

# **National Standard Practice Manual Case Study: Arkansas' Current Practices**

**Prepared for:**

Arkansas Public Service Commission

**Prepared by:**

The Parties Working Collaboratively (PWC),  
the Independent Evaluation Monitor (IEM) and  
E4TheFuture

*FINAL REPORT*

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## Glossary

**APSC or Commission:** Arkansas Public Service Commission

**Avoided costs:** An estimation of the future value of avoided market purchases of electric and gas energy resources that is applied to the amount of energy that did not need to be generated or purchased due to an installed energy efficiency (EE) measure that reduced the energy need. The energy efficiency resources are evaluated for cost-effectiveness. The avoided costs are what make up the utility system benefits of EE resources.

**AOG:** Arkansas Oklahoma Gas Company

**BHEA:** Black Hills Energy Arkansas, Inc.

**C&EE Rules:** Rules for Conservation and Energy Efficiency Programs

**CNP:** CenterPoint Energy Arkansas Gas

**EAI:** Entergy Arkansas Inc.

**Energy efficiency resource:** Energy efficient technologies, services, measures, or programs funded by, and promoted on behalf of, electric and gas utility customers.

**E4TheFuture:** E4TheFuture promotes residential clean energy and sustainable resource solutions to help build a resilient and vibrant energy efficiency and clean energy sector.

**Free Riders:** Customers who received a rebate or incentive to participate in a program, but would have participated in the program without the rebate or incentive.

**IEM:** Independent Evaluation Monitor

**NEBs:** Non-Energy Benefits

**NSPM:** National Standard Practice Manual

**Price Suppression:** Price suppression refers to a potential decrease in the wholesale price of energy or capacity resulting from an aggregate reduction in demand.

**PWC:** Parties Working Collaboratively

**OG&E:** Oklahoma Gas & Electric Company

**SARP:** Standard Annualized Reporting Packet

**SWEPCO:** Southwestern Electric Power Company

## Executive Summary

On November 2, 2017, the Arkansas Public Service Commission directed the Parties Working Collaboratively (PWC) to consider the findings and recommendations of the National Standard Practice Manual (NSPM).<sup>1</sup> The PWC formed an NSPM Working Group which has been meeting on a regular basis. The PWC NSPM Working Group collaborated with E4TheFuture to develop a Case Study regarding the NSPM in Arkansas.<sup>2</sup>

The overall goal of this case study was to document Arkansas' progress in adhering to the six NSPM underlying principles. Specifically, this case study:

- Summarizes the status of six of the seven Arkansas Investor-Owned Utilities (IOUs)<sup>3</sup> regarding incorporating the NSPM principles into their current energy efficiency policies and programs' cost-effectiveness analysis; *and*
- Identifies specific areas in which additional review, discussion, and consideration may be needed to fully meet these underlying principles.

This case study provides a snapshot of current IOU cost-effectiveness practices during Program Year 2017 and Program Year 2018. However, the energy efficiency landscape in Arkansas is constantly evolving. Where possible, we have also identified those areas that are undergoing current review as well as areas that may require additional guidance from the Commission. It is important to note that there are several areas of overlap between the various NSPM principles which are identified in this case study as appropriate.

## Conclusions

Arkansas has demonstrated ongoing leadership and commitment to sound energy efficiency programs and policies for a number of years. This is evident in its long history of establishing policies that promote energy efficiency programs and its commitment to measuring the overall effectiveness in both program planning and implementation through annual EM&V and transparent reporting.

With respect to assessing cost-effectiveness of ratepayer funded efficiency program, review and consideration of the NSPM suggests that there are both many aspects of Arkansas' current approach that are consistent with NSPM principles and some areas where refinement may be warranted.

The case study documented that the APSC's current guidance on cost-effectiveness analyses addresses all of the biggest utility system impacts (avoided energy, avoided capacity, avoided T&D and marginal line losses); it also addresses most of the state's key policy objectives.

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<sup>1</sup> Order No. 27, Docket No. 10-100-R and Order No. 40, Docket No. 13-002-U.

<sup>2</sup> See General Staff's Status Report Concerning the National Standard Practice Manual Case Study filing on May 30, 2018, in Docket Nos. 10-100-R and 13-002-U.

<sup>3</sup> Due to its uniquely small and rural service territory and corresponding waiver of certain C&EE Rules and requirements as recognized by the Commission in Docket No. 07-076-TF, Order No. 62, The Empire District Electric Company was not used in the NSPM study group.

However, the NSPM case study uncovered both some inconsistencies in application of the APSC’s guidance on application of the Total Resource Cost Test (TRC) and several additional areas in which Arkansas’ cost-effectiveness analyses are inconsistent with NSPM principles:

- Some utilities are using different approaches to quantify utility system impacts (e.g., not accounting for avoided T&D costs and using average rather than marginal line loss rates) than the APSC directed them to use.
- There are also inconsistencies in the treatment of incentives paid to free riders in the TRC test, the choice of discount rates, and the incorporation of assumptions regarding carbon costs.
- Several categories of utility system impacts have not been addressed by APSC guidance on cost-effectiveness and are not being included in cost-effectiveness analyses by the six IOUs (e.g. avoided ancillary service costs, avoided credit and collection costs and the risk mitigating value of efficiency resources);
- Asymmetrical application of participant impacts – specifically inclusion of all participant costs, but exclusion of some participant non-energy benefits (NEBs).
- Impacts associated with some state policy objectives for efficiency programs are not currently included in the current definition of the Arkansas cost-effectiveness test. Specifically, Environmental, Economic Development, and Energy Security impacts are not quantified as part of the cost-effectiveness testing. However, these NEBs were only noted in the initial energy conservation orders in 2007 and have not been addressed in subsequent orders.

The following table summarizes these findings.

**Table E- 1 : Summary of Arkansas' Consistency with the NSPM Principles**

Utility Status	NSPM Principles					
	#1: Treat Efficiency as a Resource	# 2: Policy Goals	#3: Hard-to-Quantify Impacts	# 4: Symmetry	#5: Forward-Looking Analysis	# 6: Transparency
Overall Portfolio	●	●	●	●	●	●
AOG	●	●	●	●	●	●
BHEA	●	●	●	●	●	●
CenterPoint	●	●	●	●	●	●
EAI	●	●	●	●	●	●
OG&E	●	●	●	●	●	●
SWEPCO	●	●	●	●	●	●
Fully Met = ● Mostly Met = ● Partially Met = ● Did Not Meet = ○						

## **Recommendations**

This case study has also identified several areas that merit further consideration by the Commission with input from the PWC.

- The Commission may want to review the areas of inconsistency identified in the case study (e.g., in the development of utility system impacts such as avoided T&D costs and the use of marginal line losses, the selected discount rates, and the handling of incentives to free riders) and develop more clarity regarding the inputs and calculations for the cost-effectiveness calculations in Arkansas.
- The Commission may want to seek additional guidance regarding carbon cost pricing as the NSPM does not provide specific guidance on this topic. Appendix B summarizes the additional resources and approaches for addressing the issue.
- The Commission may want to consider expanding the current approved NEBs to include those specific to low-income programs that are consistent with the criteria set forth by the Commission in its order approving the inclusion of NEBs in the TRC test of cost-effectiveness, if a Low-Income Pilot Program is launched.
- The Commission may want to consider requiring the six Arkansas utilities to document which other utility system and non-utility impacts are being included in cost-effectiveness analysis (e.g., wholesale price suppression effects; avoided other regulatory costs) in the SARP workbooks in order to reveal any areas of inconsistency.
- Besides participant NEBs directly attributable to low-income programs, there is a long list of potential participant impacts that the Arkansas PSC could consider adding to the cost-effectiveness testing to address current asymmetry in treatment of participant costs and benefits (i.e. current inclusion of all participant costs, but only some participant benefits).<sup>4</sup> The current Commission approach has been to focus on those NEBs that are quantifiable, material, and relevant to the analysis of a specific utility program or program portfolio.”<sup>5</sup> Analysis of some NEBs actually produced by the state’s efficiency programs would address the current inconsistencies used in Arkansas as well as affirm Arkansas’ commitment to focus on quantifiable, Arkansas-specific NEBs going forward.
- The Commission may want to consider whether previously stated policy interest in the environmental, energy security and economic development impacts of efficiency programs is of sufficient magnitude to warrant future inclusion of these impacts in the state’s cost-effectiveness test and if so, provide appropriate guidance.

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<sup>4</sup> C&EE Rules, Section 2, as amended by Orders 15 and 18 of APSC Docket No. 06-004-R, effective April 12, 2007 and May 25, 2007, respectively.

<sup>5</sup> APSC Docket No. 13-002-U, Order No. 30, p. 16; Order No. 7, p. 88.

## Table of Contents

Glossary .....	i
Executive Summary .....	ii
1. Introduction .....	1
2. Methodology .....	3
A. PWC Working Group Discussions .....	3
B. Review of Arkansas’ Current Practices .....	4
C. Cost-Effectiveness Review by Utility Staff .....	5
3. Comparison of NSPM Principles to Arkansas Current Practices .....	6
Principle #1: Treat Efficiency as a Resource .....	6
Background .....	6
Efficiency as a Resource in Cost-Effectiveness Analyses .....	7
Principle #2: Policy Goals.....	8
Implications of Policy Goals for Categories of Impacts Included in Arkansas Cost-Effectiveness Test	8
Implications of Policy Goals for Discount Rates Used in Arkansas Cost-Effectiveness Test .....	8
Principle #3: Hard-to-Quantify Impacts .....	9
Low-Income NEBs .....	11
Carbon Impacts.....	11
Other Hard-to-Quantify Impacts .....	12
Summary .....	12
Principle #4: Symmetry .....	13
Asymmetry in Treatment of Utility System Impacts .....	13
Inconsistent Reporting of Utility System Impacts .....	14
Omitted Utility System Impacts .....	15
Asymmetry in Treatment of Participant Impacts.....	15
Principle #5: Forward-Looking Analysis.....	15
Principle #6: Transparency .....	16
4. Conclusions and Recommendations .....	20
Conclusions.....	20
Recommendations .....	21
References.....	23
Appendices bound separately	

**List of Figures**

Figure 1: NSPM Steps ..... 3  
Figure 2: Summary of Utility System Impacts Reported by Utility and Category ..... 13

**List of Tables**

Table E- 1 : Summary of Arkansas' Consistency with the NSPM Principles .....iii  
  
Table 1: Summary of the Universal Principles Articulated in the NSPM ..... 1  
Table 2: Summary of Occurrences of NSPM Impacts in the Docket Review ..... 4  
Table 3: Summary of Total 2017 Gas and Electricity Primary Savings ..... 6  
Table 4: Discount Rates Used in the Benefit Cost Tests ..... 9  
Table 5: Description of Arkansas' Comprehensiveness Checklist Factors..... 18  
Table 6: Summary of the Commission's Comprehensiveness Checklist Factors by Utility..... 19  
Table 7: Summary of Arkansas' Consistency with the NSPM Principles ..... 21

## 1. Introduction

On November 2, 2017, the Arkansas Public Service Commission directed the Parties Working Collaboratively (PWC) to consider the findings and recommendations of the National Standard Practice Manual (NSPM).<sup>6</sup> The PWC formed an NSPM Working Group which has been meeting on a regular basis. The PWC NSPM Working Group collaborated with E4TheFuture to develop a Case Study regarding the NSPM in Arkansas.

The NSPM provides a comprehensive framework to determine cost-effectiveness of energy efficiency resources. This approach presents an objective and neutral Resource Value Framework that can be used to define a jurisdiction's *primary* cost-effectiveness test (e.g. the Resource Value Test). The Resource Value Framework is based on six underlying principles that embody the perspective of a jurisdiction's applicable policy objectives, and it includes and assigns value to all relevant impacts (costs and benefits) related to those objectives (NSPM 2017, p. 1). These six principles are the focus of this case study.

**Table 1: Summary of the Universal Principles Articulated in the NSPM**

<b>Efficiency as a Resource</b>	Energy efficiency is one of many resources that can be deployed to meet customers' needs, and therefore should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.
<b>Policy Goals</b>	A jurisdiction's primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives. These goals and objectives may be articulated in legislation, commission orders, regulations, advisory board decisions, guidelines, etc., and are often dynamic and evolving.
<b>Hard-to-Quantify Impacts</b>	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified based on policy goals,) even those that are difficult to quantify and monetize. Using best-available information, proxies, alternative thresholds, or qualitative considerations to approximate hard-to-monetize impacts is preferable to assuming those costs and benefits do not exist or have no value.
<b>Symmetry</b>	Cost-effectiveness practices should be symmetrical, where both costs and benefits are included for each relevant type of impact.
<b>Forward-Looking Analysis</b>	Analysis of the impacts of resource investments should be forward-looking, capturing the difference between costs and benefits that would occur over the life of the subject resources as compared to the costs and benefits that would occur absent the resource investments.
<b>Transparency</b>	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

(Source: NSPM 2017, p. viii)

<sup>6</sup> The Commission issued the directive as part of its Findings and Rulings on Issue B - Inclusion of a Common Annual Forecasted Value of Carbon Costs of the Planning Period in Future Analyses (Docket No. 10-100-R, Order No. 27; Docket No. 13-002-U, Order No. 40) p. 3 of 4).

The overall goal of this case study was to assess and document the consistency of current practice in Arkansas with the six NSPM principles. Specifically, this case study:

- Provides an assessment of the current cost-effectiveness testing procedures used by six of the Investor-Owned Utilities (IOUs) with the NSPM principles; *and*
- Identifies specific areas in which additional review, discussion, and consideration may be warranted to determine potential revisions to current cost-effectiveness practice pertaining to energy efficiency program planning and implementation.

This case study provides a snapshot of current IOU cost-effectiveness practices during Program Year 2017 and Program Year 2018. However, the energy efficiency landscape in Arkansas is constantly evolving. Where possible, we have also identified those areas that are undergoing current review as well as areas that may require additional guidance from the APSC in the future.

## 2. Methodology

The Arkansas Public Service Commission directed that the PWC, with assistance from Staff, the Independent Evaluation Monitor (IEM), and E4theFuture, develop a case study assessing the current status of Arkansas' energy efficiency policies and cost-effectiveness testing relative to the best practices described in the NSPM. The seven steps used to conduct the study are summarized in the following figure.

NSPM Steps	
Step 1	Identify and articulate the jurisdiction's applicable policy goals.
Step 2	Include all utility system costs and benefits.
Step 3	Decide which additional <i>non-utility</i> system costs and benefits to include in the test, based on applicable policy goals.
Step 4	Ensure the test is symmetrical in considering both costs and benefits.
Step 5	Ensure the analysis is forward-looking, incremental, and long-term.
Step 6	Develop methodologies and inputs to account for all impacts, including hard-to-quantify impacts.
Step 7	Ensure transparency in presenting the analysis and the results.

(Source: NSPM 2017, p. ix)

**Figure 1: NSPM Steps**

The next section summarizes the ways in which this information was collected, reviewed, and documented to prepare this case study.

### A. PWC Working Group Discussions

The PWC formed a specific Working Group to assist in providing and assessing the information required to complete the requested case study. This Working Group was comprised of representatives from the Arkansas electric and gas utilities, Staff, Intervenors (Audubon), and IEM team members. From March through September 2018, the Working Group members met monthly to discuss the development of the Arkansas Case Study, gather the information required from the Arkansas utilities, and reviewed progress on developing the case study. The Working Group discussed this Case Study in person during the July 2018 PWC meeting and a follow-up meeting on September 18, 2018.

## B. Review of Arkansas' Current Practices

Commission Staff provided invaluable assistance in developing this case study. They conducted a thorough review of the Arkansas Commission Dockets and summarized all of the relevant information regarding the Commission's historical policies on energy conservation and related topics since 1977.

This comprehensive review identified additional impacts that could be quantified and included in future cost-effectiveness testing for the Arkansas utilities. There was a total of 31 instances in which the Commission Orders matched specific impacts described in the NSPM. Table 2 summarizes these findings.<sup>7</sup>

**Table 2: Summary of Occurrences of NSPM Impacts in the Docket Review**

Policy	Number of Orders Referenced	Currently in TRC?	Notes
<b>Utility System</b>			
Utility System Impacts	9	Y	Captured in utility EE portfolio costs and in the system avoided costs reported by the utilities
Reliability Impacts	1	N	Not quantified in current cost-effectiveness tests
<b>Participants</b>			
Other Fuels	5	Y	Part of NEBs
Water Impacts	2	Y	Part of NEBs
Low-Income Impacts	2	TBD	Will be addressed in the Low-Income Pilot Program currently in development by the PWC if approved
Other Participant Impacts	4	Limited	Besides other fuels and water, the only participant NEB currently in cost-effectiveness tests is reduced O&M costs
<b>Society</b>			
Equitable Access Impacts	2	NA	Not quantified in current cost-effectiveness tests
Carbon Impacts	3	Partially, in some cases	Some utilities include value for avoided carbon emissions; others do not. Those that do base the value on estimate of avoided future carbon regulation costs (utility system impact) rather than societal value.
Other Environmental Impacts	1	N	Not quantified in current cost-effectiveness tests
Economic Development Impacts	1	N	Not quantified in current cost-effectiveness tests
Energy Security Impacts	1	N	Not quantified in current cost-effectiveness tests

(Source: Summary from Energy Efficiency Policy Docket Review 2018)

The summary of the Commission's Energy Efficiency Policies is provided in Appendix A.

<sup>7</sup> Section 3 of this case study explores more fully Arkansas' policy approach of viewing energy efficiency "as a resource."

### **C. Cost-Effectiveness<sup>8</sup> Review by Utility Staff**

All of the Arkansas IOUs are also required to provide detailed information each year in the Standard Annual Reporting Packet (SARP) workbooks. These workbooks record the current assumptions used to determine each utility's costs and benefits by program and across the portfolio.

As part of this review, each utility provided details regarding which costs are included in its avoided cost assumptions. Reviewing the individual utility responses identified a few discrepancies regarding the utilities' assumptions for several Utility System Impacts which are related directly to Principles 1 and 4 of the NSPM. These discrepancies focused on the ways in which the electric utilities currently report the following system impact costs:

- Avoided Transmission & Distribution (T&D) Capacity Costs;
- Transmission and distribution (T&D) Line Losses for both energy and peak KW;
- Wholesale Price Suppression Effects; and
- Environmental Regulatory Costs, particularly avoided future carbon regulation costs.

These findings are discussed more fully as this issue also relates to Principle 4: Symmetry in Section 3 of this case study.

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<sup>8</sup> The C&EE Rules, Section 3, defines "cost-effective" to mean [a] standard used to describe a 'net beneficial' result for programs to be implemented, determined through a process that includes a review of relevant benefit/cost tests. A 'cost-effective' program would be one that has a high probability of providing aggregate ratepayer benefits to the majority of utility customers."

### 3. Comparison of NSPM Principles to Arkansas Current Practices

This section summarizes the current status of Arkansas' energy efficiency program policies relative to the six NSPM principles. It is important to note that there are several areas of overlap between the various NSPM principles which are identified in this case study as appropriate.

#### ***Principle #1: Treat Efficiency as a Resource***

NSPM's first guiding principle is that efficiency should be considered a resource. As the NSPM explains,

*“Energy Efficiency (EE) is one of the resources that can be deployed to meet customers' needs, and therefore should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.”* (NSPM 2017, p. 9)

The key research question for this principle is:

- Are all utility system impacts – costs and benefits – included in cost-effectiveness test?

#### **Background**

Arkansas has clearly demonstrated its intention to treat efficiency as a resource through a variety of policies including its energy savings goals and the rigor through which it evaluates performance to ensure claimed savings are verifiable. Indeed, the state is widely regarded as an energy efficiency leader in the Southeast. According to the Program Year (PY) 2017 evaluations, all but one of the six reporting Arkansas utilities exceeded its energy savings goals with the exception of CenterPoint Energy Arkansas Gas, which achieved 97 percent of its goal, as summarized in the following table.

**Table 3: Summary of Total 2017 Gas and Electricity Primary Savings**

Utility	Planned Therm Savings	Net Evaluated Therm Savings	Planned kWh Savings	Net Evaluated kWh Savings	Percent of Planned Savings Achieved
AOG	444,944	536,208	-	-	121%
BHEA	1,180,976	1,261,851	-	-	107%
CenterPoint	3,536,126	3,423,918	-	-	97%
EAI	-	-	238,130,000	264,991,920	111%
OG&E	-	-	18,062,811	21,130,663	117%
SWEPCO	-	-	32,381,870	33,666,826	104%
<b>Total Gas</b>	<b>5,162,550</b>	<b>5,221,977</b>	-	-	<b>101%</b>
<b>Total Electric</b>	-	-	<b>288,574,681</b>	<b>319,812,165</b>	<b>111%</b>

Source: 2017 EM&V Reports and Evaluator-provided summary workbooks

The APSC has articulated benefits and objectives for energy efficiency initiatives to pursue in Section 2 of the Commission's C&EE Rules. *“When providing information on these objectives, utilities are directed to describe, in quantitative terms, the benefits and costs of these different aspects of the program, standard, or code, and to comment on the barriers that impede accomplishment of these energy efficiency objectives and how to overcome these barriers.”*

Arkansas' commitment to “Efficiency as a Resource” is also evident in Order No. 43 of Docket 13-002-U, establishing energy savings targets for achieving performance incentives during the next program cycle.

*“For PY 2020-2022, the utility energy savings targets shall be 1.20% of 2018 baseline sales as adjusted for Self-Direct customers for electric utilities and 0.50% of 2018 baseline sales as adjusted for Self-Direct customers for natural gas utilities.”* (Docket No. 13-002-U, Order No. 43, page 11 of 12)

The Commission noted that the establishment of these savings targets *“is consistent with the policy goal of capturing all cost-effective, achievable savings; promotes the policy objective of program comprehensiveness; provides ratepayers with increased opportunity to achieve substantial economic benefits that will be forgone if targets are set to maintain lower levels of savings; and provides for the payment of shareholder incentives that are commensurate with the level of achievement of potential economic benefits returned to ratepayers.”* (*Id.* at 10)

These are just a few examples of how Arkansas is fostering “*Efficiency as a Resource*” and providing concrete guidance to ensure that energy efficiency initiatives will achieve specific energy savings goals and cost-effective energy efficiency programs for its ratepayers, while promoting the state's policy objectives.

### **Efficiency as a Resource in Cost-Effectiveness Analyses**

The APSC has also endeavored to treat efficiency as a resource in its guidance on cost-effectiveness analyses. For example, it requires the state's utilities to include the biggest categories of utility system benefits in their analyses, including avoided energy, avoided capacity, avoided Transmission & Distribution (T&D) and line losses. In the case of line losses, the APSC has instructed the utilities to use marginal line loss rates, which is a national best practice.

However, this case study has revealed that not all utilities are uniformly following the APSC's guidance on cost-effectiveness analyses. Further, there are several categories of utility system impacts on which the APSC has not yet issued guidance and which are not included in any utility's cost-effectiveness analyses (e.g. avoided ancillary services costs, the value of risk mitigation, and avoided credit and collection costs). The inconsistencies and omissions in the utility system impacts are discussed more fully in Principle 4.

## **Principle #2: Policy Goals**

Principle #2 is closely aligned with Principle #1 in that the commitment to “*efficiency as a resource*” is articulated through the policy goals in a specific jurisdiction. The NSPM provides the following explanation of this principle:

*“Applicable Policy Goals. A jurisdiction’s primary cost-effectiveness test should account for its energy and other applicable policy goals. These goals may be articulated in legislation, commission orders, regulations, advisory board decisions, guidelines, etc., and are often dynamic and evolving.”* (NSPM 2017, p. 9)

For the purposes of this analysis, Principle #2 focuses on examining the following two questions:

- What does the state’s policy goals suggest about the categories of non-utility system impacts that should be included in its test? Are all of those categories of impacts included?
- Is the discount rate consistent with the policy objectives of the state?

### **Implications of Policy Goals for Categories of Impacts Included in Arkansas Cost-Effectiveness Test**

The review of Arkansas’ policy objectives, as shown in Table 2 and Appendix A, indicate that most of the policy goals are currently intended to be reflected in the cost-effectiveness testing conducted by the six IOUs under guidance from the APSC. This issue is discussed more fully in Principles #3 and #4.

In addition, there are some potential state policy objectives for efficiency programs for which impacts are not currently included in the current definition of the Arkansas cost-effectiveness test. Specifically, Environmental, Economic Development, and Energy Security impacts are not yet quantified as part of the cost-effectiveness testing. However, these societal NEBs were only noted in the initial energy conservation orders in 2007 and have not been addressed in subsequent orders. Clarity on the importance of these objectives is necessary to determine whether they should be reflected in the state’s cost-effectiveness test in the future.

### **Implications of Policy Goals for Discount Rates Used in Arkansas Cost-Effectiveness Test**

The NSPM has an entire chapter devoted to discount rates (Chapter 9), noting that:

*“The discount rate reflects a particular pattern of ‘time preference,’ which is the relative importance of short- versus long-term impacts. A higher discount rate gives more weight to short-term impacts, while a lower discount rate gives more weight to long-term impacts. The choice of discount rate is a policy decision that should be informed by the jurisdiction’s energy and other applicable policies—and thus should reflect the regulatory perspective.”* (p. 73)

As Table 4 shows there is substantial inconsistency in the selected discount rates that the utilities currently use as part of their TRC tests: four of the utilities use weighted average cost of capital (WACC), one utility (CNP) uses a societal discount rate (based on long-term treasury bond yields), while another

utility (AOG) uses a blend of WACC and societal discount rates. In addition, the assumed rate of inflation differs between the utilities.<sup>9</sup>

**Table 4: Discount Rates Used in the Benefit Cost Tests**

	Electric Utilities			Gas Utilities		
Utility	EAI	SWEPCO	OG&E	AOG	BHEA	CNP
Rate for BC Tests	6.36%	6.1%	5.4%	5.0%	5.3%	2.6%
Basis for the Rate	WACC	After-tax WACC	WACC	Blend of WACC and Societal	WACCC approved in last rate case	U.S. Department of the Treasury's 20-year Constant Maturity Rate (CMT) Rate, averaged from January 2, 2015 to December 31, 2015
Real or Nominal Rate	Nominal	Nominal	Nominal	Nominal	N/A	Nominal

These differences suggest that there is a need for guidance from the APSC on discount rates. As shown in Table 2 and discussed above, statutes and APSCs order suggest efficiency programs are intended to address a wide range of policy objectives.

### **Principle #3: Hard-to-Quantify Impacts**

This principle is defined in the NSPM as follows:

*“Hard-to-Quantify Impacts. Cost-effectiveness practices should account for all relevant, substantive impacts (as identified based on policy goals,) even those that are difficult to quantify and monetize. Using best-available information, proxies, alternative thresholds, or qualitative considerations to approximate hard to-monetize impacts is preferable to assuming those costs and benefits do not exist or have no value.” (NSPM 2017, p. 9)<sup>10</sup>*

The key research question for Principle #3 is:

- Does the difficulty in quantifying some impacts prevent the state from including all relevant utility and non-utility impacts?

The APSC has identified several hard-to-quantify benefits associated with energy efficiency programs. Commission Order No. 30 of Docket 13-002-U reflects a thorough analysis of how Non-Energy Benefits (NEBs) should be treated in Arkansas, including the following information submitted by the PWC:

<sup>9</sup> While the use of real vs. nominal discount rates vary between the utilities, the varying rates are not an issue as long as the avoided costs are also in similar real or nominal dollars

<sup>10</sup> While the NSPM promotes the use of hard-to-quantify NEBs, it provides no specific guidance in this regard on the carbon pricing issue and therefore the PWC requests additional guidance from the Commission concerning how to address the carbon cost issue.

“The PWC indicate that it researched and analyzed the quantification of NEBs in cost-effectiveness testing for the next three-year EE planning cycle, with the facilitation and technical assistance of the Independent Evaluation Monitor (IEM). The PWC submit a report developed by the IEM, Dr. Katherine Johnson: *An Examination of Non-Energy Benefits: Definitions, Approaches and Values Used in Other Jurisdictions* (June 17, 2014) at 3 (IEM Report), which includes a review of the literature on NEBs. Joint Comments at 3, Appendix A to Attachment A, Document 204 in Docket No. 13-002-U. The PWC report that, while some jurisdictions rely on adders of 10 to 15 percent to the value of EE programs to account for the additional value of NEBs, rather than trying to quantify specific values for a variety of NEBs, many PWC participants agreed that such an adder does not fit the Commission's definition of well-defined NEBs. *Id.* at 4. The PWC state that they agreed to focus on a few of the most important and most quantifiable NEBs, including:

- Avoided "other fuels" consumption;
- Avoided water/sewerage consumption;
- Avoided and deferred equipment replacement; and
- Avoided utility cost of service.

*Id.* at 4-5. The PWC indicate that they decided early on not to further investigate methods of quantifying avoided utility cost of service because it would require significant research and would be difficult to quantify and because such avoided costs are comprehended in cost of service updates in general rate proceedings.<sup>11</sup> *Id.* at 5. Regarding savings of ‘other’ fuels," the PWC indicate that for programs that save both natural gas and electricity, most Arkansas utilities already account for the benefit of saving both of these fuels, but not propane, if the benefit is not accounted for by another utility. *Id.*”<sup>12</sup>

After noting difficulties in quantifying avoided utility cost of service items and equipment, the Commission directed that the following three NEBs should be used in the TRC cost-effectiveness tests provided they meet the Order No. 7 standards:<sup>13</sup>

- Benefits of electricity, natural gas, and liquid propane energy savings;
- Benefits of public water and wastewater savings; and
- Benefits of avoided and deferred equipment replacement costs.<sup>14</sup>

At the Commission’s direction, the IEM has provided guidance on calculating the value of these NEBs in the EM&V Protocols-which were reported in annual reports starting in PY2017. Protocol L in Volume 1

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<sup>11</sup> During the course of the NSPM case study, it was suggested that the fact that some avoided costs are included in cost of service upgrades in general rate proceedings may not be relevant to the question of whether such avoided costs should be included in cost-effectiveness analyses. Due to time limitations, this issue did not get resolved as part of the work on this case study.

<sup>12</sup> Docket 13-002-U, Order No. 30, pp. 2-3.

<sup>13</sup> Docket 13-002-U, Order No. 7, p. 88, stating “that the TRC test shall include well-defined NEBs which (a) measurably reduce scarce resources, add significant value or reduce costs; (b) have a quantifiable economic value; and (c) are clearly applicable to the specific program or measure at issue.”

<sup>14</sup> Docket 13-002-U, Order No. 30, pp. 20-21.

of Arkansas' Technical Reference Manual (TRM) provides detailed information, examples, and reporting templates for each of the approved NEBs.

### **Low-Income NEBs**

More recently, the Arkansas General Assembly passed Act 1102 of 2017 which provided guidance to the Commission regarding energy efficiency programs for utility customers who are sixty-five (65) years of age or older or who meet the income eligibility qualifications of the Low Income Home Energy Assistance Program (LIHEAP) administered by the Department of Human Services.<sup>15</sup>

Currently, the six IOUs are working to develop pilot programs that will specifically target the LIHEAP-eligible population for the next program cycle.

Offering dedicated low-income programs also expands the potential NEBs that could result from this program design. As identified in the NEB Literature Review (Johnson & Eisenberg 2014, p. 10), low-income programs also provide a variety of Non-Energy Benefits specific for low-income customers. These include helping utilities reduce the effects of termination of service (i.e., reduced "uncollectibles," reduced termination of service costs, other administrative cost savings) (Johnson & Eisenberg 2014, pp. 6-7).

In addition, low-income participants receive many additional NEBs through the installation of weatherization including improved overall health, comfort, and safety.

States have taken different approaches to quantify the NEBs related to low-income programs. One approach is to use an adder designed to capture all of the benefits associated with a low-income program. Another strategy has been to gather specific data from the utilities, weatherization agencies, and other institutions to quantify these improvements in health, comfort, and safety. These NEBs can be broken down further into specific quantifiable metrics such as: reductions in the number of asthma cases, length of hospital stays, number of missed school or work days, etc.

Quantifying the NEBs associated with Arkansas' low-income pilot program is an emerging area that has not yet been addressed in any Commission Orders.

### **Carbon Impacts**

Another goal of this case study, in response to PSC Order No. 40, was to determine whether the NSPM can provide guidance concerning the inclusion of a common annual forecasted value of carbon costs in program cost-effectiveness testing. Currently, the electric utilities assign different values of carbon ranging from zero to \$15/ton; the gas utilities do not include carbon costs in their cost-effectiveness testing.<sup>16</sup>

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<sup>15</sup> The applicable parts of Act 1102, sections 1 and 2, are codified at Arkansas Code § 23-2-304(a) (11) and § 23-3-405(a).

<sup>16</sup> See generally APSC Docket No. 13-002-U, Order No. 7, September 9, 2013, pp. 31-39 and 87-88, and Docket No. 13-002-U, Order No. 40, November 2, 2017, pp. 3-4.

The NSPM views carbon as one part of a jurisdiction's overall policy goals, along with other policy goals such as those related to low-income programs or reducing price volatility (NSPM 2017 p. 77). The NSPM does not provide specific guidance on the best approaches to quantify the cost of carbon across a specific jurisdiction. Therefore the question of the use of a common annual forecasted value of carbon costs in program cost-effectiveness testing remains unresolved among the members of the PWC. Appendix B provides a summary of recent carbon pricing trends used in other states as a way to provide additional information to the Arkansas Commission.

### Other Hard-to-Quantify Impacts

This review also identified several areas in which the current avoided cost benefits reported by the utilities that are not consistent with the Commission guidance provided by the C&EE Rules, Section 2. Specifically, this analysis identified several impacts associated with energy efficiency programs that are not currently included in the cost-effectiveness testing uniformly across the six IOUs:

- **Avoided other environmental regulatory costs:** Only EAI<sup>17</sup> includes a cost assumption for this impact while the other two electric utilities and none of the gas utilities currently quantify this system impact.
- **Energy Security Impacts and Benefits:** This category is not included in any of the utility cost-effectiveness testing. This is likely due to its difficulty in quantifying these costs and benefits.
- **Economic Development Impacts and Benefits:** This category is not included in any of the utility cost-effectiveness testing. This is likely due the challenge of quantifying these costs and benefits. However, several states have taken an incremental approach to begin quantifying specific economic impacts such as direct and indirect job creation and increased tax revenues.<sup>18</sup>
- **Costs and Benefits of Low-Income Energy Efficiency Programs:** As mentioned earlier, the launch of a Low-Income Pilot Program could expand the list of potential NEBs to include health, safety, and comfort impacts as well as reduced administrative costs associated with improved payment rates and lower overall energy bills for program participants.<sup>19</sup>

### Summary

Arkansas currently includes a number of costs and benefits in its cost-effectiveness test that are hard to quantify. Others – such as low income NEBs and the avoided cost of future carbon emission regulation – are currently under discussion. The current Arkansas cost-effectiveness test does not fully adhere to the NSPM principle of assigning some value to hard-to-quantify impacts, which are discussed more fully in NSPM Principle #4 – Symmetry.

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<sup>17</sup>EAI adds the following clarification: *The cost for Seasonal NOx is included as an adder to fuel cost which is avoided as a result of the implementation of energy efficiency. Fuel cost is a component of the avoided energy value in the TRC test. This is the same as CO2 cost.*

<sup>18</sup> This is the approach used in Illinois under the Stipulation and Future Energy Jobs Act (FEJA) legislation.

<sup>19</sup> Note, the Arkansas IOUs are currently capturing these administrative costs through rate cases. However, this system impact could be explored more fully to be sure it is capturing all of the costs and benefits associated with low-income programs, once the pilot program has been launched.

## Principle #4: Symmetry

Symmetry means that the cost-effectiveness analysis should capture both costs and benefits in a balanced way. As the NSPM explains, this assures that the cost-benefit test is not skewed or misleading (NSPM 2017, p. 12). Specifically, the NSPM defines symmetry as:

*“Symmetry. Efficiency assessment practices should be symmetrical, for example by including both costs and benefits for each relevant type of impact.” (NSPM 2017, p. 9)<sup>20</sup>*

This need for symmetry applies to all type of impacts, including both utility system impacts and non-utility system impacts deemed important by state policies (as discussed in NSPM Principle #2). In this case study, we have identified two areas where there is asymmetry in Arkansas’ application of cost-effectiveness analyses:

- Utility system impacts
- Participant impacts

Each of these is discussed further below.

### Asymmetry in Treatment of Utility System Impacts

As described previously, Principle #1 shows Arkansas utilities are including all of the utility system costs, and most of the larger utility benefits in most cases, but not all utility system benefits. The result is some asymmetry in the treatment of utility system impacts.

As part of this case study, all six utilities provided a summary of the current avoided cost benefit assumptions they use in developing their cost-effectiveness tests. The case study also revealed a number of areas in which the utilities use differing assumptions regarding utility system benefits, or do not claim several categories of utility system benefits at all. Figure 2 summarizes these findings by utility and system impacts.

Category of Utility System Impacts	Electric Utilities			Gas Utilities		
	EAI	SWEPCO	OG&E	AOG	BHEA	CNP
Avoided Energy Costs	Yes	Yes	Yes	Yes	Yes	Yes
Avoided Generating Capacity Costs	Yes	Yes	Yes	N/A	N/A	N/A
Avoided T&D Capacity Costs	Yes	No	No	N/A	N/A	N/A
Avoided T&D Line Losses						
energy kWh	Yes (Marginal)	Yes (Average)	Yes (Average)	Yes	Yes	Yes
peak kW	Yes (Marginal)	No	Yes (Average)	N/A	N/A	N/A
Avoided Ancillary Services	No	No	No	N/A	N/A	N/A
Wholesale price suppression effects						
energy kWh	Yes	No	No	N/A	N/A	N/A
peak kW	Yes	No	No	N/A	N/A	N/A
Avoided carbon emission regulatory costs	Yes	Yes	No	No	No	No
Avoided other environmental regulatory costs	Yes	No	No	No	No	No
Avoided credit & collection costs	No	No	No	No	No	No
Changes to Risk Profile (e.g. fuel diversity)	No	No	No	N/A	N/A	N/A

**Figure 2: Summary of Utility System Impacts Reported by Utility and Category**

<sup>20</sup> We also note that symmetry overlaps with Principle #2: Policy Goals regarding cost and benefit analysis. See Principle #2 for a discussion of Arkansas’ cost-effectiveness policy goals.

## Inconsistent Reporting of Utility System Impacts<sup>21</sup>

- **Avoided Transmission & Distribution Capacity Costs:** This cost category is treated differently by each Arkansas electric utility. For example, EAI includes this information based on an internal study which has been classified as “Highly Sensitive Protected Information (HSPI). In contrast, SWEPCO does not include these costs, noting that, “*AEP does not believe that energy efficiency alone creates a measurable level of avoided T&D costs.*” OG&E also does not include these avoided costs.

Commission Order No. 7 of Docket No. 13-002-U described two recommended approaches for calculating these system impacts. The electric utility could base its avoided capacity cost on the cost of a combustion turbine (CT) as modified to account for market conditions and as applied to the year in which the utility or relevant market do not have surplus capacity. Alternatively, the Commission suggested that this cost be based on available market data and account for any “significant, foreseeable changes to marginal capacity costs.”<sup>22</sup> None of the gas utilities includes avoided T&D costs in their cost-effectiveness analyses. Though such benefits tend to be smaller for gas utilities, their omission from gas cost-effectiveness analyses also constitutes a lack of alignment with the NSPM symmetry principle.

- **Avoided Transmission & Distribution Line Losses:** The three electric IOUs also have different approaches to quantifying the T&D peak kW line losses. EAI and OG&E use assumptions based on external (EAI) and internal (OE&E) studies, while SWEPCO excludes avoided peak kW T&D line losses in its cost-benefit calculations. Furthermore, SWEPCO and OG&E use average line loss rates – rather than more accurate marginal loss rates – for both energy and peak T&D line losses. Note the use of average line loss rates is inconsistent with APSC Docket No. 13-002-U, Order No. 7, p. 39, which states “*The Commission adopts the use of marginal, rather than average line losses, to quantify EE’s incremental effects, which is unopposed by any party, to quantify EE’s incremental effects.*” which is inconsistent with the NSPM recommendations.<sup>23</sup> The NSPM states:

*“A portion of all electricity produced at electric generating facilities is lost as it travels from the generating facilities to the homes and businesses that ultimately use the power... Another key characteristic of line losses is that they expand exponentially as the system experiences higher volumes. For this reason, it is important that calculations account for marginal loss rates for energy savings and peak savings.”* (NSPM 2017, p. 52).

- **Wholesale Price Suppression Effects:** Both SWEPCO and OG&E do not include these system impacts. However, EAI assumes effects are built into its AURORA model through a reduction in usage from energy efficiency, but it is not calculated separately.<sup>24</sup>

<sup>21</sup> The six utilities completed individual worksheets regarding utility system impacts using a template developed by E4theFuture. The information in this section is summarized from the individual utility responses.

<sup>22</sup> Order No. 7, Docket No. 13-002-U, p. 38.

<sup>23</sup> National Standard Practice Manual, p. 13.

<sup>24</sup> EAI does include wholesale price suppression effects. The EAI load is reduced by the energy efficiency which lowers the LMPs for energy in the market.

- **Avoided Carbon Emission Regulatory Costs:** The three electric utilities have differing cost assumptions regarding carbon. EAI assumes a cost of \$2.73/ton beginning in 2028, while SWEPCO assumes a cost of \$15.08/ton for carbon beginning in 2022. OG&E sets its carbon price to zero. Currently, none of the gas utilities provide a cost for carbon.<sup>25</sup>
- **Other Environmental Regulatory Costs:** EAI assumes a cost of \$528/ton for nitrogen oxide (NOx) beginning in 2018 and then decreasing annually, while the other utilities (electric and gas) do not include Other Environmental Regulatory Costs.<sup>26</sup>

### Omitted Utility System Impacts

Several categories of utility system benefits were not included by any utilities, including:

- Value of risk mitigation (e.g. reduced exposure to future fuel price volatility);
- Avoided ancillary services costs; and
- Avoided credit and collection costs.<sup>27</sup>

### Asymmetry in Treatment of Participant Impacts

As described more fully in Principles #2 and #3, the six Arkansas utilities include all participant costs, but only a portion of participant NEBs. The result is that there is asymmetry in the way participant impacts are treated in cost-effectiveness analyses.

### Principle #5: Forward-Looking Analysis

The fifth NSPM principle focuses on ensuring that the cost-benefits analysis remain dynamic and reflect changing market conditions. As defined in the NSPM,

*“Forward-Looking. Analysis of the impacts of efficiency investments should be forward-looking, capturing the difference between costs and benefits that would occur over the life of efficiency measures and those that would occur absent the efficiency investment.” (NSPM 2017, p. 9)*

Principle #5 focuses on the following key research questions:

- Key question #1: does the analysis include only future costs and benefits (i.e., excluding sunk costs)?
- Key question #2: does the analysis cover a period sufficiently long to capture all EE impacts?
- Key question #3: does the analysis treat free rider costs as “baseline” (and therefore not an incremental cost) if it includes participant impacts?
- Key question #4: does the analysis value marginal utility system impacts?

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<sup>25</sup> Links to the individual utility SARP workbooks can be located at the following website:  
<http://www.apscservices.info/eeAnnualReports.aspx>

<sup>26</sup> EAI further explains, “The cost for Seasonal NOx is included as an adder to fuel cost which is avoided as a result of the implementation of energy efficiency.”

<sup>27</sup> Note that while Cost of Service rate structures may capture reduced credit and collection costs, they are not currently being captured as part of the benefit cost test screening (i.e., while the benefits may be realized through reduced customer collection costs and thus passed on as reduced rates, they are not being assigned to measure and program screening as a benefit).

Ultimately, this principle recommends that the cost-benefit analyses for energy efficiency portfolios should focus on “what would have happened in the absence of the program” and capture the full lifecycle cost for the installed measures.

Arkansas meets the first two criteria by:

- Appropriately including only future costs and benefits (i.e., excluding sunk costs); and
- Appropriately including the full lifecycle costs and benefits of its approved energy efficiency measures in its Technical Reference Manual (i.e., there is no truncation of the lifetime benefits, as is done in some states).

However, the analysis did identify an area of inconsistency regarding capturing free ridership costs.

- **Incentives to Free Riders:** Only EAI<sup>28</sup> includes incentives to free riders as an administrative cost in its TRC calculation, which is consistent with the current guidance from the Commission. The other five utilities do not include this incentive as an administrative cost. The NSPM notes *“Financial incentives paid to free riders are a cost only if the cost-effectiveness test excludes participant impacts; otherwise the value of the financial incentive to the participant offsets the cost of the financial incentive to the utility system. In other words, the net cost of free riders is zero under any test that includes participant impacts.”* (NSPM 2017, p. 99)
- **Average vs. Marginal Costs:** In addition, there is inconsistency in the use of average vs. marginal costs, with EAI using marginal rates for the avoided line losses, SWEPCO using average rates, and OG&E using a blend. The NSPM notes that, *“Cost-effectiveness analyses should consider only marginal impacts. These are defined as the incremental changes that will occur because of the EE resource, relative to a scenario where the resource is not in place.”* (NSPM 2017, p. 13)

This analysis suggests that additional Commission guidance may be required to ensure that the cost-benefit analysis across all the utilities is fully forward-looking and properly assessing what would happen in absence of energy efficiency programs.

## ***Principle #6: Transparency***

The NSPM definition of transparency is:

*“Transparency. Efficiency assessment practices should be completely transparent and should fully document all relevant inputs, assumptions, methodologies, and results.”* (NSPM 2017, p.9)

Principle #6 focuses on the following key research questions:

- Key question #1: Is the rationale for what impacts are included in the Arkansas test clear?
- Key question #2: Is it clear what impacts the Arkansas utilities are including in their tests?

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<sup>28</sup> EAI Staff reported that they are following the previous guidance regarding the California Standard Practice Manual, which has since been updated by the five other utilities. However, this update has not yet been reflected in any Commission orders.

- Key question #3: Is the methodology used to estimate values for efficiency costs and benefits clear and publicly reviewable (except for cases where confidentiality is absolutely necessary)?

Basically, the NSPM wants to ensure that all stakeholders understand the “rules of the road” regarding cost-effectiveness testing. The second premise is to ensure that the assumptions used and the results are clearly defined.

Arkansas has developed a transparent energy efficiency reporting process in both documenting the cost-effectiveness analysis and reporting the energy savings across all the entire energy efficiency program portfolio. For example, the development of Arkansas’ energy efficiency program portfolio has been conducted in a straightforward and transparent manner.

The PWC was initially designed to only focus on launching energy efficiency programs through the IOUs. However, the PWC has evolved into a highly effective group that now discusses energy efficiency program planning, policy issues, and evaluation matters. The Commission has repeatedly looked to the PWC to sort out various policy options and make recommendations for future programs (Li & Bryson 2015, p. 14). A large measure of the PWC’s success is due to the fact that each stakeholder is given ample opportunity to provide input and feedback, decisions are made in a fully transparent manner, and participants are able to “disagree without being disagreeable.” (Li & Bryson 2015, p. 14)

The PWC has contributed to the significant progress made in Arkansas’ energy efficiency portfolio from developing a leading TRM to establishing criteria for quantifying non-energy benefits and requiring annual EM&V activities to track program success and document program progress towards energy savings goals.

One example of this transparency that directly benefits the cost-effectiveness testing is the updating process for the TRM. The steps are fully described in Volume 1 of the TRM. The annual updating process includes opportunities for input from all the parties and prescribed paths to discuss or escalate concerns, as appropriate (Li & Bryson 2015, p. 18).

Arkansas also has embedded EM&V into the architecture of its program planning and design process. Annual impact evaluations must be conducted by independent third-party evaluators and annual process evaluations must include progress reports regarding the status of previous recommendations.

The IEM provides another layer of review and oversight to ensure that the findings from these individual evaluations are accurate, appropriate, and comply with the established EM&V protocols. The IEM summarizes the progress of Arkansas’ overall energy efficiency portfolio in an annual report submitted to the Commission each year.

**Table 5: Description of Arkansas' Comprehensiveness Checklist Factors**

<b>Commission Checklist Factor</b>	<b>Criteria</b>
<b><i>Factor One: Adequate Education, Training and Marketing</i></b>	Whether the programs or portfolio provide, 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.
<b><i>Factor Two: Adequate Budgetary, Management, and Program Delivery Resources</i></b>	Whether the program and/or portfolio have adequate budgetary, management, and program delivery resources to plan, design, implement, oversee, and evaluate energy-efficiency programs.
<b><i>Factor Three: Reasonably Addresses All Major End-Uses</i></b>	Whether the programs and/or portfolio reasonably address all major end-uses of electricity or natural gas, or electricity and natural gas, as appropriate.
<b><i>Factor Four: Addresses the Needs of Customers Comprehensively</i></b>	Whether the programs and/or portfolio, to the maximum extent reasonable, comprehensively address the needs of customers at one time, in order to avoid cream-skimming and lost opportunities.
<b><i>Factor Five: Addresses Comprehensive Needs of Targeted Customer Sectors</i></b>	Whether such programs take advantage of opportunities to address the comprehensive needs of targeted customer sectors or to leverage non-utility program resources.
<b><i>Factor Six: Enables the Delivery of All Achievable, Cost-Effective Energy Efficiency</i></b>	Whether the programs and/or portfolio enable the delivery of all achievable, cost-effective energy efficiency within a reasonable period of time and maximize net benefits to customers and the utility system.
<b><i>Factor Seven: Evaluation, Measurement, and Verification</i></b>	Whether the programs and/or portfolio have EM&V procedures adequate to support program management and improvement, calculation of energy, demand, and revenue impacts, and resource planning decisions.

(Source: IEM PY2017 Annual Approach, pp. 47-52)

These evaluations must also include a progress report for each utility's performance based on seven criteria established by the Commission. The "Commission's Comprehensiveness Checklist" Factors are summarized next.

Each EM&V contractor reports on the progress each energy efficiency program portfolio has made compared to the seven comprehensiveness factors identified by the APSC. Table 5 summarizes these findings from the comprehensive checklist as reported in the individual EM&V reports. Using the following legend, energy organizations have been evaluated as having either fully met, partially met, or failed to meet the criteria associated with each factor as set forth in the Commission's Comprehensiveness Checklist (IEM PY2017 Annual Report, p. 48).

Fully Met Criteria = ●

Utilities or third-party administrators are fully meeting the criteria established by the Commission Comprehensive Checklist.

Partially Met Criteria = ◐

Utilities or third party administrators are partially meeting the criteria established by the Commission Comprehensive Checklist.

Did Not Meet Criteria = ○

Utilities or third-party administrators did not meet the criteria established by the Commission Comprehensive Checklist.

Not Applicable = ■

Identifies those cases where the Commission Comprehensive Checklist cannot be assessed.

**Table 6: Summary of the Commission’s Comprehensiveness Checklist Factors by Utility**

Utility	Factor 1: Education/ Training/ Outreach	Factor 2: Provide Adequate Resources	Factor 3: Address Major End Uses	Factor 4: Comprehensively Address Customer Needs to Avoid "Cream Skimming"	Factor 5: Target All Customer Sectors	Factor 6: Are Cost-Effective	Factor 7: Have Appropriate EM&V Procedures in Place
AOG	●	●	●	●	●	●	●
BHEA	●	●	●	●	●	●	●
CenterPoint	●	◐	●	◐	●	●	●
EAI	●	●	●	●	●	●	●
OG&E	●	●	●	◐	◐	●	●
SWEPCO	●	●	●	●	●	●	●
Fully Met = ●      Partially Met = ◐      Did Not Meet = ○      Not Applicable = ■							

(Source: Analysis of PY2017 EM&V Reports, IEM PY2017 Annual Report, p. ix)

This case study has further illuminated the ways in which the six Arkansas utilities conduct their cost-effectiveness testing, serving as an exercise to both document what impacts should be included in the Arkansas cost-effectiveness tests, as well as which impacts the utilities are currently including. This transparency has also extended to the specific assumptions and rationale for the impacts that are captured in the utility cost-effectiveness analysis testing. Furthermore, five of the six utilities include details of their avoided cost assumptions for public review.

## 4. Conclusions and Recommendations

### ***Conclusions***

The Case Study for Arkansas has documented the consistency of the current cost-effectiveness practices in Arkansas relative to the six underlying principles of the NSPM. However, the case study uncovered a number of inconsistencies in application of the APSC's guidance on the application of the Total Resource Cost Test (TRC):

- Some utilities are using different approaches to quantify utility system impacts (e.g., not accounting for avoided T&D costs and using average rather than marginal line loss rates) than the APSC directed them to use.
- There are also inconsistencies in the treatment of incentives paid to free riders, the choice of discount rates, and the incorporation of assumptions regarding carbon costs.
- Several categories of utility system impacts have not been addressed by APSC guidance on cost-effectiveness and are not being included in cost-effectiveness analyses by the six IOUs (e.g. avoided ancillary service costs, avoided credit and collection costs and the risk mitigating value of efficiency resources);
- Asymmetrical application of participant impacts – specifically inclusion of all participant costs, but exclusion of some participant non-energy benefits (NEBs);
- Impacts associated with some state policy objectives for efficiency programs are not currently included in the current definition of the Arkansas cost-effectiveness test. Specifically, Environmental, Economic Development, and Energy Security impacts are not quantified as part of the cost-effectiveness testing. However, these NEBs were only noted in the initial energy conservation orders in 2007 and have not been addressed in subsequent orders.

The following table summarizes these findings.

**Table 7: Summary of Arkansas' Consistency with the NSPM Principles**

Utility Status	NSPM Principles					
	#1: Treat Efficiency as a Resource	# 2: Policy Goals	#3: Hard-to-Quantify Impacts	# 4: Symmetry	#5: Forward-Looking Analysis	# 6: Transparency
Overall Portfolio	●◐	●	◐	◐	●◐	●
AOG	●◐	●	◐	◐	●	●
BHEA	●◐	●	◐	◐	●	●
CenterPoint	●◐	◐	◐	◐	●	●
EAI	●◐	●	◐	◐	◐	◐
OG&E	●◐	●	◐	◐	●◐	●
SWEPCO	●◐	●	◐	◐	●◐	●
Fully Met = ● Mostly Met = ●◐ Partially Met = ◐ Did Not Meet = ○						

Overall, Arkansas continues to demonstrate ongoing leadership and commitment to sound energy efficiency programs and policies. This is evident in its long history of establishing policies that promote energy efficiency programs and its commitment to measuring the overall effectiveness in both program planning and implementation through annual EM&V and transparent reporting.

### **Recommendations**

This case study has also identified several areas that merit further consideration by the Commission with input from the PWC.

- The Commission may want to review the areas of inconsistency identified in the case study, specifically:
  - a. Avoided T&D costs;
  - b. Use of marginal line losses;
  - c. The selected discount rates; and
  - d. The handling of incentives to free riders.

The Commission may want to consider providing clarity regarding the inputs and calculations for the cost-effectiveness calculations in Arkansas.

- The Commission may want to seek additional guidance regarding carbon cost pricing as the NSPM does not provide specific guidance on this topic. Appendix B summarizes the additional resources and approaches for addressing the issue.
- The Commission may want to consider expanding the current approved NEBs to include those specific to low-income programs that are consistent with the criteria set forth by the Commission in its order approving the inclusion of NEBs in the TRC test of cost-effectiveness, if a Low-Income Pilot Program is launched.

- The Commission may want to consider requiring the six Arkansas utilities to document which other utility system and non-utility impacts are being included in cost-effectiveness analysis (e.g., wholesale price suppression effects; avoided other regulatory costs) in the SARP workbooks in order to reveal any areas of inconsistency.
- Besides participant NEBs directly attributable to low-income programs, there is a long list of potential participant impacts that the Arkansas PSC could consider adding to the cost-effectiveness testing to address current asymmetry in treatment of participant costs and benefits (i.e. current inclusion of all participant costs, but only some participant benefits).<sup>29</sup> The current Commission approach has been to focus on those NEBs that are quantifiable, material, and relevant to the analysis of a specific utility program or program portfolio.”<sup>30</sup> Analysis of some NEBs actually produced by the state’s efficiency programs would address the current inconsistencies used in Arkansas as well as affirm Arkansas’ commitment to focus on quantifiable, Arkansas-specific NEBs going forward.
- The Commission may want to consider whether previously stated policy interest in the environmental, energy security and economic development impacts of efficiency programs is of sufficient magnitude to warrant future inclusion of these impacts in the state’s cost-effectiveness test and if so, provide appropriate guidance.

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<sup>29</sup> C&EE Rules, Section 2, as amended by Orders 15 and 18 of APSC Docket No. 06-004-R, effective April 12, 2007 and May 25, 2007, respectively.

<sup>30</sup> APSC Docket No. 13-002-U, Order No. 30, p. 16; Order No. 7, p. 88.

## References

Arkansas Public Service Commission Docket Review- see summary in Appendix A.

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National Efficiency Screening Project 2017, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, EDITION 1 Spring.

**Appendix A: Arkansas EE Policies to  
National Standard Practice Manual Case Study:  
Arkansas' Current Practices**

**Prepared for:**

Arkansas Public Service Commission

**Prepared by:**

The Parties Working Collaboratively (PWC),  
the Independent Evaluation Monitor (IEM) and

E4theFuture

October 10, 2018

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
<p>Energy Conservation Endorsement Act of 1977, Arkansas Code §23-3-401, et seq. [Enacted by Act 748 of 1977, effective 7/6/77 except as subsequently noted]</p>	<p>The primary source of statutory authority for energy efficiency policy for the State of Arkansas (the “Energy Conservation Act”).</p>	<p><b>§ 23-3-402</b> – The General Assembly recognizes that enormous amounts of energy are wasted by consumers of all classes and economic levels due to inadequate insulation of buildings and other inefficiencies in the use of energy. The overriding public interest in the conservation of natural gas and oil, as well as the use of alternative forms of energy, is indisputable.</p> <p><b>§ 23-3-404</b> – It shall be considered a proper and essential function of public utilities regulated by the Arkansas Public Service Commission to engage in energy conservation programs, projects, and practices which conserve, as well as distribute, electrical energy and supplies of natural gas, oil, and other fuels.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> <li>• Other fuel impacts</li> <li>• (maybe ???) participant impacts</li> </ul>	
<p>Energy Conservation Act, § 23-3-405(a)(1)(A), effective 7/6/77</p>	<p>Gives extensive authority to the Commission to promote the development of utility energy efficiency programs.</p>	<p><b>Section (a)(1)(A)</b> – The General Assembly authorized the Arkansas Public Service Commission to propose, develop, solicit, approve, require, implement, and monitor measures by utility companies which cause the companies to incur costs of service and investments which conserve, as well as distribute, electrical energy and existing supplies of natural gas, oil, and other fuels.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> <li>• Other fuel impacts</li> </ul>	
<p>Energy Conservation Act, § 23-3-405(a)(1)(B), added by Act 1102 of 2017, effective 7/30/17</p>	<p>Authority to promote EE programs for utility customers sixty-five (65) years and older or low income eligible.</p>	<p><b>Section (a)(1)(B)</b> – The commission is authorized to order, require, promote, or engage in energy conservation programs and measures for the benefit of utility customers who are sixty-five (65) years of age or older or who meet the income eligibility qualifications for the Low Income Home Energy Assistance Program administered by the Department of Human Services.</p>	<ul style="list-style-type: none"> <li>• Low income impacts</li> </ul>	
<p>Energy Conservation Act, § 23-3-405(a)(2), effective 7/6/77</p>	<p>Approval of programs for elderly or low-income persons</p>	<p><b>Section (a)(2)</b> – After proper notice and hearings, the energy conservation programs and measures may be approved and ordered into effect by the commission if the commission determines that the energy conservation programs and measures will be beneficial to the ratepayers of the public utilities and to the public utilities themselves.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
Energy Conservation Act, § 23-3-405(a)(3)(A), effective 7/6/77		<b>Section (a)(3)(A)</b> – In such instances, the commission shall declare that the cost of the energy conservation programs and measures is a proper cost of providing utility service.	<ul style="list-style-type: none"> <li>Utility system impacts</li> </ul>	
Energy Conservation Act, § 23-3-405(a)(3)(B), effective 7/6/77; amended by Act 1102 of 2017, effective 7/30/17	Provides that the affected public utility be allowed to increase its rates or charges as necessary to recover any costs incurred by the public utility as a result of engaging in the energy conservation programs and measures.	<b>Section (a)(3)(B)</b> – At the time the energy conservation programs and measures are approved and ordered into effect, the commission shall also order that the affected public utility company be allowed to increase its rates or charges as necessary to recover from consumers who have not opted out of utility-sponsored energy conservation programs and measures under subdivision (c)(1) of this section any costs incurred by the public utility company as a result of its engaging in the energy conservation programs and measures.		
Energy Conservation Act, § 23-3-405(b), effective 7/6/77	Commission authority over EE not limited to specified programs and measures	<b>Section (b)</b> – Nothing in this subchapter shall be construed as limiting or cutting down the authority of the commission to order, require, promote, or engage in other energy conservation programs and measures.		
Energy Conservation Act, § 23-3-405(c)-(f) [added by Act 253 of 2013, effective 7/1/13; amended by Act 78 of 2015 and Act 1102 of 2017]	Authorizes qualified industrial customers and state-supported institutions of higher education to opt out of utility-sponsored energy conservation programs and measures and direct their own energy conservation programs and measures under	<b>Section (c)(1)(A)</b> – A nonresidential business consumer that is classified within sectors 31 through 33 of the North American Industry Classification System, as it existed on January 1, 2013, or a nonresidential business consumer that is a state-supported institution of higher education may provide notice by mail or email to the commission on or before September 15 of any year of the nonresidential business consumer's decision to opt out of utility-sponsored energy conservation programs and measures and direct the nonresidential business consumer's own energy conservation programs and measures.		

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
	specified terms and conditions.			
Arkansas Public Service Commission's Rules for Conservation and Energy Efficiency Programs, effective 1/11/07, Order 12, APSC Docket 06-004-R, except as subsequently noted	The primary statement of policy for the State of Arkansas' Energy Efficiency requirements (the "C&EE Rules").	These rules apply to the provision of both electricity and natural gas service subject to the jurisdiction of the Arkansas Public Service Commission.		
C&EE Rules, Section 2, as amended by Orders 15 and 18 of APSC Docket No. 06-004-R, effective 4/12/07 and 5/25/07	Section 2: Benefits and Objectives of Energy Efficiency Programs	<p>The overall objectives of the initiative are to encourage and enable utility customers to make the most efficient use of utility capacity and energy and to discourage inefficient and wasteful use of energy. Objectives can take the form of standards, codes, or programs. EE programs shall accomplish one or more of the following objectives:</p> <ul style="list-style-type: none"> <li>• Energy savings directly attributable to program activities;</li> <li>• Long-term and permanent changes in behavior, attitudes, awareness, and knowledge about energy savings and use of energy efficient technologies in order to achieve energy savings;</li> <li>• Permanent peak electric demand reduction;</li> <li>• Energy cost savings and cost-effectiveness;</li> <li>• Reliability enhancements;</li> <li>• Energy security benefits;</li> <li>• Environmental benefits;</li> <li>• Economic development/competitiveness benefits;</li> </ul>	<ul style="list-style-type: none"> <li>• Reliability impacts</li> <li>• Utility system impacts</li> <li>• Energy Security impacts</li> <li>• Environmental impacts</li> <li>• Economic Development impacts</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<ul style="list-style-type: none"> <li>Increases in system-wide capacity;</li> <li>Accelerating the commercialization of advanced or emerging technologies;</li> <li>Improving affordability of energy for all customers; and</li> <li>Implementing programs in an efficient manner.</li> </ul>		
C&EE Rules, Section 4, effective 1/11/07, Order 12, APSC Docket 06-004-R	Section 4: Administration and Implementation of Energy Efficiency Programs	<p>Unless exempted by the Commission, all electric and gas utilities in Arkansas under the jurisdiction of the Commission shall propose and be responsible for the administration and implementation of cost-effective energy efficiency programs within their service territories. Each utility shall file an application for approval by the Commission of its portfolio of energy efficiency programs. The energy efficiency program portfolio of each utility shall include programs for all customer classes.</p>	Equitable access	<ul style="list-style-type: none"> <li>Portfolio comprehensiveness (may speak to analysis level – NSPM Chapter 10)</li> </ul>
C&EE Rules, Section 5A, effective 1/11/07, Order 12, APSC Docket 06-004-R	Section 5A: Plan Filing Requirements – General Requirements	<p>Administrators shall propose general program designs, specific programs, and specific measures. Administrators may propose programs and/or measures in any combination. All programs should include the following general elements:</p> <ul style="list-style-type: none"> <li>A showing of high probability of providing aggregate ratepayer benefits to the majority of ratepayers.</li> <li>Identification of the specific objectives of the program.</li> <li>Identification of the specific EM&amp;V procedures that will be used to determine whether the program has achieved its stated objectives.</li> </ul>	<ul style="list-style-type: none"> <li>Equitable access</li> </ul>	<ul style="list-style-type: none"> <li>Portfolio comprehensiveness (may speak to analysis level – NSPM Chapter 10)</li> </ul>
C&EE Rules, Section 5D, effective 1/11/07, Order 12, APSC Docket 06-004-R, as amended by Order 15, 4/12/07	Section 5D: Plan Filing Requirements – Uniformity of Programs	<p>Programs addressing both electric and gas customers shall be coordinated to the extent reasonable.</p> <p>Fuel switching and load building programs not otherwise authorized under the Commission Rules and Regulations Governing Promotional Practices of Electric and Gas Utilities shall not be included as energy efficiency programs.</p>	<ul style="list-style-type: none"> <li>All fuel impacts</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
<p>C&amp;EE Rules, Section 5E, effective 1/11/07, Order 12, APSC Docket 06-004-R <i>(continued next page)</i></p>	<p>Section 5E: Plan Filing Requirements – Customer Incentives</p>	<p>Programs may include incentives to encourage customers to make energy efficient investments if the incentives are cost justified and are a component of a program that has a high probability of providing aggregate ratepayer benefits to the majority of utility customers.</p> <p>Incentives may include information, technical assistance, leasing programs, product giveaways, and direct financial inducements. Financial inducements may include but are not limited to rebates, discounted products and services, and low rate financing.</p> <p>All customer incentives shall be considered in the benefit/cost testing of programs. Costs of customer incentives shall be considered a direct program cost.</p> <p>Incentives should not be any higher than necessary to overcome the customers’ barriers to invest in the measure and should be reduced or eliminated as the measure becomes more of a standard practice.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> </ul>	
<p>C&amp;EE Rules, Section 5F, effective 1/11/07, Order 12, APSC Docket 06-004-R</p>	<p>Section 5F: Plan Filing Requirements – Statewide Programs</p>	<p>The Commission, after notice and hearing, may direct utilities to offer uniform statewide energy efficiency and conservation programs if it determines such standardization to be the most cost-effective result and in the public interest. Utilities may request approval to offer statewide or region-wide programs for which public messages, commercial terms and conditions, and customer reception are best served by such an approach.</p>		
<p>C&amp;EE Rule, Section 5H, effective 1/11/07, Order 12, APSC Docket 06-004-R s</p>	<p>Section 5H: Plan Filing Requirements – Program Filing Procedures and Schedule</p>	<p>A program filed under these rules shall not be implemented until a Commission order is issued expressly approving the program.</p> <p>The period from the filing date to the date of the Commission order shall be no more than one hundred and eighty days which will permit investigation, analysis, and adjudication of the program.</p>		

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		The Commission shall establish a procedural schedule for the review of each program filing.		
C&EE Rules, Section 6A, effective 1/11/07, Order 12, APSC Docket 06-004-R as amended by Order 15, 4/12/07	Section 6A: Benefit/Cost Tests	<p>Administrators shall present sufficiently detailed calculations, sensitivity analyses, and supporting testimony of the effect of the proposed conservation and energy efficiency program using each of the following tests set forth in the California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects, (State of California, Governor’s Office of Planning and Research, July 2002), (hereafter “Manual”): The Participant Test, The Ratepayer Impact Measure Test, The Total Resource Cost Test, and the Program Administrator Cost Test.</p> <p>The Commission will rely on the formulae found in the Manual. However, the Commission may rely on some inputs contained in the Manual and not on others. Furthermore, the costs and benefits contained in the Manual are suggestions and are not endorsed by the Commission for every program. For this reason, the Commission will not limit the costs and benefits that can be considered in the benefit/cost tests to those listed therein.</p> <p>Cost-effectiveness results shall be presented on both a program and portfolio basis.</p> <p>Administrators may submit additional economic analyses and benefit/cost test information in support of a proposed program.</p>		<ul style="list-style-type: none"> <li>• Multiple ben-cost tests (perhaps to inform spending choices per NSPM Chapter 5)</li> <li>• Suggest openness to consider application guidance in NSPM chapters 9 (disc. Rate), 11 (end effects), 12 (early retirement), 13 (NTG)</li> </ul>
C&EE Rules, Section 6B, effective 1/11/07, Order 12, APSC Docket 06-004-R	Section 6B: Benefit/Cost Tests and Table 1 with Primary and Secondary Means of Expressing Test Results	A utility shall use an evaluation period of either ten years (a gas utility may use an evaluation period of fifteen years), or the actual measure lives for each measure in a program to evaluate a program or program portfolio.		<ul style="list-style-type: none"> <li>• NSPM chapter 11 (analysis period)</li> </ul>

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<p>Results of the tests shall be presented consistent with the descriptions shown in Table 1, or by other means as approved by the Commission.</p>		
<p>C&amp;EE Rules, Section 7 , effective 1/11/07, Order 12, APSC Docket 06-004-R, as amended by Orders 15, 25, and 29, effective 4/12/07, 6/14/11, and 5/26/14, respectively</p> <p><i>(continued next page)</i></p>	<p>Section 7: Cost Recovery</p>	<p>Cost recovery shall be limited to the incremental costs of providing the program that are not already included in the then current rates of the utility, and may include direct program costs, lost contributions to fixed costs, and utility energy efficiency incentives.</p> <p>If a utility requests cost recovery through a surcharge or rider, the cost recovery through that mechanism shall be limited to the incremental costs of providing the program that are not included in the then current rates of the utility, and may include direct program costs, lost contributions to fixed costs and utility energy efficiency incentives.</p> <p>A utility may request that direct program costs and lost contribution to fixed costs from approved program budgets be included in the rider. A utility may request contemporaneous recovery of these costs via the rider.</p> <p>Demand response programs that involve rates (e.g., interruptible service, curtailment, off-peak service, time-of-use rates) shall not be included in any surcharge or rider. The rates for those mechanisms will be established through utility-specific rate or tariff proceedings.</p> <p>If a utility is recovering conservation and energy efficiency program costs through a surcharge or rider, the utility shall file, contemporaneous with the Annual Report under Section 9, a re-determined Energy Efficiency Cost Rate (“EECR”). In support of this re-determined rate, the utility shall file a schedule of actual program costs for the reporting period, actual amounts collected under the</p>		

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<p>rider for the reporting period, and approved program budgets for the next calendar year. In addition, if the utility seeks Commission approval to recover lost contributions to fixed costs, utility energy efficiency incentives, or both, and the utility seeks to recover these costs through a surcharge or rider, the utility shall incorporate these costs into the supporting schedule. Any incentive calculations shall be based on the reporting year. The EECR shall be adjusted to reflect a reconciliation of any over-recovery or under-recovery for the prior year and the approved budget for the next calendar year.</p>		
<p>C&amp;EE Rules, Section 8 , effective 1/11/07, Order 12, APSC Docket 06-004-R , as amended by Orders 15 and 18 effective 4/12/07 and 5/25/07</p>	<p>Section 8: Program Plans</p>	<p>Program plans shall cover at least one year and may cover up to three years.</p> <p>All programs filed by gas and electric utilities should be consistent and should be fuel neutral, i.e., they should be compliant with the Commission Rules and Regulations Governing Promotional Practices of Electric and Gas Utilities, including restrictions on fuel substitution and load building programs.</p> <p>Program plans shall reflect the effects of all energy efficiency programs in the electric resource plans or natural gas procurement plans of the electric and natural gas utilities respectively. Furthermore, all energy efficiency programs shall be consistent with each utility’s current electric resource plans or natural gas procurement plans.</p>	<ul style="list-style-type: none"> <li>• All fuel impacts</li> </ul>	
<p>C&amp;EE Rules, Section 9, effective 1/11/07, Order 12, APSC Docket 06-004-R, as amended by</p>	<p>Section 9: Annual Reporting Requirement</p>	<p>By May 1 annually, each electric and gas utility shall file an annual report addressing the performance of all approved conservation and energy efficiency programs.</p> <ul style="list-style-type: none"> <li>• The report shall present the results of the prescribed Evaluation, Measurement, and Verification (EM&amp;V) measures for each program.</li> </ul>	<ul style="list-style-type: none"> <li>• N.A.</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
Order 29, effective 5/26/14		<ul style="list-style-type: none"> <li>The report shall present the EM&amp;V measures for the utility’s portfolio.</li> <li>The report shall include a measure of each program’s savings.</li> <li>The report shall present the amounts spent on each conservation and energy efficiency program and the total amounts spent on all programs.</li> </ul>		
C&EE Rules, Section 11, added 8/23/11, Order 10, APSC Docket 10-101-R, and amended by Orders 28 and 33 in APSC Docket No. 10-101-R, effective 1/1/13 and 11/15/13, respectively <sup>1</sup>	Section 11: Opt Out / Self Direct Option for Qualifying Non-Residential (NR) Customers	Prescribes the requirements and conditions under which a qualified nonresidential customer may opt out of a utility’s conservation and energy efficiency programs and measures, and direct its own conservation and energy efficiency programs and measures under Arkansas Code § 23-3-405(c)-(e) or the C&EE Rules.		
C&EE Rules, Section 12, added by Order 11, APSC Docket No. 10-100-R, effective 9/29/11  <i>(continued next page)</i>	Section 12: Evaluation, Measurement, and Verification	<p>All aspects of utility-sponsored energy efficiency efforts, including, but not limited to, measures, programs, and reports are potentially subject to Evaluation, Measurement, and Verification (EM&amp;V).</p> <p>All EM&amp;V activities undertaken as part of a utility-sponsored program, including, but not limited to, estimation of energy efficiency savings and process evaluations, shall be conducted consistent with the Arkansas Technical Reference Manual (TRM) and with national best program evaluation practices as established</p>		

<sup>1</sup> Amendments to include a state-supported institution of higher education as a qualifying, “opt out” entity and to incorporate payback options for self-direct customers were approved by Order No. 37 of the Commission on 1/19/18, and are scheduled for review by the Administrative Rules Committee of the Arkansas Legislative Council April 17, 2018, and the full Legislative Council on April 20, 2018.

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<p>by the National Action Plan for Energy Efficiency (“NAPEE”), the State &amp; Local Energy Efficiency Action (“SEE Action”) Network, the International Performance Measurement and Verification Protocol (“IPMVP”), or other similar nationally or internationally accepted EM&amp;V standards.</p> <p>The TRM shall set forth Protocols for EM&amp;V activities. An organization selected by a program administrator to conduct EM&amp;V activities shall be independent of the organization or organizations involved in the particular EE program design, management, and implementation, such that the verification professionals conducting or reviewing evaluations have no financial stake, beyond the evaluation contract itself, in the program or program components being evaluated.</p>		
<p>APSC Docket No. 06-004-R, Order No. 1, 1/12/06</p>	<p>Rulemaking initiated for developing and implementing EE Programs and adopting initial C&amp;EE Rules</p>	<p>Formal inquiry and workshop initiated to evaluate which types of energy efficiency measures would be most appropriate for Arkansas consumers and the most appropriate ways to increase the use of energy efficiency and conservation measures to the benefit of the state and all classes of customers; to determine the proper balance among the goals identified and adopted in Section 2 of the C&amp;EE Rules; and to consider the following issues:</p> <ul style="list-style-type: none"> <li>• Experiences of Other States and Regions</li> <li>• Energy Efficiency and Resource Planning</li> <li>• Cost Recovery</li> <li>• Technologies</li> <li>• Education and Public Awareness</li> <li>• Financial Incentives</li> <li>• Funding Levels</li> <li>• Energy Efficiency Services</li> <li>• Metrics and Program Evaluation</li> </ul>		<ul style="list-style-type: none"> <li>• NSPM Chapter 5 (secondary tests to inform resource choices)</li> </ul>

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<ul style="list-style-type: none"> <li>Development Process</li> </ul>		
APSC Docket No. 06-004-R, Order No. 3, 6/30/06	With the benefit Of the workshop and corresponding comments, the Commission directed the initiation of a collaborative process to further the development of EE rules and guidelines	<p>The Commission directed the parties to initiate a collaborative process to begin on August 28, 2006, to address the following issues, and to then submit a report of its findings to the Commission not later than October 13,2006:</p> <ul style="list-style-type: none"> <li>The nature and design of energy efficient and conservation programs that can be started quickly and produce near-term benefits for Arkansas</li> <li>The appropriate incentives and standards for customers and utilities</li> <li>The development of energy efficient market structure principles and guidelines</li> <li>The advantages of fostering cooperative gas and electric energy efficient program templates</li> <li>Possible development of a “deemed savings approach” for Arkansas</li> <li>Development of uniform standards and mechanisms for evaluating, measuring, and validating energy efficient programs</li> <li>The proper economic tests to use in determining whether a program is in the public interest</li> </ul>		
APSC Docket No. 06-004-R, Order No. 12, 1/11/07	Initial C&EE Rules adopted	The C&EE Rules required that the utilities file “Quick Start” or pilot programs by July 1, 2007 and that all utilities file annual reports on April 1 of each year.		
APSC Docket No. 07-152-TF	“Deemed Savings” Docket	Docket established for the receipt, review, consideration, and final determination of all deemed savings estimates (subsequently transferred to APSC Docket No. 10-100-R	<ul style="list-style-type: none"> <li>N.A.</li> </ul>	
APSC Docket No. 08-137-U, Order No. 14, 12/10/10	Lost Contribution to Fixed Costs	Approved the recovery of Lost Contribution to Fixed Costs (LCFC) that result from utility EE programs.		

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
APSC Docket No. 08-137-U, Order No. 15, 12/10/10	Utility Incentives	Approved Utility Incentives to reward achievement in the delivery of EE programs and established energy savings goals.		<ul style="list-style-type: none"> <li>• NSPM Chapter 6 (utility shareholder incentives are utility system cost)</li> </ul>
APSC Docket No. 08-144-U, Order No. 17, 12/10/10  <i>(continued next page)</i>	Defined “Comprehensiveness” in the planning, approval, and implementation of EE programs in terms of whether the greatest amount of cost-effective potential that can effectively be delivered and a “Comprehensiveness Checklist” for guidance in assessing the comprehensiveness of EE programs and developing a rigorous but workable EM&V Protocol.	<p>The Commission established the following checklist of factors the Commission will use when determining whether a utility’s proposed EE programs and total EE portfolio are “Comprehensive” pursuant to the C&amp;EE Rules, and urged the parties to keep these factors in mind to develop a rigorous but workable EM&amp;V Protocol:</p> <ul style="list-style-type: none"> <li>• Whether the program 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;</li> <li>• Whether the programs and /or portfolio, have adequate budgetary, management, and program delivery resources to plan, design, implement, oversee and evaluate energy efficiency programs;</li> <li>• Whether the programs and/or portfolio, reasonably address all major end-uses of electricity or natural gas, or electricity and natural gas, as appropriate;</li> <li>• Whether the programs and/or portfolio, to the maximum extent reasonable, comprehensively address the needs of customers at one time, in order to avoid cream-skimming and lost opportunities;</li> <li>• Whether such programs take advantage of opportunities to address the comprehensive needs of targeted customer sectors (for example, schools, large retail, agricultural users, or restaurants) or to leverage non-utility program resources (for</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Efficiency</li> <li>• Comprehensiveness</li> <li>• Utility system impacts</li> <li>• Participant impacts?</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
		<p>example, state or federal tax incentive, rebate, or lending programs);</p> <ul style="list-style-type: none"> <li>• Whether the programs and/or portfolio enables the delivery of all achievable, cost-effective energy efficiency within a reasonable period of time and maximizes net benefits to customers and to the utility system; and</li> <li>• Whether the programs and/or portfolio, have evaluation, measurement, and verification (EM&amp;V) procedures adequate to support program management and improvement, calculation of energy, demand and revenue impacts, and resource planning decisions.</li> </ul>		
<p>APSC Docket No. 10-010-U, Order No. 10, 12/10/10</p>	<p>Participation options, detailed guidelines, and a rulemaking proceeding APSC Docket 10-101-R) established to allow self-directed EE programs for large commercial and industrial customers and corresponding guidelines for utilities</p>	<p>The Commission concludes, at p. 26, that it is in the public interest, in furtherance of the Energy Conservation and Endorsement Act of 1977, and that public policy favors allowing industrial and large commercial customers to “opt-out” of EE program only upon the implementation of a Self-Directed Option for Commercial &amp; Industrial Customer Energy Efficiency, with the approval of the Commission.</p> <p>The Commission believes that all customers should pay for energy efficiency programs, just as all customers pay for any generation or supply-side resource that a utility system acquires. Likewise, the Commission believes that there should be well-designed, accessible EE programs for each customer sector. A self-directed or opt-out alternative should be pursued as a means of maximizing the achievable benefits for all ratepayers and for the utility system of verifiable, cost-effective energy savings, where that alternative is more likely to reach this goal. At a minimum, a Self-direct/opt-out program must deliver at least as much energy efficiency for the system as would occur in the absence of such a program.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> </ul>	

Appendix A: Arkansas Energy Efficiency Policies

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APSC Docket No. 10-010-U, Order No. 11, 12/10/10	Full fuel cycle efficiency not adopted as an EE justification under the C&EE Rules at this time	The Commission declined to adopt Full Fuel Cycle Efficiency (FFCE) at this time as a method of screening EE programs. The Commission noted in its discussion beginning on page 8 that it does not reject the notion of FFCE or its merits as a cost effective efficiency resource, but rather noted its preference for first initiating basic EE programs that could be expanded to comprehensive within-fuel EE programs as a greater priority.		
Order No. 12; Docket No. 10-010-U	Declined to adopt an Independent administrator for EE programs but outlined a strategy, carried out through contemporaneous orders, to otherwise achieve the benefits of independent administration and of utility energy efficiency program administration.	The Commission declined to adopt an Independent Administrator for EE programs but outlined a strategy, carried out through contemporaneous orders, to otherwise achieve the benefits of independent administration and legitimate concerns of the Attorney General while preserving the advantages of utility EE program administration through companion orders, i.e., Order 17 in Docket No. 08-144-U (“Comprehensiveness Order”) and Order 15 in Docket No. 08-137-U (“Incentives Order”) establishing performance targets to expand the scope of utility-administered EE programs and increase economies of scale in program delivery; the comprehensiveness checklist established by Order 17 in Docket 08-144-U to guide the review of annual utility program applications with the aim of achieving, among other things, the benefits that otherwise might result from independent administration, such as avoidance of cream skimming or lost opportunities, and the provision of services such as customer financing and adequate contractor training; and Order 16 in Docket No. 08-137-U (“EM&V Order”) and identical Order 1 in Docket 10-100-R (among others) establishing an EM&V Collaborative and rulemaking docket to implement an independent, high-quality EM&V program to continuously evaluate, measure, verify and improve EE programs in Arkansas.		

Appendix A: Arkansas Energy Efficiency Policies

Energy Efficiency Policy/Source	Summary/Description	Legislative/Administrative Statement of Policy/Purpose	AR Policy Support for Impacts to Potentially Include in EE Cost/Benefit Analysis	AR Policy Relevance to Other NSPM & Cost-Effectiveness Issues
APSC Docket No. 10-010-U, Order No. 20, 9/19/17	EE Standardized Reporting Requirements	The Commission approved the energy efficiency annual reporting requirements as set forth in the SARP 4.0.		
APSC Docket No. 10-100-R, Order No. 11, 9/29/11	Added Section 12 to the C&EE Rules concerning EM&V requirements and use of the Technical Reference Manual (TRM)	The Commission approved EM&V requirements and protocols for the independent evaluation of EE programs and the proposal that a TRM 1.0 be filed on or before September 30, 2011, and that collaboratively-developed revisions to the Protocols and to the TRM be filed by August 31, 2012.		
APSC Docket No. 10-100-R, Order Nos. 11, 17, 18, 20, 22, and 23, 10/14/11 through 10/17/16	Approval of TRMs	TRM versions 1.0, 2.0, 3.0, 4.0, 5.0, and 6.0 adopted for use in computing and evaluating EE program results.		
APSC Docket No. 10-100-R, Order No. 24; 2/22/17	Approval of Prospective TRM	The Commission approved the transition from a retrospective to a prospective TRM [2/22/17].		
APSC Docket No. 10-100-R, Order No. 25; 5/25/17	Approval of TRM 6.1 to transition to a prospective TRM	The Commission approved TRM 6.1 for use in computing and evaluating 2017 EE program results.		
APSC Docket No. 10-100-R, Order No. 26; 9/13/17	Approval of TRM 7.0	The Commission approved TRM 7.0 for use in computing and evaluating 2018 EE program results.		
APSC Docket No, 13-002-U, Order No. 7, 9/9/13	Potential Study	The Commission provided issues for the PWC to consider concerning the parameters of a Potential Study to help inform goal setting when making its recommendations and submitting a proposed RFP for the Commission’s approval.		

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APSC Docket No. 13-002-U, Order No. 7, 9/9/13	Utility Incentive Structure Modification	<p>Established refinements to the Utility Incentive structure, but retained an annual goal and incentive structure on a linear rather than stepwise basis, but recognized that performance incentives should not become a major share of EE program budgets.</p> <ul style="list-style-type: none"> <li>• Incentive mechanism awards 10% of net benefits. Awards are capped on a sliding scale between 4% and 8% of budget, based on 80% to 120% of goal attainment</li> </ul>		<ul style="list-style-type: none"> <li>• NSPM chapter 6 (utility shareholder incentives as utility system cost)</li> </ul>
<p>APSC Docket No. 13-002-U, Order No. 7, 9/9/13</p> <p><i>(continued next page)</i></p> <p>APSC Docket No. 13-002-U, Order No. 7, 9/9/13</p>	Utility Avoided Costs	<p>Established guidelines for utility avoided cost determination. For the purposes of calculating any utility EE performance incentive, the approved avoided cost component of net benefits will remain fixed during the three-year program implementation period.</p> <ul style="list-style-type: none"> <li>• <b>Avoided Energy Costs</b> <ul style="list-style-type: none"> <li>○ Should include the value of energy freed by EE programs and sold into the wholesale market or avoided market price.</li> <li>○ Should be differentiated by time and season so as to facilitate the valuation of individual EE programs, or individual measures, if the measure forms a significant portion of the portfolio energy savings.</li> </ul> </li> <li>• <b>Avoided Capacity Cost</b> <ul style="list-style-type: none"> <li>○ May be based on the cost of a combustion turbine (“CT” or “peaking unit”), as modified to account for market conditions, and as applied to year in which the utility or relevant market are not in surplus for capacity.</li> <li>○ Also may be based on available market data, taking into account any significant, foreseeable changes to marginal capacity costs, including any such foreseeable changes due to major investments such as environmental controls.</li> <li>○ Adoption of a RECC (Real Economic Carrying Charge) methodology for calculating EE avoided capacity savings,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> <li>• Carbon impacts</li> </ul>	<ul style="list-style-type: none"> <li>• NSPM Chapter 6 (utility system impacts to include)</li> <li>• NSPM Chapters 6 (carbon impacts) and 7 (options for accounting for carbon impacts)</li> </ul>

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		<p>when the cost of building a CT is used as a proxy for avoided capacity costs.</p> <ul style="list-style-type: none"> <li>• <b>Transmission &amp; Distribution</b> <ul style="list-style-type: none"> <li>○ Each electric utility should develop estimates of avoided transmission substation and line upgrade cost, as well as distribution substation and line upgrade costs, as elements of their avoided cost.</li> </ul> </li> <li>• <b>Line Losses</b> <ul style="list-style-type: none"> <li>○ The Commission adopts the use of marginal, rather than average line losses, to quantify EE's incremental effects.</li> </ul> </li> <li>• <b>Carbon Pricing</b> (No Action taken, but requested a recommendation for a price of carbon regulatory cost avoidance be included as part of the Potential Study RFP submission)</li> </ul>		
<p>APSC Docket No. 13-002-U, Order No. 7, 9/9/13</p>	<p>Cost-Effectiveness Test and Non-Energy Benefits (NEBs)</p>	<p>Established the Total Resource Cost (TRC) Test as the primary cost-effectiveness test</p> <ul style="list-style-type: none"> <li>• The TRC will include Commission approved NEBs (later approved by Order 30 on 12/10/15)</li> <li>• The Portfolio must pass both the TRC and PACT.</li> <li>• Individual measures do not have to pass the TRC Test.</li> </ul> <p>The Commission will continue to require the presentation of all four standard cost-effectiveness tests, considering each as appropriate. The Commission thus retains the flexibility to include individual education, training, and marketing programs that may not pass TRC within overall program portfolios that are cost effective.</p> <p>The Commission will continue to accept the voluntary utility submission of the Societal Test.</p>	<ul style="list-style-type: none"> <li>• Utility system impacts</li> <li>• Participants impacts</li> </ul>	<ul style="list-style-type: none"> <li>• NSPM chapter 5 (secondary tests)</li> </ul>

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APSC Docket No. 13-002-U, Order No.16, 2/20/14	Potential Study	<ul style="list-style-type: none"> <li>• Approved the issuance of the Potential Study Request for Proposal.               <ul style="list-style-type: none"> <li>○ The final Potential Study was filed on 7/2/15.</li> </ul> </li> </ul>		
APSC Docket No. 13-002-U, Order No. 22, 12/9/14	Consistent Approach to Weatherization	Approved the Consistent Approach to Weatherization Programs Across all Utilities in Arkansas.	<ul style="list-style-type: none"> <li>• Low income impacts</li> </ul>	
APSC Docket No. 13-002-U, Order No. 27, 6/8/15	Common Commercial and Industrial (C&I) Approach	Approved the Common C&I Approach Across all Utilities in Arkansas [6/8/15].		
APSC Docket No. 13-002-U, Order No. 30, 12/10/15	Non-Energy Benefits (NEBs)	<p>Approved certain NEBs to be used in the TRC cost-effectiveness test if quantifiable and material and that such NEBs should continue to be carefully and individually evaluated to determine whether they are quantifiable, material, and relevant to the analysis of a specific utility program or program portfolio.</p> <ul style="list-style-type: none"> <li>• Benefits of electricity, natural gas, and liquid propane energy savings;</li> <li>• Benefits of public water and wastewater savings; and</li> <li>• Benefits of avoided and deferred equipment replacement costs.</li> </ul> <p>Ordered that each recommended approach for customer deferred equipment replacement NEB quantification be included within the annual TRM update filing, and that its reasonableness be addressed in testimony by the IEM and/or Staff so that the Commission may approve or disapprove such proposed NEB quantifications.</p>	<ul style="list-style-type: none"> <li>• All fuel impacts</li> <li>• Water impacts</li> <li>• Participant impacts</li> </ul>	<ul style="list-style-type: none"> <li>• NSPM chapter 7 (options to monetize NEBs)</li> </ul>
Docket No. 13-002-U, Order No. 31, 12/17/15	2017-2019 EE Savings Targets	<p>For PY 2017-2018, utility energy savings targets shall be 0.90% of 2015 retail sales and PY 2019 shall be 1.00% of 2015 retail sales for electric IOUs.</p> <p>For PY 2017-2019, utility energy savings targets shall be 0.50% of 2015 retail sales for natural gas IOUs.</p>		

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Docket No. 13-002-U, Order No. 40, 11/2/17	Threshold Benefit-Cost Ratio (BCR) of 1.0	Noting the PWC's agreement that setting an arbitrary threshold value for a BCR greater than 1.0 could prevent new measures from being proposed and developed in the marketplace, the Commission found that it is appropriate to retain the policy of evaluating EE measures generally for program inclusion where the BCR is greater than 1.0, but that measures with a BCR less than 1.0 may still be included, consistent with prior Commission Orders.		<ul style="list-style-type: none"> <li>• NSPM Chapter 10 (analysis level)</li> </ul>
Docket No. 13-002-U, Order No. 40, 11/2/17	Carbon Costs	The Commission defers a decision at this time and will provide further guidance prior to the commencement of the planning for PY 2020-2022. The Commission directed the PWC to consider the findings and recommendations of the National Standard Practices Manual as it resumes work on the next three-year cycle of planning and to address the carbon pricing issue in that context.	<ul style="list-style-type: none"> <li>• Carbon Impacts</li> </ul>	<ul style="list-style-type: none"> <li>• NSPM Chapter 7 (options for monetizing)</li> </ul>

**Appendix B: Carbon Prices by State to  
National Standard Practice Manual Case Study:  
Arkansas' Current Practices**

**Prepared for:**

Arkansas Public Service Commission

**Prepared by:**

The Parties Working Collaboratively (PWC),  
the Independent Evaluation Monitor (IEM) and

E4theFuture

October 10, 2018

Appendix B: Carbon Cost Prices by State

State	Jurisdiction	Ruling	Value	Source
California	State	\$123/Mt CO2e for 2020 emissions (2016 IWG SCC high-impact values, 3% discount rate).	\$123/metric ton	Rulemaking 14-10-003: Order Instituting Rulemaking to Create a Consistent Regulatory Framework for the Guidance, Planning and Evaluation of Integrated Distributed Energy Resources.
Connecticut	State	HB5363 - A revenue neutral bill with carbon priced at \$15 per ton increasing by \$5 per ton annually.	\$15/ton	Carbon Costs Coalition One Pager
Colorado	Xcel	“The ruling explicitly states that Xcel is to use a \$43/ton value in 2022 and escalate that to \$69/ton in 2050,” Those are social cost of carbon values taken from the IWG’s Technical Support Document.”	\$43/ton in 2022 to \$69/ton in 2050	<a href="https://www.utilitydive.com/news/carbon-calculus-more-states-are-adding-carbon-costs-to-utility-planning-gu/503613/">https://www.utilitydive.com/news/carbon-calculus-more-states-are-adding-carbon-costs-to-utility-planning-gu/503613/</a>
Maryland	State	HB939 - A revenue positive bill with carbon priced at \$15 per ton increasing by \$5 per ton annually until 2025 where it would remain at \$45	\$15/ton to max at \$45/ton	Carbon Costs Coalition One Pager
Massachusetts	State	SB 1821 - A revenue neutral bill with carbon priced at \$10 per ton.	\$10/ton	Carbon Costs Coalition One Pager
Minnesota	State	Minnesota’s proceeding over the social cost of carbon was slightly different. The state already used a carbon cost, but decided to update the value ranges, increasing it to a range of \$9.05 to \$43.06 per short ton of emissions by 2020.	Range of \$9.05 to \$43.06 per short ton of emissions	<a href="https://www.utilitydive.com/news/carbon-calculus-more-states-are-adding-carbon-costs-to-utility-planning-gu/503613/">https://www.utilitydive.com/news/carbon-calculus-more-states-are-adding-carbon-costs-to-utility-planning-gu/503613/</a>
New York	State	S02846 & A00107 - A revenue positive bill with carbon priced at \$35 per ton with a rate increase of \$15 per year until it reaches \$185 per ton.	\$35/ton capped at \$185/ton	Carbon Costs Coalition One Pager
Rhode Island	State	• H5369 and S0365 - A revenue positive bill with carbon priced at \$15 per ton with a rate increase of \$5 per year.	\$15/ton increased at \$5/year	Carbon Costs One Pager
Washington	State	\$78 per metric ton for 2020 emissions based on 2010 IWG SCC estimates.	\$78 per metric ton	PSE: UE-160918, UG-160919
				Avista: UE-161036, UG-160292
				Pacific Power: UE-160353

Sources: NCEL Info Sheet, Carbon Costs Coalition, \*<https://www.ncel.net/carbon-costs-coalition/> ; <https://www.utilitydive.com/news/carbon-calculus-more-states-are-adding-carbon-costs-to-utility-planning-gu/503613/>

<Accessed 9/20/2018>

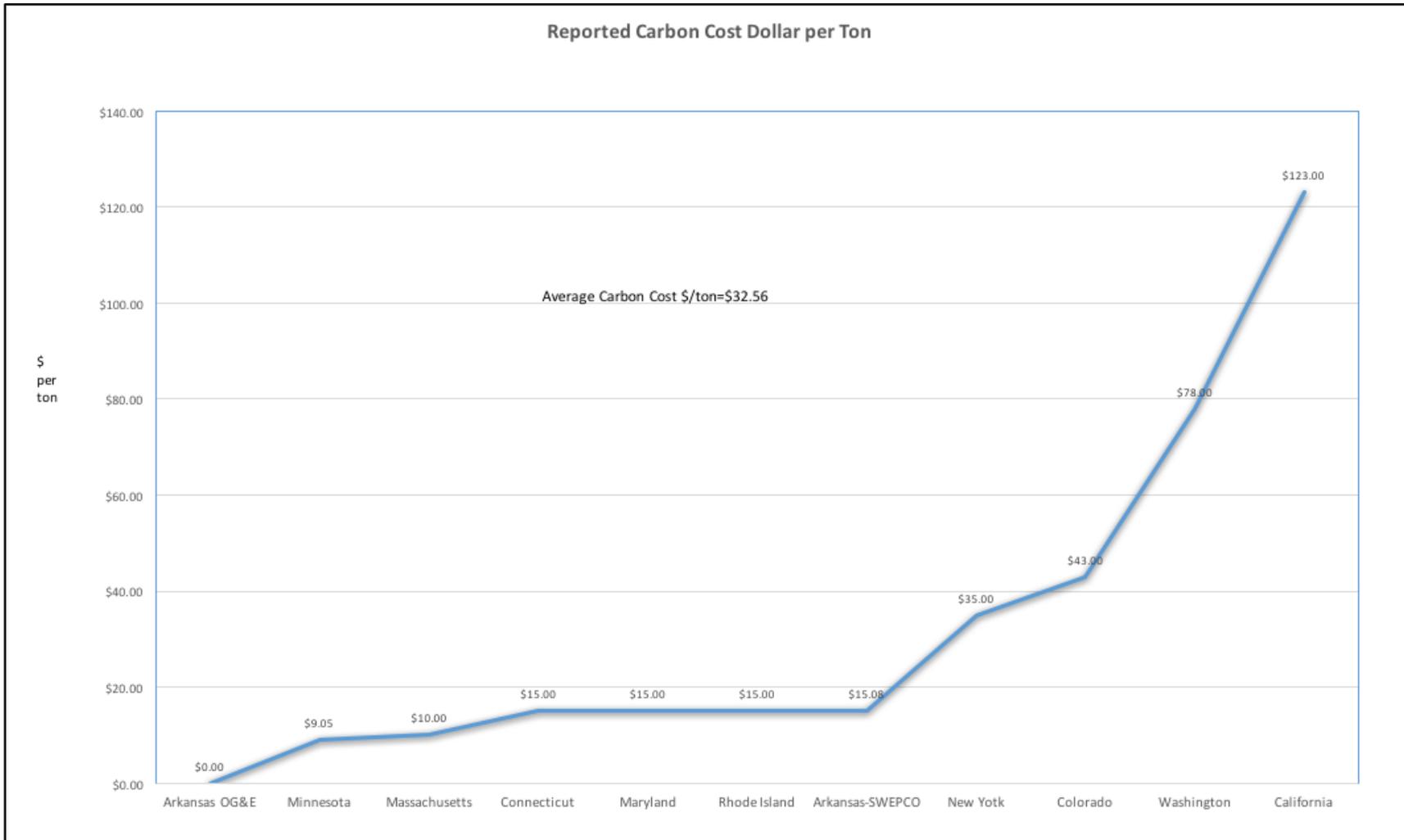


Figure B-1: Summary of Current Carbon Prices - \$/Ton by State