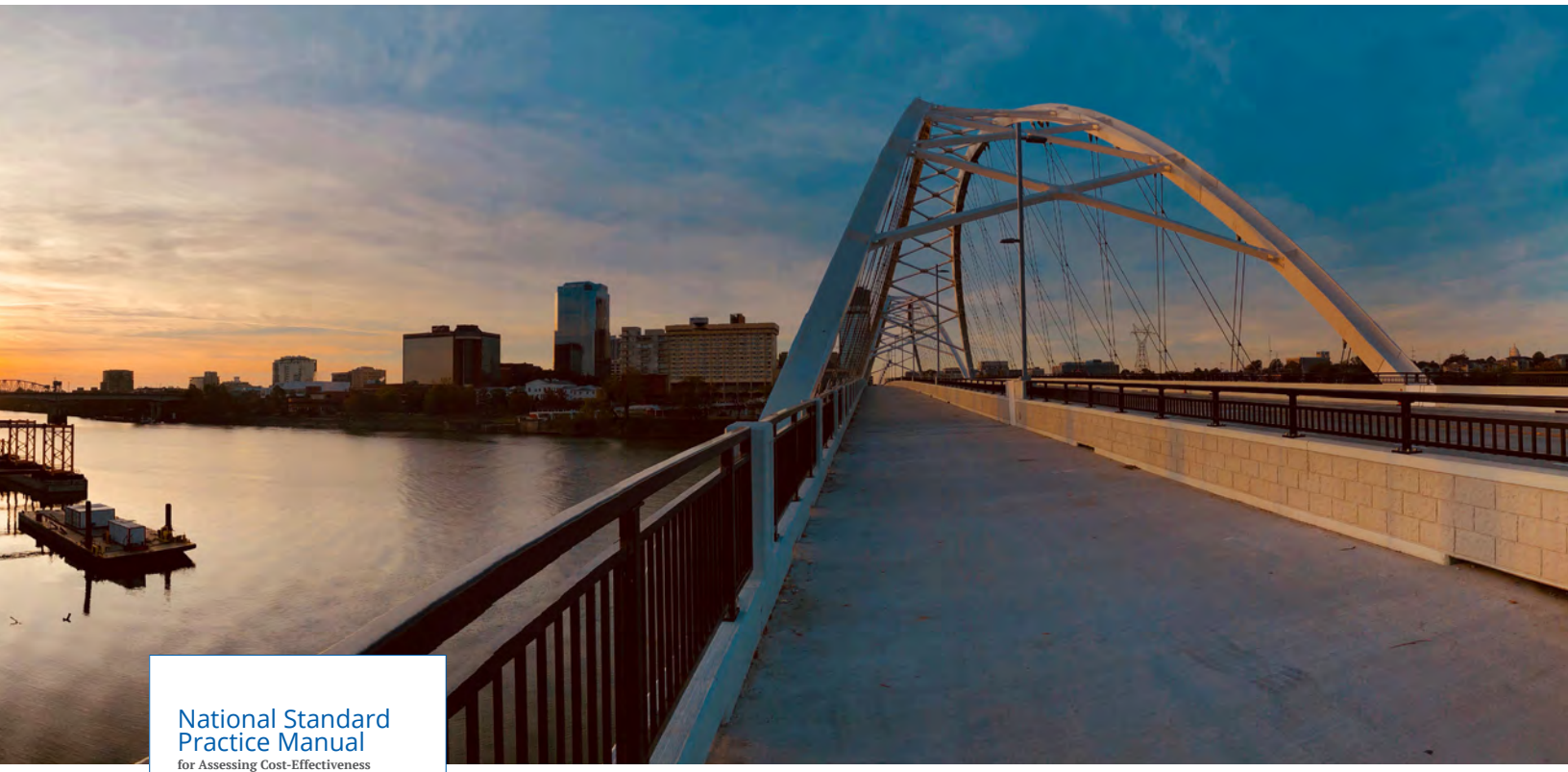
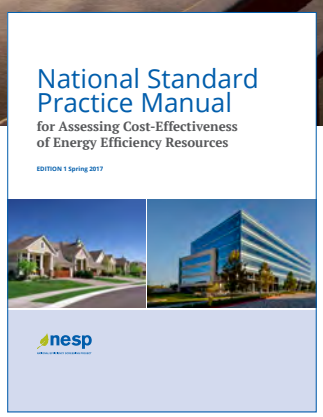
National Standard Practice Manual

CASE STUDY:

Arkansas





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NATIONAL EFFICIENCY SCREENING PROJECT

National Standard Practice Manual (NSPM)
Application to the State of Arkansas – An Example

January 2019
Amended June 2019

This NESP publication provides a summary of a full Case Study report prepared by the Arkansas Parties Working Collaboratively to the Arkansas Public Service Commission – Filed October 26, 2018, Docket No. 13-002-U

Amendments to page 13 reflect the May 10, 2019 Commission Order for Dockets No. 10-100-R (Order no. 31) and 13-002-U (Order no. 48).

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.

EM&V: Evaluation, Measurement & Verification activities that provide independent review of utility savings estimates and program operations.

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

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1. Introduction

The purpose of this case study is to provide an example of how one state, Arkansas, underwent a formal process in 2018 to review its current cost-effectiveness practices vis-a- vis the National Standard Practice Manual (NSPM) framework and set of core principles in response to a directive from the Arkansas Public Service Commission, as described herein.

The NSPM provides a comprehensive framework for assessing the cost-effectiveness of energy efficiency (EE) resources.[1] The manual is directly applicable to all types of electric and gas utilities and all jurisdictions where EE resources are funded by and implemented on behalf of electric or gas utility customers.

The NSPM offers a set of guiding principles for EE cost-effectiveness analyses, as provided in Table 1 below. The principles, based on sound economic practices, present a foundation that jurisdictions can use as the basis for their cost-effectiveness framework for EE. These principles and associated concepts in the NSPM can also be used to assess the cost-effectiveness of distributed energy resources (DERs).

Table 1. NSPM Guiding Principles

Efficiency as a Resource	EE should be compared with other energy resources (both supply-side and demand-side) in a consistent and comprehensive manner.
Policy Goals	A jurisdiction's primary cost-effectiveness test should account for its energy and other applicable policy goals and objectives.
All Relevant Impacts	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified by policy goals,) even those that are difficult to quantify and monetize.
Symmetry	Cost-effectiveness practices should be symmetrical, where both costs and benefits are included for each relevant type of impact.
Forward-Looking Analysis	Cost-effectiveness practices should apply a forward-looking, long-term approach that captures incremental impacts of energy efficiency.
Transparency	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

2. Background: Cost-Effectiveness Testing in Arkansas

Arkansas is widely regarded as one of the Southeast's leading energy efficiency states.[2] Its leadership role appears to be a function: of (1) an engaged regulator; (2) the institutionalization of a utility-stakeholder collaborative – officially referred to as the "Parties Working Collaboratively" (PWC) – which has met regularly since 2006 to work on EM&V, various related policy issues, efficiency program design and other issues as needed; and (3) the hiring by the regulator of an Independent Evaluation Monitor (IEM) to develop the state's EM&V framework and facilitate discussions of the PWC.[3]

The Arkansas Public Service Commission ('Commission') currently requires the seven Investor-Owned Utilities (IOUs) to report cost-effectiveness from the perspective of all five of the tests in the California Standard Practice Manual. However, its principal focus is on results from the total resource cost (TRC)

[1] National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Spring, 2017, available at: https://nationalefficiencyscreening.org/national-standard-practice-manual/.

[2] Arkansas was the highest scoring southern state in ACEEE's 2018 state energy efficiency scorecard in terms of electric and gas utility funded program savings in 2017. Berg, Weston et al., *The 2018 State Energy Efficiency Scorecard*, ACEEE Report U1808, October 2018.

[3] Johnson, K. and M. Klucher. "All Together Now! How Collaboration Works in Arkansas." Proceedings of 2014 IEPPEC, Berlin

test with the inclusion of collaboratively-developed non-energy benefits (NEBs). In recent years, the PWC undertook extensive discussions regarding assigning values to NEBs. The PWC reached agreement on monetization of three NEBs: other fuel savings, water savings and the value of deferred equipment replacement. Efforts to account for other NEBs did not proceed on the basis that they were too difficult to quantify, as was documented in a 2014 report developed by the IEM, as further discussed herein.

In November 2017, the Commission ordered the PWC stakeholder group to "consider the findings and recommendations of the NSPM as it resumes work on the next three-year cycle of planning" (Order No. 40) [4] for six of the seven IOUs.[5] This directive included addressing how the NSPM could help Arkansas account for the value of carbon emissions reductions associated with EE investments. The PWC began this work in February 2018, initiating a "case study" of how Arkansas' current cost-effectiveness screening practices align with the NSPM principles and guidance. At the request of the PWC, E4Thefuture provided technical assistance.[6] The PWC finalized and submitted to the Commission a report titled *"National Standard Practice Manual Case Study – Arkansas' Current Practices*" (PWC Report) in October 2018.[7]

This document summarizes the PWC Report and incorporates key tables, conclusions and recommendations. Beyond being a more condensed version of the PWC Report, this document provides some additional information on the approach taken by the PWC in its process so that readers can better understand the process and consider how a case study for their jurisdiction might be approached.

3. Process Used to Review Arkansas' Practice Using the NSPM

The PWC formed a specific NSPM Working Group to assist in providing and assessing the information required to complete the NSPM case study requested by the Commission. This Working Group was comprised of representatives from the Arkansas investor-owned 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.

The Working Group focused on the NSPM's six core principles to organize its self-assessment which allowed it to consider both the construct of the state's primary cost-effectiveness test (i.e. what categories of impacts it covers) and a variety of issues related to the application of that test, including the extent to which the current test is applied consistently across the six IOUs in the state. For each

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[4] 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.

[5] 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.

[6] Mr. Chris Neme of Energy Futures Group (and NSPM co-author) provided the PWC technical support on E4TheFutures' behalf.

[7] Parties Working Collaboratively, The Independent Evaluation Monitor, and E4TheFuture, "National Standard Practice Manual Case Study – Arkansas' Current Practices" Final Report prepared for the Arkansas Public Service Commission. October 10, 2018. https://nationalefficiencyscreening.org/wp-content/uploads/2018/11/Arkansas-NSPM-Case-Study-Report-Oct-2018.pdf

principle, the PWC identified key questions raised by the NSPM, current Arkansas practice relative to the questions and areas for potential future refinement of Arkansas practices.

4. Comparison of Arkansas Current Practices with the NSPM Principles

This section summarizes the extent to which Arkansas' current energy efficiency cost-effectiveness practices align with the six guiding NSPM principles. Each subsection summarizes the principle with direct reference to the NSPM as made in the PWC report, articulates the key question(s) the PWC endeavored to address in assessing how well Arkansas' IOU's current cost-effectiveness practices align with the NSPM guidance, and summarizes the PWC's conclusions on those questions. It is important to note that the PWC identified several areas of overlap between the various NSPM principles which are also 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 provided in Table 1. The key research question addressed for this principle is:

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

The PWC report identifies several examples of Commission orders that make clear the Commission's view that efficiency is a resource. Most notable is language the Commission used to describe the savings goals it recently established for PY 2020-2022 (1.2% of 2018 electric sales and 0.5% of 2018 gas sales to eligible customers), stating that the establishment of the targets "is consistent with the policy goal of capturing all cost-effective, achievable savings" and "provides ratepayers with increased opportunity to achieve substantial economic benefits that will be forgone if targets are set to maintain lower levels of savings".[8]

The Commission has also endeavored to treat efficiency as a resource in its guidance on cost-effectiveness analyses. For example, it requires the six IOUs 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 Commission has instructed the utilities to use marginal line loss rates, which is a national best practice.

A critically important activity of the PWC Working Group was to document utility system impacts, as well as several other key assumptions (discount rates, analysis periods, etc.), that each IOU currently includes in its application of the Arkansas TRC test. To support that effort, E4TheFuture developed a template for a questionnaire each utility was asked to complete. A copy of the template is shown in **Error! Reference source not found.**, which also included a column (not shown) with questions specific to certain categories of utility system impacts. As discussed in further below, this effort was helpful in informing assessments of how well current Arkansas cost-effectiveness practices were aligned with several NSPM principles. It also revealed some differences between how each of the six utilities apply the current Arkansas TRC test.

Upon completion of populating the table in Figure 1, the case study revealed that not all utilities are uniformly following the Commission's guidance on cost-effectiveness analyses. Further, there are several categories of utility system impacts, as identified in the NSPM, on which the Commission has not

[8] APSC Docket No. 13-002-U, Order No. 43, page 10 of 12.

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 the section below on Principle #4 regarding symmetry of costs and benefits.

Figure 1: Arkansas Utility System Impacts Survey Template

Arkansas PWC

Utility System Impacts Included in Energy Efficiency Cost-Effectiveness Analyses

Utility Name XXX Electric Company

Catetory of Utility System Impacts	Included in Cost-Effectiveness Analyses?	Values Used	Units	Source(s) of Values Used
Avoided Energy Costs	yes or no		specify	IRP modeling, EIA fuel price forecasts, internal study, MISO data, etc.
Avoided Generating Capacity Costs	yes or no		specify	IRP modeling, EIA fuel price forecasts, internal study, MISO data, etc.
Avoided T&D Capacity Costs	yes or no		specify	Internal study, benchmarking relative to other utilities, etc.
Avoided T&D Line Losses				
energy kWh	yes or no		% loss rate	Internal study, system data adjusted for marginal/average ratio
peak kW	yes or no		% loss rate	Internal study, system data adjusted for marginal/average ratio
Avoided Ancillary Services	yes or no		specify	Internal study, MISO values, DSMore estimates, etc.
Wholesale price suppression effects				
energy kWh	yes or no		specify	internal study, external study (specify)
peak kW	yes or no		specify	internal study, external study (specify)
Avoided carbon emission regulatory costs	yes or no		$/ton CO2	internal study, external study (specify)
Avoided other environmental regulatory costs	yes or no		specify	internal study, external study (specify)
Avoided credit & collection costs	yes or no		specify	internal study, extrapolation from other utility studies (specify)
Changes to Risk Profile (e.g. fuel diversity)	yes or no		specify	internal study, extrapolation from other utility studies (specify)
Other impacts 1	yes or no		specify	specify
Other impacts 2	yes or no		specify	specify

Notes:

1 Avoided cost values (energy, capacity, T&D, ancillary services) can be provided on separate sheets.

2 If any requested values are proprietary and cannot be made public, please note as such and reason for why they are proprietary.

Other Cost-Effectiveness Screening Questions

Discount Rate	
What rate is used?	%
What is the basis for the rate used?	WACC, T-bill yields, other?
Is the rate "real" or "nominal"	specify
Analysis Period	
What years are covered by analyses?	specify start year and end year, or no. of years

Principle #2: Articulate Applicable Policy Goals

The PWC identified the following two questions as central to this key principle in its case study:

- What do the state's policy goals suggest about the categories of non-utility system impacts that should be included in its cost-effectiveness test, and are those impacts included?
- Is the discount rate consistent with the policy objectives of the state?

One of the first activities of PWC's NSPM Working Group was to document all Arkansas policies potentially relevant to its energy efficiency programs. That effort was led by Commission Staff, which produced a table of legislative language and Commission orders dating back to 1977. The Working Group then worked together to identify specific categories of impacts that each of the identified policies suggested might be appropriate to include in the state's cost-effectiveness analyses. There were 31 instances in which the legislative language and/or Commission Orders matched specific impacts

described in the NSPM. **Error! Reference source not found.** summarizes these findings as documented in the PWC's report to the Arkansas Commission.

Table 1: Summary of Occurrences of Cost-Effectiveness Impacts in the Docket Review

Policy	Number of Orders Referenced	Currently in TRC?	Notes
Utility System			
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
Participants			
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
Society			
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

The full table of policies and their potential application to cost-effectiveness analyses of Arkansas efficiency programs is provided as Appendix A of the PWC Report to the Commission.

The PWC's review of Arkansas' policy objectives indicate that most of the state's policy goals are currently intended to be reflected in the cost-effectiveness testing conducted by the six IOUs. However, in some cases, there is a less than full accounting for all the impacts associated with some policy goals. This issue is discussed under Principles #3 (Hard-to-Quantify Impacts) and #4 (Symmetry) below.

In addition, there are several potential state policy objectives for efficiency programs for which impacts (e.g., Environmental, Economic Development, and Energy Security impacts) are not currently included in the current definition of the Arkansas cost-effectiveness test. However, these societal NEBs were noted in initial energy conservation orders in 2007 but have not been addressed in subsequent orders. As such,

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. This issue is also discussed more fully in Principles #3 and #4 below.

Implications of Policy Goals for Discount Rates

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 2 shows, the PWC Report found that 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.[9]

Table 2: 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	WACC approved in last rate case	U.S. Dept. of Treasury 20-year Constant Maturity Rate (CMT) Rate, averaged over 2015
Real or Nominal Rate	Nominal	Nominal	Nominal	Nominal	N/A	Nominal

These differences suggest that there is a need for guidance from the Commission on discount rates. As shown in **Error! Reference source not found.** and discussed above, statutes and Commission order suggest efficiency programs are intended to address a wide range of policy objectives.

Principle #3: Account for All Relevant Impacts Even if Hard-to-Quantify

The key research question posed by the PWC Report for Principle #3 is:

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

[9] 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.

The PWC has had numerous discussions regarding participant NEBs in recent years, informed in part by an extensive review of the literature on NEBs developed by the IEM, Dr. Katherine Johnson.[10] The outcome of those discussions was a recommendation to the Commission to focus on a few of the most important and most quantifiable NEBs. The Commission ultimately agreed and directed the utilities to include the following three categories of participant impacts (in addition to utility system impacts) in their TRC cost-effectiveness analyses, provided they meet previously established Commission standards for consideration of NEBs:[11]

- 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.[12]

At the Commission's direction, the IEM has provided guidance on calculating the value of these NEBs in Protocol L provided in Volume 1 of Arkansas' Technical Reference Manual (TRM)[13] including detailed information, examples, and reporting templates for each of the approved NEBs.

The PWC Working Group's review of various NEBs regarding its inventory of applicable policy goals led to its focus on low-income NEBs, carbon emission impacts, and several societal NEBs.

Low-Income NEBs

With recent legislation expanding EE programs to certain LIHEAP income eligible population[14], and the utilities developing pilot programs for the next program cycle, the PWC Report recognized the need to consider potential NEBs in in cost-effectiveness analyses. These included helping utilities reduce the effects of termination of service (i.e., reduced "uncollectibles," reduced termination of service costs, other administrative cost savings).

The PWC Report further notes that quantifying the NEBs associated with Arkansas' low-income pilot program is an emerging area that has not yet been addressed in any Commission Orders and could expand the list of potential NEBs to include health, safety, and comfort impacts.

Carbon Impacts

A specific objective of the PWC Report in response to the Commission's 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.[15]

The PWC Report found that with respect to the value of avoided carbon emissions, the NPSM only really provides guidance on how to assess whether such impacts should be included in a state's cost-

[10] Johnson & Eisenberg, An Examination of Non-Energy Benefits: Definitions, Approaches and Values Used in Other Jurisdictions (June 17, 2014).

[11] 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."

[12] Docket 13-002-U, Order No. 30, pp. 20-21.

[13] Arkansas Technical Reference Manual Version 7.0, Approved by the Public Service Commission Docket 10-100-R

[14] Arkansas General Assembly Act 1102 of 2017. The applicable parts, sections 1 and 2, are codified at Arkansas Code § 23-2-304(a) (11) and § 23-3-405(a).

[15] See Arkansas Commission 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.

effectiveness test (i.e., they can be considered as a utility system impact to the extent that they reduce potential future costs of compliance with future emission regulations, and their societal value can be considered if the state's policies dictate that emissions reductions are an important state objective). 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 to the PWC report provides a summary of recent carbon pricing trends used in other states to provide additional information to the Arkansas Commission.

Other Hard-to-Quantify Impacts

The PWC's 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.[16] as follows:

- **Avoided other environmental regulatory costs**: Only one utility 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, likely due to 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.[17]

Summary

The PWC report notes that the six Arkansas IOUs currently includes several costs and benefits in its cost-effectiveness test that are hard to quantify, while others – such as low-income NEBs and the avoided cost of future carbon emission regulation – are currently under discussion. The PWC also concluded that the current cost-effectiveness test methodologies do not fully adhere to the NSPM principle of assigning some value to hard-to-quantify impacts, as further discussed below.

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, either with regard to utility system impacts and non-utility system impacts, as deemed important by state policies (as discussed in NSPM Principle #2).

The PWC identified two areas where there is asymmetry in Arkansas' application of cost-effectiveness analyses: Utility System Impacts and Participant Impacts. Each of these is discussed further below.

Asymmetry in Treatment of Utility System Impacts

[16] 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.

[17] This is the approach used in Illinois under the Stipulation and Future Energy Jobs Act (FEJA) legislation.

As described previously under Principle #1 and as shown below in Figure 2, the Arkansas IOUs currently include all of the utility system costs and most of the larger utility benefits in most cases – but not all utility system benefits – in their cost-effectiveness analyses. Further, inconsistencies were found across these utilities in what benefits were included.

Figure 2: Summary of Utility System Benefits Reported by Utility and Category

	Electric Utilities			Gas Utilities		
Catetory of Utility System Impacts	**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

Several categories of utility system benefits were not included by any of the 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.[18]

The case study also revealed several areas in which the utilities use differing assumptions regarding utility system benefits, such as:

- **Avoided Transmission & Distribution Capacity Costs:** This cost category is treated differently by each Arkansas IOU electric utility.
- **Avoided Transmission & Distribution Line Losses**: The three IOU electric utilities use different approaches to quantifying T&D peak line losses.
- **Wholesale Price Suppression Effects**: two IOUs do not include these system impacts while one assumes effects are built into its IRP model through a reduction in usage from energy efficiency.[19]
- **Avoided Carbon Emission Regulatory Costs**: The three IOU electric utilities use differing cost assumptions for carbon ranging from $2.73/ton to $15.08/ton beginning in 2028 or 2022, while a fourth IOU electric utility assumes a price of zero.
- **Other Environmental Regulatory Costs**: One of the utilities 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.[20]

[18] 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).

[19] The utility, EAI suggested that the fact that price suppression effects are captured by its AURORA modeling means they are implicitly reflected in its avoided energy and avoided capacity costs. Some questions about this assumption were raised by the PWC Working Group but it did not have the time to fully investigate the issue.

[20] 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.*"

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. Specifically, other than all fuel savings, the only participant benefits that these Arkansas utilities currently include in their cost-effectiveness analyses are: water/wastewater savings and avoided and deferred equipment costs; no value is currently assigned to the benefits of improved health and safety benefits, comfort, building durability, business productivity, or other ways in which participants can benefit from efficiency programs. The result is that there is asymmetry in the way participant impacts are treated in cost-effectiveness analyses.

Principle #5: Forward-Looking Analysis

This NSPM principle focuses on ensuring that the cost-benefit analysis remain dynamic and reflect changing market conditions, focusing on questions such as:

- Does the analysis include only future costs and benefits (i.e., excluding sunk costs)?
- Does the analysis cover a period sufficiently long to capture all EE impacts?
- Does the analysis treat free rider costs as "baseline" (and therefore not an incremental cost) if it includes participant impacts?
- Does the analysis value marginal utility system impacts?

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

The PWC Report found that the Arkansas IOUs meet the first two criteria by appropriately including only future costs and benefits (i.e., excluding sunk costs); and including the full lifecycle costs and benefits of EE measures in its Technical Reference Manual (i.e., there is no truncation of the lifetime benefits).

However, the analysis did identify an area of inconsistency regarding capturing free ridership costs, where one utility includes incentives to free riders as an administrative cost in its TRC calculation while the other five utilities do not. 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).

In addition, there is inconsistency in the use of average vs. marginal costs, with one utility using marginal rates for the avoided line losses, another using average rates, and yet another 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).

The PWC report states that 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 provides guidance on transparency where "*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 questions:

- Is the rationale for what impacts are included in the Arkansas test clear?
- Is it clear what impacts the Arkansas utilities are including in their tests?
- Is the methodology used to estimate values for efficiency costs and benefits clear and publicly reviewable (except for cases where confidentiality is absolutely necessary)?

The PWC report notes that Arkansas has developed a transparent EE reporting process, 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. 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.

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 currently include. 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 provide details of their avoided cost assumptions for public review.

4. Conclusions, Recommendations, and Commission Decision

The PWC Report to the Commission clearly documents the extent to which current cost-effectiveness practices in Arkansas align with the six underlying principles of the NSPM. Though there are many areas in which the current Arkansas practices are aligned, there are also some areas of incomplete alignment. Key observations from the PWC's work are as follows:

- 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 Commission directed them to use.
- There are 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 the Commission 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);
- There is 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 (from earlier 2007

conservation orders) include environmental, economic development, and energy security impacts, but these are not currently accounted for in Arkansas's practice

Based on these observations, the PWC "scored" each utility and the state as a whole, on a scale of 0 to 4, on how its current cost-effectiveness practices align with the guidance of the NSPM, specifically with regard to its six core principles. Table 3 presents these scores using a Harvey ball format.

Table 3: Summary of Arkansas' Alignment with the NSPM Principles

	NSPM Principles					
Utility Status	**#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 = ○						

The PWC Report also identified several areas that merit further review, consideration, and/or clarification by the Commission, as follows:

1. Review areas of inconsistency in the six IOU assumptions for avoided T&D costs; use of marginal line losses; the selected discount rates; and the handling of incentives to free riders. And consider requiring the IOUs to document which other utility system and non-utility impacts are being included in their cost-effectiveness analysis to reveal any areas of inconsistencies.
2. 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 if a Low-Income Pilot Program is launched.
3. Consider how to address the asymmetry in the current treatment of NEBs (i.e., full accounting of participants costs but only some participant benefits). Analysis of some key NEBs produced by the state's EE programs would address the current inconsistencies as well as affirm Arkansas' commitment to focus on quantifiable, Arkansas-specific NEBs going forward.
4. Consider whether previously stated policy interest in environmental, energy security and economic development impacts of EE programs is of sufficient magnitude to warrant inclusion of these impacts in the state's cost-effectiveness test and if so, to provide appropriate guidance.
5. 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 to the PWC Report

summarizes the additional resources and approaches for addressing the issue.

Commission Decision: The Commission issued an order (Order No. 31, Docket No. 10-100-R and Order No. 48, Docket No. 13-002-U) on May 10, 2019 instructing the PWC to further provide recommendations on how it can address many of the inconsistencies between current cost-effectiveness testing practices and the principles described in the NSPM, in particular with regard to asymmetrical treatment of costs and benefits.