TRM. However, Appendix H in TRM V5.0 specifies that NEAT/MHEA peak savings for storm windows should be multiplied by a deemed demand factor. This approach was used for the 2015 evaluation.

Table 2-9 TRM Sections by Measure Type

Measure	*TRM Version*	*Section in TRM*
Air Infiltration	5.0	2.2.9
Ceiling Insulation	5.0	2.2.2
Central AC Replacement	5.0	2.1.6
ENERGY STAR® Windows	5.0	2.2.7
Floor Insulation	5.0	2.2.4
Gas Furnace Replacement	5.0	2.1.3
Heat Pump Replacement	5.0	2.1.8
Lighting Efficiency	5.0	2.5.1
ENERGY STAR® Refrigerator	5.0	2.4.3
Smart Thermostat	5.0	2.1.12
Storm Windows	5.0	Appendix H
Direct Vent Heaters	5.0	2.1.1
Wall Insulation	5.0	2.2.3
Water Heater Jackets	5.0	2.3.2
Water Heater Pipe Insulation	5.0	2.3.3
Window AC	5.0	2.1.10

Air infiltration reduction and ceiling insulation accounted for the majority of both gas and electric savings for the AWP in 2015. Residential lighting (CFL installation) also accounted for a substantial portion of electric savings. The calculation methodologies for these three measures are detailed in the following sections.

The deemed savings algorithms in TRM 5.0 for air infiltration reduction were developed through simulation modeling in BEopt, a residential building simulation modeling platform that uses the DOE EnergyPlus simulation engine. Multiple equipment configurations were simulated in each of the four Arkansas weather zones in developing savings values denominated in deemed savings per CFM50 of air leakage rate reduction. The following table summarizes the deemed savings values for Weather Zone 7.

Table 2-10 Deemed Savings Values for Air Infiltration Reduction, Zone 7

Equipment Type	*kWh Savings / CFM50 (ESF)*	*kW Savings / CFM50 (DSF)*	*Therm Savings / CFM50 (GSF)*	*Peak Therms / CFM50 (GPSF)*
Electric AC with Gas Heat	0.190	0.00016	0.0707	0.002181
Gas Heat Only (no AC)	0.053	n/a	0.0747	0.002181
Elec. AC with Resistance heat	1.812	0.00016	N/A	N/A
Heat Pump	0.818	0.00016	N/A	N/A

The following example considers a residence in Weather Zone 7 with electric AC and gas heat. If the residence had a leakage rate of 16,100 CFM_{50} before air infiltration reduction and a leakage rate of 7,220 CFM_{50} after, then the residence would have an annual gross savings of 1,687 kWh.

$$Air\ Infiltration\ Savings = 0.190 \frac{kWh\ Savings}{CFM_{50}} \cdot \left(16{,}100\ CFM_{50\ pre} - 7{,}220\ CFM_{50\ post}\right)$$

$$Air\ Infiltration\ Savings = 1{,}687\ kWh$$

TRM V5.0 also specifies Minimum Final Ventilation Rates (MVR) and Maximum Pre-installation Infiltration Rates in order to ensure that air infiltration work is performed in accordance with health and safety guidelines and that infiltration reduction is not attempted on homes with prohibitively severe leakage levels.

TRM V5.0 specifies that the MVR must comply with current Arkansas building codes, which present three options for calculating MVR. However, as per Protocol E2 of TRM V5.0, the enforcement date for a code or standard update is the end of the current program year if the effective date of the code or standard update is before July 1. Therefore the Evaluators applied the MVR guidelines from TRM V4.0 for the 2015 evaluation. TRM V4.0 specifies MVR as follows:

The MVR specifies the minimum post-installation air infiltration value that can be applied to the deemed savings calculation. If a home's final CFM50 value is below the MVR, the deemed savings calculation for air infiltration reduction on the home is calculated using the MVR rather than the actual post-installation leakage value.

The MVR for a given home is calculated as follows:

$$Min\ CFM50 = [0.01 \times A_{floor} + 7.5 \times (BR + 1)] \times N$$

Where:

Min CFM50 = Minimum final ventilation rate (CFM50)

AFloor = Floor area (ft^2)

BR= Number of bedrooms (must be at least 1)

N = N factor (deemed value based on type of wind shielding and number of stories in home)

With regard to Maximum Pre-installation Infiltration Rate, TRM 5.0 specifies that in order to avoid incentivizing homes with severe building envelope issues that cannot be remedied with typical air infiltration procedures, the baseline pre-installation infiltration rate should be based on a maximum air change rate of 3.0. With this baseline in effect, the maximum allowable pre-installation CFM50 value is calculated as follows:

$$CFM_{50,pre}/ft^2 = \frac{ACH_{Nat,pre} \times h \times N}{60}$$

Where:

CFM50,pre /ft^2 = Per square foot pre-installation infiltration rate (CFM50/ft^2)

ACHNat,pre = Maximum pre-installation air change rate (ACHNat) = 3.0

60 = Constant to convert from minutes to hours

h = Ceiling height (ft) = 8.5 (default)

N = N factor (deemed value based on type of wind shielding and number of stories in home)

If a home's pre-installation infiltration rate exceeds the rate calculated above, the Maximum Pre-installation Infiltration Rate is used for deemed savings calculations.

Additionally, TRM 5.0 specifies a maximum CFM50 per-square-foot value. For deemed savings calculations, pre-installation leakage rates cannot exceed these values.

2.3.1 Ceiling Insulation Savings Calculations

The deemed savings algorithms in TRM 5.0 for ceiling insulation were developed through simulation modeling in BEopt, a residential building simulation modeling platform that uses the DOE EnergyPlus simulation engine. Multiple equipment configurations were simulated in each of the four Arkansas weather zones in developing savings values denominated in deemed savings per square footage of ceiling area. Table 2-11 summarizes the deemed savings values for R-38 insulation for participants located in Weather Zone 8.

Table 2-11 Deemed Savings Values for Ceiling Insulation, Zone 8

Ceiling Insulation Base R-value	*AC/Gas Heat kWh*	*Gas Heat (no AC) kWh*	*Gas Heat (no AC) Therms*	*AC/Electric Resistance kWh*	*Heat Pump kWh*	*AC Peak Savings (kW)*	*Peak Gas Savings[13] (therms)*
	(/ sq. ft.)	*(/ sq. ft.)*	*(/ sq. ft.)*	*(/ sq. ft.)*	*(/ sq. ft.)*	*(/ sq. ft.)*	*(/ sq. ft.)*
0 to 1	1.8642	0.2203	0.3060	8.734	4.572	0.00107	0.00539
2 to 4	1.0497	0.1215	0.1687	4.846	2.495	0.00061	0.00284
5 to 8	0.6330	0.0728	0.1011	2.909	1.495	0.00038	0.00165
9 to 14	0.3909	0.0446	0.0618	1.784	0.917	0.00025	0.00099
15 to 22	0.1847	0.0216	0.0299	0.858	0.439	0.00011	0.00048

[13] Data in table are for Blytheville peak. Other Zone 8 peaks can be calculated by multiplying Blytheville peak by the appropriate factor, m. For Jonesboro, m=0.890 (0-1), m = 0.901 (2 to 4), 0.906 (5 to 8), 0.907 (9 to 14), 0.918 (15 to 22). For Fort Smith, m=0.859 (0-1), m = 0.872 (2 to 4), 0.878 (5 to 8), 0.879 (9 to 14), 0.891 (15 to 22).

The following example considers a residence that had R-38 insulation installed in Weather Zone 8 with a heat pump, and a pre-retrofit R-value of ceiling insulation in the range of 9 to 14. If the residence has a ceiling area of 1,200 sq. ft., then the residence would have an annual gross savings of 1,100 kWh.

$$Ceiling\ Insulation\ Savings = 0.917\frac{kWh}{ft^2} \cdot (1{,}200\ ft^2) = \ 1{,}100\ kWh$$

TRM 5.0 specifies an efficiency standard of R-38, meaning that in order to qualify for deemed savings the combined R-value of existing and added insulation should be at least R-38.

2.3.2 Compact Fluorescent Lamps (CFLs) Savings Calculations

The deemed savings for compact fluorescent lamps can be calculated by using the following equation.

$$kWh_{savings} = ((Watts_{base} - \ Watts_{post})/1{,}000)\ x\ Hours\ x\ ISR\ x\ IEF_E$$

The inputs, which assume the following prerequisite knowledge, can be found in Section 2.5.1 of TRM V5.0:

- The quantity, lumens, and wattages post fixtures;
- Whether or not the retrofits were time of sale or direct install (this defines the in-service rate); and
- The heating type of the residence.

For example, if in March 2015 (5) 13W and 800 lumen CFLs were directly installed in a residence with gas heating, the residence would have an annual gross savings of 128 kWh.

$$kWh_{savings} = ((5 \cdot 43 - 5 \cdot 13)/1{,}000\ \cdot\ 792.6\ \cdot\ 0.98\ \cdot\ 1.10 = 128\ kWh$$

TRM 5.0 includes specifications for heating penalties from CFLs in natural gas heated homes, calculated as follows:

$$Therms_{penalty} = \left((W_{base} - W_{post})/1000\right)\ x\ ISR\ x\ IEF_G$$

Where:

IEFg = Interactive Effects Factor to account for gas heating penalties

TRM V5.0 also accounts for future changes in lighting baselines as per EISA 2007 guidelines. Specifically, TRM V5.0 specifies that the 1st Tier EISA 2007 baselines come into effect in January 2014, and that the 2nd Tier EISA 2007 baselines come into effect in January 2022. These baseline changes affect lifetime savings calculations for CFLs.

As per Protocol E2 of TRM V5.0, the enforcement date for a code or standard update is the end of the current program year if the effective date of the code or standard update

is before July 1. Thus, the Evaluators calculated 2015 first-year savings using the 1st Tier EISA baseline.

2.4 Net Savings Determination

As with prior program years, the Evaluators applied a net-to-gross ratio of 1 for savings achieved through the program in 2015. The context for and explanation of this determination, which appeared in prior AWP evaluation reports, is provided below.

The Evaluators conducted a net-to-gross assessment of the program in 2012 in order to determine the likelihood of significant free-ridership or savings spillover. Feedback obtained from customers, community action agencies, and utility staff indicates that the likelihood for program free-ridership is very low. As a high percentage of AWP participants qualified for and participated in the income-qualified statewide Weatherization Assistance Program (WAP), they are unlikely to be candidates for free-ridership in the AWP.

The promotional structure of the AWP targets customer groups who would be very unlikely to pursue these weatherization projects in the absence of the program, and who would likely not seek out an energy audit at their own cost. Additionally, participants who were visited by the Evaluators' field staff were asked a series of questions related to program savings spillover, and none of these customers identified any potential spillover savings.

Due to these factors, the Evaluators determined the net-to-gross ratio for the Arkansas Weatherization Program to be 1, or 100% of gross savings, for the 2012 program year. This determination has been carried over and applied to the 2015 program year, and 2015 AWP gross savings are equal to net savings.

2.5 On-site Verification Procedure

In addition to TRM verification, the Evaluators conducted on-site field verification of a sample of participant homes. This process involved reviewing tracking information and inspecting the completeness and accuracy of the implemented measures. This section provides a summary of the methodology used by the Evaluators to conduct the verification activity.

2.5.1 Verification Sampling Methodology

The Evaluators conducted a random sample of participants for the ex-post verification process. The sample size for verification was calculated to meet 90% confidence and 10% precision (90/10) for the overall 2015 program population at the time of the on-site verification activity. The main purpose of the verification activity was to determine whether measures were properly installed in the quantities reported in program tracking data. Thus, the coefficient of variation (CV) used for sampling was not based on

participant savings but was assumed to be 0.5, which is a commonly assumed CV value for residential program evaluations. The resulting sample size is estimated as:

$$n_0 = \left(\frac{1.645 * CV}{RP}\right)^2$$

Where,

1.645 = Z Score for 90% confidence interval in a normal distribution

CV = Coefficient of Variation

RP = Required Precision, 10% in this evaluation

With 10% required precision (RP), this calls for a sample of 68 for programs with a sufficiently large population. However, for programs with lower levels of participation, a finite population correction is used to maintain cost-effective verification while meeting precision goals. For the AWP, the Evaluators applied a finite population correction factor as follows:

$$n = \frac{n_0}{1 + {}^{n_0}/_{N}}$$

Where

n_0 = Sample Required for Large Population

N = Size of Population

n = Corrected Sample

During 2015, 94 residences received measures through the AWP. After applying the population correction factor, the program calls for a sample size of 40 participants.

In total, the Evaluators attempted to schedule 28 site visits but due to the limited number of participants in the program population, as well as cancellations and customer absences, Evaluator field staff members were able to conduct on-site visits for 13 program participants. This does not meet the sampling requirement specified above. To supplement the verification effort, the Evaluators conducted participant satisfaction surveys with 24 customers which also served to confirm that they had participated in and received measures through the program. Of these 24 survey respondents, 9 were also part of the group of 13 customers who received on-site verification visits from the Evaluators. Thus, 13 customers received on-site measure verification, and 15 additional customers received program participation verification through the participant survey. This was supplemented by 12 brief telephone verification calls to bring the total number of unique customer verifications to 40.

Although the participant satisfaction survey did not verify individual measure installation, the Evaluators were able to confirm that all 40 sampled customers had participated in

the program. The sample achieved for the evaluation is not representative of the population at the measure level, but it is representative at the project level in verifying customer participation.

2.5.2 On-site Verification Procedure

The primary goal of field verification was to ensure that the reported measures were installed and operating correctly in participant homes. Participants were given Walmart gift cards for their time; these were in the amount of $25. During the on-site visits, the Evaluators' field technicians accomplished the following:

- Verified the implementation status of the measures; verified that the measures were installed, that they were installed correctly, and were functioning properly. Photographs were taken of most of the installed measures.
- Data collected at each site focused on obtaining more specific information regarding the characteristics of the home where the measures were implemented.

A field visit form was completed for each visited site in order to document measure quantities, home characteristics, and any needed additional commentary regarding the visit. Specifically, the field form included the following fields:

- Home Characteristics: The field engineer documented the type of home (i.e. single story vs. multi-story), number of bedrooms, number of bathrooms, total conditioned area, and heating type.
- Measure Quantity Verification: The engineer documented reported vs. actual quantities of each measure type (e.g. CFLs, water heater measures) and any applicable notes regarding burnt out bulbs or non-operational equipment.
- Insulation Assessment: The form includes fields for insulation square footage, the R-value or inches of insulation, and the type of insulation (e.g. blown cell).
- Infiltration Assessment: For homes receiving air infiltration measures, the field engineer conducted a blower door test and recorded ex-post leakage for comparison with reported leakage values.
- Supplemental Notes: The field engineer recorded any notable comments provided by the customer regarding the work that was performed, and identified any verification issues that had occurred during the visit (e.g. if the attic was not accessible).

2.6 Onsite Verification Results

As described in Section 2.5 of this report, the Evaluators conducted onsite verification visits to 13 participant homes. These site visits were conducted in order to verify

complete and proper measure installation, to conduct post-implementation measurements, and to collect information regarding residence characteristics such as square footage and heating type.

The field and telephone verification activity showed that the weatherization measures had for the most part been installed in the quantities reported within program tracking data, although quality of work issues were identified in two homes. This section summarizes the verification findings by measure category.

Specific notes regarding the onsite and telephone verification findings include:

2.6.1 Contact Information

All residences were located at the addresses provided within the tracking data. Additionally, a high percentage of telephone numbers were found to be accurate, which is an improvement over the 2014 program year. In total, only 4 out of the 54 telephone numbers (7%) dialed by the Evaluators were found to be disconnected or incorrect during the site visit scheduling process.

2.6.1 Air Infiltration

The Evaluators conducted blower door testing in nine participant homes for the 2015 program year. Of these homes, the CFM_{50} value measured during the verification visit was within 10% of the reported value for four homes. The Evaluated CFM_{50} value was more than 10% greater than the Reported CFM50 value for four homes. Overall, the Evaluated CFM_{50} value was greater than the Reported CFM_{50} value for six of the nine homes.

As mentioned in prior evaluation reports for this program, there are several factors that may cause the Evaluated CFM50 value to be greater than the Reported CFM_{50} value, including customer actions following the weatherization work (such as removing door sweeps), methodological differences between contractor blower door testing and Evaluator blower door testing, and environmental or weather effects. Without additional information regarding air sealing and leakage testing procedures conducted by contractors for each home, it is not possible to determine the reason for these measurement discrepancies. The Evaluators have previously recommended that itemized air infiltration measures be included in program tracking data, but this may be associated with a database programming cost. Similarly, field notes regarding how the initial blower door test was conducted (such as whether a fireplace flue was open or closed) may be useful for the verification process but generating a report of this information may require additional EnerTrek programming.

Overall, increasing the level of tracking data detail and minimizing methodological differences among contractors would help to distinguish data entry and implementation errors from situational and procedural differences. As this is the final year of program operation, moving forward this issue may only be relevant to IOUs who will continue to

use community action agency contractors to provide services under the Consistent Weatherization Approach framework.

2.6.1 Attic Insulation

All reported instances of attic insulation were verified. There were no significant differences between reported pre-installation R values and evaluated pre-installation R values. There were no significant differences between reported square footage and evaluated square footage.

2.6.1 CFLs

All reported instances of CFL installation were verified, in quantities that matched or closely matched program tracking data. All verified CFLs matched the wattage and lumen range reported in the EnerTrek tracking data.

2.6.2 Water Heater Jacket and Pipe Wrap

The Evaluators were able to verify all but one instance of water heater jackets. In this case, the Evaluators found that silver bubble wrap had been used to wrap the water heater, rather than standard insulation jackets. The agency responsible for this work reported that the silver bubble wrap is no longer being used. All reported instances of water heater pipe wrap were verified, but in at least two cases the pipe wrap was installed on the pressure release valve line. The agency responsible for this work reported that the water heater pipe wrap had been installed on the proper lines during the initial inspection of the home.

2.6.3 Central Air Conditioner Replacement

All but one reported instance of central air conditioning replacement were verified. One customer did not appear to have had a new unit installed, and their existing unit was not functioning at the time of the site visit.

2.6.4 Gas Heat Replacement

All reported instances of gas central replacement were verified.

2.6.5 Window Replacement

All reported instances of window replacement were verified.

2.6.6 Smart Thermostat

All reported instances of smart thermostat installation were verified.

2.6.7 Wall Insulation

All reported instances of wall insulation were verified.

2.6.8 Refrigerator Replacement

All reported instances of refrigerator replacement were verified.

2.6.9 Direct Vent Heater

All reported instances of direct vent heater installation were verified.

The results of the verification activity suggest that measures are for the most part installed in the quantities reported in program tracking data. However, the Evaluators found that the quality of work conducted in the two sampled homes serviced by PBJCEOC was fairly poor. This includes the instances of bubble wrap and pipe insulation on pressure relief line mentioned above. Overall, issues identified within these homes include:

- It appeared that silver bubble wrap was used as water heater insulation, rather than a standard insulation jacket;
- Plenum sealing was done with tape that did not effectively stick to surfaces;
- Caulk was used in gaps that were too large, where foam sealing should have been used;
- Water heater pipe insulation was added to the pressure release line; and
- One customer indicated that the contractor had damaged paint/trim in the home.

These findings were submitted to CADC and PBJCEOC staff responded, indicating that the silver water heater wrap is no longer being used and that the water heater pipe insulation had been added to the proper lines when the home was inspected. However it may be beneficial to conduct further training with PBJCEOC staff in order to ensure that they are complying with industry quality standards, and that they are providing adequate customer service to participants. As a result of the field verification activity, the Evaluators made the following adjustments to program savings:

- No water heater tank wrap savings were attributed to the home where silver bubble wrap was used instead of standard tank insulation;
- No water heater pipe wrap savings were attributed to the two homes where the pipe wrap was installed on the pressure relief valve; and
- No central air conditioner savings were attributed to the home where the central air conditioner did not appear to have been replaced.

Rather than extrapolating these savings adjustments to the program population based on the limited sample of 13 site visits that were conducted, these adjustments only affected the individual homes where the verification issue occurred.

2.7 Review of EnerTrek Input Assumptions

Although the EnerTrek system calculated savings for the AWP using protocols in TRM V4.0, some of the measure inputs required by the TRM were not collected by program contractors during 2015. In order to calculate savings, Frontier Associates developed input assumptions for individual measure types. The Evaluators reviewed these

assumptions and attempted to validate or supplement specific assumptions during the verification activity. The assumptions applied to individual measure calculations for some homes in 2015 include:

- ENERGY STAR® Refrigerator Replacement: For measures where an early retirement savings methodology can be applied, but a unit age is not provided, savings were calculated using the Replace on Burnout methodology.
- Central AC Replacement: For measures where an early retirement savings methodology can be applied, but a unit age is not provided, savings were calculated using the Replace on Burnout methodology.
- Direct Vent Heaters: For measures where an early retirement savings methodology can be applied, but a unit age is not provided, savings were calculated using the Replace on Burnout methodology.
- Gas Central Replacement: Assume replace on burnout.
- Heat Pump Replacement: Assume replace on burnout.
- Water Heater Pipe Insulation: Assume water heater is located in a conditioned space.

Data collected by the Evaluators during the verification activity indicated that the assumptions for CFLs and window replacements were reasonable and consistent with actual measure characteristics.

Overall, following a review of program tracking data and field verification findings, the Evaluators determined that all of the listed assumptions were reasonable for measures implemented during 2015.

2.8 Ex Post Net Savings by Measure

Ex post savings were calculated through TRM verification of EnerTrek inputs and *ex ante* savings values. Any instances of discrepancies between *ex ante* and *ex post* savings were due to one of three issues:

- Difference in TRM: EnerTrek calculated measure savings in 2015 using TRM V4.0, and the Evaluators conducted savings verification using TRM V5.0. There were differences in input assumptions, measure parameters, and savings equations between the two TRM versions for some measures.

- Calculation Error: Any difference in interpretation of TRM protocols, mathematical errors, or data entry errors may cause *ex ante* savings to be higher or lower than *ex post* (verified) savings.

- On-site Verification Issues: Measures that were unable to be verified during verification visits at participant's homes received zero savings.

Table 2-12 presents electric and gas realization rates by measure category. These realization rates are presented at the program level, and individual utility realization rates may vary from those presented in this table. Individual utility realization rates are presented in Section 2.10 and Section 2.11.

Table 2-12 Gas and Electric Realization Rates by Measure Type

Measure	*kWh Realization Rate*	*kW Realization Rate*	*Therms Realization Rate*	*Peak Therms Realization Rate*
Air Infiltration	100%	100%	100%	100%
Ceiling Insulation	101%	149%	102%	101%
Central AC Replacement	71%	161%	-	-
Direct Vent Heater	-	-	162%	162%
Duct Sealing Installation	-	-	-	-
Floor Insulation	75%	68%	100%	-
Gas Central Replacement	-	-	107%	108%
Heat Pump Replacement	49%	52%	-	-
Refrigerator Replacement	178%	178%	-	-
Residential Lighting	110%	118%	230%	-
Smart Thermostat	1909%	-	129%	-
Storm Windows	100%	125%	100%	146%
Wall Insulation	104%	131%	107%	0%
Water Heater Insulation	0%	0%	100%	100%
Water Heater Pipe Insulation	96%	98%	100%	102%
Window AC	148%	100%	-	-
Window Replacement	100%	100%	100%	100%
Overall	103%	118%	103%	101%

The Evaluators found that the majority of discrepancies between *ex ante* and *ex post* savings were due to differences between TRM V4.0 and TRM V5.0 rather than due to calculation errors.

The following list identifies measure categories where there were significant differences between *ex ante* and *ex post* savings, and specifies whether this was due to differences in TRM versions or due to calculation errors:

- Ceiling Insulation
    - Difference in TRM: High overall electric and gas realization rates were due to differences in TRM versions. TRM V5.0 provides deemed saving tables for both R-38 and R-49 and allows for linear interpolation for insulation

that is between the two R-values. TRM V4.0 only provides a deemed savings table for R-38 insulation.

- Floor Insulation
    - Calculation Error: Low overall electric realization rates are due to differences in TRM versions. Deemed savings in TRM V5.0 included negative energy savings values depending on weather zone and HVAC equipment configuration. The simulation procedures used for this measure in TRM V5.0 identified negative electric savings, likely caused by the floor insulation acting as a barrier to ground cooling effects. This would cause the home temperature to be higher during cooling months, likely resulting in increased air conditioner usage. The *ex ante* savings calculation did not allow for homes to receive negative energy savings for floor insulation while realized savings incorporated this increased energy usage.
- Wall Insulation
    - Difference in TRM: High overall electric and gas realization rates were due to differences in TRM versions. TRM V5.0 provides deemed saving tables for both R-13 and R-23 and allows for linear interpolation for insulation that is between the two R-values. TRM V4.0 only provides a deemed savings table for R-13 insulation.
- Residential Lighting
    - Difference in TRM/Calculation Error: High overall electric and gas realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. CFL annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. Additionally, the interactive effects factor to account for gas heating penalties was updated in TRM V5.0.
- Refrigerator Replacement
    - Difference in TRM/Calculation Error: High overall electric realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. Refrigerator annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. ADM also assigned TRM V5.0 refrigerator types based on the model number of the efficient refrigerator provided in the tracking data.
- Central AC Replacement
    - Difference in TRM: The low kWh realization rate and high kW realization rate is due to differences in TRM versions. TRM V4.0 provides a deemed

savings table while TRM V5.0 provides a savings algorithm requiring additional measure specific inputs. Additionally, it did not appear that this measure was in place in one of the sites visited during on-site verification, and that instance of this measure was not attributed with savings.

- Direct Vent Heater
    - Calculation Error: High overall electric realization rates were due to differences between TRM versions and possible EnerTrek calculation issues. Direct vent heater annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. In addition, in cases where existing unit exceeded the age of eligibility that can be claimed as early retirement according to Section 1.8 of TRM V5.0, replacement on burnout methodology was used.
- Gas Central Replacement
    - Difference in TRM/Calculation Error: High overall gas realization rates were due to differences in TRM versions and possible EnerTrek calculation issues. Gas Central Replacement annual kWh savings in EnerTrek may have been calculated as an increment of lifetime savings, which takes into account future baseline changes that should not affect first-year kWh savings. In addition, in cases where existing unit exceeded the age of eligibility that can be claimed as early retirement according to Section 1.8 of TRM V5.0, replacement on burnout methodology was used. Finally, heating load value and equivalent full hours were updated in TRM V5.0.
- Heat Pump Replacement
    - Difference in TRM/Calculation Error: The low electric realization rates are due to differences in TRM versions. TRM V4.0 provides a deemed savings table while TRM V5.0 provides a savings algorithm requiring additional measure specific inputs.
- Smart Thermostat
    - Difference in TRM: The high electric and gas realization rates are due to differences in TRM versions. Smart Thermostats were added for TRM V5.0. Previous evaluations relied on NEAT savings values.
- Storm Windows
    - Difference in TRM: The high peak savings realization rates are due to differences in TRM versions. TRM V5.0 provides updated multipliers used estimating peak demand reductions.
- Water Heater Pipe Insulation

  - Difference in TRM/On-site Verification Issues: The low electric realization rates are due to an adjustment made by the Evaluators based on on-site verification results. This is described in more detail in Section 2.6. The high peak gas realization rates are due to updates to TRM V5.0.

- Water Heater Pipe Insulation
  - The 0% electric realization rate is due to an adjustment made by the Evaluators based on on-site verification results. This is described in more detail in Section 2.6.
- Window AC
  - Difference in TRM: The high overall electric realization rates are due to differences in TRM versions. The room adjustment factor was updated for TRM V5.0 causing an increase in savings.

2.9 Overall Ex Post Net Savings

Table 2-13 presents the savings results of the evaluation of the 2015 Arkansas Weatherization Program, by measure. Total savings summarizes the savings calculations performed as per TRM V5.0 protocols for the AWP. As previously noted, the net-to-gross ratio for the 2015 program year is 1.

Table 2-13 Ex Post Net Savings by Measure Type – Overall

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*
Air Infiltration	42.63	93,953.88	1,033,492.63	470.42	15,608.29	171,691.19
Ceiling Insulation	44.86	66,225.09	1,324,501.86	78.29	4,548.53	90,970.65
Central AC Replacement	4.19	4,351.15	82,671.92	-	-	-
Direct Vent Heater	-	-	-	17.73	1,161.06	14,678.90
Duct Sealing Installation	-	-	-	-	-	-
Floor Insulation	0.04	676.16	13,523.24	(0.09)	8.73	174.56
Gas Central Replacement	-	-	-	9.36	603.44	11,321.70
Heat Pump Replacement	0.55	2,875.80	46,012.78	-	-	-
Refrigerator Replacement	0.64	4,368.84	56,566.98	-	-	-
Residential Lighting	3.97	27,054.29	213,511.46	-	(0.31)	(2.35)
Smart Thermostat	-	7,043.15	77,474.61	-	397.11	4,368.21
Storm Windows	0.01	28.30	566.00	0.90	29.20	584.00
Wall Insulation	0.54	521.73	10,434.56	-	194.52	3,890.50
Water Heater Insulation	-	-	-	0.03	18.64	242.32
Water Heater Pipe Insulation	0.02	394.75	4,342.25	0.12	59.12	768.58
Window AC	0.77	637.73	6,696.16	-	-	-
Window Replacement	12.55	15,433.52	308,670.38	16.92	439.71	8,794.12
Total	110.78	223,564.39	3,178,464.84	593.67	23,068.05	307,482.37

2.10 Ex Post Net Savings for Electric Utilities

The participating electric IOUs with homes achieving savings through the 2015 program were AEP-SWEPCO and EAI. Table 2-14 presents the *ex post* net savings results of the evaluation of the 2015 AWP for electric utilities.

Table 2-14 Ex Post Net Savings by Electric Utility

Electric Utility	*# of Homes*	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*
AEP-SWEPCO	13	23.12	43,922.09	693,639.06
EAI	68	69.30	155,489.33	2,146,105.97
OG&E	0	-	-	-
Non-IOU	13	18.37	24,152.96	338,719.81
Total	94	110.78	223,564.39	3,178,464.84

and Table 2-16 summarize the *ex post* net savings and net realization rates by measure for the two electric IOUs that had participating homes during 2015.

Table 2-15 Ex Post Net Savings by Measure Type – AEP – SWEPCO

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*	*kWh Realization Rate*	*kW Realization Rate*
Air Infiltration	6.44	11,863.45	130,497.93	100%	100%
Ceiling Insulation	10.51	17,748.29	354,965.83	101%	148%
Central AC Replacement	1.68	1,804.85	34,292.08	77%	182%
Direct Vent Heater	-	-	-		-
Duct Sealing Installation	-	-	-		-
Floor Insulation	-	-	-		-
Gas Central Replacement	-	-	-		-
Heat Pump Replacement	0.21	1,038.73	16,619.74	49%	52%
Refrigerator Replacement	0.07	477.38	6,016.73	148%	148%
Residential Lighting	0.67	4,272.31	32,751.01	109%	115%
Smart Thermostat	-	1,684.76	18,532.32	1755%	-
Storm Windows	-	-	-		-
Wall Insulation	-	-	-		-
Water Heater Insulation	-	-	-		-
Water Heater Pipe Insulation	0.00	75.91	835.05	100%	102%
Window AC	-	-	-		-
Window Replacement	3.53	4,956.42	99,128.37	100%	100%
Total	23.12	43,922.09	693,639.06	101%	121%

Table 2-16 Ex Post Net Savings by Measure Type – EAI

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*	*kWh Realization Rate*	*kW Realization Rate*
Air Infiltration	28.06	72,113.45	793,247.98	100%	101%
Ceiling Insulation	27.27	42,359.52	847,190.31	101%	146%
Central AC Replacement	1.68	1,643.88	31,233.81	62%	138%
Direct Vent Heater	-	-	-		-
Duct Sealing Installation	-	-	-		-
Floor Insulation	0.04	676.16	13,523.24	75%	68%
Gas Central Replacement	-	-	-		-
Heat Pump Replacement	0.35	1,837.07	29,393.04	49%	52%
Refrigerator Replacement	0.55	3,802.21	43,298.02	194%	194%
Residential Lighting	2.58	18,269.85	143,099.52	110%	117%
Smart Thermostat	-	4,655.24	51,207.64	2293%	-
Storm Windows	0.00	13.00	260.00	100%	578%
Wall Insulation	0.54	521.73	10,434.56	104%	131%
Water Heater Insulation	-	-	-	0%	0%
Water Heater Pipe Insulation	0.01	296.46	3,261.11	94%	97%
Window AC	0.77	637.73	6,696.16	148%	100%
Window Replacement	7.44	8,663.03	173,260.58	100%	100%
Total	69.30	155,489.33	2,146,105.97	104%	116%

presents the electric savings that were not associated with any AWP IOU. These savings are attributable to municipal utilities, co-op utilities, or other energy providers. Thus, the savings are not attributed to any specific program sponsoring utility.

Table 2-17 Ex Post Net Savings by Measure Type – Non-IOU (Electric)

Measure	*Peak Demand Savings (kW)*	*Annual Savings (kWh)*	*Lifetime Savings (kWh)*	*kWh Realization Rate*	*kW Realization Rate*
Air Infiltration	8.13	9,976.98	109,746.73	100%	100%
Ceiling Insulation	7.08	6,117.29	122,345.72	102%	161%
Central AC Replacement	0.84	902.42	17,146.04	77%	182%
Direct Vent Heater	-	-	-		-
Duct Sealing Installation	-	-	-		-
Floor Insulation	-	-	-		-
Gas Central Replacement	-	-	-		-
Heat Pump Replacement	-	-	-		-
Refrigerator Replacement	0.01	89.26	7,252.23	53%	53%
Residential Lighting	0.72	4,512.13	37,660.93	109%	125%
Smart Thermostat	-	703.15	7,734.65	1005%	-
Storm Windows	0.01	15.30	306.00	100%	94%
Wall Insulation	-	-	-		-
Water Heater Insulation	-	-	-		-
Water Heater Pipe Insulation	0.00	22.37	246.09	100%	109%
Window AC	-	-	-		-
Window Replacement	1.58	1,814.07	36,281.42	100%	100%
Total	18.37	24,152.96	338,719.81	103%	121%

2.11 Ex Post Net Savings for Gas Utilities

The only gas IOU with participating homes during 2015 was CenterPoint. presents the savings results of the evaluation of the 2015 AWP for CenterPoint and for non-IOU sources. Table 2-19 summarizes the *ex post* net savings and net realization rate by measure for CenterPoint.

Table 2-18 Ex Post Net Savings by Gas Utility

Gas Utility	*# of Homes*	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*
AOG	0	-	-	-
CenterPoint	76	554.85	21,461.16	283,903.33
Black Hills	0	-	-	-
Non-IOU	18	38.82	1,606.89	23,579.04
Total	94	593.67	23,068.05	307,482.37

Table 2-19 Ex Post Net Savings by Measure Type – CenterPoint

Measure	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*	*Therms Realization Rate*	*Peak Therms Realization Rate*
Air Infiltration	444.52	14,721.36	161,935.00	100%	100%
Ceiling Insulation	68.53	3,988.73	79,774.60	102%	102%
Central AC Replacement	-	-	-		-
Direct Vent Heater	15.94	1,047.07	12,950.95	163%	163%
Duct Sealing Installation	-	-	-		-
Floor Insulation	(0.09)	8.73	174.56	100%	-
Gas Central Replacement	9.36	603.44	11,321.70	107%	108%
Heat Pump Replacement	-	-	-		-
Refrigerator Replacement	-	-	-		-
Residential Lighting	-	(0.28)	(2.13)	230%	-
Smart Thermostat	-	397.11	4,368.21	175%	-
Storm Windows	0.90	26.30	526.00	100%	146%
Wall Insulation	-	194.52	3,890.50	107%	0%
Water Heater Insulation	0.03	18.64	242.32	100%	100%
Water Heater Pipe Insulation	0.11	55.59	722.63	100%	102%
Window AC	-	-	-		-
Window Replacement	15.54	399.95	7,999.00	100%	100%
Total	554.85	21,461.16	283,903.33	104%	101%

presents the *ex post* net gas savings that were not associated with any AWP IOU. The "Non-IOU" *ex post* savings may represent propane customers or other types of customers that do not receive gas service from an IOU.

Table 2-20 Ex Post Net Savings by Measure Type – Non-IOU (Gas)

Measure	*Peak Demand Savings (Therms)*	*Annual Savings (Therms)*	*Lifetime Savings (Therms)*	*Therms Realization Rate*	*Peak Therms Realization Rate*
Air Infiltration	25.90	886.93	9,756.19	100%	100%
Ceiling Insulation	9.76	559.80	11,196.05	100%	100%
Central AC Replacement	-	-	-		-
Direct Vent Heater	1.78	114.00	1,727.96	152%	154%
Duct Sealing Installation	-	-	-		-
Floor Insulation	-	-	-		-
Gas Central Replacement	-	-	-		-
Heat Pump Replacement	-	-	-		-
Refrigerator Replacement	-	-	-		-
Residential Lighting	-	(0.03)	(0.22)	233%	-
Smart Thermostat	-	-	-	0%	-
Storm Windows	-	2.90	58.00	100%	-
Wall Insulation	-	-	-		-
Water Heater Insulation	-	-	-		-
Water Heater Pipe Insulation	0.01	3.53	45.95	100%	101%
Window AC	-	-	-		-
Window Replacement	1.38	39.76	795.12	100%	100%
Total	38.82	1,606.89	23,579.04	97%	102%

3. Process Evaluation Findings

This chapter presents the key findings from the limited process evaluation that the Evaluators conducted in 2015. This includes a status assessment of recommendations from prior program evaluations and a summary of updates to program operation and delivery. Additionally, the chapter presents findings from in-depth interviews with program staff, provides a review of customer surveys conducted by the participating community action agencies, and addresses the checklist factors for portfolio comprehensiveness.

3.1 Process Evaluation Considerations

The Evaluators conducted a formal process evaluation of the AWP in 2012 and conducted limited process evaluations in 2013 and 2014. These process evaluation efforts resulted in several recommendations and identified program strengths and weaknesses, as well as existing opportunities. TRM V5.0 Protocol C addresses the criteria used to determine the timing and conditions needed for a process evaluation, and the following tables summarize the AWP in the context of these requirements.

Table 3-1 Determining Process Evaluation Timing

Component	*Determination*
New and Innovative Components	No. The overall program design has not been significantly modified in recent years.
No Previous Process Evaluation	No. A full process evaluation was conducted in 2012, and limited process evaluations were conducted in 2011, 2013, and 2014.
New Vendor or Contractor	Yes. The program continued to be funded by the Arkansas IOUs and implemented by the Arkansas community action agencies and their contractor, but the program administrator is now one of the agencies (CADC) rather than ACAAA.

Table 3-2 Determining Process Evaluation Conditions

Component	*Determination*
Are program impacts lower or slower than expected?	Yes. Program activity has decreased over time and the program did not meet its savings goals for any of the IOUs in 2015.
Are the educational or informational goals not meeting program goals?	No. Program awareness is sufficient and participants have reported substantial increases in energy efficiency and home maintenance awareness.
Are the participation rates lower or slower than expected?	Yes. Program activity has decreased over time, and the program did not meet its savings goals for any of the IOUs in 2015.
Are the program's operational or management structure slow to get up and running or not meeting program administrative needs?	Yes. The community action agencies have struggled to expend utility funds towards weatherization projects.
Is the program's cost-effectiveness less than expected?	Cost-effectiveness scores for the program vary significantly by IOU.
Do participants report problems with the programs or low rates of satisfaction?	No. Participants in past years reported very high levels of satisfaction with their participation and with the quality of work performed.
Is the program producing the intended market effects?	Possibly. Overall weatherization activity, including development of additional weatherization programs, has increased since the initiation of the AWP, although attribution to the AWP has not been formally established.

As 2015 marks the final year of operation for the AWP before the IOUs begin implementing weatherization services under the Consistent Weatherization Approach framework, a full process evaluation is not needed. Instead, the Evaluators conducted a limited process evaluation focusing on the program's response to prior recommendations, current participant feedback and satisfaction, and identifying issues that may be relevant to the agencies or IOUs moving forward.

In order to address these areas, the Evaluators conducted the following research tasks:

- Tracking database and documentation review;
- Interviews with program staff; and
- Participant surveys.

Additionally, the Evaluators gained insight into savings performance through the impact evaluation. Results from the TRM verification provided insight into *ex ante* vs. *ex post* savings discrepancies and overall measure savings estimates.

below summarizes the survey and interview data collection for the process evaluation activities, including data collection type, number of respondents, and additional details. The Evaluators invited staff from each of the seven sponsoring IOUs to participate in in-depth interviews for the 2015 program evaluation. This request was ultimately accepted by staff representing four of the IOUs. Additionally the Evaluators discussed the

program with CADC staff during the 2015 program year, but CADC did not respond to requests for a formal in-depth interview.

Table 3-3 Interview and Survey Data Collection Summary

Component	*Activity*	*N*	*Details*
AOG Program Manager and Staff	Interview	1	The program manager and operational staff are responsible for managing reimbursements to local agencies, planning for overall program activity and savings expectations, and communicating with agency and ACAAA staff as necessary throughout the program year.
OG&E Program Manager and Staff	Interview	1	
SWEPCO Program Manager	Interview	1	
EAI Program Manager	Interview	1	
CADC Staff	Mid-year Discussion	1	CADC serves as the lead community action agency and coordinates program implementation, quality assurance, and data reporting processes.
Participating Customers	Surveys	24	Participating residential utility customers received weatherization services through the program in 2015.

3.2 Response to Program Recommendations

Table 3-4 summarizes the status of issues and recommendations identified in the 2014 process evaluation and impact evaluation of the Arkansas Weatherization Program. Some issues such as tracking data errors have been addressed, but several of the issues have persisted through the 2015 program year.

Table 3-4 Status of Recommendations from 2014 Program Year

Issue	***Consequences***	***Recommendation***	***Program Response***	***Status of Issue***
Many AWP operational and performance issues are related to WAP operations and WAP requirements for community action agencies.	Restricts agency participation in AWP May create inconsistencies in data collection, leading to potential errors for the AWP	CADC should continue to make efforts to work with the AEO in developing a mutually beneficial working relationship, and maintain consistency between the two programs where feasible.	There does not appear to have been an improvement in agency activity or improved cooperation between WAP and AWP mechanisms.	Persists
There were minor tracking data errors such as missing *ex ante* savings, calculation errors, and other missing fields in some cases.	Potentially lost savings Skewed measure-level realization rates	Resolve these tracking data issues for the 2015 program year.	Most tracking issues have been resolved, only minor issues remain	Resolved
Some utilities provide or link to program documents that are out-of-date. Most of the participating agencies do not discuss the AWP on their websites, and frame weatherization as an income-qualified service.	Customers may gain inaccurate information regarding service providers and other details. May reduce program interest from private co-pay customers.	The utilities should review their website materials and provide links to updated program documentation if possible. The agencies should provide information regarding the AWP on their websites, and explain that the program does not have an income level requirement.	No longer relevant for most utilities, and AWP marketing has ceased due to program ending after 2015.	Reviewed and Rejected/No Longer Applicable
Some data are not available due to being only in hardcopy form or decentralized from the CADC.	Potential lost data Potential delays in data transfer if additional data are needed	Agencies should maintain electronic records of all collected audit, implementation, and verification data.	Sufficient electronic data exist to satisfy TRM requirements, but some data remain in hard copy only	Partially Addressed

Issue	*Consequences*	*Recommendation*	*Program Response*	*Status of Issue*
Periodic program activity updates to the utilities do not include measure level cost data or measure counts.	Limits utility ability to plan for annual reporting Limits utility awareness of program performance	Include more details in the periodic reports that are sent to utilities, including measure counts/descriptions, customer names, etc.	The level of detail in monthly and quarterly reports to the utilities from CADC and other agencies has not increased. Measure counts and specific participant information have not been included.	Persists
The reported air infiltration leakage rates appear skewed downward, based on the Evaluators' site visits.	Possible issues with measure implementation or data collection Possible discrepancies between implementation and verification that will lead to skewed realization rates.	1: Include itemized air infiltration measures in the tracking data so that the Evaluators are able to verify individual measure elements 2: Include any field notes related to the blower door test in the tracking data so that the Evaluators may more accurately recreate the testing conditions 3: Discuss air infiltration testing procedures with the Evaluators in order to ensure that the testing methodologies are consistent among agencies, their contractors, and the Evaluators.	There has been no change in the level of detail of air infiltration measures, and no clarification of methodologies	Persists

3.3 Program Structure Overview

Program design and structure in 2015 remained fairly consistent with the 2014 program year. The following provides a review of program design characteristics and operational procedures, noting any specific updates for 2015.

The primary change for the 2015 program year was that administration of the program, including coordination of implementation activity and allocation of funding to participating agencies, transitioned to the Central Arkansas Development Council (CADC) from the Arkansas Community Action Agencies Association (ACAAA). As CADC had already been closely involved in program implementation and coordination of agencies in prior years, the effects of this transition were fairly minimal.

In 2015, the Arkansas Weatherization Program (AWP) provided residential energy audits and energy efficiency measure installations to homes whose residents are customers of one or more of the following investor owned utilities (IOUs):

- American Electric Power – Southwestern Electric Power Company (AEP-SWEPCO);
- Entergy Arkansas, Inc. (EAI); and
- CenterPoint Energy (CenterPoint).

The following IOUs are sponsoring utilities for the AWP and have achieved savings through the program in past years but did not have any customers participate in the program during 2015:

- Empire District Electric Company (EDEC).
- Oklahoma Gas and Electric (OG&E);
- Black Hills Energy; and
- Arkansas Oklahoma Gas Corporation (AOG).

The program is offered in conjunction with the Department of Energy (DOE) Weatherization Assistance Program (WAP), which provides federal assistance to fund the customer co-payment in the AWP for income-qualified households. In Arkansas, the WAP is administered by the Arkansas Energy Office (AEO). If the customer meets the eligibility requirements of the WAP, the weatherization project can be funded by both the WAP and the AWP in order to fully cover the project cost and eliminate the cost to the customer.[14] Customers who are not eligible for the WAP are required to provide

[14] Eligibility for the Weatherization Assistance Program (WAP) is based on income thresholds, which increase with the number of residents in the home. A description of the WAP, along with the associated income requirements, can be found here: http://www.benefits.gov/benefits/benefit-details/1843.

their own co-pay in order to participate in the AWP and receive the audit and associated measures.

Rather than an income requirement, eligibility for the AWP is based on a set of criteria regarding customer residence energy efficiency. In order to qualify, customer homes must meet specific criteria indicating that the residence is severely energy-inefficient. There were no modifications to these criteria for the 2015 program year.

Local community action agencies work with customers to enroll in the program and determine AWP and WAP eligibility. In 2015, qualifying AWP projects were completed by the following agencies:

- Central Arkansas Development Council (CADC);
- Crowley's Ridge Development Council (CRDC); and
- Pine Bluff Jefferson County Economic Opportunities Commission, Inc. (PBJCEOC).

After the customer is approved and the in-home audit is performed, optimal energy efficiency measures for AWP (and WAP, for eligible customers) are identified through the use of National Energy Audit Tool (NEAT) or Mobile Home Energy Audit (MHEA) software. The measures implemented in participating homes during 2015 include:

- Ceiling, floor and wall insulation;
- Air infiltration reduction;
- Window replacement and storm window installation;
- Heating and air conditioning replacement;
- Water heater insulation jackets and pipe wrap;
- Refrigerator replacement;
- CFL retrofits; and
- Smart thermostats.[15]

The local agencies conduct onsite audits and install the necessary measures using their internal crews or subcontractors. Audit and installation crews record all relevant measure input data and report it to the Central Arkansas Development Council (CADC), who aggregates the information from each agency. Batches of data are then sent to Frontier Associates, the program database provider that manages the EnerTrek software tool. EnerTrek incorporates the onsite data into TRM savings formulas (and

[15] A complete list of all eligible program measures can be found in ACAAA Docket no. 07-079-TF, Attachment A (AWP Modified Program Design and Description).

NEAT/MHEA values for measures not included in the TRM) to calculate *ex ante* savings for each measure. The resulting savings are made accessible to program utilities and EM&V contractors, who use EnerTrek database exports to conduct measure implementation and savings verification activities.

Table 3-5 identifies core program stages and includes key activities performed throughout the program process. The activities and stages shown for 2015 are fairly consistent with those of 2014 and prior years, with modifications to include additional details and clarifications regarding program procedures, and to reflect CADC's role as the program administrator.

Table 3-5 Key Activities and Program Stages, 2015 Program Year

Program Stage	*Key Activities*
Program Design Planning	• Utilities set budgets and savings goals for the program year. • Frontier Associates and the participating agencies make any necessary modifications to data collection procedures or program delivery based on TRM changes or other program design changes. • Agencies plan their program activity based on expected WAP funding levels and planned AWP funding.
Training and Implementation Planning	• Community action agencies, contractors, and other program operations staff attend program-relevant training sessions (primarily for new contractor staff) • CADC and local agencies discuss implementation and program updates (primarily to comply with TRM changes).
Program Promotion	• Agencies market the program to local customers who may provide a private co-pay. • Agencies enroll customers from the WAP wait list. • Utilities answer customer inquiries about the AWP or refer customers to their respective agencies.
Program Participation	• Customers apply for the AWP and home eligibility is determined. • WAP eligibility is determined. • Participants receive in-home audits and measures are identified.
	• Contractors install measures that are either stipulated based on NEAT or MHEA software or are agreed upon with the customer (depending on whether or not WAP funds are used for the co-pay).
Data Processing and Monitoring	• Measure costs and participant tracking data are collected by each agency and reported to CADC. • CADC provides periodic cost and participation updates to the utilities. • Frontier Associates receives implementation data from CADC and calculates *ex ante* savings • Frontier Associates sends savings data in batches to the utilities. • Utilities, CADC, and Frontier Associates have periodic discussions regarding program participation levels and other topics.

Starting in 2016, the Arkansas IOUs will be implementing individual and joint weatherization programs that comply with the Consistent Weatherization Approach developed by the Arkansas Parties Working Collaboratively (PWC). The Consistent Weatherization Approach will replace the AWP as the statewide weatherization offering

implemented by the Arkansas IOUs, and thus the 2015 program year marks the final year of operation for the AWP.

3.4 Arkansas Weatherization Program 2015 Participation

In 2015, the Arkansas Weatherization Program conducted energy audits and installed measures in 94 homes. This is a substantial reduction in participation from each of the prior program years (168 homes serviced in 2014, 291 in 2013, 641 in 2012, and 810 in 2011).

displays total participation disaggregated by the community action agency associated with the participant. As with prior years, CADC was the most active agency within the program, completing 73% of projects (CADC completed 76% of AWP projects during the 2014 program year).

Table 3-6 Total Participation by Community Action Agency

Agency Name	*Percentage of Participating Homes*
Central Arkansas Development Council (CADC)	73%
Crowley's Ridge Development Council (CRDC)	11%
Pine Bluff-Jefferson County Economic Opportunities Commission (PBJCEOC)	16%
N	94

The AWP is offered in all investor-owned utility service territories and is funded by participating gas utilities and electric utilities throughout Arkansas. Depending on the location of customers and the fuel sources used in their homes, services for each customer are funded by one gas utility, one electric utility, or both a gas and an electric utility. EAI and SWEPCO were the only electric IOUs with participating homes during 2015, and CenterPoint was the only gas IOU with participating homes. cross-tabulates participation by the gas and/or electric utility associated with the participant. “N/A” represents projects performed in homes with only one utility source or with a utility service provider that is not part of the AWP.

Table 3-7 Participation by Associated Utility, 2015

Electric Utility	Gas Utility	
	CenterPoint	*N/A*
EAI	54	14
SWEPCO	9	4
N/A	13	-

displays a comparison between 2015 and 2013 in terms of participation rates by month, based on the installation date included in program tracking data.[16] The number of

[16] The installation date was not listed for three participants.

weatherization projects per month in 2015 was lower than 2014 for all months other than February and December. The most active month of 2015 was February, with 16 participants.

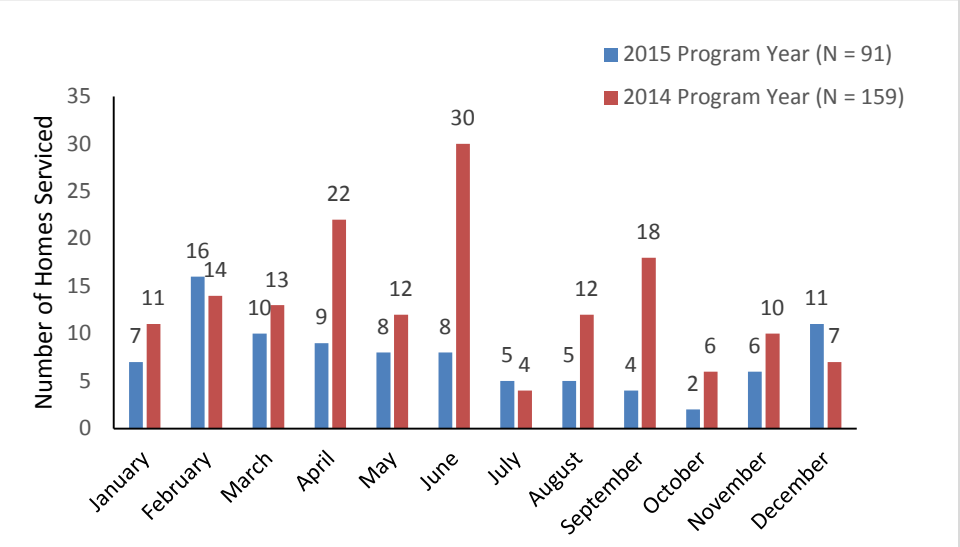

Figure 3-1 Participation Rates by Month, 2015 vs. 2014

3.5 Participant Survey Results

This section highlights key findings from participant surveys for the 2015 program year of the Arkansas Weatherization Program (AWP). The surveys were administered individually to program participants over the phone, and each program participant was given the same survey. The survey primarily focused on participants' satisfaction with the program and the perceived benefits of participating. A similar participant survey was administered as part of the 2012 AWP evaluation, and these results from 2015 may be used to compare participant satisfaction with the program over time. In total, 24 program participants responded to the survey.

The data collected from this survey provides insight into participants' overall program experience, specifically addressing:

- Customer motivations and awareness of the program;
- Customer familiarity with energy efficiency;
- Customer satisfaction; and
- Customer characteristics.

This section highlights key findings related to the above categories, and draws comparisons between the results from the 2012 program evaluation and the current evaluation where appropriate.

3.5.1 Participant Removal of Measures

In order to assess whether the measures reported in program tracking data were still installed at the time of the survey, respondents were asked whether they had removed or replaced any of the equipment or energy efficiency improvements that had been installed through the program. Only one respondent initially indicated that they had removed a measure, stating that they had replaced their new windows with old windows. However, the Evaluators conducted a follow up call with this respondent and found that this had been a miscommunicated response and that the customer had not actually removed any of their measures. Thus, the survey found a measure removal rate of 0% among the participant survey sample.

3.5.2 Participant Motivations and Familiarity with Energy Efficiency

This section details findings related to how participants learned about the Arkansas Weatherization Program and discovering the extent of their prior experience with energy efficiency practices. illustrates that the majority of participants (54%) heard about the program from friends, family, or other personal acquaintances. This was also the top result for this question during the 2012 evaluation, and suggests that the program has continued to receive positive word-of-mouth marketing within the customer base. Only three respondents (13%) stated that they learned of the program through their local agency, and only two respondents indicated learning of the program online.

Table 3-8 How Participants Learned of the Program

	Response	*Percentage of Respondents (N = 24)*
How did you learn of the Arkansas Weatherization Program?	Information that came in the mail	8%
	Newspaper or magazine article/ad	4%
	Contractor	0%
	Word of mouth from friends, relatives, or others	54%
	TV ad	0%
	Radio ad	0%
	Utility bill message	0%
	Utility website	8%
	Other website	0%
	Local community action agency	13%
	Other	13%
	Don't know	4%

Respondents were able to provide more than one response for this question. Percentages displayed are percentages of respondents rather than percentages of responses. Therefore, the total exceeds 100%.

Participants were then asked about their reasons for participating, and the results are shown in . Although respondents were provided with a list of response options, the

majority of respondents selected the option of "Other" and provided an open-ended response indicating that they participated in the program because their home needed specific improvements. These improvements included insulation, making the house warmer, replacing the air conditioning unit, and reducing air leakage. Among the remaining listed response options, respondents most commonly selected "to reduce my monthly electric bill" or "to reduce my monthly gas bill". Reduction of utility bills was the most common reason for participating found during the 2012 evaluation.

Table 3-9 Reasons for Participation

	Response	*Percentage of Respondents (N = 24)*
What is the main reason you decided to participate in the program?	To reduce my monthly electric bill	17%
	To reduce my monthly gas bill	21%
	Save energy	13%
	AWP paid for some or all of the improvements	13%
	Recommendation from a friend, relative, neighbor	8%
	[The house needed specific improvements]	54%
	Help save the environment	0%
	Contractor recommendation	0%
	Community Action Agency Recommended	0%
	Other	8%
	It is the right thing to do	0%

Respondents were able to provide more than one response for this question. Percentages displayed are percentages of respondents rather than percentages of responses. Therefore, the total exceeds 100%.

In order to further understand participants' reasons for participating in the AWP, the survey asked a series of questions relating to their understanding of the concept of energy efficiency prior to participation in the program. For these questions, participants responded on a scale of 1 to 5, where "5" is very familiar, "1" is very unfamiliar, and "3" is neutral, i.e. neither familiar or unfamiliar.

The findings suggest that the majority of participants consider themselves to have had some familiarity with energy efficiency prior to the start of the program. shows that the majority of respondents (63%) stated that they were at least somewhat familiar with the installation of various energy efficiency home improvements while shows that three-quarters of respondents considered themselves to be at least somewhat familiar with various household energy saving activities, such as washing clothes with cold water, changing light bulbs, and adjusting heating systems. These results are similar to those

found during the 2012 evaluation.[17] As with the 2012 program year, a greater percentage of respondents reported being familiar with energy saving activities rather than energy saving purchases, which may suggest that these customers are more likely to take no-cost or low-cost actions when attempting to reduce their energy consumption.

Table 3-10 Participants' Past Familiarity with Energy Efficiency Improvements

	Response	*Percentage of Respondents (N = 24)*
Prior to the audit, how familiar were you with the benefits of installing various energy efficiency improvements similar to those offered by the Arkansas Weatherization Program?	Very Familiar	21%
	Somewhat Familiar	42%
	Neither Familiar or Unfamiliar	0%
	Somewhat Unfamiliar	12%
	Very Unfamiliar	17%
	Don't Know	8%

Table 3-11 Participants' Familiarity with Energy Savings Activities

	Response	*Percentage of Respondents (N = 24)*
Prior to the audit, how familiar were you with various household energy saving *activities* such as washing with cold water, reducing your use of light fixtures, and adjusting heating system settings?	Very Familiar	33%
	Somewhat Familiar	42%
	Neither Familiar or Unfamiliar	0%
	Somewhat Unfamiliar	17%
	Very Unfamiliar	0%
	Don't Know	8%

Following this, respondents were asked whether they are now more knowledgeable about energy efficiency than they were before participating in the program. As shown in , approximately two-thirds (67%) of respondents indicated that they are now much more knowledgeable than they were before participating in the program. Only two respondents (8%) stated that they are no more knowledgeable about energy efficiency and energy efficient options than they were previously. These results suggest that although participants considered themselves to be fairly knowledgeable about energy efficiency before participating in the AWP, they also credit the AWP with further increasing this level of knowledge.

Table 3-12 Increase in Energy Efficiency Knowledge Following AWP

As a result of your experience with the AWP, would you say	*Response*	*Percentage of Respondents (N = 24)*

[17] During the 2012 survey, 52% of respondents stated that they were at least somewhat familiar with energy efficiency improvements, and 67% stated that they were at least somewhat familiar with energy saving behaviors.

you are more knowledgeable about energy efficiency and energy efficient options for your home?	Yes, much more knowledgeable than before participating	67%
	Yes, somewhat more knowledgeable than before participating	13%
	Yes, slightly more knowledgeable than before participating	8%
	No, not more knowledgeable than before participating	8%
	Don't Know	4%

3.5.3 Participant Perspectives on Energy Efficiency

Upon establishing a baseline of understanding about participants' familiarity with energy efficiency, the survey asked participants about their previous, current and potential future involvement with implementation of energy efficiency improvements in their homes. shows that 46% of respondents claimed to be performing energy-saving activities, which is a similar percentage to that found during the 2012 evaluation.[18] Respondents who reported that they had previously performed energy saving activities were asked to identify these activities, with common responses including turning off lights, washing with cold water, and turning down the thermostat.

Table 3-13 Participants' Prior Energy Saving Activities

	Response	*Percentage of Respondents (N = 24)*
Prior to the audit, did you perform any common household energy saving activities?	Yes	46%
	No	42%
	Don't Know	12%

Participants were then asked whether they now take additional energy saving actions in their home as a result of participating in the program. As shown in , 88% of program participants stated that they now do this. When asked to elaborate on these activities, participants primarily cited common, no-cost improvements such as washing with cold water, turning down the thermostat, and turning off lights when not in use. The majority of these respondents (53%) reported implementing more than one energy saving action in their home.

Table 3-14 Participants' Current Energy Saving Activities

	Response	*Percentage of Respondents (N = 24)*
As a result of your experience with the program, do you now take additional action to save energy in your home?	Yes	88%
	No	12%
	Don't Know	0%

[18] During the 2012 survey, 54% of respondents indicated that they had performed energy saving activities prior to participating in the program.

3.5.4 Participant Satisfaction

This section presents the findings from survey questions geared toward understanding participants' satisfaction with the program. Participants were asked about various elements of the program's functioning; the results can be found in . These elements include the information provided by the agency, the quality of installation work, the performance of the equipment installed, and the savings on utility bills. The vast majority of responses show that participants were very satisfied. Other than their overall program experience, respondents provided the most ratings of "very satisfied" for their improvement in home comfort.

Table 3-15 Participant Satisfaction with Selected Program Elements

Program Element	*Very satisfied*	*Somewhat satisfied*	*Neither satisfied nor dissatisfied*	*Somewhat dissatisfied*	*Very dissatisfied*	*Don't know*	*N*
Information provided by the community action agency	67%	21%	4%	4%	4%	0%	24
The quality of installation work by the contractor	63%	25%	4%	0%	4%	4%	24
The performance of the equipment installed	79%	13%	0%	0%	4%	4%	24
The savings on your monthly utility bills	67%	17%	8%	4%	0%	4%	24
The effort required for the application process	63%	21%	8%	0%	4%	4%	24
The wait-time to receive services	42%	21%	21%	0%	12%	4%	24
Information provided by utilities on how to reduce your utility bill	63%	25%	8%	0%	4%	0%	24
Improvement in home comfort	83%	13%	0%	4%	0%	0%	24
Usefulness of the energy audit	67%	17%	4%	0%	4%	8%	24
Overall program experience	88%	8%	0%	0%	4%	0%	24

As was the case with the 2012 program evaluation, the program element with the lowest average satisfaction was wait time. The three respondents who indicated that they were either somewhat or very dissatisfied with the wait time explained that they had waited either two or three years to receive services through the AWP. This is consistent with program staff comments during the current and prior evaluations, and suggests that wait times have not improved over the course of the program.

Overall, the results suggest that respondents are highly satisfied with each element of the program experience, with the exception of a few respondents. It should be noted that the majority of “somewhat dissatisfied” and “very dissatisfied” responses were provided by a single respondent, and only three respondents total indicated dissatisfaction with any program elements.

When asked whether they would recommend the AWP to a friend or family member, all but one respondent (96%) stated that they would do this. The respondent who stated that they would not recommend the program did not provide a specific reason for this response other than stating that they “would have to think about it”. This further suggests that participants are highly satisfied with the program overall, and that participant satisfaction levels have been maintained over the course of the program since 2012.

3.5.5 Participant Characteristics

This section presents the results from survey questions intended to provide insight into participant and home characteristics, including the age, square footage, heating type, and water heating type of participating homes. Additionally, respondents were asked about the number of bedrooms, bathrooms, showers, and total residents in their homes.

Table 3-16 Home Construction Dates

	Response	*Percentage of Respondents (N = 24)*
When was your home built?	Before 1970	58%
	1970's	13%
	1980's	13%
	1990-1994	0%
	1995-1999	0%
	2000-2005	0%
	Don't know	16%
	Refused	0%

Table 3-17 Approximate Square Footages of Participant Homes

	Response	*Percentage of Respondents (N = 24)*
What is the approximate square footage of your home?	Less than 1,000	17%
	1,001 - 1,500	17%
	1,501 - 2,000	4%
	2,001 - 2,500	4%
	Greater than 2,500	4%
	Don't know	50%
	Refused	4%

Table 3-18 Number of Bedrooms in Participant Homes

	Response	*Percentage of Respondents (N = 24)*
How many bedrooms are there in your home?	1	4%
	2	50%
	3	38%
	4	8%
	Don't Know/Refused to Answer	0%

Table 3-19 Number of Bathrooms in Participant Homes

	Response	*Percentage of Respondents (N = 24)*
How many bathrooms are there in your home?	1	75%
	2	25%
	3	0%
	Don't Know/Refused	0%

Table 3-20 Number of Showers in Participant Homes

	Response	*Percentage of Respondents (N = 24)*
How many showers are there in your home?	0	4%
	1	75%
	2	21%
	3	0%
	Don't Know/Refused	0%

Table 3-21 Number of Residents in Home Year-Round

	Response	*Percentage of Respondents (N = 24)*
How many people live in your home year round, including yourself?	1	59%
	2	29%
	3	4%
	4	8%
	5	0%
	7	0%
	Don't Know/Refused	0%

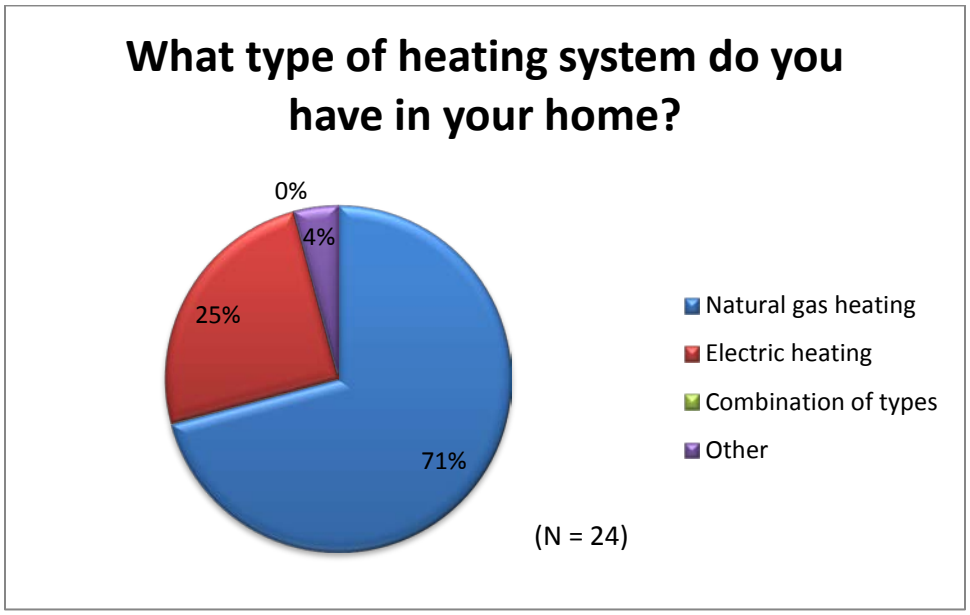

Figure 3-2 Types of Heating Systems in Participant Homes

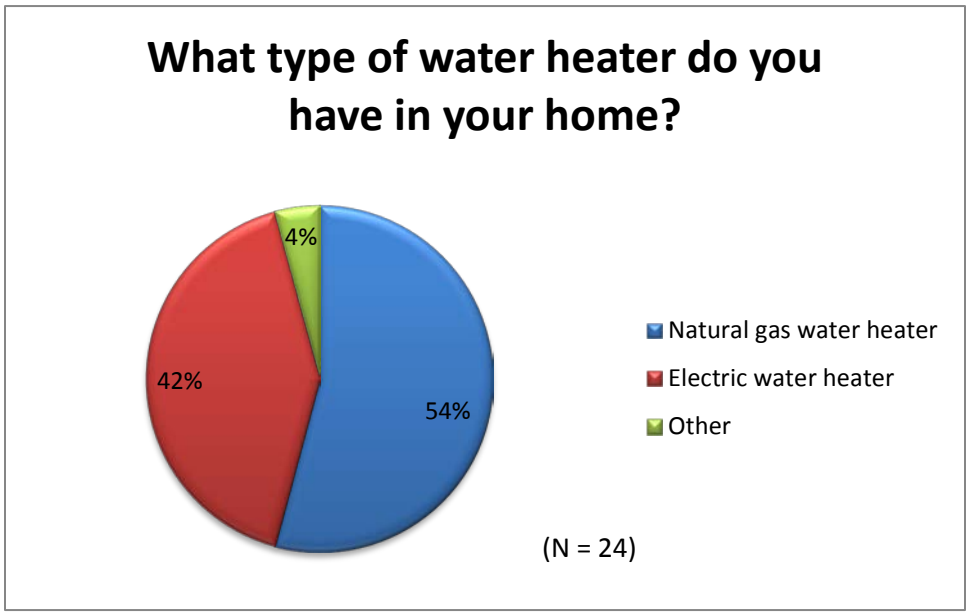

Figure 3-3 Types of Water Heaters in Participant Homes

3.6 Program Staff Interviews

As part of the evaluation of the 2015 Arkansas Weatherization Program, the Evaluators conducted in-depth interviews with utility staff representing four of the participating IOUs. These interviews primarily served to assess the status of previous evaluation conclusions and recommendations, as well as to identify notable changes in program operation, delivery, and performance. As 2015 marks the final year of AWP operation before the Arkansas IOUs implement weatherization services as part of the Consistent Weatherization Approach framework, the interviews did not focus on further changes to the AWP but program staff provided feedback on the upcoming core framework.

This section presents key findings and issues identified through these interviews and through mid-year discussions with CADC staff.

3.6.1 Program Efficiency and Performance

Minimal Effects from CADC Transition: When asked about the transition from ACAAA to CADC as the program administrator, utility staff explained that the effects of this change have been minimal. One staff member noted that from their perspective, nothing about the operational structure had changed during the 2015 program year. Staff generally did not have much feedback regarding CADC's performance as the program administrator, but noted that CADC had continued to be the most active agency in performing weatherization for the program during 2015.

Continued Prioritization of WAP Funding: As with prior years staff acknowledged the challenges that have emerged and persisted due to the AWP's relationship with the Weatherization Assistance Program (WAP). The Arkansas Energy Office (AEO), which administers the WAP, has directed the agencies to follow a specific set of rules in order to comply with WAP procedures. The participating agencies have continually been directed to prioritize LIHEAP funding over AWP funding when implementing weatherization projects; remaining LIHEAP funds were set to expire on September 30th, 2015. This has continued to work as a barrier to the AWP and was not resolved during 2015.

Advancing Funds to the Agencies: CADC noted that some agencies have been unable to complete jobs through the AWP because they were concerned about being reimbursed for the work performed. As CADC typically provides funds to the agencies after the work is completed, some agencies preferred to conduct work under the WAP only. In order to address this, CADC staff requested that the utilities allow CADC to advance funds to the agencies. The purpose of this would be to provide the agencies with immediate funds that they could use to provide services, without having to rely on reimbursements from either the state or the AWP utilities. The utilities explored this possibility with CADC but ultimately it did not have any significant effects on agencies' ability to complete jobs under the AWP.

Continued Program Decline: When asked about program performance in 2015 as compared with prior years, utility staff emphasized the fact that participation rates have steadily decreased during recent years and that very few significant program improvements had been made over time. Several utility staff members reported that their expectations for AWP performance were low or non-existent for 2015, and at least one utility received commission approval to move its funds away from the program in order to focus its other program offerings. Overall, utility staff noted that they have already shifted their focus to the Consistent Weatherization Approach, and stated that there seemed to be an overall lack of interest in the AWP on the part of program staff for 2015.

3.6.2 Data Quality and Availability

Minor Improvements in Data Accuracy: When asked about the quality of data provided to them in 2015, utility staff noted that the quality had either remained the same as 2014 or had only improved slightly. One utility staff member noted that there appeared to be fewer errors in the data during 2015 but that this could be due to the small participant population, as fewer errors would exist in a smaller data set. The level of detail in periodic reporting from CADC did not increase significantly, but one utility staff member noted that they did receive information about costs and the location of participant homes each month. Additionally, the utilities received periodic batches of *ex ante* measure-level savings data from Frontier throughout the year. Overall fewer data revisions and error corrections occurred during the 2015 program year.

3.6.3 Communication and Collaborative Efforts

Agency Roles in Upcoming Programs: Utility staff noted that as the Consistent Weatherization Approach framework allows the utilities to use community action agencies as audit and installation contractors, they may continue to work with the agencies moving forward. Two utility staff members explained that they have already begun recruiting the agencies into their weatherization programs. One staff member stated that they have reached out to six agencies and that one of the agencies has expressed interest in participating, while the other has had two agencies (Crawford Sebastian and CADC) attend their contractor kick-off meeting.

Consistent Weatherization Approach Development: When asked about communications surrounding the Consistent Weatherization Approach, utility staff stated that this process has been beneficial and that it has provided a mechanism by which the utilities are able to corroborate. Staff noted that the development of the Consistent Weatherization Approach framework has resulted in additional joint program partnerships and will hopefully lead to a more coordinated approach to weatherization.

3.7 Tracking Database Review

As with prior years, Frontier Associates develops and maintains EnerTrek, the software tool that is used to store participant data and to calculate measure level savings based on collected inputs and TRM formulas. EnerTrek includes a full list of all participants, the measures that were installed in their homes, and the kWh and Therms savings associated with each measure.

During the 2015 program year, the Evaluators received periodic tracking data updates as well as final tracking exports.

The Evaluators previously reviewed program tracking data in 2014 in order to assess its compliance with Protocol A of TRM V5.0, which specifies that tracking data should be checked for:

- Participating Customer Information;
- Measure Specific Information;
- Vendor Specific Information;
- Program Tracking Information;
- Program Costs; and
- Marketing & Outreach Activities.

The Evaluators conducted a review of each of the above factors within the 2015 program tracking data with the exception of marketing and outreach activities as these are outside the scope of EnerTrek reporting.

Each of these factors was assessed individually based on the guidelines stated in TRM V5.0. Overall, the Evaluators conclude the following regarding tracking data completeness:

- The tracking data contained names, addresses, and contact information for all participants, and contained contact information for all but one participant. All participants were listed with a Job ID number. Additional participant information present in the tracking data included gas and electric utility provider designations and utility account numbers.
- All participant records included the name of the agency that implemented the weatherization services, and all but three records included the date of measure installation.
- The tracking data included project level costs for each home. The exports received by the Evaluators did not include measure-level costs.
- Premise characteristics such as home heating type, cooling type, construction date, baseline measurements, and attic square footage were present for all participants where necessary.

3.8 Comprehensiveness Factors

The Arkansas Public Service Commission has in place a set of criteria in order to determine whether a DSM portfolio qualifies as "Comprehensive". This section provides updates to the review of the Arkansas Weatherization Program that was conducted by the Evaluators in prior years in relation to each factor.

As the AWP is one component of the larger utility energy efficiency program portfolios, a broader perspective is necessary in order to determine how well it is serving its intended role in those groups of programs. Utility annual reports and portfolio evaluations may present the AWP within the context of these broader energy efficiency portfolios. This section focuses on the comprehensiveness factors as they relate to the AWP on the program-level.

Additionally, as there were few changes to program design and operation during the 2015 program year, this review uses the prior comprehensiveness findings as a baseline and provides updates where appropriate.

- ***Factor 1:*** *Whether the programs and/or portfolio provide, either directly or through identification and coordination, the education,* ***training****, marketing, or outreach needed to address market barriers to the adoption of cost-effective energy efficiency measures;*
    - **Assessment of Education**
      The AWP has continued to implement educational efforts towards its prospective participants and other customers, although these efforts declined substantially during 2015. Educational efforts offered by the program have included:
        - Providing educational materials (energy audit, brochures, demonstrations)
        - Providing education targeted to specific market barriers (emphasizing increased comfort and safety levels as a benefit of energy efficiency)

      The program did not excel in the following components:
        - Providing outreach through multiple channels. A few agencies continued to promote the program but overall outreach declined substantially during 2015.
        - Providing coordinated education from multiple entities. Each agency and some utilities provide this, but based on interviews with agency and utility staff, the coordination could be improved substantially. Lack of coordination during 2015 is most likely attributable to the fact that several of the IOUs and agencies did not focus on the AWP as a major method of achieving energy savings.

- **Assessment of Training**
  The active community action agencies have continued to participate in multiple training courses throughout the year. This includes training related to program updates and data requirements, as well as training that leads to residential audit and installation certifications. These courses maintain contractor skill levels and ensure that agency services comply with up-to-date audit and installation requirements. However, due to issues identified during the on-site verifications, it appears that there are significant opportunities to train some staff members on proper installation techniques and proper materials to use when performing this work.

- **Marketing and Outreach**
  Marketing for the program during 2015 was very minimal. Due to continual waiting list issues and the program ending after 2015, marketing was not a priority for the program and increased marketing may not have improved program performance.

  The program therefore did not excel in the following criteria:

  - Performed through several channels. Overall outreach declined substantially during 2015.
  - Promoted by trade allies (agencies and their contractors). Program promotion was minimal during 2015, with most agencies prioritizing the WAP over the AWP.
  - Address specific barriers. One major barrier to AWP participation has been that customers who are able to provide their own co-payment do not commonly participate. With minimal outreach conducted, this barrier persisted throughout 2015.

- ***Factor 2:*** *Budgetary, Management, and Program Delivery Resources*
  Although utility budget allocations to the AWP have historically been sufficient to fund the targeted number of homes, the AWP has continually experienced challenges in meeting program goals due to organizational and program delivery issues.
  As utilities began shifting their funds away from the AWP, the program was left with fewer operational resources. Additionally, funding issues within the WAP have constrained the AWP's participation potential and effectively reduced program resources.

- ***Factor 3:*** *Addressing Major End-Uses*

  The measure list available to the AWP did not change in 2015. The AWP offers a wide range of measures, which are chosen based on cost-effectiveness testing through NEAT and MHEA. The list of eligible program measures covers all major end-uses for targeted customer homes, including:

- HVAC systems;
- Equipment tune-ups;
- Hot water measures;
- Appliances (refrigerators);
- Safety measures (smoke detectors);
- Lighting; and
- Building envelope measures.[19]

The "whole house" approach to participant home improvements is conducive to providing a comprehensive set of measures in each home.

- ***Factor 4:*** *Comprehensively Addressing Customer Needs*

  The AWP is designed to comprehensively address the major needs of its participants by providing the following benefits:

  - Technical assistance through in-home audits;
  - Energy and monthly bill savings through measure installation; and
  - Increased comfort and/or safety for participants.

  Although the AWP is able to provide these benefits to customers who participate in the program, there remain a large number of utility customers who are in need of such services but whose participation has been delayed due to the program's operational issues.

  Participants who provide their own private co-pay for the audit and energy efficiency measures may choose to receive a less comprehensive set of services as they are allowed to select individual measures. These participants are encouraged to install the full set of recommended items, but comprehensiveness within measure installation is not required by the program in these cases.

- ***Factor 5:*** *Targeting Market Sectors & Leveraging Opportunities*

  The AWP focuses on a specific market of utility residential customers whose homes are severely energy inefficient. The AWP also involves utility partnerships and is intended to provide cross-fuel coordination rather than focusing only on gas or electric savings in isolation. This program is intended to amplify the benefits of the statewide Weatherization Assistance Program (WAP) in order to provide additional services to customers who have substantial weatherization needs. Thus, in theory, the program leverages WAP resources and is delivered through the same channels as the WAP.

[19] A complete list of eligible AWP measures can be found in program filing and planning documentation such as Attachment A, (AWP Modified Program Design and Description), of ACAAA Docket no. 07-079-TF.

- ***Factor 6:*** *Cost-Effectiveness of Energy Efficiency*

  There have been no significant improvements to program cost-effectiveness for 2015. Although the program is designed to cost-effectively generate net savings and meet the stated annual program goals, it has been unable to meet the annual goals thus far. Cost-effectiveness has varied widely among utilities in prior years. The AWP has successfully met industry standards for net-to-gross levels, as the Evaluators have determined that it calls for a net-to-gross ratio of 1. However, in terms of cost-effectiveness and savings goals, the AWP has not excelled.

- ***Factor 7:*** *Adequacy of EM&V Procedures*

  The AWP was reviewed for EM&V procedures in the following areas:

  - QA/QC and EM&V procedures conducted by utility staff;
  - QA/QC and EM&V procedures conducted by installation contractor staff; and
  - QA/QC and EM&V procedures conducted by the Evaluators.

  The onsite QA/QC procedures currently conducted by utility staff and agency staff are adequate in most cases. During onsite field verification visits during 2015, the Evaluators found that the reported installation data was fairly accurate and matched actual observed conditions for the majority of measures, but that there were significant quality of work issues with two homes. It is unclear whether this is an indication of systematic problems, but sufficient training and quality control should have identified or prevented these issues. The issues that were identified during these site visits are detailed in Section 2.6.

  Tracking data errors have been for the most part resolved in 2015, and the current version of the tracking database within EnerTrek contains the necessary information to comply with TRM V4.0 requirements.[20]

The Arkansas Weatherization Program meets several of the comprehensiveness requirements, but the program has struggled to achieve success and was not able to fully resolve any of its major operational issues during the past program cycle or recent bridge years. As previously noted, utility annual reports and other portfolio-level assessments may provide a more comprehensive view of how the AWP fits into the larger context of the sponsoring utilities' energy efficiency program portfolios.

[20] See Section 2.8 of this report for detailed information regarding the program tracking data review.

4. Conclusions and Recommendations

After reviewing the Arkansas Weatherization Program for 2015, the Evaluators highlight the following conclusions:

Minimal Effects from CADC Transition: The transition from ACAAA to CADC as the program administrator does not appear to have mitigated the AWP's operational or performance issues. It appears that CADC made efforts to work with the AEO and increase agency involvement with the program, but any beneficial effects of these efforts were for the most part overshadowed by the program's decreased activity overall.

Quality of Work Issues: The Evaluators visited two participating homes that received weatherization services from PBJCEOC during 2015. The Evaluators identified issues with the quality of work performed, and one of the homeowners indicated that the agency contractors had chipped paint in their home and had not been considerate of the home in general. The Evaluators found that silver bubble wrap had been used as water heater tank insulation in one home and that water heater pipe wrap had been installed incorrectly in both homes. It is unclear whether these quality of work issues are limited to this agency or are indicative of a larger problem, and agency staff responded to the findings indicating that the silver bubble wrap is no longer being used and that the pipe wrap had been installed properly. However it may be beneficial to conduct further training with agency staff in order to ensure that they are complying with industry quality standards, and that they are providing adequate customer service to participants.

Minor Improvements in Data Accuracy: Tracking data errors have been for the most part resolved in 2015, and the current version of the tracking database within EnerTrek contains the necessary information to comply with TRM V4.0 requirements. Overall Frontier Associates has been very responsive to data requests and provided the utilities with fairly accurate batches of data throughout the program year. There were fewer tracking data issues in 2015 as compared to 2014.

Continued WAP Reliance Issues: As with prior years, program staff acknowledged the challenges that have emerged and persisted due to the AWP's relationship with the Weatherization Assistance Program (WAP). Ideally, this arrangement would use utility funds to efficiently leverage federal funding and substantially increase the number of weatherization projects that the agencies are able to perform. However, the AWP's inherent link to the WAP has continued to result in performance issues due to federal funding reductions. Additionally, the participating agencies were directed to prioritize LIHEAP funding over AWP funding when implementing weatherization projects, which is a key barrier to AWP program activity.

Decreasing Program Activity: The number of participants and the resulting savings levels for the AWP have steadily decreased since the 2011 program year. A major

contributing factor to this decline in program activity is likely the fact that the program was winding down in 2015 and the IOUs were already focusing efforts on the Consistent Weatherization Approach. However other issues including variable agency engagement in weatherization services, inconsistent availability of WAP funding, and insufficient interest from private co-pay customers have historically limited the program's performance.

Upcoming Consistent Weatherization Approach: The new weatherization framework developed by the utilities and other stakeholders has established statewide weatherization procedures and services, and will be implemented beginning in 2016. Utility staff reported that they anticipate that this Consistent Weatherization Approach will be a more effective method of meeting the state's weatherization needs. Additionally, utility staff noted that the collaborative relationship among utilities has improved during the development of the new framework and that the core framework will hopefully lead to a more coordinated approach to weatherization in the state.

Although 2015 marks the final year of operation for the AWP as it currently stands, the Evaluators provide the following recommendations that the utilities or agencies may consider when moving forward with weatherization services under the Consistent Weatherization Approach framework:

Mitigate Quality of Work Issues: The quality of work issues identified by the Evaluators during on-site verifications during 2015 suggest that additional verification and training may be needed for contractors in the Pine Bluff region. Overall, the Evaluators suggest that additional quality assurance and training be conducted with any new contractors who are brought onto the IOUs' Consistent Weatherization Approach offerings.

Record and Report Air Infiltration Details: As with prior years, the Evaluators identified discrepancies between reported air infiltration leakage rates and verified air infiltration leakage rates. Although only nine homes received blower door testing as part of the 2015 evaluation, the majority of these homes showed verified infiltration rates that were higher than reported infiltration rates. Moving forward, the Evaluators recommend that the IOUs and contractors collect and report the itemized air infiltration measures that are installed. As it is very difficult to reliably replicate blower door results during a site visit, having this additional information will allow program staff or their EM&V contractors to verify that the work was performed properly.

Table 4-1 Recommendations from 2015 Program Year Evaluation

Issue	Consequences	Recommendation
The Evaluators identified significant issues with the quality of work in two homes during the on-site verification efforts	Some measures were not eligible for savings Negatively affects customer satisfaction	Contractors joining Consistent Weatherization Approach offerings, namely in the Pine Bluff area, should receive additional training and undergo quality control procedures that ensure sufficient customer service and installation of measures.
The reported air infiltration leakage rates appear skewed downward, based on the Evaluators' site visits.	Possible issues with measure implementation or data collection Possible discrepancies between implementation and verification that will lead to skewed realization rates.	Record and report itemized air infiltration measures in the tracking data so that it is possible to verify individual measure elements. Also, Include any field notes related to the blower door test in the tracking data so that testing conditions can be more accurately replicated.

Appendix A: Participant Survey Instrument

Arkansas Weatherization Program

Participant Telephone Survey

ID No. _____

Customer Name: _____

Date of interview: _____

Date data entered _____

.....

Hello. May I please speak with [CONTACT NAME]: _____)?

Hello. My name is ____ and I'm calling from [Surveying Company Name] on behalf of the Arkansas gas and electric utilities about the Arkansas Weatherization Program your household participated in during 2015. Through this program your home received items such as attic insulation, air sealing, light bulbs, and other energy saving measures. Are you the person who is most familiar with your household's participation in this program?
(IF NOT RIGHT PERSON) May I please speak to the person who would know the most about your household's participation in this program?
REPEAT INTRODUCTION AND CONTINUE
(IF RIGHT PERSON) We are conducting a study to evaluate the Arkansas Weatherization Program, known as the AWP. AWP and community agency staff will use the results of this evaluation to determine the effectiveness of the program and to make improvements. We would like to include your opinions about the program in our evaluation. The interview will take approximately 10 minutes. May I ask you some questions about the work performed? Your responses will remain completely confidential.

Q-1 Our records indicate that you participated in the Arkansas Weatherization Program in 2015 by having an energy audit completed and receiving several energy efficient items installed in your home. Do you recall participating in this program?

- ❑ Yes [SKIP TO Q-4]
- ❑ No [GO TO Q-2]
- ❑ Don't know [GO TO Q-2]

Q-2 Is there anyone else in your household who may be familiar with your household's participation in the program?

- ❑ Yes [GO TO Q-3]
- ❑ No [THANK RESPONDENT AND TERMINATE INTERVIEW]
- ❑ Don't know [THANK RESPONDENT AND TERMINATE INTERVIEW]

Q-3 May I speak with that person?

- ❑ Yes [RETURN TO Q-1 AND BEGIN QUESTIONS WITH NEW RESPONDENT]
- ❑ No [THANK RESPONDENT AND TERMINATE INTERVIEW]
- ❑ Don't know [THANK RESPONDENT AND TERMINATE INTERVIEW]

RESPONDENT BACKGROUND

As a reminder, your responses to this survey will be kept completely confidential. I'll begin with a few questions about your decision to participate in the program.

Q-4 How did you learn of the Arkansas Weatherization Program? [SELECT ALL THAT APPLY]

- ❑ Information that came in the mail
- ❑ Newspaper or magazine article/ad
- ❑ Contractor
- ❑ Word of mouth from friends, relatives, or others
- ❑ TV ad
- ❑ Radio ad
- ❑ Utility bill message
- ❑ Utility website
- ❑ Other website
- ❑ Local community action agency
- ❑ Other (*Specify*) _____
- ❑ Don't know [DO NOT READ]

Q-5 What is the main reason you decided to participate in the program? [SELECT ALL THAT APPLY]

- ❑ To reduce my monthly gas bill
- ❑ To reduce my monthly electric bill
- ❑ The AWP paid for some or all of the improvements
- ❑ Contractor recommendation
- ❑ Utility recommendation or information *(Specify which utility)* _____
- ❑ Recommendation from a friend, relative, neighbor
- ❑ Community action agency recommendation
- ❑ It is the right thing to do
- ❑ Help save the environment
- ❑ Save energy
- ❑ Other (*Specify*) _____

Q-5A Of the things you mentioned, which was the most important?

- ❑ To reduce my monthly gas bill
- ❑ To reduce my monthly electric bill
- ❑ The AWP paid for some or all of the improvements

- ❑ Contractor recommendation
- ❑ Utility recommendation or information *(Specify which utility)* _____
- ❑ Recommendation from a friend, relative, neighbor
- ❑ Community action agency recommendation
- ❑ It is the right thing to do
- ❑ Help save the environment
- ❑ Save energy
- ❑ Other (*Specify*) _____

MEASURE INSTALLATION

Next, I have some questions about the work that was performed in your home through the Arkansas Weatherization Program.

Q-6 Since the work was performed, have you removed or replaced any of the equipment or energy efficiency improvements implemented in your home through the program?

- ❑ Yes *(Please specify which items have been removed or replaced):* _____ _____
- ❑ No
- ❑ Don't know

[IF Q-6 = Yes, Ask Q-7. Otherwise skip to Q-8]

Q-7 Why did you remove or replace these items? [SELECT ALL THAT APPLY]

- ❑ They were no longer working properly
- ❑ I purchased new items that I liked better
- ❑ I liked my old items better so I reinstalled them
- ❑ I performed some remodeling or maintenance that required the removal of these items
- ❑ Other: _____
- ❑ Don't know

OVERALL ENERGY EFFICIENCY DECISION MAKING

Q-8 Based on your experience with the Arkansas Weatherization Program, would you recommend the program to a friend or family member?

- ❑ Yes [SKIP TO Q-9]
- ❑ No [ASK Q-8A]

Q-8A Why wouldn't you recommend the Arkansas Weatherization Program to a friend or family member? [OPEN-ENDED]

_____ _____

Q- 9 Prior to the audit, how familiar were you with the benefits of installing various energy efficiency improvements similar to those offered by the Arkansas Weatherization Program?

- ❑ 5: Very familiar
- ❑ 4: Somewhat familiar
- ❑ 3: Neither familiar nor unfamiliar
- ❑ 2: Somewhat unfamiliar
- ❑ 1: Very unfamiliar
- ❑ 99: Don't know

Q-9A Prior to the audit, how familiar were you with various household energy saving activities such as washing with cold water, reducing your use of light fixtures, and adjusting heating system settings?

- ❑ 5: Very familiar
- ❑ 4: Somewhat familiar
- ❑ 3: Neither familiar nor unfamiliar
- ❑ 2: Somewhat unfamiliar
- ❑ 1: Very unfamiliar
- ❑ 99: Don't know

Q-9B Prior to the audit, did you perform any common household energy saving activities? If so, which activities?

- ❑ Yes *(please explain):* _____
  _____
- ❑ No
- ❑ Don't know

Q-10 As a result of your experience with the Arkansas Weatherization Program, how much more knowledgeable would you say you are about energy efficiency and energy efficient options for your home?

- ❑ Much more knowledgeable than before participating
- ❑ Somewhat more knowledgeable than before participating
- ❑ Slightly more knowledgeable than before participating
- ❑ No more knowledgeable than before participating
- ❑ Don't know

Q-11 As a result of your experience with the program, do you now take additional action to save energy in your home, such as wash with cold water, reduce your use of light fixtures, and adjust heating system settings?

- ❑ Yes *(please explain):* _____
  _____
- ❑ No
- ❑ Don't know

PROGRAM SATISFACTION

Now I'd like to ask you about your satisfaction with several aspects of this program.

Q-12 On a scale of 1 to 5, where "5" is very satisfied and "1" is very dissatisfied, and a "3" is neutral, how would you rate your satisfaction with the following? [RECORD AS '99' IF DON'T KNOW]

Element of Program Experience	***Very Satisfied*** **[5]**	***Somewhat Satisfied*** **[4]**	***Neither Satisfied or Dissatisfied*** **[3]**	***Somewhat Dissatisfied*** **[2]**	***Very Dissatisfied*** **[1]**	***Don't Know*** **[99]**
Information provided by the community action agency	❑	❑	❑	❑	❑	❑
The quality of installation work	❑	❑	❑	❑	❑	❑
The performance of the equipment installed	❑	❑	❑	❑	❑	❑
The savings on your monthly utility bills	❑	❑	❑	❑	❑	❑
The effort required for the application process	❑	❑	❑	❑	❑	❑
The wait-time to receive services	❑	❑	❑	❑	❑	❑
Information provided by utilities on how to reduce your utility bill	❑	❑	❑	❑	❑	❑
Improvement in home comfort	❑	❑	❑	❑	❑	❑
Usefulness of the energy audit	❑	❑	❑	❑	❑	❑
Overall program experience	❑	❑	❑	❑	❑	❑

Q-13 (If any item in Q-12 rated 2 or 1) Why were you dissatisfied with [Program Element]? [VERBATIM]:

_____

_____

_____

Q-14 Are there any changes or improvements you would like to see for the Arkansas Weatherization Program? [VERBATIM]:

_____

_____

_____

DEMOGRAPHICS

Finally, I have a few questions about your household. As a reminder, your responses will remain confidential.

Q-15 When was your home built? [IF RESPONDENT DOES NOT GIVE VERBATIM ANSWER, READ OFF YEAR RANGES UNTIL RESPONDENT INDICATES ONE]

- ❑ Verbatim____
- ❑ Before 1970's
- ❑ 1970's
- ❑ 1980's
- ❑ 1990-1994
- ❑ 1995-1999
- ❑ 2000-2005
- ❑ 2006 or newer
- ❑ Don't know [DON'T READ]
- ❑ Refused

Q-16 What is the approximate square footage of your home? [IF RESPONDENT DOES NOT GIVE VERBATIM ANSWER, READ OFF SIZE RANGES UNTIL RESPONDENT INDICATES ONE]

- ❑ Verbatim____
- ❑ Less than 1,000
- ❑ 1,001-1,500
- ❑ 1,501-2,000
- ❑ 2,001-2,500
- ❑ Greater than 2,500
- ❑ Don't know [DON'T READ]
- ❑ Refused

Q-17 How many bedrooms are there in your home?

- ❑ Quantity:____
- ❑ Don't know [DON'T READ]
- ❑ Refused

Q-18 What type of heating system do you have in your home?

- ❑ Natural gas heating
- ❑ Electric heating
- ❑ Combination of types *(Specify):*_____
- ❑ Other *(Specify):* _____
- ❑ Don't know [DON'T READ]

Q-19 What type of water heater do you have in your home?

- ❑ Natural gas water heater
- ❑ Electric water heater
- ❑ Other *(Specify):* _____
- ❑ Don't know [DON'T READ]

Q-20 How many bathrooms are there in your home?

- ❑ Quantity:____
- ❑ Don't know [DON'T READ]

- ❑ Refused

Q-21 How many showers are there in your home?

- ❑ Quantity:____
- ❑ Don't know [DON'T READ]
- ❑ Refused

Q-22 Including yourself, how many people currently live in your home year-round?

- ❑ Quantity:____
- ❑ Don't know [DON'T READ]
- ❑ Refused

Q-23 Do you have any other comments that you would like to relay to Arkansas Weatherization Program staff about energy efficiency in residences or about these programs in general? [VERBATIM]

_____

_____

_____

This completes the survey. Your input is greatly appreciated.Thank you very much for your time!

Appendix B – AWP Program Description as of July 1, 2011 – as approved

Arkansas Weatherization Program ("AWP")
For Severely Energy-Inefficient Homes

AWP Collaborative

In 2007, the following utility companies ("AWP Utilities") collaborated with the Arkansas Community Action Agencies Association ("ACAAA") and the Arkansas Department of Human Services Office of Community Services ("DHS OCS") weatherization providers (collectively, the "AWP Collaborative") to develop the Arkansas Weatherization Program for Severely Energy Inefficient Homes ("AWP") to comply with the ***Rules for Conservation and Energy Efficiency Programs*** ("CEE Rules") established by the Arkansas Public Service Commission ("Commission") in Docket No. 06-004-R:

- Arkansas Oklahoma Gas Corporation
- Sourcegas Arkansas
- CenterPoint Energy Arkansas
- Empire District Electric
- Entergy Arkansas
- Oklahoma Gas & Electric
- Southwestern Electric Power Company

The AWP Collaborative has remained intact into the comprehensive phase of implementation of the AWP Utilities' approved energy efficiency portfolios. The AWP has evolved since its original approval in October 2007 as a "quick-start" program.

Benefits and Objectives

The AWP program is designed to have a high probability of providing aggregate ratepayer benefits to the majority of utility customers. Continued implementation of the AWP will potentially:

- Encourage and enable utility customers to make the most efficient use of utility capacity and energy and discourage inefficient and wasteful use of energy;
- Achieve energy efficiency improvements to severely energy-inefficient homes;
- Achieve meaningful energy and demand savings of both electricity and natural gas that contribute to:
    - Reduced energy costs for owners of severely energy-inefficient homes;
    - Improved affordability of energy for all ratepayers through:
        1. Downward pressure on energy prices
        2. Avoided system capacity costs
        3. Reduced collections costs and bad debt write-offs
        4. Improved customer retention
    - Energy security benefits;
    - Environmental benefits;
    - Economic development/competitiveness benefits;
    - Permanent peak electric and gas demand reductions;

  - Long term changes in customer behavior, attitudes, awareness, and knowledge of energy efficiency and energy efficiency technology;
- Enable the AWP Utilities to implement a weatherization program in an efficient manner; and
- Provide a comprehensive, consistent, quality-controlled, weatherization program serving energy-inefficient homes in utility service territories.

Program Design

- Target severely energy-inefficient homes using the following selection criteria:
  - Residential heating or cooling customers of at least one AWP Utility, to which savings can be attributed.
  - Site-constructed or mobile homes
  - Homes built prior to 1997 must meet three of the following seven criteria. Homes built in 1997 or later do not qualify for the AWP.
    1. Attic insulation equal to or less than R-30
    2. Wall insulation equal to R-0
    3. Floor insulation equal to R-0
    4. Single pane windows with no storm windows attached
    5. Non-working heating system or heating system with less than 70% efficiency
    6. Non-working cooling system or cooling system with Seasonal Energy Efficiency Rating ("SEER") of 8 or less
    7. Air infiltration problems identified through:
       a) visual inspection of ductwork, walls, floors, ceilings, doors, and windows; or
       b) pre-blower door test resulting in: i) greater than 2,200 CFM at 50 pa (for households of five persons or fewer); or ii) greater than 2,700 CFM at 50 pa (for households of more than five persons)
  - Pre and post carbon monoxide (CO) readings must meet the health and safety regulation specified by the U.S. Department of Energy ("DOE").
- AWP is modeled on the DOE Weatherization Assistance Program ("WAP"); however, it is open to all AWP Utility residential customers living in homes meeting the above selection criteria.
- AWP is implemented by the WAP delivery network of DHS OCS and Community Action Agencies/Service Providers with support and coordination from ACAAA (collectively, the "Weatherization Network").
- DOE WAP protocols, standards, and quality control provisions are followed.
- The following list of measures are approved for use in the AWP:
  - Attic insulation
  - Floor insulation
  - Wall insulation
  - Duct insulation
  - Duct sealing/repair
  - Sillbox insulation
  - Foundation insulation

  - Air infiltration
  - Window sealing
  - Window replacements
  - Storm windows
  - Low flow shower heads
  - Furnace replacements
  - Furnace tune-ups
  - Air conditioner replacements
  - Air conditioner tune-ups
  - Heat pump replacements
  - Heat pump tune-ups
  - Refrigerator replacements
  - Lighting retrofits
  - Water heater tank insulation
  - Water heater pipe insulation
  - Water heater replacement
  - Smart thermostats
- Energy efficiency information will be provided to each participant as a part of the AWP.
- AWP cost of services (for energy audits, health and safety, materials and labor to install measures, and program support) will be capped at $8,000 for each home.
- The AWP Utilities will pay a percentage of the costs, with the share depending on whether the customer has only one participating utility (gas or electric), two participating utilities (both gas and electric), or lives in an all-electric house, provided that savings can be attributed to the respective utility.
- Weatherization Network administrative expenses will be 14% of the AWP cost of services for each home, with each customer co-payment amount and utility co-payment amount grossed up proportionately for Weatherization Network administrative expenses.
- As illustrated in Attachment C:
  - Where there is one participating AWP Utility (gas or electric):
    1. The AWP Utility will pay $146 toward the pre-installation audit, and the customer co-payment will be $196.
    2. The AWP Utility will pay up to $855 (of a targeted average cost of $3,420) for installation of determined energy-efficiency measures, and the customer co-payment will be the remaining cost of installation.
    3. The AWP Utility will pay $57 toward the post-installation audit, and the customer co-payment will be $57.
  - Where there are two participating AWP Utilities (gas and electric):
    1. Each of the AWP Utilities will pay $146 toward the pre-installation audit, and the customer co-payment will be $50.
    2. Each AWP Utility will pay up to $855 for installation of determined energy-efficiency measures, and the customer co-payment will be the remaining cost of installation.
    3. Each AWP Utility will pay $57 toward the post-installation audit, and the customer co-payment will be $0.
  - Where the customer lives in an all-electric AWP Utility home (i.e., electric space heat):

1. The electric AWP Utility will pay $292 toward the pre-installation audit, and the customer co-payment will be $50.
2. The electric AWP Utility will pay up to $1,710 for installation of determined energy-efficiency measures, and the customer co-payment will be the remaining cost of installation.
3. The electric AWP Utility will pay $114 toward the post-installation audit, and the customer co-payment will be $0.

- For customers served by an electric cooperative and with AWP gas utility space heat, the payment breakdown will be that of the scenario above for one participating AWP Utility.
- For customers served by an electric AWP Utility but with no AWP Utility space heat (*e. g*., propane space heat), the payment breakdown will be that of the scenario above for one participating AWP Utility.
- Customers will be responsible for 100% of AWP cost of services beyond AWP Utility maximum payment amounts, up to the total cap of $8,000 per home.
- Low-income customers qualifying for the WAP may have DOE funds used to pay for the customer's AWP co-payment and for the customer's responsibility for costs up to the maximum allowed under DOE.
- Customers not eligible for DOE WAP assistance will make their applicable pre-installation energy audit co-payment in "good funds" to the Weatherization Network prior to their energy audit.
- Customers not eligible for DOE WAP assistance and making their own co-payments will be able to choose which measures will be installed after energy-savings potential has been determined by the audit. These customers will make full payment in "good funds" for their applicable co-payment for cost of AWP services to the Weatherization Network prior to the delivery of measures. All work will be done on a fixed price basis. AWP Utilities will hold Weatherization Network harmless from loss with respect to customer payments.
- "Good funds" include: bank certified check, bank cashier check, credit union certified check, or money order.
- Attachment B is the funding model for the AWP for the period of July 1, 2011 through December 31, 2011, for 2012, and for 2013. For the period July 1 through December 31, 2011, the target would be 620 homes weatherized, for a total utility spending target of $1,051,771. In 2012, there will be a 10% increase from the 2011 annualized number, to 1,259 homes and a total utility spending target of $2,130,818. There will be another 11% increase in 2013, to 1,402 homes, for a total utility spending target of $2,389,360.
- Under-spending of an AWP Utility's annual spending target in any program year will be carried over and added to the AWP annual spending target for the following program year, where demand and Network capacity indicate.
- Each AWP Utility will make utility co-payments each year up to at least its spending target amount, provided there exists both demand for AWP services by its customers and capacity for delivery of AWP services by the Weatherization Network.
- Total AWP Utilities' co-payments during a year may not exceed 120% of that year's AWP spending target.
- Any home can receive AWP benefits only one time.
- AWP Utilities' administrative costs resulting from the AWP are not included in the spending targets shown in Attachments B or C. Each AWP Utility has included utility

administrative costs for the AWP in its Comprehensive Energy Efficiency program filing to include incremental program costs not included in its base rates.

Administration and Implementation

- All AWP Utilities will have one "joint" contract with Central Arkansas Development Council ("CADC") for delivery of all AWP services through the Weatherization Network.
- The AWP Collaborative will meet as necessary during the term of the AWP to review progress of the AWP and to provide guidance and support to the Weatherization Network.
- By utilizing the existing Weatherization Network for statewide training, administration, coordination, delivery and quality control activities, the AWP administrative costs will be less than if each AWP Utility developed its own individual delivery system.
- A single point of delivery will remove the significant market barrier of customers having to coordinate utility programs on their own.

Promotion

- Each AWP Utility may, but is not required to, promote the AWP locally using targeted marketing techniques designed to create demand for the AWP to match the capacity of the Weatherization Network to deliver AWP services.
- AWP Utilities agree to not use statewide promotion of AWP unless targeted marketing is not successful in meeting the objective in the previous bullet.
- AWP Utilities agree that promotion of AWP will include the following message elements: 1) the local AWP Utility is, or AWP Utilities are, offering to assist customers in making cost-effective energy efficiency improvements to their homes, to save them money while helping to improve the environment by weatherizing their homes and providing other energy efficiency measures; 2) customers will receive services on a first-come-first-served basis; 3) customers will be required to contribute to the cost of energy audits and to the cost of energy efficiency improvements to their homes, although those eligible for the low-income WAP may have federal funds used to pay their contribution; and 4) program design and availability of AWP services may be changed with approval of the PSC.
- Should the AWP be under-subscribed, as it has been in some areas previously, the program will be analyzed for barriers to participation, and those barriers will be addressed collaboratively with an appropriate marketing and promotion strategy.
- Should the AWP become severely over-subscribed (waiting time for service of more than one year), this situation will be addressed by:
    - Suspending all promotional activities;
    - Sending letters to all customers on the AWP waiting list explaining the situation;
    - Analyzing the cause of over-subscription of the AWP; and
    - Collaboratively considering appropriate strategies for addressing the over-subscription.

Barriers and How They Are Being Addressed

- As barriers or challenges arise, they are being addressed by the AWP Collaborative through periodic meetings and other contact.
- Affordability of home weatherization services for many customers is being addressed through utility co-payments toward energy audit AWP services on each home.
- Limited utility experience with weatherization programs is being addressed through the AWP Collaborative process (seven investor-owned utilities in partnership with the Weatherization Network).
- Inefficiency of utility administration for individual smaller utility weatherization programs is being addressed through: 1) the AWP Collaborative process to design and file the AWP, and 2) "joint" contract with CADC for delivery of all AWP services through the Weatherization Network as described in this AWP design template.
- Multiple points of contact by customers with both AWP gas service and AWP electric service for individual utility weatherization programs is being addressed through one AWP with one customer point of contact for all AWP services.

Estimated Annual Energy Savings and Estimated Demand Savings

- For AWP weatherization measures installed in 2010 and costing a total of approximately $1,315,948 (utility co-payments only), estimated energy savings and estimated demand savings at the customers' meters are:
    - 125,183 therms (normal weather conditions)
    - 6.4 therms per day per home (peak demand conditions)
    - 3,670,098 kWh (normal weather conditions)
    - 1.12 kW per home (peak demand conditions)
- Estimates of energy and demand savings for the period of implementation covered by this design, *i.e.*, July through December 2011, 2012 and 2013, based on measured results from 2009, follow:[1]
    - July–December 2011
        - 146,495 therms (normal weather conditions)
        - 6.4 therms per day per home (peak demand conditions)
        - 2,541,906 kWh (normal weather conditions)
        - 1.12 kW per home (peak demand conditions)
    - Program year 2012
        - 302,120 therms (normal weather conditions)
        - 6.4 therms per day per home (peak demand conditions)
        - 5,155,668 kWh (normal weather conditions)
        - 1.12 kW per home (peak demand conditions)
    - Program year 2013
        - 327,020 therms (normal weather conditions)
        - 6.4 therms per day per home (peak demand conditions)

[1] These estimates of energy and demand savings were up-dated once results from implementation of the AWP during 2010, 2011 and 2012 were reviewed and analyzed.

- 5,748,480 kWh (normal weather conditions)
- 1.12 kW per home (peak demand conditions)

Funding and Cost Recovery

- Each AWP Utility will deposit funds into the AWP working fund quarterly or more frequently as necessary to assure a positive balance always exists in the AWP working fund.
- The AWP working fund shall be an interest bearing account.
- Each AWP Utility will incur AWP costs as a result of its customers' participation in the AWP and its resulting utility co-payments for energy audits, measures, and Weatherization Network administrative expenses.
- For those low-income customers eligible for the WAP, federal funds may be applied towards customer co-payments.
- Each AWP Utility may apply for recovery of its AWP costs through an approved adjustment to rates in its own Comprehensive Energy Efficiency docket.

Evaluation, Measurement and Verification ("EM&V")

- The Weatherization Network will maintain financial and operational data for each AWP home for the duration of the AWP and will deliver all utility-specific data to each AWP Utility at least quarterly.
- Commission-approved deemed savings for both energy savings and demand savings for both natural gas and electricity will be used to estimate AWP energy savings and demand savings for each AWP utility.
- Estimated energy savings and estimated demand savings for AWP-installed measures will result from use of Commission-approved deemed savings estimates developed by Frontier Associates.
- Consistent with WAP protocol, Community Action Agencies/Service Providers will audit 100% of their own AWP projects and DHS OCS and/or CADC will audit at least 10% of all AWP projects with a DOE WAP co-payment annually.
- Minimum data to be reported to each AWP utility and to the PSC for each program year to determine whether the AWP is meeting its stated objectives include:
    - Number of energy audits completed;
    - Number of home weatherization projects completed;
    - Number of customers who requested AWP services and have not yet received AWP services (i.e., the backlog);
    - Summary analysis of customer satisfaction survey results;
    - Total AWP utility co-payments for AWP services (energy audits and measures) including 14% markup for Weatherization Network administrative expenses;
    - Total customer co-payments for AWP services (energy audits and measures) including 14% markup for Weatherization Network administrative expenses;
    - Estimated annual energy savings for kWh and for therms; and
    - Estimated peak demand savings for kW and for therms per day.
- AWP utilities and ACAAA will annually report AWP EM&V data consistent with rules and procedures established by the Commission.

Benefit/Cost Evaluation

- The AWP Utilities individually conduct benefit/cost analyses of the AWP based on deemed savings estimates provided by Frontier Associates and each utility's avoided energy and demand costs.
- The Utilities' analyses show that the AWP provides aggregate ratepayer benefits to utility customers.
- National and international research studies show that weatherizing severely energy inefficient homes provides considerable benefits to society in addition to energy and demand savings.

Appendix C - AWP Customer Satisfaction Survey Results 2015

In addition to providing data on energy and demand savings, productivity, program costs, and other quantitative data, as part of the annual reporting process, to assess customer satisfaction with the AWP, the Weatherization Network providers survey each household that has received AWP services during that year. In 2015, one questionnaire was used. A samples of this questionnaire is in Appendix D:

- **AWP Satisfaction Survey** (confirming that work has been completed; rating energy audit information, materials used, workmanship, speed of delivery of services, overall satisfaction with the AWP; comments) This survey was prepared for use in both the AWP and DOE WAP.

The AWP Satisfaction Survey represented 100% of the surveys submitted. Additionally, there were 11[2] customers who were private co-pay customers.

A total of ***74*** completed and usable responses were received:

- ***74*** AWP Satisfaction Surveys

Summary results are reported below.

[2] 6 private pay jobs were audit only.

AWP Satisfaction Survey

Were you satisfied with the information supplied in the **Energy Audit** (*74* responses):

Very Satisfied ***64*** (***87%)***
Satisfied ***9*** (***12***%)
Dissatisfied ***0*** (***0***%)
Very Dissatisfied ***1*** (***1***%)
No Response ***0*** (***0***%)

Were you satisfied with the **Material Used** for the weatherization work? (*74* responses):

Very Satisfied ***65*** (***89***%)
Satisfied ***7*** (***9***%)
Dissatisfied ***1*** (***1***%)
Very Dissatisfied ***1*** (***0***%)
No Response ***0*** (***0*** %)

Were you satisfied with the **Workmanship** of the delivered service? (*74* responses):

Very Satisfied ***62*** (***85***%)
Satisfied ***9*** (***12*** %)
Dissatisfied ***2*** (***2*** %)
Very Dissatisfied ***0*** (***0***%)
No Response ***1*** (***1***%)

Were you satisfied with the **Speed of Delivered Services** (*74* responses):

Very Satisfied ***64*** (***87*** %)
Satisfied ***8*** (***11***%)
Dissatisfied ***0*** (***0***%)
Very Dissatisfied **1** (***1***%)
No Response ***1*** (***1***%)

Were you satisfied with the weatherization Program as a whole? (*74* responses):

Very Satisfied ***65*** (***88***%)
Satisfied ***7*** (***11*** %)
Dissatisfied ***0*** (***0*** %)
Very Dissatisfied ***1*** (***1*** %)
No Response ***1*** (***1***%)

Please provide an explanation for any comments you scored a 1 or 2:

- Vent fan does not turn off; heater has not got shut off valve; heater zip tied to wall instead of a bracket. (COMMENT: Follow up was made of the weatherizing agency. All issues were corrected.)
- The person that was sent out to do the work of replacing the fan over the stove did not protect my property, did not care to properly dispose any excess waste from the old equipment, just knocks it out on to my stove and floor. I did not appreciate the disrespect at all and using my paper towels to clean is mess off the stove. We as ordinary people appreciate any measure of help we receive from

another. But when an individual comes into your domain and don't even respect you enough to even speak and acknowledge you, then you would just want to give that person some select words. Well thank God I'm a better person than the older guy from the window place will be. (COMMENT: Follow up was made of the weatherizing agency. This work was completed by an outside contractor.)

COMMENT: Private Pay job PP-1121 responded with 1's to questions 1, 2 and 5. Follow up with this customer revealed that those responses were marked in error. Customer was very satisfied with the work.

Please provide any additional comments or suggestions: A total of ***15***comments were received. Of those, ***13*** comments (***87***%) were positive. Some examples:

- Comfort level in the home is much higher after work was done. John, Joe, Billy and Jimmy were very friendly and did great work.
- Amazed at the reduction of air leakage after jobs were done.
- All workers great to talk to, answered all my questions and were excellent at their work. Thanks very much for everything.
- Excellent work.
- I can sleep safer knowing I have smoke and carbon monoxide detectors and now my house is sealed up from the draft.
- Loved working with the whole team. Excellent service from knowledgeable people.
- Thanking God for creating someone so special. They are heaven sended. Thanks for everything.

Appendix D Customer Survey Response Form

AWP Satisfaction Survey

Agency:
CADC

Date of Satisfaction Survey: _____/_____/_____
Customer Name: _____ Job Number _____
Customer Address: _____
City: _____ State: _____ Zip: _____
County: _____
Please use the following scale to answer the question below:

4 - Very Satisfied 3 - Satisfied 2 - Dissatisfied 1 - Very dissatisfied

Were you satisfied with the information supplied in the energy audit?	☐ 4	☐ 3	☐ 2	☐ 1
Were you satisfied with the material used for the weatherization work?	☐ 4	☐ 3	☐ 2	☐ 1
Were you satisfied with the workmanship of the delivered service?	☐ 4	☐ 3	☐ 2	☐ 1
Were you satisfied with the speed of delivered services?	☐ 4	☐ 3	☐ 2	☐ 1
Were you satisfied with the Weatherization Program as a whole?	☐ 4	☐ 3	☐ 2	☐ 1

Please provide an explanation for any responses you scored a 1 or a 2:

_____
_____
_____

Please provide any additional comments or suggestions:

_____
_____
_____

This confirms that work has been completed and the following measures were not done at the request of the occupant.

_____
_____
_____

_____ _____
Client Date

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Appendix E

Information Provided to Clients

During the auditor's initial visit to the AWP customer household, the network provides information on ways to save energy beyond the weatherization measures to be installed. Depending on the agency, this can be done verbally during the walk through or through written materials that the auditor provides to the client. The three agencies that performed work on AWP clients and the counties they covered during calendar year 2015 were as follows:

Central Arkansas Development Council (CADC) – Calhoun, Clark, Columbia, Dallas, Garland, Hempstead, Hot Spring, Howard, Lafayette, Little River, Miller, Montgomery, Nevada, Ouachita, Pike, Polk, Saline, Sevier, Union

Pine Bluff - Jefferson County Economic Opportunities, Inc. (PBJCEOC) - Arkansas, Ashley, Bradley, Chicot, Cleveland, Desha, Drew, Grant, Jefferson, Lee Lincoln, Monroe, Phillips, Prairie

Information Provided

CADC

Among the materials CADC provided were 12 donated weatherization kits provided to clients on a first come first served basis. Each donated client kit consisted of the following materials:

- 2 rows of foam tape
- Water heater jacket
- Compact Florescent Lightbulbs
- Tube of Caulk

Additional handouts:

The table below lists online resources and booklets that either some or all of the agencies provided to AWP clientele. The table lists the material source/website, the name of the materials, and the agency or agencies that provided the information:

Agency/Agencies	Info Provided to WAP Clients	Information Site/Description of Information
CADC, PBJCEOC	**The Lead-Certified Guide to Renovate Right - accessed 03-16-15**	http://www2.epa.gov/sites/production/files/documents/renovaterightbrochure.pdf
CADC, PBJCEOC	**A Brief Guide to Mold, Moisture, and Your Home - accessed 03-16-15**	http://www.epa.gov/mold/pdfs/moldguide.pdf
PBJCEOC	**Energysaver Guide: Tips on Saving Money & Energy at Home - Accessed 03-16-15**	http://energy.gov/sites/prod/files/2014/09/f18/61628_BK_EERE-EnergySavers_w150.pdf
	30 Simple things you can do to save energy and money	Book given to clients provided from Arkansas Energy Office
	Energy Efficiency Facts: Locating and Sealing Air Leaks - Accessed 03-16-15	http://www.energyefficiencyarkansas.org/wp-content/uploads/2011/07/locating-and-sealing-air-leaks.pdf
	Energy Efficiency Facts: Cooling - Accessed 03-16-15	http://www.energyefficiencyarkansas.org/wp-content/uploads/2011/07/cooling.pdf
	Energy Efficiency Facts: Heating - Accessed 03-16-15	http://www.energyefficiencyarkansas.org/wp-content/uploads/2011/07/heating.pdf
	Energy Efficiency Facts: Lighting and Appliances - Accessed 03-16-15	http://www.energyefficiencyarkansas.org/wp-content/uploads/2011/07/lighting-and-appliances.pdf
	Energy Efficiency Facts: Water Heating	http://www.energyefficiencyarkansas.org/wp-content/uploads/2011/07/water-heating.pdf