

**GOVERNMENT OF PUERTO RICO  
PUBLIC SERVICE REGULATORY BOARD  
PUERTO RICO ENERGY BUREAU**

**IN RE: PUERTO RICO TEST FOR DEMAND  
RESPONSE AND ENERGY EFFICIENCY**

**CASE NO: NEPR-MI-2021-0009**

**SUBJECT: Puerto Rico Test Proceeding**

**RESOLUTION AND ORDER**

**I. INTRODUCTION**

On December 10, 2020, the Energy Bureau of the Puerto Rico Public Service Regulatory Board ("Energy Bureau") issued a Resolution<sup>1</sup> approving the *Regulation for Demand Response* ("Regulation 9246")<sup>2</sup>. Regulation 9246 establishes guidelines for developing demand response ("DR") programs. Section 2.01(B) of Regulation 9246 states that:

PREPA shall pursue all cost-effective Demand Response resources (as defined under the cost-effectiveness test established in ARTICLE 4 of this regulation), including diverse technologies and various services provided, through its own DR programs and rate designs, and through DR Aggregators.<sup>3</sup>

To determine whether DR resources are cost-effective, Regulation 9246 requires the Energy Bureau to initiate a proceeding to define the Puerto Rico Benefit Cost Test ("PR Test") within six (6) months of its effective date.<sup>4</sup> The PR Test is defined as a cost-effectiveness screening test, reflecting Puerto Rico public policy, and used to evaluate whether, and to what extent, proposed or actual DR programs or initiatives provide benefits greater than their costs.<sup>5</sup>

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<sup>1</sup> Resolution, *In Re: Regulation for Energy Efficiency and Demand Response*, Case No. NEPR-MI-2019-0015, December 10, 2020 ("December 10 Resolution").

<sup>2</sup> Regulation 9246, *Regulation for Demand Response*, December 21, 2020.

<sup>3</sup> *Id.*, Section 2.01(B).

<sup>4</sup> *Id.*, Section 4.02(D).

<sup>5</sup> *Id.*, Section 1.09(B)(20).



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The Energy Bureau expects the PR Test will also be necessary and applicable to energy efficiency.<sup>6</sup> On April 22, 2021, the Energy Bureau issued a proposed Regulation for Energy Efficiency<sup>7</sup> ("Proposed EE Regulation") to establish a framework for developing energy efficiency programs to achieve the goal of thirty percent (30%) of energy efficiency by 2040.

The Proposed EE Regulation also requires the Energy Bureau to initiate a proceeding to define the PR Test within six (6) months of its effective date.<sup>8</sup>

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Through this Resolution and Order, the Energy Bureau **INITIATES** the PR Test proceeding required by Regulation 9246, which will also serve the same purpose of the Proposed EE Regulation. The purpose of this proceeding is to develop a Puerto Rico specific cost-effectiveness framework to assess the benefits and costs of future DR and EE programs. Regulation 9246 indicates that the PR Test shall include:

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All relevant generation, transmission, and distribution impacts, reliability and resilience, other fuel impacts, and environmental impacts, and may include other non-energy impacts, water impacts, economic development impacts, and social equity impacts. The accrual of specific non-energy impacts to certain programs or technologies, such as income eligible programs or combined heat and power, may be considered.<sup>9</sup>

Within this proceeding the Energy Bureau will use the *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources*<sup>10</sup> ("NSPM for DERs") as a guide to develop the PR Test.

The Energy Bureau seeks stakeholder feedback regarding the specific benefits and costs to be included in the PR Test.

## II. THE PUERTO RICO TEST

Cost-effectiveness is foundational to implementing successful DR and EE programs. Evaluating cost-effectiveness helps to ensure that funds invested in these programs create

<sup>6</sup> December 10 Resolution, p. 9.

<sup>7</sup> Resolution, *In Re: Regulation for Energy Efficiency*, Case No. NEPR-MI-2021-0005, April 22, 2021. The Proposed EE Regulation is available at <https://energia.pr.gov/en/dockets/?docket=nepr-mi-2021-0005>.

<sup>8</sup> Section 4.02(E), Proposed EE Regulation.

<sup>9</sup> Section 4.02(C), Regulation 9246.

<sup>10</sup> National Efficiency Screening Project ("NESP"), *National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources* ("NSPM for DERs"), Aug. 2020. Available at: [https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs\\_08-04-2020\\_Final.pdf](https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-04-2020_Final.pdf).

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sufficient benefits to Puerto Rico. Both, Regulation 9246 and the Proposed EE Regulation establish a two-step process for cost-effectiveness. The first step is to use a standard Utility Cost Test that can be utilized almost immediately for evaluating proposed DR and EE programs, while a Puerto Rico-specific test is developed. As indicated by the Energy Bureau, the PR Test will be better tailored to Puerto Rico's context and public policy using the Resource Value Framework established by the National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources ("NSPM for EE").<sup>11</sup>

The NSPM for EE is a product of the National Energy Screening Project ("NESP"), an organization working to improve cost-effectiveness screening practices for distributed energy resources ("DERs"). To date, the NESP has issued two guidance manuals on cost-effectiveness screening: the NSPM for EE in 2017, and the recently published NSPM for DERs that incorporates and expands upon the guidance in the NSPM for EE. The goal of the NSPM is to provide "objective, policy- and technology-neutral, and economically sound guidance" for developing a primary DER cost-effectiveness test (or modifying an existing primary test). It has been vetted by a cross-cutting advisory group consisting of regulators, state agencies, utilities, expert consultants, and representatives from the DER industry.<sup>12</sup> This proceeding will be guided by the updated NSPM for DERs.

The NSPM contains a multi-step process for developing a jurisdiction's primary cost-effectiveness test guided by a set of principles. In recent years, the NSPM has been used by several states to guide the development of a jurisdiction specific cost-effectiveness test. These include New Hampshire<sup>13</sup>, Minnesota, Arkansas, and Rhode Island. Attachment A to this Resolution and Order includes case studies summarizing these efforts.

Section 4.02 of the Proposed EE Regulation contains a set of principles the Energy Bureau shall apply when developing the PR Test, many of which mirror the principles of the NSPM. These include the following:

- 1) Efficiency as a Resource. EE is one of many resources that can be deployed to meet customers' needs. It should, therefore, be compared with both supply side and demand-side alternative energy resources in a consistent and comprehensive manner.
- 2) Energy Policy Goals. Puerto Rico's cost-effectiveness test should account for its applicable policy goals, as articulated in legislation, Energy Bureau orders, regulations, guidelines, and other policy directives.

<sup>11</sup> Resolution, *In Re: Regulation for Energy Efficiency and Demand Response*, Case No. NEPR-MI-2019-0015, September 21, 2020, p. 6

<sup>12</sup> NSPM for DERs, pp. 1-3.

<sup>13</sup> Benefit-Cost Workshop materials available at:  
[https://www.puc.nh.gov/EESE%20Board/EERS Working Groups.html#benefitcost](https://www.puc.nh.gov/EESE%20Board/EERS%20Working%20Groups.html#benefitcost).



- a) The PR Test should reflect the guiding principles of the Puerto Rico Electric system as defined in Act 17-2019, namely efficiency, quality, continuity, adaptability, impartiality, solidarity, and equity.

- 3) Hard-to-Quantify Impacts. Efficiency assessment practices should account for all relevant, important impacts, even those that are difficult to quantify and monetize.
- 4) Symmetry. Efficiency assessment practices should be symmetrical, for example, by including both costs and benefits for each relevant type of impact.
- 5) 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 with those that would occur absent the efficiency investments. Sunk costs and benefits are not relevant to a cost-effectiveness analysis.
- 6) Transparency. Efficiency assessment practices should be transparent, and should document and reveal all inputs, assumptions, methodologies, and results.

The additional requirements for the PR Test in Section 4.02 of the Proposed EE Regulation are as follows:

- 1) The PR Test shall reflect the policy objectives of Puerto Rico regarding energy, environmental, and society impacts.
- 2) The Energy Bureau shall include in the PR Test all generation, transmission, and distribution impacts, reliability and resilience, other fuel impacts, and environmental impacts, and may include other non-energy impacts, water impacts, economic development impacts, and social equity impacts. The accrual of specific non-energy impacts to certain programs or technologies, such as income eligible programs or combined heat and power, may be considered.
- 3) Benefits and costs projected to occur over time shall be in present value terms in the PR Test calculation using a discount rate that appropriately reflects that energy efficiency or demand response is a low-risk resource in terms of cost of capital risk, project risk, and portfolio risk. The discount rate shall be reviewed and updated in the Energy Efficiency Plans to ensure that the applied discount rate is based on the most recent information available.
- 4) The number of years over which cost-effectiveness is assessed shall be long enough to capture the full stream of costs and benefits associated with the life of the suite of measures.
- 5) Benefits in the PR Test shall reflect net resource impacts. Free Ridership and Spillover effects shall be accounted for in cost effectiveness calculations

While Regulation 9246 is less specific on the PR Test than is the Proposed EE Regulation, both EE and DR programs should be assessed using the same PR Test to be developed in this proceeding, which is therefore guided by the Proposed EE Regulation requirements and the NSPM. The Energy Bureau has begun the process of developing avoided costs for use in the Utility Cost Test and will provide results regarding utility system and other costs and benefits during this proceeding as those results are available.

### III. THE PROCEDURE FOR THIS PROCEEDING

The Energy Bureau initiates this proceeding to enable stakeholder feedback on developing the PR Test. The NSPM for DERs recommends a five step process for developing a jurisdiction specific cost-effectiveness test.

- Step 1. Articulate Applicable Policy Goals.
- Step 2. Include All Utility System Impacts.
- Step 3. Decide Which Non-Utility System Impacts to Include.
- Step 4. Ensure that Benefits and Costs are Properly Addressed.
- Step 5. Establish Comprehensive, Transparent Documentation.

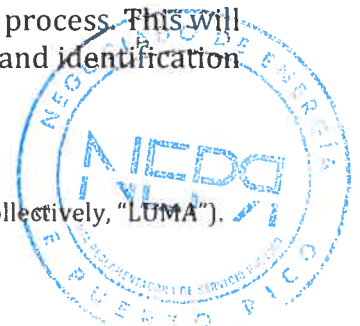
The Energy Bureau will discuss each step and obtain stakeholder feedback over four 1-day technical workshops. The Energy Bureau will hold these workshops on a monthly schedule, open to all stakeholders as described. The Energy Bureau **ORDERS** LUMA<sup>14</sup> and the Puerto Rico Electric Power Authority ("PREPA") to attend each technical workshop and participate as part of the proceeding. After each technical workshop, stakeholders will be asked to submit comments to the Energy Bureau on the relevant components of the PR Test discussed at the workshop. Stakeholders shall file comments with the Energy Bureau no later than three (3) weeks after each technical workshop.

The expected breakout of workshop topics is as follows:

Technical Workshop 1. This workshop will summarize the NSPM for DERs including the principles of developing a jurisdiction specific cost-effectiveness test, and an overview of the five-step process. This workshop will also cover Step 1 of the NSPM process, which is to identify Puerto Rico's applicable policy goals related to DR and EE. The Energy Bureau is seeking comments from stakeholders on the list of policy goals related to DR and before this workshop. Attachment B to this Resolution and Order provides a template to facilitate providing comments. The Energy Bureau is encouraging all stakeholders to provide comments by June 4, 2021.

Technical Workshop 2. This workshop will cover Step 2 of the NSPM process. This will involve identifying all utility system impacts to be included in the PR Test and identification of methodologies that could quantify costs and benefits.

<sup>14</sup> LUMA ENERGY, LLC as ManagementCo, and LUMA ENERGY SERVCO, LLC as ServCo (collectively, "LUMA").





*Technical Workshop 3.* This workshop will cover the remaining steps in the NSPM process. This will include determining which non-utility system impacts to include in the PR Test based on Puerto Rico's applicable policy goals as identified in Workshop 1. It will also cover issues related to choice of discount rate and analysis period.

*Technical Workshop 4.* This workshop will include a proposed draft PR Test from the Energy Bureau and discussion of remaining open questions from the earlier workshops.

These workshops will culminate in an Energy Bureau Order memorializing the process and the PR Test framework.

#### Summary Preliminary Timeline Goals for Proceeding / Workshops:

Date	Event	Comments
May 2021	Resolution and Order opening proceeding	Attachment A includes case studies from other jurisdictions. NSPM for DERs available at: <a href="https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-04-2020_Final.pdf">https://www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-04-2020_Final.pdf</a>
June 2021	1 <sup>st</sup> Technical Workshop	NSPM for DERs overview and identification of Puerto Rico energy statutes, regulations, and policies.
July 2021	2 <sup>nd</sup> Technical Workshop	Identification of utility system impacts
August 2021	3 <sup>rd</sup> Technical Workshop	Identification of non-utility system impacts and overarching considerations including discount rate.
September 2021	4 <sup>th</sup> Technical Workshop	Overview of proposed draft PR Test and discussion of remaining open questions from prior workshops.
TBD	Order	Energy Bureau Resolution and Order on the PR Test for Demand Response and Energy Efficiency.

The Energy Bureau will issue a subsequent Resolution establishing the dates for the Technical Workshops.

#### IV. CONCLUSION

Through this Resolution and Order, the Energy Bureau **INITIATES** the instant case to develop a Puerto Rico specific cost-effectiveness framework to assess the benefits and costs of future DR and EE programs. The Energy Bureau **ORDERS** LUMA and PREPA to attend each technical workshop and participate as part of the proceeding. As stated above, stakeholders shall comments to Attachment B of this Resolution and Order **on or before**

**June 4, 2021.** The Energy Bureau will issue a subsequent Resolution establishing the dates for the technical workshops described in Part III of this Resolution and Order.

Be it notified and published.



Edison Aviles Deliz  
Chairman



Ángel R. Rivera de la Cruz  
Associate Commissioner



Ferdinand A. Ramos Soegaard  
Associate Commissioner



Lillian Mateo Santos  
Associate Commissioner




Sylva B. Ugarte Araujo  
Associate Commissioner

#### **CERTIFICATION**

I hereby certify that the majority of the members of the Puerto Rico Energy Bureau has so agreed on May 14, 2021. I also certify that on May 14, 2021 a copy of this Resolution was notified by electronic mail to: [kbolanos@diazvaz.law](mailto:kbolanos@diazvaz.law), [jmarrero@diazvaz.law](mailto:jmarrero@diazvaz.law), [margarita.mercado@us.dlapiper.com](mailto:margarita.mercado@us.dlapiper.com). I also certify that today, May 14, 2021, I have proceeded with the filing of the Resolution issued by the Puerto Rico Energy Bureau.

I sign this in San Juan, Puerto Rico, today May 14, 2021.



Sonia Seda Gaztambide  
Clerk



**Attachment A:**

**NSPM for DER Case Studies**

- 1) Arkansas
- 2) Minnesota
- 3) Rhode Island

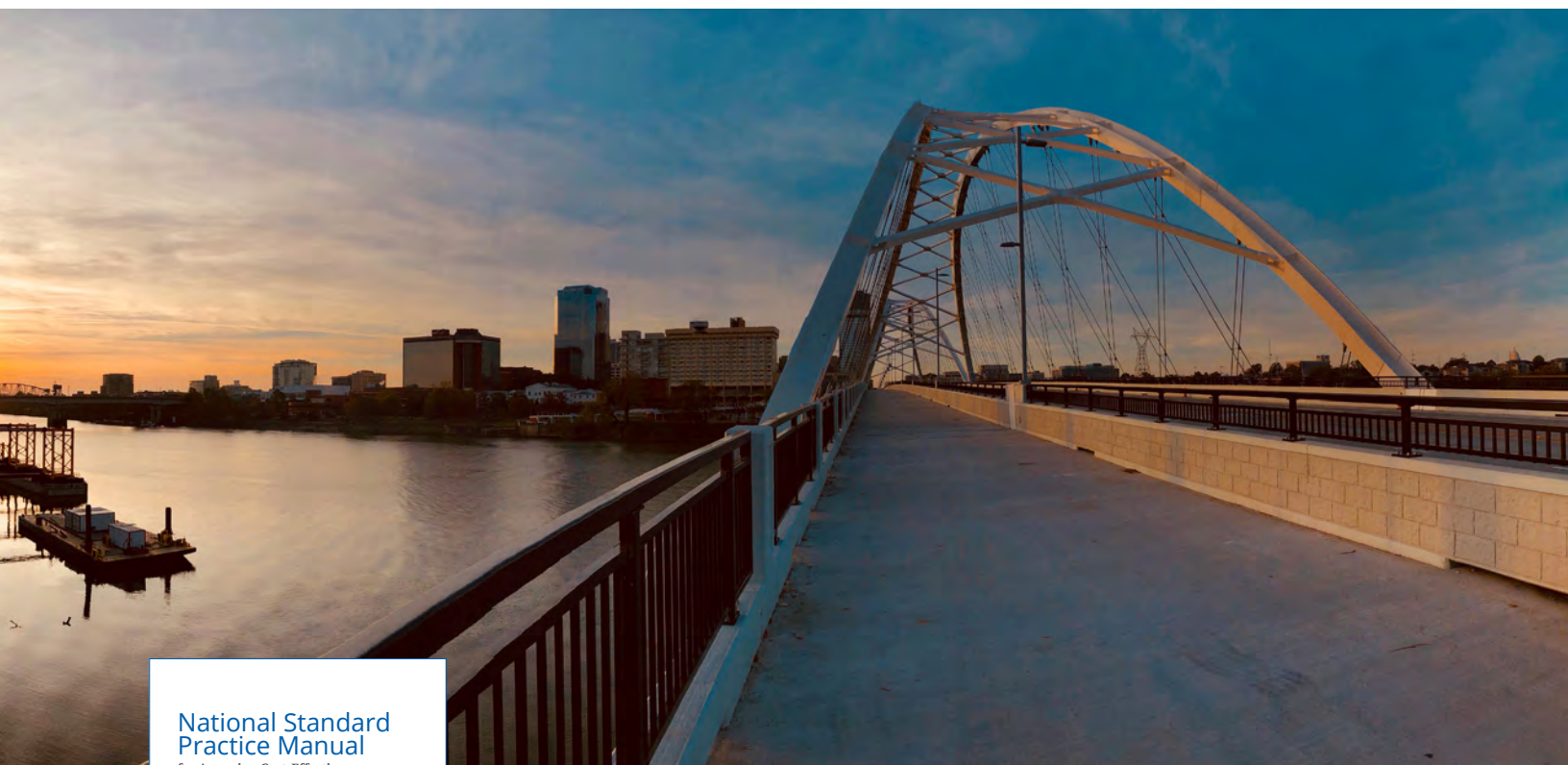
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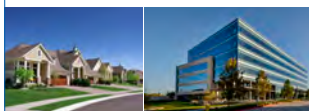
# National Standard Practice Manual

## CASE STUDY: Arkansas



National Standard  
Practice Manual  
for Assessing Cost-Effectiveness  
of Energy Efficiency Resources

EDITION 1 Spring 2017



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NATIONAL EFFICIENCY SCREENING PROJECT

 **nesp**  
NATIONAL EFFICIENCY SCREENING PROJECT

# **National Standard Practice Manual (NSPM)**

## **Application to the State of Arkansas – An Example**

**January 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

# 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.<sup>1</sup> 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**

<b>Efficiency as a Resource</b>	EE 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.
<b>All Relevant Impacts</b>	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified by policy goals,) even those that are difficult to quantify and monetize.
<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>	Cost-effectiveness practices should apply a forward-looking, long-term approach that captures incremental impacts of energy efficiency.
<b>Transparency</b>	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.<sup>2</sup> 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.<sup>3</sup>

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)

<sup>1</sup> 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/>.

<sup>2</sup> 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.

<sup>3</sup> 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)<sup>4</sup> for six of the seven IOUs.<sup>5</sup> 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.<sup>6</sup> 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.<sup>7</sup>

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, Intervenor (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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<sup>4</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.

<sup>5</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.

<sup>6</sup> Mr. Chris Neme of Energy Futures Group (and NSPM co-author) provided the PWC technical support on E4TheFutures’ behalf.

<sup>7</sup> 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".<sup>8</sup>

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

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<sup>8</sup> 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			
Catagory 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
<b>Notes:</b>				
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.				
<b>Other Cost-Effectiveness Screening Questions</b>				
<b>Discount Rate</b>				
What rate is used?	%			
What is the basis for the rate used?	WACC, T-bill yields, other?			
Is the rate "real" or "nominal"	specify			
<b>Analysis Period</b>				
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
<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

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.<sup>9</sup>

**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?

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<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.

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.<sup>10</sup> 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.<sup>11</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>12</sup>

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)<sup>13</sup> 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<sup>14</sup>, 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.<sup>15</sup>

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-

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

<sup>11</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>12</sup> Docket 13-002-U, Order No. 30, pp. 20-21.

<sup>13</sup> Arkansas Technical Reference Manual Version 7.0, Approved by the Public Service Commission Docket 10-100-R

<sup>14</sup> 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).

<sup>15</sup> 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.<sup>16</sup> 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.<sup>17</sup>

### **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**

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<sup>16</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>17</sup> 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		
Catortory of Utility System Impacts	EAI	SWPCO	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.<sup>18</sup>

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.<sup>19</sup>
- **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.<sup>20</sup>

<sup>18</sup> 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).

<sup>19</sup> 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.

<sup>20</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.”

## 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 and Recommendations**















































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**

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 = 						

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

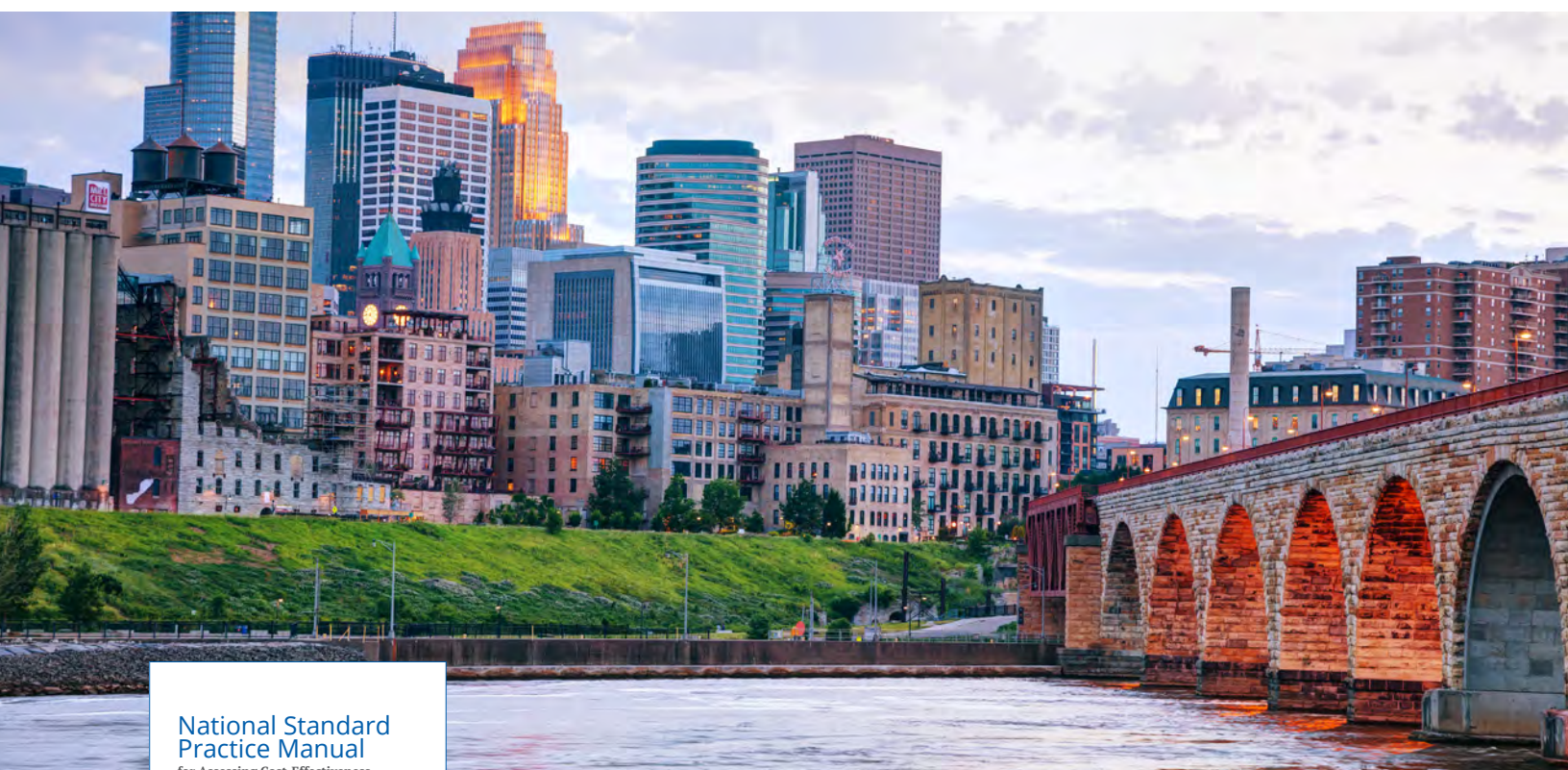
1. Review areas of inconsistency in the six IOU assumptions for avoided T&D costs; use of marginal line losses; the selected discount rates; and the handling of incentives to free riders. And consider requiring the IOUs to document which other utility system and non-utility impacts are being included 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.

**Next Steps:** As of the writing of this synopsis of the Arkansas PWC Report, the Arkansas commission is reviewing the report, findings and recommendations. Any decision or guidance issued by the Commission will be posted to [http://www.apscservices.info/efilings/docket\\_search.asp](http://www.apscservices.info/efilings/docket_search.asp) under docket # 13-002-U.

# National Standard Practice Manual

## CASE STUDY: Minnesota



National Standard  
Practice Manual  
for Assessing Cost-Effectiveness  
of Energy Efficiency Resources

EDITION 1 Spring 2017



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# **National Standard Practice Manual**

## **Case Study: Minnesota**

December 2018

**Prepared by  
The National Efficiency Screening Project**



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# 1. INTRODUCTION

In 2017, the National Efficiency Screening Project released a comprehensive framework for assessing the cost-effectiveness of energy efficiency (EE) resources. Developed as a collaborative effort by some of the nation's top EE experts, this National Standard Practice Manual (NSPM) 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 (NESP 2017).

The NSPM offers a set of guiding principles for EE cost-effectiveness analyses. The principles, based on sound economic practices, present a foundation that states can use as the basis for their cost-effectiveness framework for energy efficiency. The principles and concepts in the NSPM also apply to the cost-effectiveness of distributed energy resources.

The purpose of this case study is to provide an example of how one state, Minnesota, is working to develop an EE cost-effectiveness framework that incorporates the key principles in the NSPM.

Table 1, below, summarizes the NSPM's six guiding principles that are fundamental to helping jurisdictions develop their primary cost-effectiveness test. This case study summarizes the key findings from a comprehensive study conducted for the Minnesota Department of Commerce (the MN Department), described further herein.

**Table 1. NSPM Guiding Principles**

<b>Efficiency as a Resource</b>	Energy efficiency 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.
<b>All Relevant Impacts</b>	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified by policy goals,) even those that are difficult to quantify and monetize.
<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>	Cost-effectiveness practices should apply a forward-looking, long-term approach that captures incremental impacts of energy efficiency.
<b>Transparency</b>	Cost-effectiveness practices should be completely transparent and should fully document all relevant inputs, assumptions, methodologies, and results.

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## 2. COST-EFFECTIVENESS IN MINNESOTA

Minnesota's energy policy history is extensive, dating back as far as 1980 for energy efficiency. Since then, Minnesota has developed comprehensive policy goals and specific rules/targets for EE resources.

One of the key goals is to achieve energy savings equivalent to 1.5 percent of electricity sales each year. Minnesota also has many broad policy goals that support reducing customer utility bills, protecting the environment, and reducing fuel imports, among other goals. With its long history of implementing successful EE programs, Minnesota is among the top states in the American Council for an Energy-Efficient Economy's Scorecard (ACEEE 2018).

### Key Minnesota Policy Goals

- Achieve 1.5% electricity savings annually
- Reduce customer bills
- Reduce environmental impacts
- Reduce fuel imports

The Next Generation Energy Act (NGEA) passed in 2007 dictates that in assessing EE cost-effectiveness, Minnesota utilities and stakeholders should examine the costs and benefits to society, the utility, the participant, and ratepayers (Minn. Stat. § 216B.241, (f)). In practice, this has resulted in the use of four traditional benefit-cost tests: the Societal Cost Test (SCT), the Utility Cost Test (UCT), the Participant Cost Test (PCT), and the Ratepayer Impact Measure Test (RIM). While the utilities calculate results for all four tests in their EE plans and reports, the SCT is the primary determinant of cost-effectiveness. The other three tests are provided for informational purposes, to inform program design and to determine performance incentives.

## 3. REVIEW OF COST-EFFECTIVENESS PRACTICES IN MINNESOTA

### Review of Minnesota Practices

In 2018, the MN Department conducted a study titled "Updating the Energy Efficiency Cost-effectiveness Framework in Minnesota" (the Framework Study) to review the state's EE cost-effectiveness practices and to assess how well they align with the principles in the NSPM (Synapse 2018). The purpose of the study was to inform stakeholder discussions about whether and how to improve Minnesota's EE practices. The Framework Study included:

- an assessment of Minnesota's energy policy goals;
- an evaluation of the state's current EE cost-effectiveness practices;
- application of the NSPM resource value framework for determining the primary EE cost-effectiveness test for Minnesota;
- recommendations for primary and secondary EE tests; and
- recommendations for further research.

Much of this case study is based on the results of the Framework Study.

### Alignment with NSPM Principles

Table 2 summarizes the extent to which current Minnesota energy efficiency cost-effectiveness practices are in alignment with the NSPM guiding principles. As indicated, there are several important instances where practices do not adhere to key NSPM principles.

**Table 2. Minnesota Practices Compared with NSPM Guiding Principles**

<b>Efficiency as a Resource</b>	Aligned. Minnesota law and current practice treat energy efficiency as a resource to be compared comparably with other resources.
<b>Policy Goals</b>	Not aligned. The primary cost-effectiveness test does not include impacts related to several statutory policy goals, including participant NEBs, other fuel impacts, job impacts, public health and safety, and energy security.
<b>All Relevant Impacts</b>	Not aligned. Some utility system impacts are not included; participant NEBs are not included; and some societal impacts are not included.
<b>Symmetry</b>	Not aligned. Participant costs are included, but not participant NEBs.
<b>Forward-Looking Analysis</b>	Aligned. The Societal, Utility, and Participant tests use forward-looking, incremental, long-term costs; and the RIM test is not used in practice.
<b>Transparency</b>	Partly aligned. The current screening tools are not transparent and do not provide supporting measure or cost details.

## Application of the Resource Value Framework

The Minnesota Framework Study applied the resource value framework from the NSPM to develop a primary cost-effectiveness test that reflects Minnesota energy policy goals and adheres to the guiding principles in the NSPM. The study refers to the new primary test as the “Minnesota Test.” The key steps in the resource value framework as applied to Minnesota are summarized below.

### Articulate energy policy goals

Minnesota has a comprehensive set of policy goals related to EE programs and cost-effectiveness. Appendix A presents a summary of the Minnesota energy policy goals. It refers to relevant statutes and reports and lists the relevant policy goals, including: procuring least-cost resources, promoting fuel diversity, protecting low-income customers, mitigating environmental damage, promoting customer choice, and promoting reliability. Some of the most relevant Minnesota energy policy directives are:

The legislature finds that energy savings are an energy resource, and that cost-effective energy savings are preferred over all other energy resources (Minn. Stat. § 216B.2401).

In determining cost-effectiveness, the commissioner shall consider the costs and benefits to ratepayers, the utility, participants, and society (Minn. Stat. § 216B.241, subd. 1c (f)).

The legislature further finds that cost-effective energy savings should be procured systematically and aggressively to reduce utility costs for businesses and residents, improve the competitiveness and profitability of businesses, create more energy-related jobs, reduce the economic burden of fuel imports, and reduce pollution and emissions that cause climate change (Minn. Stat. § 216B.241).

### Key steps to develop the Minnesota Test

- Articulate energy policy goals
- Include all utility system impacts
- Determine which non-utility system impacts to include
  - Participant impacts
  - Low-income impacts
  - Other fuel impacts
  - Societal impacts

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### Include all utility system impacts

Minnesota utilities currently do not include all utility system impacts in their cost-effectiveness analyses. The Minnesota Cost-effectiveness Framework Study recommends that all utility system impacts be included in the Minnesota Test (as well as any application of the Utility Cost and Societal Cost tests). This requires adding the following impacts to those that are already accounted for:

- ancillary services
- wholesale price suppression effects
- improved reliability
- avoided credit and collection costs
- avoided renewable portfolio standards costs
- avoided cost of environmental compliance
- reduced risk

### Determine which non-utility system impacts to include

*Participant impacts.* Some of the Minnesota statutes suggest that participant impacts should be included in the EE cost-effectiveness analysis. In the primary test currently in use in Minnesota, the Societal Cost test, utilities include participant costs but not participant non-energy benefits (NEBs). Interviews with stakeholders indicate that there is much concern about the uncertainty and lack of information regarding estimates of participant NEBs. The Minnesota Cost-effectiveness Framework Study notes that Minnesota stakeholders have a choice: either include both participant costs and participant benefits (including NEBs) or include neither of them. While the decision is up to the Minnesota stakeholders, and ultimately the Minnesota Commission, the Minnesota Energy Efficiency Study recommends that the Minnesota Test include neither the participant costs nor the participant benefits, because of the concerns raised by stakeholders about participant NEBs.

#### **Participant Impacts**

The Framework Study recommends that the Minnesota Test include neither the participant costs nor the participant benefits, because of concerns raised by stakeholders about participant NEBs.

*Low-income impacts.* There is clear support for recognizing the low-income participant NEBs, based on the current practice of approving low-income efficiency programs regardless of whether they pass the cost-effectiveness tests. The Minnesota Energy Efficiency Study recommends that this current practice be continued, unless and until the values of low-income participant NEBs are monetized and included in the Minnesota Test.

*Other fuel impacts.*<sup>1</sup> Minnesota has several policy goals regarding the reduction of greenhouse gases, the reduction in the use of fossil fuels, and the promotion of strategic electrification. All of these goals require multi-fuel programs and the consideration of other fuel benefits in the cost-effectiveness tests. Further, there was strong support from Minnesota stakeholders to account for other fuel benefits of the

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<sup>1</sup> The term “other fuels” refers to fuels that are not provided by the utility that delivers the energy efficiency program, e.g., when a program delivered by an electric utility saves natural gas, oil, propane or other types of fuels.



EE programs. Consequently, the Minnesota Cost-effectiveness Framework Study recommended that these benefits be included in the Minnesota Test.

*Societal impacts.* There is clearly support to include environmental impacts, given multiple policy directives in the state and the fact that they are already included in the primary test in Minnesota. There is also legislative support for considering public health, economic development, and energy security impacts when evaluating EE cost-effectiveness. Consequently, the Minnesota Cost-effectiveness Framework Study recommended that all these societal impacts be included in the Minnesota Test.

## The Minnesota Test

Table 3 presents a summary of the impacts that the Minnesota Framework Study recommended including in the Minnesota Test.

**Table 3. Impacts Included in the Minnesota Test**

Impacts	Description	Rationale for Inclusion
Utility System Impacts	All utility system costs and benefits	Should be included in any cost-effectiveness test
Other Fuel Impacts	Changes in fuels that are not provided by the utility offering the energy efficiency program	Consistent with Minnesota statutes referring to societal impacts, as well as emission reduction, reduced fuel imports, and energy security goals.
Environmental Impacts	Net impacts on CO <sub>2</sub> and other emissions	Consistent with Minnesota statutes referring to societal impacts, as well as emission reduction goals
Water Savings	Net impacts on water consumption	Consistent with Minnesota statutes referring to societal impacts, as well as impacts on program participants
Jobs and Economic Development	Net impacts on jobs or gross state product	Consistent with Minnesota statutes referring to societal impacts, especially those related to economic prosperity and job creation
Public Health	Reduced morbidity and mortality from fossil fuel generation	Consistent with Minnesota statutes referring to societal impacts, especially those related to the protection of the life and safety of citizens
Energy Security	Reduced fuel imports	Consistent with Minnesota statutes referring to societal impacts, especially those related to reduced fuel imports and increased fuel diversity and reliability

## Secondary Tests

The NSPM notes that secondary tests are often useful for providing additional information beyond what is provided by the primary test (NESP page 43). Secondary tests might be especially important in Minnesota given that Minnesota statutes require consideration of several perspectives.

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The Minnesota Framework Study recommends that utilities use both the Utility Cost and the Societal Cost tests as secondary tests. The former indicates the likely impact of EE on the total electricity (or gas) costs, while the latter indicates the likely impact of EE accounting for all Minnesota policy goals.

However, the Minnesota Framework Study recommends that both the Utility and Societal Cost tests be modified to be consistent with their theoretical definitions. The Utility Cost test should be expanded to include some impacts that are not currently included, as noted above. The Societal Cost test should also be expanded to include some impacts that are not currently included: the utility system impacts listed above, participant NEBs, other fuel impacts, jobs and economic development, public health impacts, and energy security.

## 4. NEXT STEPS

The purpose of the Minnesota Cost-effectiveness Framework Study was to provide information and recommendations for the MN Department and other stakeholders to consider when evaluating the Minnesota EE cost-effectiveness practices. The study was presented to the MN Department in August 2018, and the authors presented the results at a stakeholder workshop in September 2018.

At the time this case study was prepared, the MN Department is evaluating Synapse's recommendations, determining what cost-effectiveness updates to prioritize, and establishing a timeline for a regulatory review process. It is anticipated that updates to Minnesota's cost-effectiveness methodologies would be implemented in 2019 as part of a formal regulatory review/approval process for Minnesota's electric and gas utilities.

## 5. REFERENCES

American Council for an Energy-Efficient Economy (ACEEE). 2018. "The 2018 State Energy Efficiency Scorecard, Report U1710." <http://aceee.org/state-policy/scorecard>.

National Efficiency Screening Project (NESP). 2017. "National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources." [https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM\\_May-2017\\_final.pdf](https://nationalefficiencyscreening.org/wp-content/uploads/2017/05/NSPM_May-2017_final.pdf).

Synapse Energy Economics (Synapse). 2018. "Updating the Energy Efficiency Cost-Effectiveness Framework in Minnesota: Application of the National Standard Practice Manual to Minnesota," a Conservation Applied Research and Development grant report, prepared for the Minnesota Department of Commerce.

## APPENDIX A. SUMMARY OF MINNESOTA ENERGY POLICY GOALS

Table 3 presents a summary of Minnesota energy policy goals as indicated by statutes and recent reports. For a more detailed presentation, see Appendix D of the Minnesota Framework Study.

**Table 3. Summary of Minnesota policy goals**

Policy	Citation	Policy Impacts Reflected in Policies						
		Least-Cost	Fuel Diversity	Risk	Reliability	Low-Income	Customer Choice	Environmental
Energy savings policy goal	Minn. Stat. § 216B.2401	✓	✓					✓
Legislative findings	Minn. Stat. § 216B.01	✓			✓			
Next Generation Energy Act of 2007, general provisions	NGEA § 2, subd. 1		✓	✓	✓			✓
Next Generation Energy Act of 2007, per capita fossil fuel use	NGEA § 2, subd. 2		✓					✓
Greenhouse gas emissions control, greenhouse gas emissions-reduction goal	Minn. Stat. § 216H.02, Subd. 1							✓
Energy conservation improvement, peak demand deficit	Minn. Stat. § 216B.241, subd. 1a (d)			✓	✓			
Energy conservation improvement, energy-savings goals	Minn. Stat. § 216B.241, subd. 1c (b)	✓	✓					✓
Energy conservation improvement, cost-effectiveness	Minn. Stat. § 216B.241, subd. 1c (f)	✓	✓					✓
Energy conservation improvement, technical assistance	Minn. Stat. § 216B.241, subd. 1d (a)				✓			
Energy conservation improvement, free choice of measures and installers	Minn. Stat. § 216B.241, subd. 2(a)						✓	
Energy conservation improvement, less expensive than new supply	Minn. Stat. § 216B.241, subd. 2(b)	✓						

Policy	Citation	Policy Impacts Reflected in Policies						
		Least-Cost	Fuel Diversity	Risk	Reliability	Low-Income	Customer Choice	Environmental
Energy conservation improvement, Department decisions	Minn. Stat. § 216B.241, subd. 2(e)					✓	✓	
Energy conservation improvement, low-income programs	Minn. Stat. § 216B.241, subd. 7(a)					✓		
Reasonable rate	Minn. Stat. § 216B.03	✓						
Renewable energy objectives, eligible energy objectives	Minn. Stat. § 216B.1691, Subd. 2		✓					
Renewable energy objectives, local benefit	Minn. Stat. § 216B.1691, Subd. 9	✓	✓		✓			
Resource planning, resource plan filing and approval	Minn. Stat. § 216B.2422, Subd. 2(c)	✓	✓					
Resource planning, long-range emission reduction planning	Minn. Stat. § 216B.2422, Subd. 2c							✓
Resource planning, environmental costs	Minn. Stat. § 216B.2422, Subd. 3(a)		✓					✓
Resource planning, preference for renewable energy facility	Minn. Stat. § 216B.2422, Subd. 4		✓		✓			
Distributed energy resources, generation projects	Minn. Stat. § 216B.2411, Subd. 1 (b)	✓					✓	✓
Minnesota's 2025 Energy Action Plan	Report, page 7	✓		✓	✓			✓
Climate solutions and economic opportunities	Report, page 3							✓

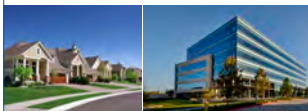
# National Standard Practice Manual

## CASE STUDY: Rhode Island



National Standard  
Practice Manual  
for Assessing Cost-Effectiveness  
of Energy Efficiency Resources

EDITION 1 Spring 2017



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# **National Standard Practice Manual**

## **Case Study: Rhode Island**

2018

**Prepared by  
The National Efficiency Screening Project**



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# 1. INTRODUCTION

This National Standard Practice Manual (NSPM) provides a comprehensive framework for assessing the cost-effectiveness of energy efficiency (EE) resources.<sup>1</sup> 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. The principles, based on sound economic practices, present a foundation that states can use as the basis for their cost-effectiveness framework for EE. The principles and concepts in the NSPM can also be used to assess the cost-effectiveness of distributed energy resources (DERs).

The purpose of this case study is to provide an example of how one state, Rhode Island, has developed an EE cost-effectiveness framework that incorporates the key principles in the NSPM.<sup>2</sup> Rhode Island has a long history of implementing successful EE programs, and ranks among the top five states in the American Council for and Energy-Efficient Economy's Scorecard. It has frequently revisited its cost-effectiveness practices to keep them up to date and to accurately reflect state policy goals. In 2017, Rhode Island adopted the guiding principles from the NSPM as part of its cost-effectiveness framework for EE and other DERs.

# 2. NSPM GUIDING PRINCIPLES

The NSPM presents six guiding principles that are fundamental to helping guide jurisdictions in the development of their primary cost-effectiveness test. These principles are summarized in Table 1.

Table 1. NSPM Guiding Principles

<b>Efficiency as a Resource</b>	EE 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.
<b>All Relevant Impacts</b>	Cost-effectiveness practices should account for all relevant, substantive impacts (as identified by policy goals,) even those that are difficult to quantify and monetize.
<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>	Cost-effectiveness practices should apply a forward-looking, long-term approach that captures incremental impacts of energy efficiency.
<b>Transparency</b>	Cost-effectiveness practices should be completely transparent, and should fully document all relevant inputs, assumptions, methodologies, and results.

<sup>1</sup> 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/>.

<sup>2</sup> The NSPM was not published at the time Rhode Island developed its draft framework, but the NSPM principles were available in draft form, and were adopted albeit without direct reference to later published NSPM.

### 3. COST-EFFECTIVENESS PRACTICES IN RHODE ISLAND

#### Historic Cost-Effectiveness Practices

The Narragansett Electric Company d/b/a National Grid (National Grid or the Company) has been implementing EE programs for its customers for well over 25 years. These programs and the underlying cost-effectiveness practices have been guided by a robust demand side management (DSM) Collaborative process that includes representatives from the Company, the Division of Public Utilities and Carriers (DPUC), the Office of Energy Resources (OER), the Energy Consortium Rhode Island (TEC-RI), low-income advocates, People's Power and Light, and others.

In 2006 the Rhode Island legislature passed the System Reliability and Least-Cost Procurement Act, which requires the Company to procure all EE resources that are cost-effective and cost less than supply-side resources.<sup>3</sup> The Act also established the Energy Efficiency and Resource Management Council (EERMC), to provide a forum for additional stakeholder input, as well as a formal structure for guiding the development of EE programs in Rhode Island.<sup>4</sup>

Rhode Island uses a set of Least Cost Procurement Standards (LCP Standards) to guide how EE and related initiatives are planned for and implemented, including guidance on cost-effectiveness analysis.<sup>5</sup> These standards are updated periodically to reflect new and evolving policy goals, and have typically been updated on a three-year cycle.

For many years the LCP Standards have required the Total Resource Cost (TRC) Test be used to assess the cost-effectiveness of EE resources. This test includes all the costs and benefits affecting the electricity system and the participants in the EE programs. The LCP Standards have also required that the cost-effectiveness analysis includes all participant benefits, including non-energy benefits.

Most of the avoided cost inputs for the cost-effectiveness analysis are derived from the New England Avoided Energy Supply Cost (AESC) Study.<sup>6</sup> This study is prepared by an independent contractor, funded by all of the electric and gas utilities in New England, and overseen by a large, diverse stakeholder group of regulatory commissions, energy offices, consumer advocates, low-income advocates, efficiency advocates, and more. As such, it is a comprehensive and credible source of information for the cost-effectiveness analysis in Rhode Island.

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<sup>3</sup> R.I. Gen. Laws § 39-1-27.7(c)(5) System Reliability and Least-Cost Procurement.

<sup>4</sup> The EERMC is separate from the DSM Collaborative, although many parties are members of both. For more information on the EERMC, see <http://www.rieermc.ri.gov/>.

<sup>5</sup> Rhode Island Public Utilities Commission, *Least-Cost Procurement Standards*, July 28, 2017. Available at: [http://www.ripuc.org/rulesregs/commrules/4684-LCP-Standards\\_7-28-17.pdf](http://www.ripuc.org/rulesregs/commrules/4684-LCP-Standards_7-28-17.pdf).

<sup>6</sup> The most recent study is *Avoided Energy Supply Costs in New England: 2015 Report*, prepared for the Avoided-Energy-Supply-Component Study Group, prepared by Tabors Caramanis and Rudkevich, April 3, 2015. A new study is currently being prepared, and is scheduled to be released in March 2018.

The participant non-energy benefits are based on several studies that have been performed for the electric and gas utilities in Massachusetts, including National Grid. There are separate studies on the low-income, residential, and commercial/industrial sectors.<sup>7</sup>

## 2017 Cost-Effectiveness Update

In 2016, the Rhode Island Public Utilities Commission opened Docket 4600 to get stakeholder input on (a) new rate design principles and concepts, and (b) cost-effectiveness for EE and other types of distributed energy resources (DERs). One of the reasons for opening the docket was to develop a cost-effectiveness framework that can be applied consistently across different types of ratepayer-funded resources and programs.<sup>8</sup>

After months of stakeholder discussions, the Working Group<sup>9</sup> recommended expanding the Rhode Island TRC Test to include a broader range of benefits to better align with its applicable state policies.<sup>10</sup> The new cost-effectiveness test was named “the Rhode Island” Test. The RI Test recognizes some of the benefits and costs related to DERs that are not relevant to EE, and expands the list of impacts that were included in its previously used TRC test, including: risk impacts, environmental impacts, jobs and economic development impacts, societal low-income impacts, public health impacts, and energy security impacts. Notably, some of these impacts, such as economic benefits, employment benefits, and air quality were statutorily required in the screening of some measures, such as combined heat and power, whereas the statute left more discretion to the Commission on other EE measures.<sup>11</sup> A motivating issue for Docket 4600 was to levelize the consideration of benefits across all EE measures, and eventually across other resources and functions on the electric system.<sup>12</sup>

The Commission accepted the recommendations of the Working Group, and directed the Company to use the new RI Test, to the extent possible, for evaluating the cost-effectiveness of EE, DERs, other Company investments and spending, and new rate proposals.<sup>13</sup> The Commission also simultaneously updated the Rhode Island LCP Standards to reflect the new RI Test. The updated LCP Standards also require that the NSPM guiding principles be used in developing a cost-effectiveness test. The new RI Test is summarized in Table 2, and compared to the earlier TRC test used by the state.

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<sup>7</sup> Massachusetts Program Administrators, *Massachusetts Special and Cross-Sector Studies Area: Residential and Low-Income Non-Energy Impacts NEI Evaluation*, NMR Group, Tetra Tech, August 15, 2011. Also, *Final Report - Commercial & Industrial Non-Energy Impacts Study*, Tetra Tech, June 29, 2012; and *Massachusetts Special and Cross-Sector Studies Area: Low-Income Single Family Health- and Safety-Related Non-Energy Impacts Study*, NMR Group and Three3 Inc., August 5, 2016.

<sup>8</sup> RI PUC Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System, Report and Order 22851, Docket 4600, July 31, 2017, page 5 at: <http://www.ripuc.org/eventsactions/docket/4600page.html>.

<sup>9</sup> The Working Group included representatives from: the Acadia Center, the Conservation Law Foundation, Direct Energy, the George Wiley Center, National Grid, New Energy Rhode Island, Northeast Clean Energy Council, People’s Power and Light, DPUC, the EERMC, OER, and TEC-RI.

<sup>10</sup> Raab et. al., *Docket 4600: Stakeholder Working Group Process*: Report to the Rhode Island Public Utilities Commission, April, 2017. Available at: <http://www.ripuc.org/eventsactions/docket/4600page.html>.

<sup>11</sup> R.I. Gen. Laws § 39-1-27.7(c)(6)(iii) System Reliability and Least-Cost Procurement.

<sup>12</sup> RI PUC Staff Memorandum RE: *Recommendations for a Docket to Investigate the Changing Distribution System*, March 1, 2016 at: [http://www.ripuc.org/eventsactions/docket/4600-PUC-Recommendation\\_3-1-16.pdf](http://www.ripuc.org/eventsactions/docket/4600-PUC-Recommendation_3-1-16.pdf)

<sup>13</sup> Rhode Island Public Utilities Commission, *Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System*, Report and Order, Docket 4600, July 31, 2017.

The next section of this case study walks through how Rhode Island applies the NSPM principles to its cost-effectiveness testing practice, where alignment with some principles has been standard practice for years, while for others, changes to practice were made as a result of Docket 4600 and adoption of the RI Test, as shown in Table 2. The next section also specifically addresses where and why changes were made to certain costs and benefits.

Table 2. The Rhode Island Cost-Effectiveness Tests

Level of Impact	Cost or Benefit	TRC Test (former)	RI Test (current)
<b>Costs</b>			
Utility System	Utility Administration Cost	✓	✓
	Utility Measure Cost	✓	✓
	Utility Shareholder Incentive	✓	✓
	Increased Transmission Cost*	N/A for EE	N/A for EE
	Increased Distribution Cost*	N/A for EE	N/A for EE
Customer	Participant Measure Cost	✓	✓
	Participant Non-Energy Cost	✓	✓
Societal	Third-Party Developer Cost*	N/A for EE	N/A for EE
	(Societal costs included in net societal benefits)		✓
<b>Benefits</b>			
Utility System	Reduced Energy Costs	✓	✓
	Reduced Generation Capacity Costs	✓	✓
	Reduced Transmission Costs	✓	✓
	Reduced Distribution Costs	✓	✓
	Wholesale Market Price Suppression Effect	✓	✓
	Reduced REC Cost	✓	✓
	Reduced GHG Compliance Cost	✓	✓
	Reduced Environmental Compliance Cost	✓	✓
	Reduced Risk (net)		✓
	Utility Non-Energy Benefits (net)	✓	✓
	Innovation		✓
Customer	Participant Water and Other Fuels Impact (net)	✓	✓
	Participant Non-Energy Benefits	✓	✓
	Low-Income Participant Benefits	✓	✓
	Customer Empowerment	✓	✓
Societal	Reduced GHG Emissions (net)		✓
	Reduced Environmental Impacts (net)		✓
	Economic Development and Jobs (net)		✓
	Societal Low-Income Benefits (net)		✓
	Public Health Benefits (net)		✓
	Energy Security Benefits (net)		✓

\*These costs apply to distributed generation and EVs

## 4. RI TEST ALIGNMENT WITH NSPM PRINCIPLES

This section provides a brief discussion of whether and how well the Rhode Island EE cost-effectiveness practices align with the guiding principles of the NSPM. It addresses each principle in turn, and describes where and how Rhode Island's past cost-effectiveness testing practice was already aligned with NSPM principles in some ways, and where it became further/fully aligned with the principles as a result of the Docket 4600 process. For any state applying the NSPM principles to cross-check its current practice, the extent of alignment with the principles will likely vary.

### Principle #1: Efficiency as a Resource

For many years Rhode Island has recognized that EE is one of many resources that can be deployed to meet customer needs, and therefore should be compared with other energy resources in a consistent and comprehensive manner. The RI System Reliability and Least-Cost Procurement statute enables the Commission to approve and provide funding for "all energy efficiency measures that are cost-effective and lower cost than acquisition of additional supply."<sup>14</sup> This is an explicit articulation that EE should be considered a resource for cost-effectiveness purposes.

Also, in approving the new RI Test, the Commission was clear that it should be used to evaluate a broad range of resources and programs funded by the Company.<sup>15</sup> This is further recognition that EE is a resource that should be compared consistently and comprehensively with other resources.

### Principle #2: Articulate Applicable Policy Goals

During this recent period of reviewing the Rhode Island cost-effectiveness practices, the RI Office of Energy Resources assessed and documented the state statutes and policies that are applicable to EE and other resources. Table 3 presents an abbreviated summary of that assessment.<sup>16</sup> OER explicitly acknowledged that RI should account for these diverse energy policy goals in future cost-effectiveness practices.

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<sup>14</sup> R.I. Gen. Laws § 39-1-27.7(c)(5) System Reliability and Least-Cost Procurement.

<sup>15</sup> Rhode Island Public Utilities Commission, *Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System*, Report and Order, Docket 4600, July 31, 2017, page 8, page 27.

<sup>16</sup> Rhode Island Office of Energy Resources, *Overview of Rhode Island Cost-Effectiveness Practice*, Danny Musher, Presentation at the NEEP EM&V Forum Summer Workshop, June 15, 2017, slide 4.

Table 3. Relevant Rhode Island Statutes and Policy Goals

	Reliability / Resilience	Economic Development	Job Creation	Price Stability / Cost Reduction	Environmental Quality	Air Quality / Health Risks	GHG Reduction	Fuel Diversity
RI Utility Restructuring Act (1996)		✓		✓	✓	✓		✓
Renewable Energy Standard (2004)			✓	✓	✓			
Least-Cost Procurement (2006)	✓	✓	✓		✓	✓	✓	
Net Metering (2011)	✓	✓		✓	✓		✓	✓
Renewable Energy Growth Program (2014)	✓	✓		✓	✓		✓	✓
Affordable Clean Energy Security Act (2014)	✓		✓	✓	✓		✓	
Resilient Rhode Island Act (2014)	✓						✓	
Energy 2035: Rhode Island State Energy Plan (2015)	✓	✓	✓	✓	✓	✓	✓	✓

In addition, the LCP Standards clearly recognize the importance of accounting for state energy policy goals in cost-effectiveness practices. The Standards currently provide that the state's EE benefit-cost test should build upon the Total Resource Cost Test, and should "more fully reflect the policy objectives of the State with regard to energy, its costs, benefits, and environmental and societal impacts."<sup>17</sup>

### Principle #3: Account for all Relevant Impacts

Rhode Island has a long history of accounting for a wide range of impacts in the cost-effectiveness practices, including some that are hard to quantify or monetize. As indicated in Table 2, the former RI TRC Test includes most of the key utility system impacts, and the current RI Test includes them all, recognizing that EE reduces risk and spurs innovation.<sup>18</sup> While there currently are no values for risk and innovation, the Commission has directed the Division to propose methodologies for determining such values.

The former TRC test used by Rhode Island and the new RI Test include a broad range of utility and participant non-energy impacts, which tend to be difficult to quantify or monetize. Table 4 presents a summary of the utility and participant non-energy impacts currently in use in Rhode Island for the Company's residential and low-income buildings programs.

<sup>17</sup> Rhode Island Public Utilities Commission, *Least-Cost Procurement Standards*, June 2017.

<sup>18</sup> Efficiency resources can reduce utility system risk by creating a more diverse portfolio of resources, reducing uncertainty in load forecasts, reducing fuel price volatility and risk, and providing optionality. See also, National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Spring, 2017, page 53.

Table 4. Non-Energy Impacts Used in Rhode Island Cost-Effectiveness Analyses – Residential Sector

NEI	Description	Low-Income	Home Retrofit	New Constrn.
Thermal Comfort	Greater participant-perceived comfort in home	✓	✓	✓
Noise Reduction	Less participant-perceived noise in the home	✓	✓	✓
Property Value Increase	Increased value of property and expected ease of selling home	✓	✓	✓
Home Durability	Increased home durability in terms of maintenance requirements because of better quality heating, cooling and structural materials	✓	✓	
Equipment Maintenance	Reduced maintenance costs of owning newer and/or more efficient appliance equipment	✓	✓	
Health Benefits	Fewer colds and viruses, improved indoor air quality and ease of maintaining healthy relative humidity as a result of weatherization in home	✓	✓	
Rental Units Marketability	Financial savings to owners of LI rental housing as a result of increased marketability of the more efficient housing.	✓		
Property Durability	Financial savings to owners of LI rental housing as a result of more durable and efficient materials being installed.	✓		
Reduced Tenant Complaints	Savings to owners of LI rental housing in terms of staff time and materials as a result of fewer tenant complaints with the more efficient measures.	✓		
Rental Unit Increased Property Value	Owner-perceived increased property value due to more energy efficient measures	✓		
Arrearages	Reduced arrearage carrying costs as a result of customers being more able to pay their lower bills	✓		
Bad Debt Write-offs	Reduced costs to utility of uncollectable, unpaid balances as a result of customers being more able to pay their lower bills	✓		
Terminations and Reconnections	Reduced costs associated with terminations and reconnections to utility due to nonpayment as a result of customers being more able to pay their lower bills	✓		
Customer Calls and Collections	Utility savings in staff time and materials for fewer customer calls as a result of more timely bill payments	✓		
Notices	Financial savings to utility as a result of fewer notices sent to customers for late payments and terminations	✓		
Safety-Related Emergency Calls	Financial savings to the utility as a result of fewer safety related emergency calls being made	✓		

In approving the new RI Test, the Commission directed the Division to prepare a report proposing methodologies that can be used to quantify and monetize the recently-added costs and benefits.<sup>19</sup> The Commission also clarified that qualitative considerations could be used when making final determinations on the cost-effectiveness of efficiency resources.<sup>20</sup> The Commission noted that the RI Test “should not be the exclusive measure of whether a specific proposal should be approved,” and that the RI Test “should serve as a starting point in making a business case for a proposal.”<sup>21</sup> The Commission noted further that

<sup>19</sup> Rhode Island Public Utilities Commission, *Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System*, Report and Order, Docket 4600, July 31, 2017, page 27.

<sup>20</sup> Rhode Island Public Utilities Commission, *Guidance Document: Goals, Principles, and Values for Matters Involving the Narragansett Electric Company d/b/a National Grid*, October 2017. Available at [www.ripuc.ri.gov/eventsactions/docket/4600A-GuidanceDocument-Final\\_Redline.pdf](http://www.ripuc.ri.gov/eventsactions/docket/4600A-GuidanceDocument-Final_Redline.pdf)

<sup>21</sup> Rhode Island Public Utilities Commission, *Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System*, Report and Order, Docket 4600, July 31, 2017, page 23.



outside factors many need to be considered, including “statutory mandates or qualitative considerations.”<sup>22</sup>

#### **Principle #4: Ensure Symmetry**

The Rhode Island cost-effectiveness practices have largely been aligned with the principle of symmetry, particularly with respect to participant impacts. This principle requires that if certain categories of costs are included in the analysis (e.g., participant costs), then the benefits associated with those categories should be included as well.

For states that use the TRC Test, which includes participant costs, it can be particularly challenging to account for all participant benefits, especially non-energy benefits. The majority of states that use the TRC test account for participant costs but not participant benefits, resulting in an asymmetrical test.<sup>23</sup> Rhode Island is one of the few states that includes a comprehensive set of participant non-energy impacts, as described in the previous section, thereby ensuring symmetry across participant benefits and costs.

#### **Principle #5: Use Forward-Looking Analysis**

The Rhode Island cost-effectiveness analyses have always been forward-looking, incremental, and long-term. The study period for the cost-effectiveness is twenty years, essentially reflecting the full life of efficiency measures. And the avoided costs from the AESC study are specifically developed to reflect incremental effects, relative to what would occur in the absence of the efficiency programs.

To further assess cost-effectiveness of EE proposals, the EERMC and Commission reviewed a bill impact analysis prepared by National Grid. This bill impact analysis is not the same as a Rate Impact Measure (RIM), because the bill impact analysis is consistent with the principle of using forward-looking analyses, whereas the RIM is not.<sup>24</sup> These bill impact analyses consider the long-term impacts on rates, both the potential increase in rates due to the recovery of lost revenues, and the decrease in rates due to avoided costs. These analyses generally find that (a) the long-term rate impacts of the efficiency programs are very small; (b) customers who participate in EE programs experience bill reductions, despite the small increase in rates; and (c) the vast majority of customers participate in the efficiency programs at one time or another.<sup>25</sup> Taken together, these three findings demonstrate that any rate impacts of the efficiency

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<sup>22</sup> Rhode Island Public Utilities Commission, *Investigation into the Changing Electric Distribution System and the Modernization of Rates in Light of the Changing Distribution System*, Report and Order, Docket 4600, July 31, 2017, page 23.

<sup>23</sup> ACEEE, 2012. “A National Survey of State Policies and Practices for the Evaluation of Ratepayer-Funded Energy Efficiency Programs.” U122. M. Kushler et al. <http://aceee.org/research-report/u122>

<sup>24</sup> The forward-looking aspect of this principle requires that the Rate Impact Measure (RIM) Test is not used for determining EE cost-effectiveness. The key difference between the RIM Test and the other tests is that the RIM Test includes the lost revenues from efficiency programs as a cost of the program. These lost revenues do not represent a new, forward-looking cost created by the EE resources. Instead, they represent the revenues that need to be collected by the utility to recover the existing fixed costs on the system. These fixed costs have been incurred in the past, and thus are “sunk” costs. According to economic theory, sunk costs should not be included when determining the cost-effectiveness of future investments. See also, National Efficiency Screening Project, *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Spring, 2017, Appendix C.

<sup>25</sup> See e.g., National Grid, *2017 Energy Efficiency Plan*, Attachment 7, Bill Impact Analysis, October 2016. Available at: <http://www.ripuc.org/eventsactions/docket/4654page.html>.

programs are not significant enough to raise equity concerns, particularly in light of the large amount of benefits derived from the programs.<sup>26</sup>

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

The Rhode Island cost-effectiveness practices are very transparent. This is the result of many factors - especially the EE filing requirements, and the stakeholder involvement in the entire EE planning and assessment process.

Each year National Grid files with the Commission an Annual Report, as well as quarterly updates, which provide detail on historic performance of the EE programs, including cost-effectiveness performance.<sup>27</sup> The Company also files with the Commission, for approval, a one-year and a three-year Energy Efficiency Plan, with detail on forecasted future performance of the EE programs, including cost-effectiveness performance.<sup>28</sup> In addition, the EE cost and performance parameters are documented in detail in the Rhode Island Technical Reference Manual,<sup>29</sup> and the avoided costs are documented in detail in the New England AESC Study.

The efficiency planning process in Rhode Island includes several layers of stakeholder input, which helps to provide transparency and open discussion of many aspects of efficiency program design and implementation, including cost-effectiveness. The EERMC has a formal process for reviewing EE program issues, including a statutory requirement to conduct an independent assessment of the cost-effectiveness of National Grid's efficiency programs.<sup>30</sup> The Rhode Island DSM Collaborative meets with the Company on a regular basis to discuss a variety of issues, including cost-effectiveness issues. And the Commission holds hearings and technical sessions to review the efficiency programs and plans, and to ensure that they are cost-effective.

## **Summary**

Rhode Island EE cost-effectiveness practices are currently well aligned with all of the NSPM guiding principles, especially as a result of the recent update to its practices. Table 5 presents a summary of how the practices are aligned with each of the principles.

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<sup>26</sup> *National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources*, Spring, 2017, Appendix C.

<sup>27</sup> See e.g., National Grid, *2016 Year-End Report*, May 2017 at: <http://www.ripuc.org/eventsactions/docket/4580page.html>.

<sup>28</sup> See e.g., National Grid, *2017 Energy Efficiency Plan* at: <http://www.ripuc.org/eventsactions/docket/4654page.html>.

<sup>29</sup> See, for example: National Grid, *Rhode Island Technical Reference Manual for Estimating Savings from Energy Efficiency Measures*, 2016 Program Year, October 2016. Available at: <http://www.ripuc.org/eventsactions/docket/4654page.html>.

<sup>30</sup> See, for example: Rhode Island Energy Efficiency and Resource Management Council, *Cost-Effectiveness Report: National Grid's 2018-2020 Energy Efficiency and System Reliability Procurement Plan*, prepared by Vermont Energy Investment Corp and Optimal Energy, submitted to the Rhode Island Public Utilities Commission, September 2017. Available at: <http://www.ripuc.org/eventsactions/docket/4654page.html>.

Table 5. Rhode Island EE Practices Relative to the NSPM Guiding Principles

<b>Efficiency as a Resource</b>	Aligned. RI statute requires that the utility implement all energy efficiency resources that are cost-effectiveness and less expensive than supply.
<b>Policy Goals</b>	Aligned. The Office of Energy Resources prepared a table outlining all the relevant state policy goals.
<b>All Relevant Impacts</b>	Aligned. Recent Working Group process led to inclusion of additional impacts reflecting state policy goals.
<b>Symmetry</b>	Aligned. The the former TRC Test and the current RI Test include comprehensive NEBs
<b>Forward-Looking Analysis</b>	Aligned. RI applies a rate, bill, and participant impact analysis to investigate the equity issues of energy efficiency plans.
<b>Transparency</b>	Aligned. The utility prepares Annual Reports, Annual Plans, and Three-Year Plans detailing the cost-effectiveness results.

## 5. 2018 DEVELOPMENTS

Since Rhode Island’s Public Utilities Commission July 31, 2017 Order to adopt a new cost-effectiveness testing framework and RI Test, a supplemental draft report was developed by the Division of Public Utilities and Carriers in response to the Commission’s request that the Division undertake a series of ongoing refinements to the Framework. This draft report, titled *“The Rhode Island Cost-Effectiveness Framework: Methodologies for Developing Inputs for Distributed Energy Resources”* (October 29, 2018)<sup>31</sup> provides guidance to support the implementation of the RI Test. It offers a set of recommendations to help the Commission, National Grid (the utility), and other stakeholders apply the new cost-effectiveness framework by providing clarity, consistency, transparency in the assumptions, sources and methodologies used to evaluate future utility investments. Specifically, among a range of things, the report:

- clarifies which impacts represent costs versus benefits;
- consolidates several areas of overlapping impacts;
- recommends sources and methodologies for developing inputs for energy efficiency as well as other DERs;
- recommends a set of proxy values that can be used to account for certain hard-to-quantify inputs; and
- identifies inputs that require additional analysis before they can be used in the framework.

A final version of the Division of Public Utilities & Carriers report to the Commission will be posted to the NESF website when available.

<sup>31</sup> *The Rhode Island Cost-Effectiveness Framework: Methodologies for Developing Inputs for Distributed Energy Resources* (October 29, 2018). See [http://www.ripuc.org/eventsactions/docket/4600A-DIV-DraftRept-FrameworkMethodology\(10-3-18\).pdf](http://www.ripuc.org/eventsactions/docket/4600A-DIV-DraftRept-FrameworkMethodology(10-3-18).pdf)

## **Attachment B**

### **Identification of Puerto Rico Policies for PR Test**

The first step in creating a jurisdiction-specific cost-effectiveness test is to articulate the key Puerto Rico policy goals relevant to demand response and energy efficiency.

Policy goals can be articulated in many ways, including but not limited to legislation; executive orders; regulations; Energy Bureau guidelines, standards, or orders; integrated resource planning principles and policies; and requirements of other governing agencies within a jurisdiction.

Please fill out the below template and submit to the Energy Bureau by June \*, 2021.

#### **Instructions**

Column A: List the name and source/citation for the policy goal that pertains to EE and/or DR.

Column B: Provide a summary of the primary goal of the policy.

Column C: List the key goals or principles of the policy. Examples include least cost, affordable, reliable, equitable, increasing energy efficiency, and reduction in greenhouse gas emissions.

Column D: List potential impacts from EE and DR that pertain to the main policy goals or principles in Column C. For example, utility system impacts such as energy, capacity, and reliability, environmental impacts, emissions, public health impacts, and/or economic development.



