

Getting Our Ducts in a Row: Using Evaluation Results to Create a Statewide Weatherization Program

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ABSTRACT

This paper provides an excellent case study of how EM&V results can be used to develop cost-effective, successful and innovative programs to serve critical market segments. Weatherization programs come in all shapes and sizes ranging from traditional low-income program delivered by Community Action Partnership (CAP) agencies to full whole-house renovations that combine deep retrofits with energy efficiency financing. So, the seven Investor-Owned Utilities (IOUs) in Arkansas faced a daunting task when Arkansas Public Service Commission (Commission) issued Order No. 7 in Docket No. 13-002-U, which directed the IOUs to implement a more unified approach to residential weatherization in Arkansas. The Commission further directed that the task of developing a unified weatherization approach be done through a collaborative working group process, known as the Parties Working Collaboratively (PWC). The PWC was ordered to submit a plan describing how the seven gas and electric utilities would develop a consistent weatherization approach available to all residential customers in less than seven months.

To meet this challenge, the PWC leveraged the results of recently completed Evaluation, Measurement and Verification (EM&V) reports for the current weatherization programs offered by all the utilities as well as the statewide Arkansas Weatherization Program (AWP). Two of these models were directly relevant to informing the final program design. This comparison also provided insights into how to deliver an effective weatherization program in the Arkansas market.

By reviewing the EM&V results, the PWC was able to compare the advantages and disadvantages of the different delivery models currently targeting the hard-to-reach customer¹. This review was supplemented by program summary, a gap analysis, and literature review of weatherization best practices. Relying on these EM&V results shortened the time needed to design a new statewide approach.

Introduction

Weatherization programs come in all shapes and sizes ranging from traditional low-income program delivered by Community Action Partnership (CAP) agencies to full whole-house renovations that combine deep retrofits with energy efficiency financing. So, the seven Investor-Owned Utilities (IOUs) faced a daunting task when the Public Service Commission issued Order No. 7.

Specifically, the Commission described the following key program features that must be included in this unified approach:

- 1) Joint funding between electric and gas utilities for whole house energy assessment and energy efficiency services including auditing, insulation, and infiltration reduction features.

¹ By law, the utilities in Arkansas are not permitted to offer programs based on income levels but rather must offer programs based on energy usage. Therefore, the program must target hard-to-reach customers who live in severely energy inefficient homes.

- 2) Comprehensive technical standards following best practices with a single set of standards and coordinated with federally funded weatherization services requirements.
- 3) Offer financing mechanism/s that encourage installation of multiple cost-effective measures and explore viability of current options in use, such as the Home Energy Affordability Loan (HEAL) program.
- 4) Eliminate duplication of programs that prevent trade allies to work together or create customer confusion.
- 5) Active participation in the reorganization of Weatherization Assistance Program (WAP) to optimize its coordination with utility funded weatherization services and leverage available personnel and federal funding
- 6) Effectively market coordinated Electric and Gas -utility weatherization services including the HEAL program.

As the Commission objectives illustrate, this consistent approach was not limited to just developing a new approach to reach hard-to-reach customers, but also to develop a strategy that would offer comprehensive weatherization programs to residential customers across all income levels. Therefore, the intent of this consistent approach was to both improve the current programs targeting Arkansas' hard-to-reach customers, as well as to encourage customers to make more comprehensive and deeper energy efficiency retrofits by leveraging the rebates and financing programs available to them.

To develop this program, the Commission directed that the collaborative working group, known as the Parties Working Collaboratively (PWC), to submit a plan describing how the IOUs would develop this weatherization program targeting residential customers in less than seven months. The PWC is composed of a variety of stakeholders and intervenor groups including the seven IOUs: Arkansas Oklahoma Gas Corporation (AOG); CenterPoint Energy Arkansas Gas (CenterPoint); Empire District Electric Company (Empire); Entergy Arkansas, Inc. (EAI); Oklahoma Gas & Electric Company (OG&E); SourceGas Arkansas (SourceGas); and American Electric Power– Southwestern Electric Power Company (SWEPCO).

Other PWC members include: Commission Staff, and representatives from intervenors from the following organizations: Arkansas Attorney General, Arkansas Advanced Energy Association, and the Arkansas Community Action Agencies Association, Audubon Arkansas, Clinton Climate Initiative Sierra Club and the Southeast Energy Efficiency Alliance. Joining this group as non voting members are staff from the program implementers, program evaluators, Arkansas Energy Office and the Independent Evaluation Monitor (IEM).

To achieve the Commission's directive, the PWC engaged the IEM to serve as the facilitator and sought assistance from outside consultants, subject-matter experts, and key stakeholders to craft an approach to developing a consistent weatherization approach.

As a way to solicit feedback from interested stakeholders and subject matter experts, the PWC hosted a Weatherization Technology Conference in March in Little Rock, Arkansas. Utility staff from several Arkansas rural electric cooperatives also participated in this conference, at the request of the PSC.

Methodology

The PWC quickly engaged in a multi-step process designed to identify the current strengths and weakness of the program models used in by the IOUs, and to identify weatherization best practices that could be incorporated into this new program approach that would meet the Commission's overall objectives. As a first step, the IEM completed the following research activities to guide the PWC's

decision-making. These activities included:

- Reviewing and comparing current weatherization programs offered across the state;
- Reviewing the most recent EM&V program evaluations to identify the strengths and weaknesses of these current program strategies;
- Conducting a gap analysis to identify gaps in current program delivery platforms; and
- Completing a review of weatherization “best practices” as defined through a literature review.

Review EM&V Results

As a first step, the IEM incorporated the most recent findings and recommendations from the Arkansas’ PY2013 program evaluations to develop a solid understanding of the current successes in program operations, identify program strategies that should be included in a statewide approach, and identify gaps in the current program designs. Highlights of these key findings from the IEM 2014 EM&V Annual Report are summarized next:

The current Arkansas Weatherization Program (AWP) design is not effective. The Arkansas Weatherization Program (AWP), which is a statewide weatherization program implemented by a third-party administrator, experienced a number of operational barriers to program effectiveness due to program reorganization. These barriers included: a continued reliance on federal funding to subsidize the AWP program; complexity and challenges associated with the reorganization and streamlining of the AWP program; ongoing data revision, tracking, transfer issues between the CAP agencies and the software provider, and; limited communication with the sponsoring utilities (AWP 2013 EM&V Report, pp. 1-10, 1-11, 3-6).

These ongoing problems were documented in previous EM&V Reports. Given the challenges of the AWP model, it did not serve well as an effective statewide model going forward.

In contrast, the joint Weatherization Program offered by the natural gas utility, AOG, and the electric utility, OG&E, exceeded its program’s energy and participation goals in PY2014. The evaluators found that the joint program had both the staff and resources to sufficiently manage and operate the program, and the number of contractors performing installations was reasonable and appropriate. Program budgets are sufficient to support the savings goals, and the overall program infrastructure is able to meet program demands. The current staffing levels will likely support increased demands in future years if needed (AOG/OG&E 2013 EM&V Report, p. 1-7).

Several other Arkansas utilities are developing effective weatherization program offerings that expand could be important components of a unified statewide approach. The program evaluators noted that SourceGas’ addition of the Home Energy Savings Program filled a large gap in the utility’s portfolio offerings by offering comprehensive weatherization services (SourceGas 2013 EM&V Report, pp. 1-3-1-5). Furthermore, CenterPoint developed an effective strategy to ensure that only gas customers received the low-flow showerheads and faucet aerators for its Low-Flow Showerhead & Faucet Aerator conservation program (CenterPoint 2013 EM&V Report, p. 11-23).

In addition, SWEPCO shifted the bonus incentive from customers to trade allies for its Home Performance with ENERGY STAR® in response to market indicators gleaned through direct experience administering and delivering programs and through the EM&V process. These adjustments resulted in a positive impact on its portfolio energy savings and participation rates (SWEPCO 2013 EM&V Report, p. 21).

The EM&V evaluations pointed out numerous opportunities for joint-utility program collaboration in Arkansas. The evaluators recommended that the gas utilities find ways to work with their electric utility counterparts to coordinate program delivery of direct install items as part of a new weatherization program. These suggestions included coordinating with the electric utilities to add CFLs

to mailer kits (AOG); or work with EAI and SWEPCO to add CFLS to the mailer kits for their low-flow showerheads and water conservation programs (AOG 2013 EM&V Report, p. 8-25; CenterPoint 2013 EM&V Report, p.11-26; SourceGas 2013 EM&V Report, p. 10-21 AWP 2013 EM&V Report, pp. 1-10, 1-11, 3-6).

In short, the EM&V results both confirmed that the specific requirements of Commission Order No. 7 was feasible as well as identified program strategies that should be leveraged and expanded upon in a consistent statewide program model.

Review Current Program Designs

As a way to supplement and update the information from the recent EM&V reports, the IEM also reviewed the current weatherization program designs offered by the IOUs. This review accomplished two important goals in informing the Weatherization working group regarding potential approaches (Summary of Weatherization Programs, 2014, p. i):

1. Summarized the current program offerings regarding weatherization measures; and
2. Compared these program offerings across all utilities to inform both the gap analysis and identify “best practices” that could be incorporated into these current weatherization program designs.

The weatherization programs were selected based on the following three criteria:

1. The programs were specifically highlighted in Commission Order No. 7;
2. The programs included an energy audit as part of the program offering; or
3. The programs included cost effective measures specifically designed to improve building envelopes, such as air sealing, duct sealing, or insulation.

Conduct a Gap Analysis

Building on the findings from both the EM&V results and the current program strategies, the IEM then completed a gap analysis to identify barriers that should be addressed in a consistent weatherization approach based on the Commission’s requirements. The gap analysis examined the ways in which the current weatherization programs operate by analyzing the key program elements such as target markets, marketing and outreach, contractor training standards, and measures that are currently installed in these programs. These elements were selected as they provide a way to both objectively assess the current weatherization program offerings in Arkansas while also addressing the key goals described in Commission Order No. 7. Table 1 summarizes the gaps in the current joint delivery programs as an example of the findings from this review of Arkansas weatherization program approaches (Gap Analysis, 2014, p. 8)

Table 1. Joint Collaboration Utility Gap Analysis

GAP Analysis	AWP	AOG	Center Point	Empire	EAI	OG&E	Source Gas	SWEPCO
Utility Joint Collaboration	All Utilities	AOG Wx	HEAL	Res. Wx	HES	OG&E Wx	HES	HPwES
Dual Fuel Program Offerings	✓	✓	✓		✓	✓	✓	
Direct Install	✓ ²		✓	✓	✓		✓	✓
Comprehensive "Whole House" Approach	✓	✓	✓	✓	✓	✓	✓	✓
Leverages national brands	NA							✓
Leverages federal funding sources	✓							
Leverages other non-federal funding programs	✓		✓		✓			

Green - gap in current program offering ✓ = Addressed in current program NA= not applicable for this program
Source: Gap Analysis, 2014, p. 8.

Review Industry Best Practices for Weatherization Programs

The final step in this process to inform the PWC working group was to conduct a literature review of Weatherization Best Practices. The Best Practices literature review identified several other program models that could provide a solid foundation for Arkansas to pursue in developing this consistent approach across all utilities. This scope of this review was based by the Commission's key objectives. These findings offered additional guidance regarding the best ways to establish a consistent weatherization approach across the IOUs by leveraging the experiences from other weatherization efforts in other states.

Table 2 highlights the industry best practices identified in weatherization programs that operate outside of Arkansas. It also shows that while not every program includes every strategy, the most successful ones, in terms of achieving program goals and meeting the needs of the target customer groups, include most of them. For example, many of these "best practices" include standardized rebate offerings, integrated, consistent training and installation guidelines, and flexibility to accommodate market changes. Where possible, these joint programs are also fuel-neutral when delivered by both electric and natural gas utilities (Best Practices, 2014, p. 5).

² The AWP program provides some direct install measures as part of a comprehensive program approach to install weatherization measures in participating homes.

Table 2. Summary of Joint-Utility Collaboration “Best Practices”

Joint-Utility Collaboration "Best Practices"	Partners in Energy Savings (PIES)	Mass Save Home Energy Services (HES) Program	CenterPoint & Xcel Energy Home Energy Squad	Home Energy Solutions (CT)
Economies of scale through joint implementation	✓		✓	
Integrated marketing, efficiency measures	✓		✓	✓
Integrated and consistent training on program protocols, guidelines installation best practices	✓	✓	✓	✓
Standardized rebate levels	✓	✓		✓
Fuel-Blind Approach		✓	✓	
Regular Communications with Key Stakeholders	✓	✓		
Flexible platform to accommodate market changes			✓	✓

Sources, Navigant 2011, Johnson Consulting Group 2014; Nowak, Kushler et al 2013, pp. 112-117 cited in Best Practices Report, p. 5.

Results

The reviews of the current EM&V program results and program designs, the gap analysis, and the literature review of Weatherization Best Practices provided a rich foundation on which to develop a recommended weatherization approach that would be consistent across the seven IOUs. The major conclusions from these three research activities were:

- *Arkansas already has a successful history of utility collaboration models delivering weatherization services.*
- *The essential program elements are already in place to deploy a consistent approach across the IOUs in Arkansas.*
- *Contractor-delivered programs have been critical to the success of the weatherization programs.*

These conclusions led to development of a recommended framework for the IOUs to offer weatherization services. This new statewide approach was called the Core Program (Supplemental Testimony, 2014, pp. 4-5).

As Table 3 illustrates, the Core Program not only addresses but also exceeds all of the requirements specified by the Commission. In addition, this approach will provide a consistency to delivering weatherization programs across the broad spectrum of Arkansas ratepayers to install cost-effective measures in a fuel-neutral manner. It also provides a pathway for utility customers to install additional measures on their own, obtain financing if they qualify, and learn about additional ways to reduce energy usage in their homes (Proposed Approach, 2014, p. 20).

Table 3. Comparison of the Commission’s Objectives with the Core Program’s Features

Commission Objective	Core Program Feature	Core Program Enhancements
1) Joint funding between electric and gas utilities for whole house energy assessment and energy efficiency services including auditing, insulation, and infiltration reduction features.	Will be jointly funded by IOUs, where customers overlap between utilities, in a coordinated way to include an energy assessment and installation of insulation and infiltration reduction measures.	The program includes installing additional water and energy savings measures that will provide immediate and direct savings to eligible customers.
2) Comprehensive technical standards following best practices with a single set of standards and coordinated with federally funded weatherization services requirements.	Incorporates the industry-best practices for contractor training and requirements. Measure savings and standards will be consistent with the Arkansas Technical Reference Manual (TRM) and measures will be installed following industry best practices.	Provides a gateway for certified WAP contractors to also participate in an energy efficiency program; Offers a coordinated approach with the Weatherization Assistance Program (WAP) agencies; Encourages ongoing contractor training. Measures will be added and/or subtracted from the program mix as technology changes.
3) Offer financing mechanism/s that encourage installation of multiple cost-effective measures and explore viability of current options in use, such as Home Energy Affordability Loan (HEAL)	HEAL financing is offered as a complementary feature for customers who want to install Other Utility Offerings (OUO) measures beyond the Core Program.	The HEAL program can continue offering the program to natural gas customers served by a co-op. Other financing mechanisms will continue to be explored.
4) Eliminate duplication of programs that prevent trade allies to work together or create customer confusion.	Provides a standard set of cost effective measures that can be installed by contractors statewide that will minimize contractor and customer confusion.	Will ensure consistency of measure offerings in an electric and gas utility coordinated manner throughout the state.
5) Active participation in the reorganization of WAP to optimize its coordination with utility funded weatherization services and leverage available personnel and federal funding	The Core Program provides a way to effectively leverage the WAP program and for the WAP to leverage utility programs.	The Core Program offers a way to reach customers in severely energy-inefficient homes that are not tied to fluctuating levels of DOE funds. Through the OUO programs, customers will be also able to leverage other federal programs as appropriate.
6) Effectively market coordinated Electric and Gas -utility weatherization services including the HEAL program.	Each utility will leverage current marketing and outreach activities for its weatherization programs. The Arkansas Energy Office (AEO) will continue to provide a central point for information through the Energy Efficiency Arkansas (EEA) which will be linked to each utility’s website.	The Core Program provides a consistent approach to reach customers who are interested in receiving weatherization program services.

Source: Proposed Consistent Approach, 2014, p. 21

Furthermore, this approach incorporates the following weatherization best practices as identified in the literature review that were directly applicable to the Commission’s specific objectives (Literature Review 2014, p. iii):

- Delivers measures using an Electric and Gas Utility-coordinated approach

- Based on proven and successful program designs
- Ensures consistent contractor training and guidelines and ongoing training and provides opportunities to enlist contractors from the Community Action Program (CAP) Agencies to participate in this new statewide approach.
- Has a flexible platform to accommodate market changes, TRM and Evaluation, Measurement and Verification (EM&V) changes in a timely manner (Proposed Approach 2014, p. 3).

Proposed Framework

This approach retains much of the existing weatherization program infrastructure, which facilitates an easy transition and should minimize costs. The “Core Program” will replace the existing AWP program offering. In this way, the Core Program’s key elements are similar across all the IOUs, substantially reducing confusion by customers and contractors.

The Core Program will also make cross utility coordination simpler and more transparent. It relies on a proven model of program delivery in a small market, through certified weatherization contractors, who are both motivated and capable of meeting each utility’s participation objectives. However, this model does not exclude CAP agencies from participating in the program, but rather opens up the participation in this program to a broader range of qualified contractors. This approach has been successfully used in both Arkansas as in the AOG-OG&E Joint Weatherization Program as well as in other jurisdictions as highlighted in the literature review.

The IOUs will administer their own coordinated electric and gas-utility weatherization services; however, the AEO will be actively involved in promoting the Core Program by acting as a centralized information point. The key program elements of this approach are as follows:

- A comprehensive assessment of the customer’s home;
- Direct installation of immediate (low-cost) energy saving measures;
- Installation of a set of weatherization measures, including insulation and air sealing, based on the funding levels provided by the utilities; and
- Management of the contractors that deliver the home assessments and installations, requiring standardized protocols, energy assessment tools and quality control.

Each utility will be responsible for the following:

- Delivery of a cost effective Core Program;
- Including the Core Program in its plan submittal to the Commission;
- Establishing its budget for the Core Program;
- Developing appropriate marketing and outreach for the program, as part of its overall marketing strategies for weatherization programs;
- Offering consistent requirements regarding contractor enrollment, training, and management, and;
- Coordinating with other utilities such as electric utilities coordinating with gas utilities to make it easy for the customer to participate and eliminate multiple outreach and service delivery.

Each IOU has the flexibility to provide additional services to include rebates for measures that are not addressed in this Core Program offering and financing options. Table 4 summarizes the types of measures that will be installed through this Core Program (Proposed Approach, 2014, pp. 17-21).

Table 4. Recommended Measures for the Core Program

Measure	TRM Section	Measures Currently Offered					Best Practices	Proposed Measures		
		AOG	OG&E	SGA	SWEPCO	EAI		Electric Only	Gas Only	Both
Central Air Conditioner Tune-Up	2.1.5					OUO		OUO		
Ceiling (Attic) Insulation	2.2.2	Core	Core	Core	Core	Core	Core			Core
Wall Insulation	2.2.3	Core	Core	Core	Core	Core	Core			Core
Window Film	2.2.8				OUO		Core	OUO		
Air Infiltration	2.2.9	Core	Core	Core	Core	Core	Core			Core
Water Heater Replacements	2.3.1			OUO	OUO		OUO			OUO
Water Heater Jackets	2.3.2		Core	Core	Core	Core	Core			
Water Heater Pipe Insulation	2.3.3	Core	Core	Core	Core	Core	Core			
Faucet Aerators	2.3.4	Core	Core	Core	Core	Core	Core			Core-DI
Low-Flow Showerheads	2.3.5	Core	Core	Core	Core	Core	Core			Core-DI
Advanced Power Strips	2.4.4				Core	Core	Core	Core-DI		
ENERGY STAR® (CFLs)	2.5.1.1		Core		Core	Core	Core	Core-DI		
ENERGY STAR® LED	2.5.2.3		Core		Core	Core		Core-DI		
Window Repair										OUO
Door Repair/Replacement										OUO
Roofs minor repair										OUO
Duct Sealing	2.1.11	Core	Core	Core	Core	Core				Core
HVAC Equipment-Central AC								OUO		
HVAC Equipment-Furnace									OUO	
HVAC Equipment-Heat Pump								OUO		

Legend: Core: Measures offered to all eligible customers; Core DI: Core Direct Install Measures

OUO: Other Utility Offering which are prescriptive measures or any other measures offered by utilities to eligible customers

Source: Proposed Approach, 2014, p. 23

Marketing/Outreach Activities

The program will be marketed by each utility using various market channels to maximize participation. Each utility will highlight the Core Program on its website and the AEO will provide a complementary website with links to the utility websites. Each IOU is encouraged to promote the Core Program to current customers using a combination of materials and market channels in a uniform format/brand including program brochures, flyers, trade allies, group presentations to targeted customers in multifamily buildings and manufactured home parks.

The IOUs are doing an excellent job of creating effective promotional and outreach materials to reach key customer groups. Several examples of the types of current marketing and advertising materials illustrate the ways in which these IOUs are incorporating marketing and outreach best practices into current program delivery.



Figure 1. AOG-OG&E Yard Signs

In addition, several utilities have started promoting this program in PY2014 including several examples of a new ad campaign by SWEPCO.



Figure 2. Web Site Banner

It's open season on high energy bills.

Save **\$300** on a home energy audit that will help you target energy waste and earn rebates up to **\$2,500** when you make select upgrades.

START THE HUNT: Call **888-266-3130** or visit **SWEPCOgridSMART.com**.

SOUTHWESTERN ELECTRIC POWER COMPANY
A unit of American Electric Power

gridSMART
From Southwestern Electric Power Company

The background of the advertisement features a circular graphic containing a bar chart titled "Avg KWH Per Day By Month". The chart shows energy usage for the months of February through January. The y-axis is labeled "KWH" and ranges from 0.0 to 65.2 in increments of 7.2. The x-axis is labeled "F M A M J J A S O N D J". The bars show a peak in usage during the summer months (June, July, August) and a low during the winter months (December, January, February). A small text "5% .0003900" is visible in the upper right corner of the circular graphic.

Figure 3. SWEPCO Bill Insert

Conclusions

In just seven months, the PWC was able to formulate an effective strategy designed to address all of the critical elements identified in Commission Order No. 7. Relying on EM&V results considerably shortened the time needed to design a new statewide approach. For example, the results directly influenced the approaches used to meet the Commission objectives, and accelerated and streamlined the program design phase. Since the EM&V results addressed current market barriers, the PWC was able to build into the program design elements that would mitigate or reduce these barriers, including focusing on a combination of both direct install and whole-house improvements, relying on third-party contractors for program delivery, and including energy efficiency measures that saved both natural gas and electricity. These activities led to the development of a statewide program with the following unifying elements:

- Consistent approach across all utilities to comprehensive audit for eligible customers;
- Consistent contractor requirements across all utilities such as the Building Performance Institute (BPI) or the Residential Energy Services Network (RESNET) and;
- Ongoing coordination by utilities and key stakeholders to monitor implementation, trouble-shoot problems and develop consistent solutions, review and recommend additional or substitute measures as technologies develop to ensure a consistent weatherization approach across the seven IOUs.

On December 9, 2014, the Commission unanimously approved the PWC's recommended approach and directed that the IOUs to begin implementation of the Core Program in January 2016. Furthermore, the Commission provided the following summation of the PWC's efforts:

The Commission congratulates the PWC for its continued excellence in achieving the benefits offered by collaboration and commends the active participants in the PWC Weatherization Working Group and the Independent Evaluation Monitor for their work and service in the public interest of Arkansas (Commission Order No. 22, p. 11 of 13).

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