



Costs, Benefits and Non-Considerations: How Midwest States Are Measuring Energy Efficiency

MEEA Policy Webinar
Tuesday, December 17, 2019



Agenda



Alaina Boyle

Introduction to DSESP



Greg Ehrendreich

Review of Midwest Cost-Effectiveness Impacts



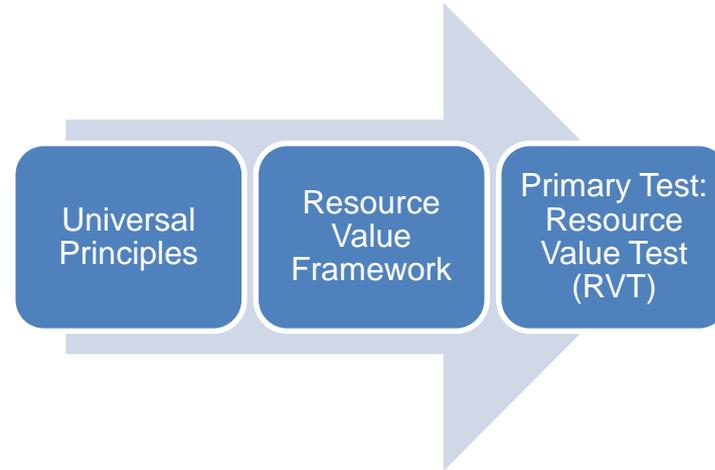
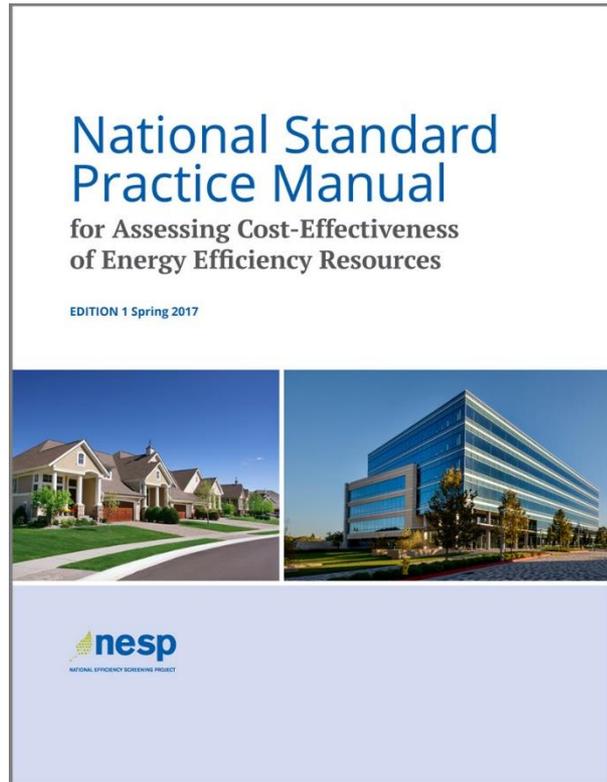
The National Efficiency Screening Project (NESP)

<https://nationalefficiencyscreening.org/>

What is the NESP?

- To improve cost-effectiveness screening practices for distributed energy resources by developing guidance documents, sharing information on current policies and practices, and providing technical support to states
- Coordinated by E4TheFuture, NESP is a stakeholder organization with guidance from an expert Advisory Group
- NESP's efforts includes:
 - the National Standard Practice Manual for EE (2017),
 - the Database of State Efficiency Screening Practices (2018), and
 - the forthcoming National Standard Practice Manual for Distributed Energy Resources (2020)

NSPM for EE (May 2017)



- Align with applicable state policies
- Treat costs & benefits symmetrically
- Account for relevant impacts (even if hard to quantify)
- A state's test may align with a traditional test.... or not

NSPM for DERs

(Edition 2 – forthcoming Summer 2020)

- Growing interest in range of DERs as grid resources and for distribution planning → regulators need further guidance to support BCA considerations and common framework for DER analyses
- States currently are using different techniques, methodologies, and assumptions for DER BCA, leading to inconsistency even within states
- NSPM for DERs will generally apply principles from the NSPM for EE guidance to DERs to support consistent and economically sound BCA policies and practices
- E4TheFuture is project coordinator and funder. Other funding sources being leveraged to support project
- Project Schedule:



- For more info, see NESP site: <https://nationalefficiencyscreening.org/wp-content/uploads/2019/06/NSPM-for-DERs.pdf>

DSESP Scope

- The DSESP is fully populated with sources for every datapoint
 - All 50 states, Washington, D.C., and Puerto Rico
 - Regularly updated and maintained
- For all jurisdictions, the DSESP includes:
 - Cost-effectiveness tests used
 - Key planning parameters; e.g., discount rate, study period
 - Utility and non-utility system impacts accounted for
 - NSPM terminology alignment (e.g., utility system impact names and categories)
- DSESP features can be easily sorted by state, test, planning parameter, etc. Includes interactive maps and chart visualizations.

Summary of State Data



Summary of State Data

Summary of key information for each state

NOTE: State names shaded yellow have used the National Standard Practice Manual (NSPM) framework to develop their primary test or review current practices. Most states currently rely on the traditional tests set forth in the California Standard Practice Manual (CoSPM), but deviate from the theoretical definition of the CoSPM tests. The NSPM aims to address limitations of the traditional tests. The DSESP will be updated periodically to reflect where states are applying the NSPM (e.g., using a State-Specific test).

Cost-Effectiveness Metric		Alabama	Alaska	Arizona	Arkansas	California	Colorado	Connecticut	Delaware	District of Columbia	Florida	Georgia	Hawaii	Idaho
Cost-Effectiveness Test & Application	Primary Test	na	na	SCT	TRC	TRC, UCT	TRC	UCT	TRC	SCT	RIM	TRC	TRC	UCT
	Secondary Test	na	na	na	UCT, PCT, RIM	na	UCT, PCT, SCT, RIM	Modified UCT, TRC	Rate and bill impacts	None	TRC, PCT	UCT, PCT, SCT, RIM	na	TRC, PCT
	Primary Assessment Level	na	na	Portfolio	Program	Portfolio	Program	Measure	na	None	na	Portfolio, Measure	Portfolio	Program
	Additional Assessment Level(s)	na	na	Program, Measure	Portfolio, Measure	Program	Measure	na	None	None	na	Portfolio, Measure	Portfolio	Program
	Discount Rate	na	na	Uncertain (Value unavailable)	WACC (4.3% real)	WACC (7.7% nominal)	WACC (7.88% nominal)	WACC (5.5% nominal)	Low-Risk (4% real)	Low-Risk (4.34% real)	WACC (7.54% nominal)	WACC (Unavailable)	Uncertain (6% nominal)	WACC (6.74%)
	Analysis period	na	na	Measure Life	Measure Life	Measure Life	Measure Life	Model limitations	Measure Life	Measure Life	Measure Life	Measure Life	Measure Life	Measure Life
Impacts Included in the Primary Test														
Utility System Costs	Measure Costs: Utility	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Other Financial or Technical Support Costs	No	No	Potentially	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
	Program Administration Costs	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Evaluation, Measurement, & Verification	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
	Shareholder Incentive Costs	No	No	No	Yes	Yes	No	Yes	Yes	No	No	No	No	No
Utility System Benefits	Energy Costs	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Capacity Costs	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	T&D Costs	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Environmental Compliance	No	No	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes
	Price Suppression	No	No	No	No	No	No	Yes	Yes	Yes	No	No	No	No
	Line Loss Costs	No	No	Potentially	Yes	Potentially	No	Yes	No	Yes	Yes	Yes	Yes	Yes
	Reduced Risk	No	No	No	No	No	No	No	No	Yes	No	No	No	No
	Ancillary Services	No	No	No	No	Yes	No	No	No	No	No	No	No	No
	RPS Compliance	No	No	No	No	Yes	No	No	Yes	No	No	No	No	No
	Avoided Credit and Collection Costs	No	No	No	No	No	No	No	Yes	No	No	No	No	No

View a Single State



State-Specific Information

All data, sources, and notes for the state selected by the user. By adjusting the state in the drop-down, the user can summarize state-specific information.

Pick a state -> **MN** [Click to size data](#)

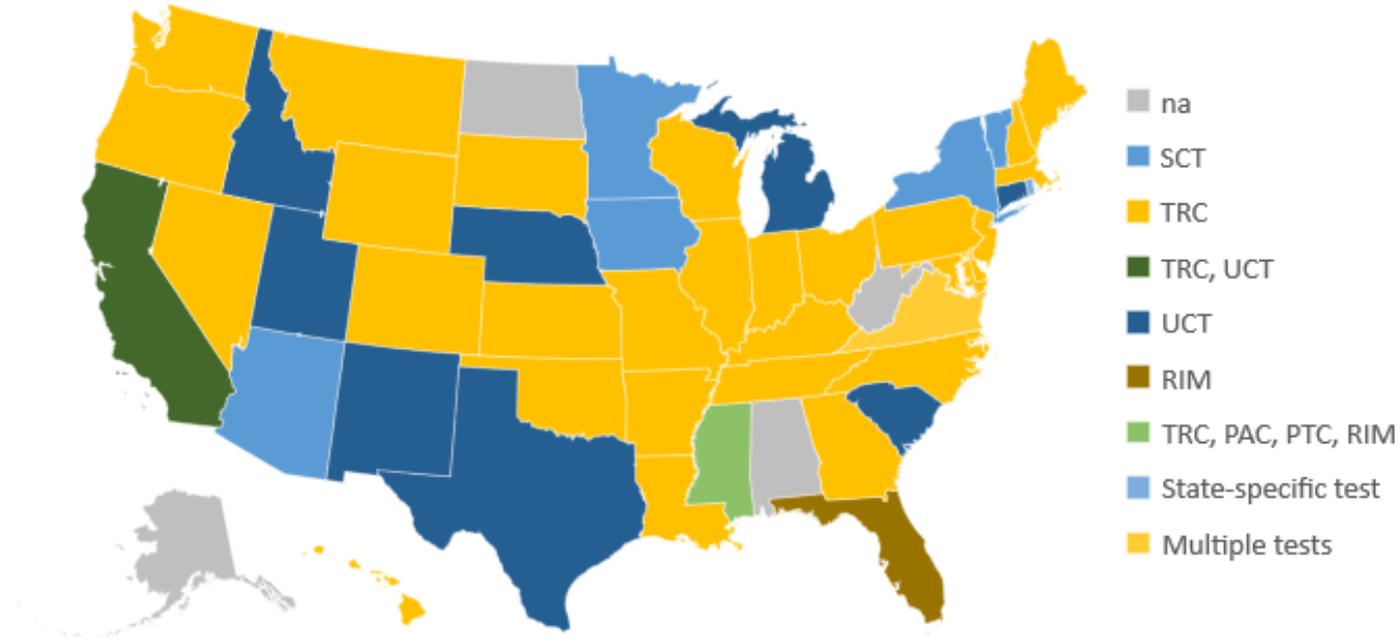
Minnesota		Notes
Screening revisions in progress	Yes	MN Department of Commerce's MN Framework Study applied RVF to develop a primary CE test. Recommendations are currently under review. See https://nationalefficiencyscreening.org/wp-content/uploads/2018/09/Synapse-MN-NSPM-09-10-18.pdf and see case study https://nationalefficiencyscreening.org/wp-content/uploads/2018/12/Minnesota_NSMP_Case-Study-12-7-18.pdf .
Using NSPM Framework	Yes	
Date last Updated	Sept 2018	
Primary Test	SCT	All PA 2017-2019 CIP Triennial Plans available at: https://www.mncee.org/policy/minnesota-energy-dockets/
Secondary Tests	UCT, PCT, RIM	0
Primary Assessment Level	Segment	
Other Assessment Levels	Project	
Discount Rate	Low-Risk Value 2.55% real	Xcel: 2.55% real. All PA 2017-2019 CIP Triennial Plans available at: https://www.mncee.org/policy/minnesota-energy-dockets/
Analysis period	Measure Life	

Policy Source	Value Source
MN Rules 7690.1200 C. https://www.revisor.mn.gov/rules/?id=7690.1200	Xcel: 2017-2019 Triennial Plan. Page 93. https://drive.google.com/file/d/1ktVr9r4A6-iU91toET12X8AeZTm6Lv9/view?usp=sharing
MN Rules 7690.1200 C. https://www.revisor.mn.gov/rules/?id=7690.1200	Xcel: 2017-2019 Triennial Plan. Page 93. https://drive.google.com/file/d/1ktVr9r4A6-iU91toET12X8AeZTm6Lv9/view?usp=sharing
DER Decision, 2012, "In the Matter of the Implementation of Northern States Power Company, a Minnesota Corporation's 2013/2014/2015 Triennial Natural Gas and Electric Conservation Improvement Program (Petition)". Page 10. https://www.edockets.state.mn.us/Efiling/edockets/searchDocuments.do?method=showPop&documentId=%7BD700B853-5F13-4687-8DDE-7A974806A5C3%7D&documentTitle=201210-79121-01	
DER Decision, 2012, "In the Matter of the Implementation of Northern States Power Company, a Minnesota Corporation's 2013/2014/2015 Triennial Natural Gas and Electric Conservation Improvement Program (Petition)." Page 9. https://www.edockets.state.mn.us/Efiling/edockets/searchDocuments.do?method=showPop&documentId=%7BD700B853-5F13-4687-8DDE-7A974806A5C3%7D&documentTitle=201210-79121-01	
Office of the Legislative Auditor, Energy Conservation Improvement Program Evaluation. 2003. oae25 https://www.leg.state.mn.us/archive/leg/minutes/database/84-s-1289-0-20050131-a.pdf	Xcel: 2017-2019 Triennial Plan. Page 79. https://drive.google.com/file/d/1ktVr9r4A6-iU91toET12X8AeZTm6Lv9/view?usp=sharing
State of Minnesota Technical Reference Manual for Energy Conservation Improvement Programs	State of Minnesota Technical Reference Manual for Energy Conservation Improvement Programs, values throughout

Cost-Effectiveness Test & Application

Graphic Presentation: which test is used?

State Primary Cost-effectiveness Test



Database of State Efficiency Screening Practices (DSESP)

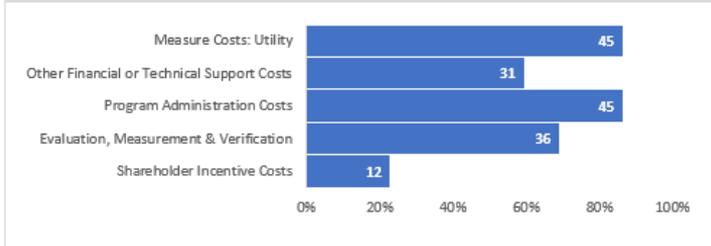
Interactive Charts: which impacts are included?

Impacts Summary

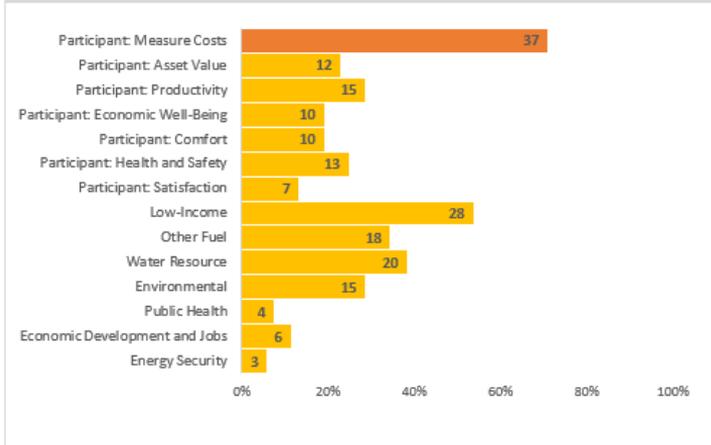
Summary of which states include each non-utility and utility system impacts.

Pick a test - All tests 52 States using selected test

Utility System Costs

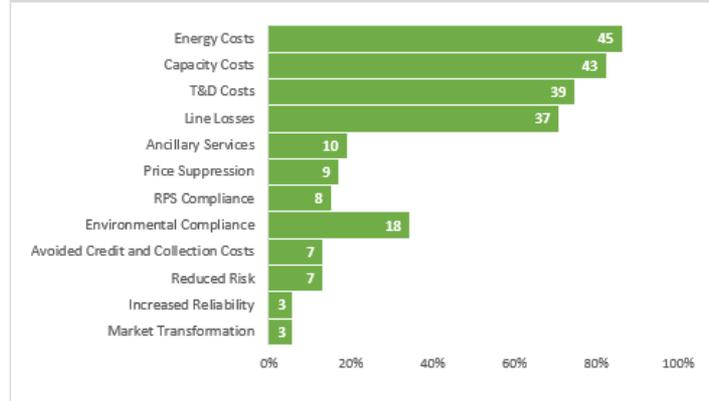


Non-Utility System Impacts



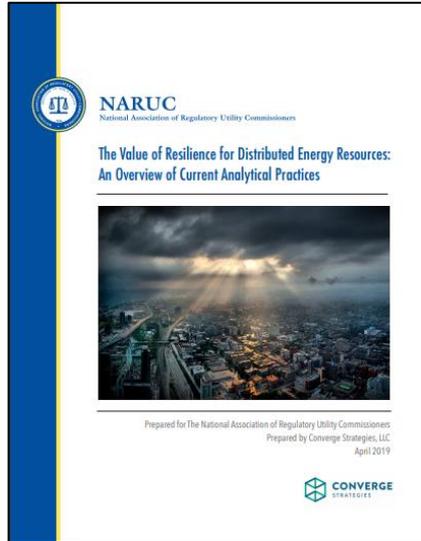
Note: includes states that use proxies, which primarily apply to participant impacts, and may not specify specific impacts.

Utility System Benefits



DSESP Guidance Documents

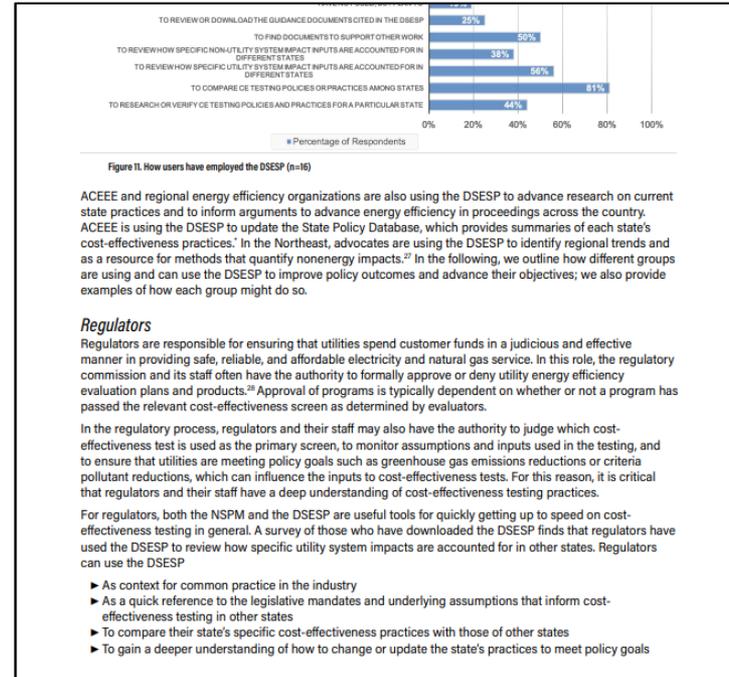
- Documents currently in the DSESP
 - New documents added with quarterly updates (e.g., NARUC's new document reviewing methods for analyzing the resilience value of DER)



Cost-Effectiveness Testing, General Guidance National Standard Practice Manual for Assessing Cost-Effectiveness of Energy Efficiency Resources (National Efficiency Screening Project, May 2017). NSPM Case Studies – State examples of NSPM application
Energy Efficiency and System Impacts Keeping the Lights On: Energy Efficiency and Electric System Reliability (ACEEE, October 2018) Everyone Benefits: Practices and Recommendations for Utility System Benefits of Energy Efficiency. (ACEEE, 2015) Valuing the Contribution of Energy Efficiency to Avoided Marginal Line Losses and Reserve Requirements (RAP, August 2011)
Energy Efficiency and Health & Environmental Impacts Public Health Benefits from Energy Efficiency and Renewable Energy (EPA, 2019) Cost-Effectiveness Tests: Overview of State Approaches to Account for Health and Environmental Benefits of Energy Efficiency (ACEEE, 2018) Avoided Emissions and Generation Tool (AVERIT) (EPA, 2018 Update) CO-Benefit Risk Assessment (COBRA) Health Impact Screening and Mapping Tool (EPA, 2018 Update) Environmental Benefit Mapping and Analysis Program - Community Edition (BenMAP-CE) (EPA, 2018 Update) Saving Energy, Saving Lives: The Health Impacts of Avoiding Power Plant Pollution with Energy Efficiency (ACEEE, February 2018) Analysis of the Public Health Impacts of the Regional Greenhouse Gas Initiative (Abt Associates, January 2017) Occupant Health Benefits of Residential Energy Efficiency (E4TheFuture, December 2016) Home Pro: The Health Benefits of Home Performance (US DOE, December 2016) State and Utility Pollution Reduction Calculator Version 2 (SUPR2) (ACEEE, January 2016)
Energy Efficiency and Multiple Benefits ACEEE State Policy Toolkit: Guidance on Measuring the Economic Development Benefits of Energy Efficiency (ACEEE, March 2019) Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy (US EPA, July 2018) Non-energy Benefits in State Cost-Effectiveness Tests – Reducing Bias in Consideration of Energy Efficiency as a Resource (Skumatz, August 2018) Assessing the Cost Effectiveness of Energy Efficiency Portfolios (LBNL, June 2017) Non-energy Impact Approaches and Values: An Examination of the Northeast, Mid-Atlantic, and Beyond (NEEP, June 2017) Evaluating and Quantifying the Non-Energy Impacts of Energy Efficiency (LBNL Webinar, December 2016) Recognizing the Value of Energy Efficiency's Multiple Benefits (ACEEE, 2015) Recognizing the Full Value of Energy Efficiency (Regulatory Assistance Project, September 2012) Energy Efficiency Cost-Effectiveness Screening How to Properly Account for 'Other Program Impacts' and Environmental Compliance Costs (Regulatory Assistance Project, November 2012)

ACEEE DSESP Topic Brief

- Used user response data from the March 2019 Survey
- Reviews the data in the DSESP including reliability and environmental benefits and which states are using the NSPM
 - Illustrated with DSESP Maps tab
- Suggests how stakeholders are using and could apply the DSESP to improve CE policy



Keep up with the NESP

Stay informed with the *NSPM Quarterly* Newsletter:

<https://nationalefficiencyscreening.org/national-standard-practice-manual/news/>

See NSPM Applications and References to date:

<https://nationalefficiencyscreening.org/state-references/>

For more information about NESP and NSPM:

<http://www.nationalefficiencyscreening.org/>

For additional questions, email:

NSPM@nationalefficiencyscreening.org

The Midwest's Tests

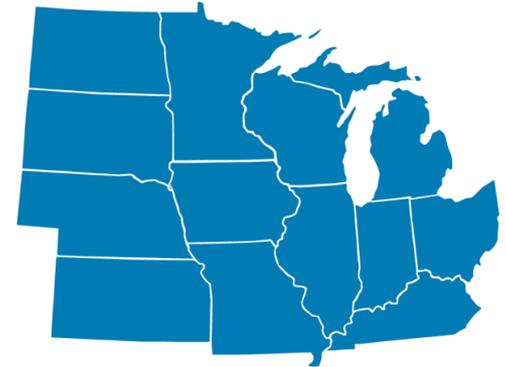
Utility Impacts and the Rest

About MEEA

The Trusted Source on Energy Efficiency

We are a nonprofit membership organization with **160+ members**, including:

- Utilities
- Research institutions
- State and local governments
- Energy efficiency-related businesses

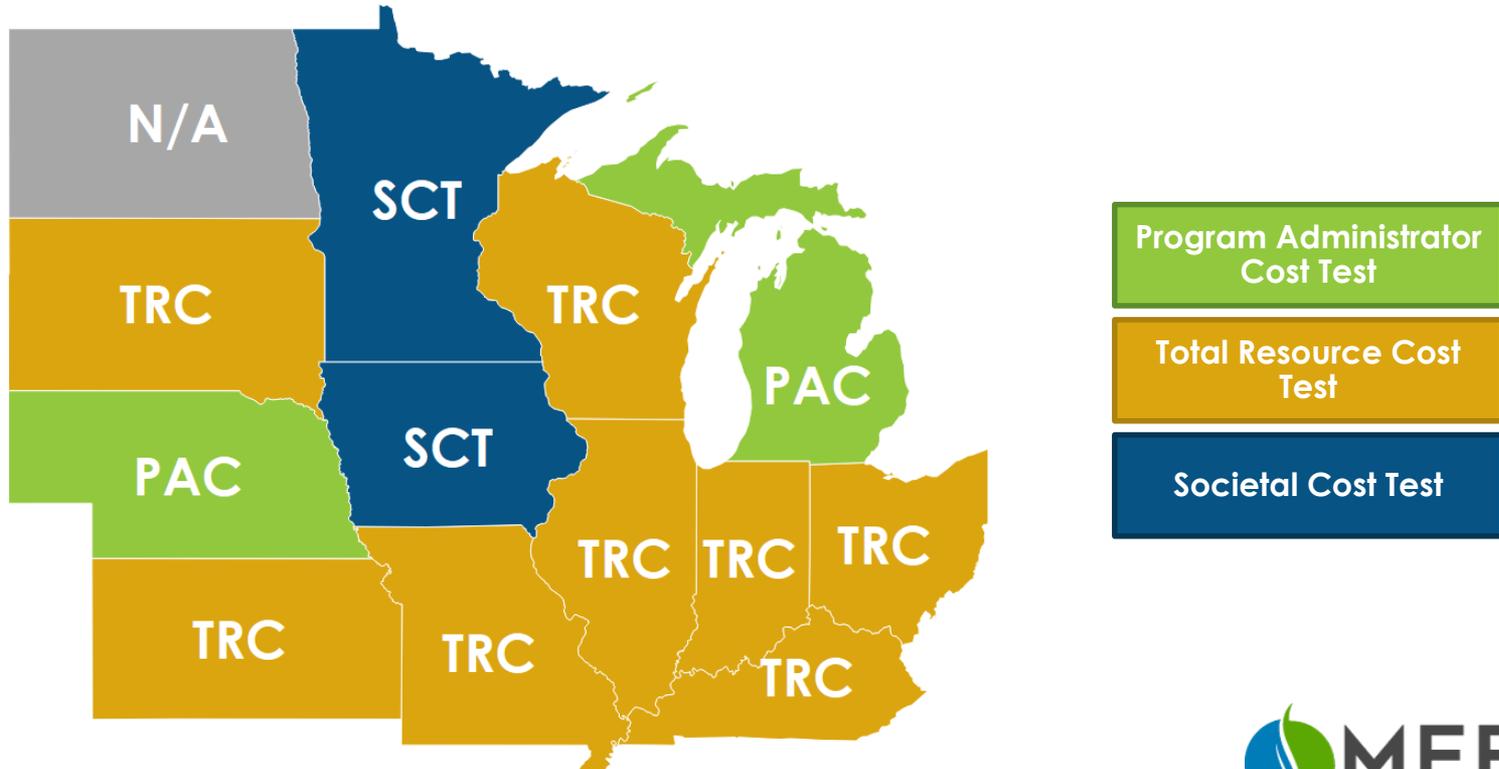


As the key resource and champion for energy efficiency in the Midwest, MEEA helps a diverse range of stakeholders understand and implement cost-effective energy efficiency strategies that provide economic and environmental benefits.



Cost-Effectiveness Tests

Primary Screening Test for EE in Midwest States



Data Source: DSEP

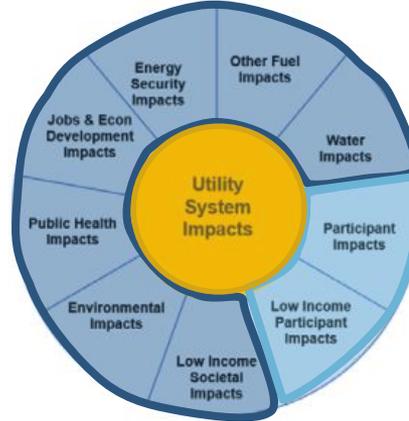
The model cost-effectiveness tests

Commonly used as primary screen for EE resources

Total Resource Cost Test



Societal Cost Test



Program Administrator Cost Test
(formerly: Utility Cost Test)



- Core of **Utility System Impacts** common to all tests
- **Participant Impacts** & **Non-Utility System Impacts** vary according to the test

Ways that impacts are included

Typical **methods for calculating impact value** for CET

Monetized $x = \$$	Proxy $x \approx Y$
$x = x_0 + a$ Adder	score < 1.0 Alternative thresholds

Cost-Effectiveness Impacts

Core **Utility System Impacts** that *could* be included

Utility portion of measure costs	Avoided ancillary services
Program administration costs	Wholesale price suppression effects
Other Financial or Technical Support Costs	Avoided credit & collection costs
EM&V costs	Avoided RPS compliance costs
Shareholder incentive costs	Avoided environmental compliance costs
Avoided marginal energy costs	Increased Reliability
Avoided generation capacity costs	Reduced Risk
Avoided T&D costs	Market Transformation
Avoided T&D line losses	

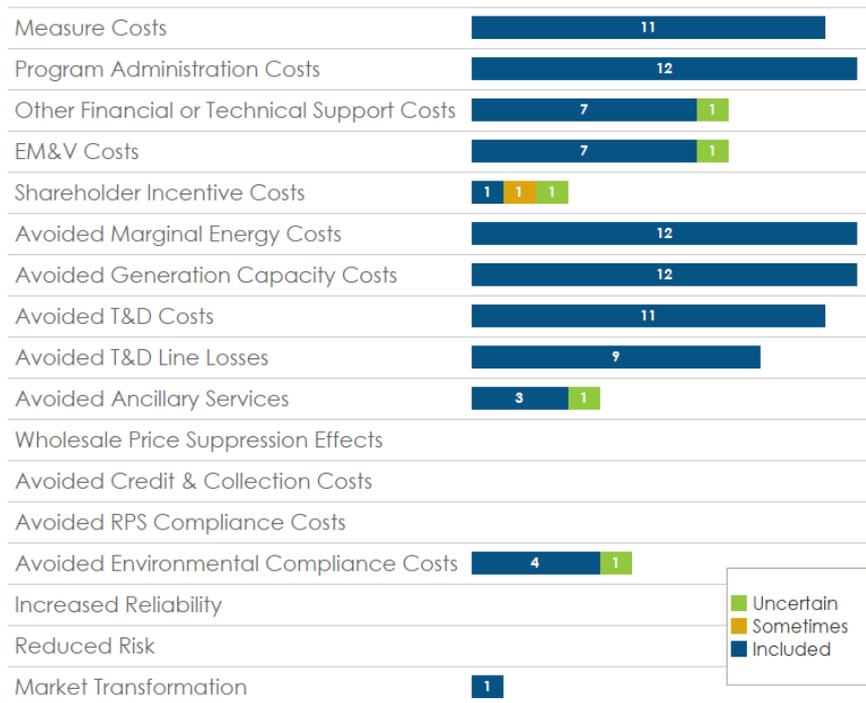
Costs

Benefits

Cost-Effectiveness Impacts

Utility System Impacts – Midwest Practices

Utility System Impacts included in Midwest states' primary cost-effectiveness tests



- A third of the impacts are included by all or most states
- Several additional impacts included by about half of the states
- Variability among states on other impacts
- A few uncertainties

Data Source: DSESP

Cost-Effectiveness Impacts

Participant impacts that *could* be included

Participant portion of measure costs

Asset value

Productivity

Economic well-being

Comfort

Health & Safety

Satisfaction

Costs

Benefits

Cost-Effectiveness Impacts

Participant Impacts – Midwest Practices

Participant Impacts included in Midwest states' primary cost-effectiveness tests

Model	States	Measure	Included	Uncertain
TRC	8 states	Measure Costs	8	0
		Asset Value	1	1
		Productivity	2	0
		Economic Well-Being	0	2
		Comfort	0	1
		Health & Safety	0	1
		Satisfaction	0	1
SCT	2 states	Measure Costs	2	0
		Asset Value	1	0
		Productivity	2	0
		Economic Well-Being	0	0
		Comfort	0	0
		Health & Safety	0	0
		Satisfaction	0	0
PAC	2 states	Measure Costs	0	0
		Asset Value	0	0
		Productivity	0	0
		Economic Well-Being	0	0
		Comfort	0	0
		Health & Safety	0	0
		Satisfaction	0	0

- TRC & SCT models include participant impacts; PAC does not include them
- Participant measure cost is included by all Midwest TRC & SCT states
- Other possible participant impacts not included by most states



Data Source: DSESP



Cost-Effectiveness Impacts

Non-Utility System Impacts that *could* be included

Low income customers

Other fuels

Water resources

Environmental impacts

Economic development & jobs

Public health

Energy security

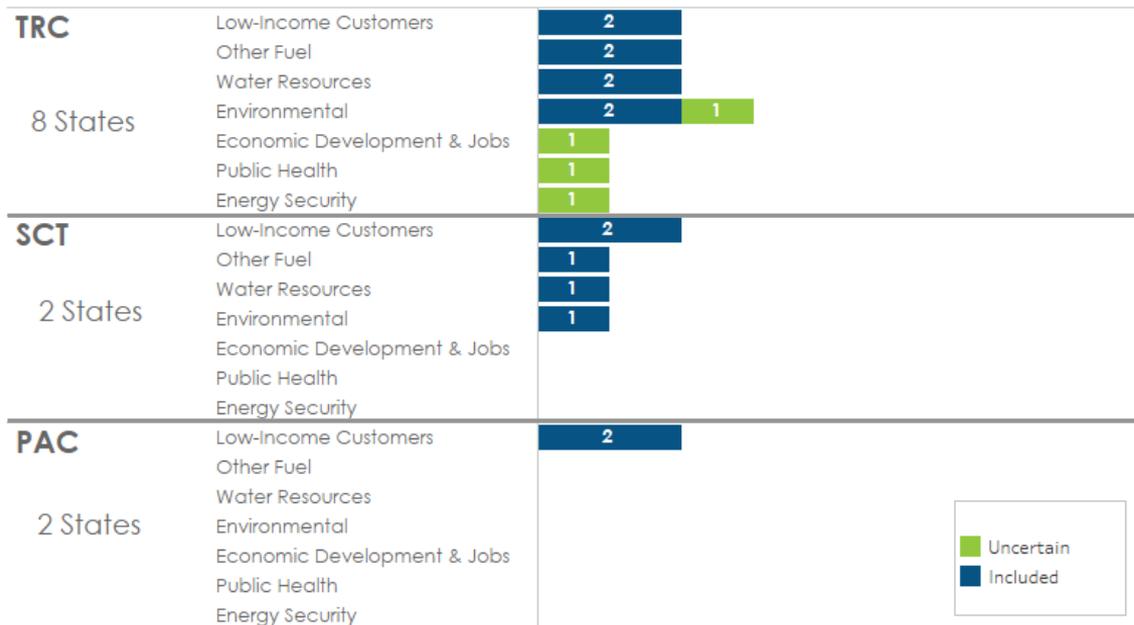
Costs

Benefits

Cost-Effectiveness Impacts

Other *non-utility system impacts* – Midwest Practices

Other Non-Utility System Impacts included in Midwest states' primary cost-effectiveness testing



- Non-utility system impacts are not widely included in Midwest CET
- Impact on low-income customers is the most often considered impact

Sometimes & Uncertain

Why aren't we sure what is in all the states' tests?

Sometimes – *Inconsistency*

- Impact included by one utility in a state but not another
- Impact included for some programs but not others (where it might also apply)

Uncertain – *Implementation or Transparency*

- Discussed/implied in policy or filing text but not directly demonstrated in testing documentation & workpapers
 - Impact potentially allowed but no evidence of being used in practice
 - Impact could be rolled up into nonitemized “other costs”
- Limited documentation of CET inputs, methodology or results – e.g. only scores or scores with nonitemized total benefits & costs
 - Or no *un-redacted* documentation (functionally the same for the public)

State Cost-Effectiveness Profiles

Iowa

Cost Effectiveness Impacts - IA Profile

Impact Category	Impact Item	Status
Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Included
	Shareholder Incentive Costs	Included
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Included
	Wholesale Price Suppression Effects	Included
	Avoided Credit & Collection Costs	Included
	Avoided RPS Compliance Costs	Included
	Avoided Environmental Compliance Costs	Included
	Increased Reliability	Included
	Reduced Risk	Included
Market Transformation	Included	
Participant Impacts	Measure Costs	Included
	Asset Value	Included
	Productivity	Included
	Economic Well-Being	Included
	Comfort	Included
	Health & Safety	Included
Other Non-Utility System Impacts	Satisfaction	Included
	Low-Income Customers	Included
	Other Fuel	Included
	Water Resources	Included
	Environmental	Included
	Economic Development & Jobs	Included
	Public Health	Included
Energy Security	Included	

■ Included
■ Sometimes
■ Uncertain

Primary Test

SCT

- Recent legislative changes include cost caps, CET changes
- Portfolios are now required to pass RIM or all-customer opt-out provisions will be triggered

Data Source: DSESP



State Cost-Effectiveness Profiles

Illinois

Cost Effectiveness Impacts - IL Profile

Impact Category	Impact Item	Status
Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Included
	Shareholder Incentive Costs	Included
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Included
	Wholesale Price Suppression Effects	Included
	Avoided Credit & Collection Costs	Included
	Avoided RPS Compliance Costs	Included
	Avoided Environmental Compliance Costs	Included
	Increased Reliability	Included
	Reduced Risk	Included
	Market Transformation	Included
Participant Impacts	Measure Costs	Included
	Asset Value	Included
	Productivity	Included
	Economic Well-Being	Included
	Comfort	Included
	Health & Safety	Included
Other Non-Utility System Impacts	Satisfaction	Included
	Low-Income Customers	Included
	Other Fuel	Included
	Water Resources	Included
	Environmental	Included
	Economic Development & Jobs	Included
	Public Health	Included
Energy Security	Included	

■ Included
■ Sometimes
■ Uncertain

Primary Test
TRC

- Ongoing research on additional monetizable impacts – Health & Safety, Public Health, Economic Development
- IL Stakeholder Advisory Group (IL SAG) responsible for modifying TRM to include impacts

Data Source: DSESP



State Cost-Effectiveness Profiles

Indiana

Cost Effectiveness Impacts - IN Profile

Impact Category	Impact Item	Status
Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Uncertain
	Shareholder Incentive Costs	Uncertain
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Included
	Wholesale Price Suppression Effects	Included
	Avoided Credit & Collection Costs	Included
	Avoided RPS Compliance Costs	Included
	Avoided Environmental Compliance Costs	Uncertain
	Increased Reliability	Included
Reduced Risk	Included	
Market Transformation	Included	
Participant Impacts	Measure Costs	Included
	Asset Value	Included
	Productivity	Included
	Economic Well-Being	Included
	Comfort	Included
	Health & Safety	Included
Other Non-Utility System Impacts	Satisfaction	Included
	Low-Income Customers	Included
	Other Fuel	Included
	Water Resources	Included
	Environmental	Included
	Economic Development & Jobs	Included
	Public Health	Included
Energy Security	Included	

Primary Test

TRC

- Uncertainties due to transparency issues with CET reporting
- Some utilities itemize other impacts in workpapers, but always at zero value

Data Source: DSESP



State Cost-Effectiveness Profiles

Kansas

Cost Effectiveness Impacts - **KS Profile**

Impact Category	Impact Item	Status
Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Uncertain
	Shareholder Incentive Costs	Uncertain
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Uncertain
	Wholesale Price Suppression Effects	Uncertain
	Avoided Credit & Collection Costs	Uncertain
	Avoided RPS Compliance Costs	Uncertain
	Avoided Environmental Compliance Costs	Uncertain
	Increased Reliability	Uncertain
	Reduced Risk	Uncertain
	Market Transformation	Uncertain
	Participant Impacts	Measure Costs
Asset Value		Uncertain
Productivity		Uncertain
Economic Well-Being		Uncertain
Comfort		Uncertain
Health & Safety		Uncertain
Satisfaction		Uncertain
Other Non-Utility System Impacts	Low-Income Customers	Uncertain
	Other Fuel	Uncertain
	Water Resources	Uncertain
	Environmental	Uncertain
	Economic Development & Jobs	Uncertain
	Public Health	Uncertain
Energy Security	Uncertain	

Primary Test
TRC

- RIM is also strongly considered by staff/commission
- Not fully clear how some included impacts are being calculated

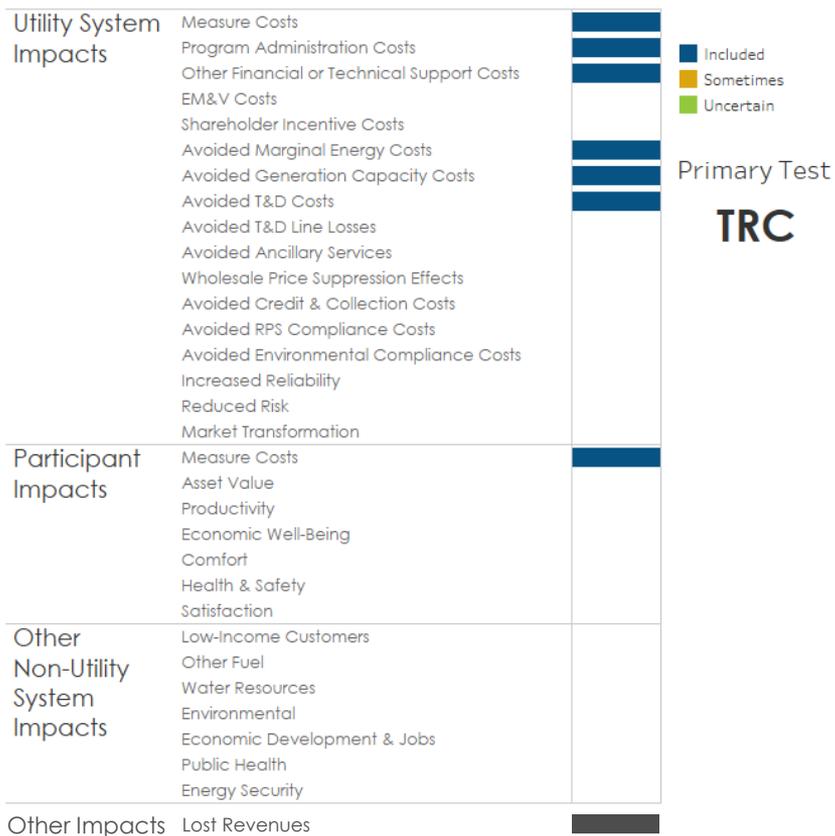
Data Source: DSESP



State Cost-Effectiveness Profiles

Kentucky

Cost Effectiveness Impacts - KY Profile



Primary Test
TRC

- One of only 3 states that has included utility lost revenues in a primary CET
- The only state that includes lost revenues without the RIM as primary test



State Cost-Effectiveness Profiles

Michigan

Cost Effectiveness Impacts - MI Profile

Impact Category	Impact Item	Included	Sometimes	Uncertain
Utility System Impacts	Measure Costs	Yes	No	No
	Program Administration Costs	Yes	No	No
	Other Financial or Technical Support Costs	No	Yes	No
	EM&V Costs	Yes	No	No
	Shareholder Incentive Costs	Yes	No	No
	Avoided Marginal Energy Costs	Yes	No	No
	Avoided Generation Capacity Costs	Yes	No	No
	Avoided T&D Costs	Yes	No	No
	Avoided T&D Line Losses	Yes	No	No
	Avoided Ancillary Services	Yes	No	No
	Wholesale Price Suppression Effects	Yes	No	No
	Avoided Credit & Collection Costs	Yes	No	No
	Avoided RPS Compliance Costs	Yes	No	No
	Avoided Environmental Compliance Costs	Yes	No	No
	Increased Reliability	Yes	No	No
	Reduced Risk	Yes	No	No
	Market Transformation	Yes	No	No
Participant Impacts	Measure Costs	No	No	No
	Asset Value	No	No	No
	Productivity	No	No	No
	Economic Well-Being	No	No	No
	Comfort	No	No	No
	Health & Safety	No	No	No
Other Non-Utility System Impacts	Satisfaction	No	No	No
	Low-Income Customers	Yes	No	No
	Other Fuel	No	No	No
	Water Resources	No	No	No
	Environmental	No	No	No
	Economic Development & Jobs	No	No	No
Public Health	No	No	No	
Energy Security	No	No	No	

Primary Test
PAC

- Uncertainty from some unspecified “other costs” included in total costs for one utility
- Only Midwest state to have an adder for market transformation programs (out of 5 that include or potentially include)

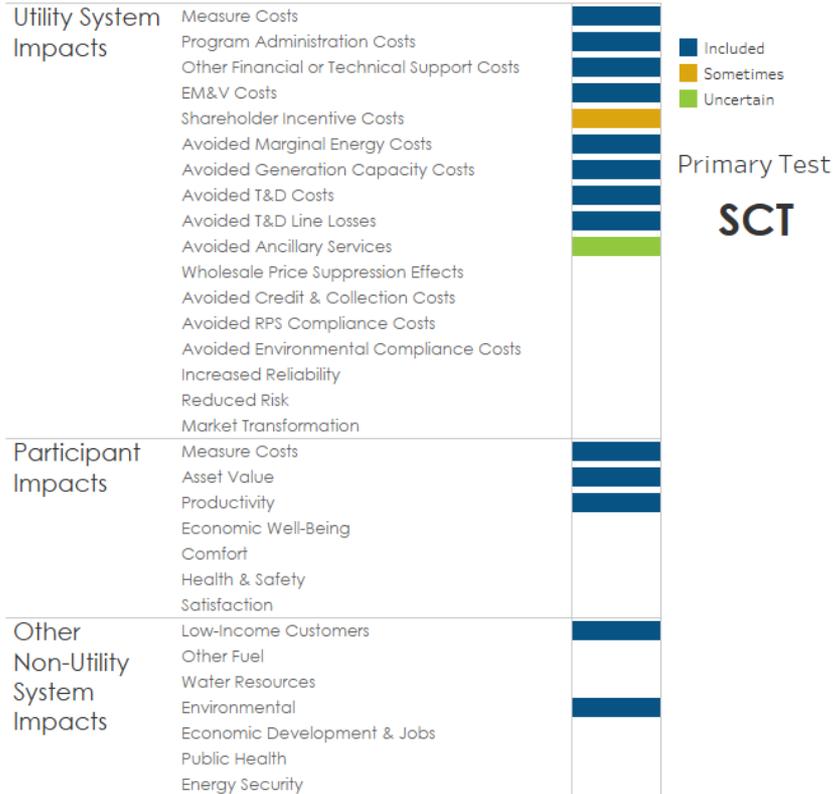
Data Source: DSESP



State Cost-Effectiveness Profiles

Minnesota

Cost Effectiveness Impacts - MN Profile



- Shareholder incentives sometimes appear to be rolled into “other costs”
- Ancillary services discussed in a recent study but unclear if any utilities have included those impacts thus far

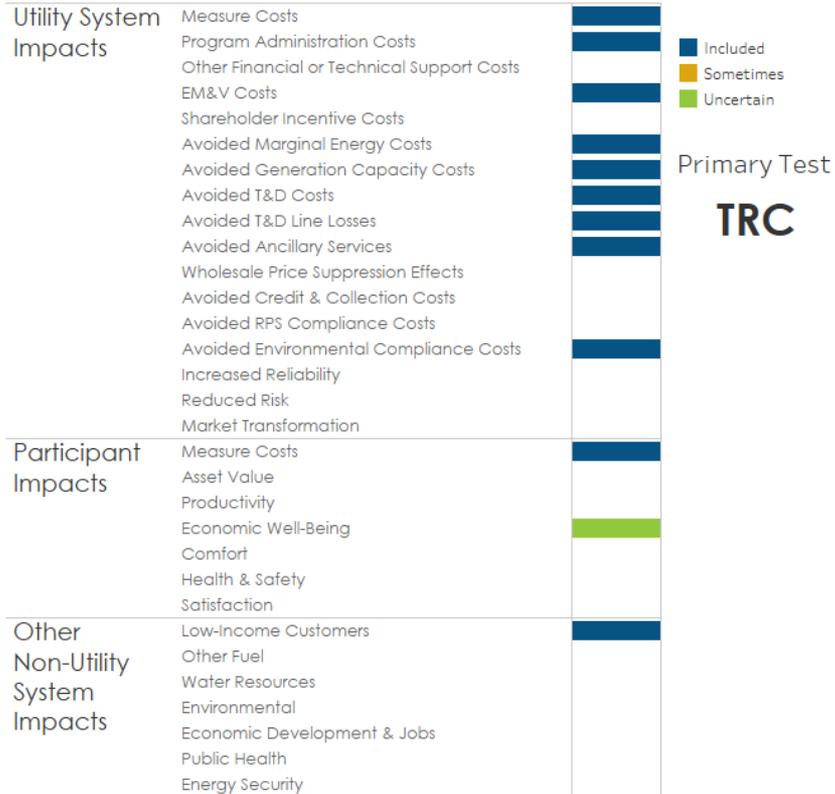
Data Source: DSESP



State Cost-Effectiveness Profiles

Missouri

Cost Effectiveness Impacts - MO Profile



- Limited legislative definition of what non-energy impacts can be included in TRC (must have a monetizable utility avoided cost)
- DSESP notes economic well-being as a participant impact that could be included under the definition if it were monetized e.g. from bill reductions

Data Source: DSESP



State Cost-Effectiveness Profiles

North Dakota

Cost Effectiveness Impacts - ND Profile

Utility System Impacts	Measure Costs Program Administration Costs Other Financial or Technical Support Costs EM&V Costs Shareholder Incentive Costs Avoided Marginal Energy Costs Avoided Generation Capacity Costs Avoided T&D Costs Avoided T&D Line Losses Avoided Ancillary Services Wholesale Price Suppression Effects Avoided Credit & Collection Costs Avoided RPS Compliance Costs Avoided Environmental Compliance Costs Increased Reliability Reduced Risk Market Transformation	
Participant Impacts	Measure Costs Asset Value Productivity Economic Well-Being Comfort Health & Safety Satisfaction	
Other Non-Utility System Impacts	Low-Income Customers Other Fuel Water Resources Environmental Economic Development & Jobs Public Health Energy Security	

- Included
- Sometimes
- Uncertain

Primary Test

NONE

- No IOU EE programs in state > 10+ yrs
- Only non-regulated small utilities (mostly co-ops) are doing EE in ND
- No formal reporting except through EIA-861

Data Source: DSESP



State Cost-Effectiveness Profiles

Nebraska

Cost Effectiveness Impacts - NE Profile

Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Included
	Shareholder Incentive Costs	Included
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Included
	Wholesale Price Suppression Effects	Included
	Avoided Credit & Collection Costs	Included
	Avoided RPS Compliance Costs	Included
	Avoided Environmental Compliance Costs	Included
	Increased Reliability	Included
	Reduced Risk	Included
Market Transformation	Included	
Participant Impacts	Measure Costs	
	Asset Value	
	Productivity	
	Economic Well-Being	
	Comfort	
	Health & Safety	
	Satisfaction	
Other Non-Utility System Impacts	Low-Income Customers	Included
	Other Fuel	
	Water Resources	
	Environmental	
	Economic Development & Jobs	
	Public Health	
	Energy Security	

■ Included
■ Sometimes
■ Uncertain

Primary Test

PAC

- Public power state – no IOUs & different regulatory structure
- Limited spending on EM&V

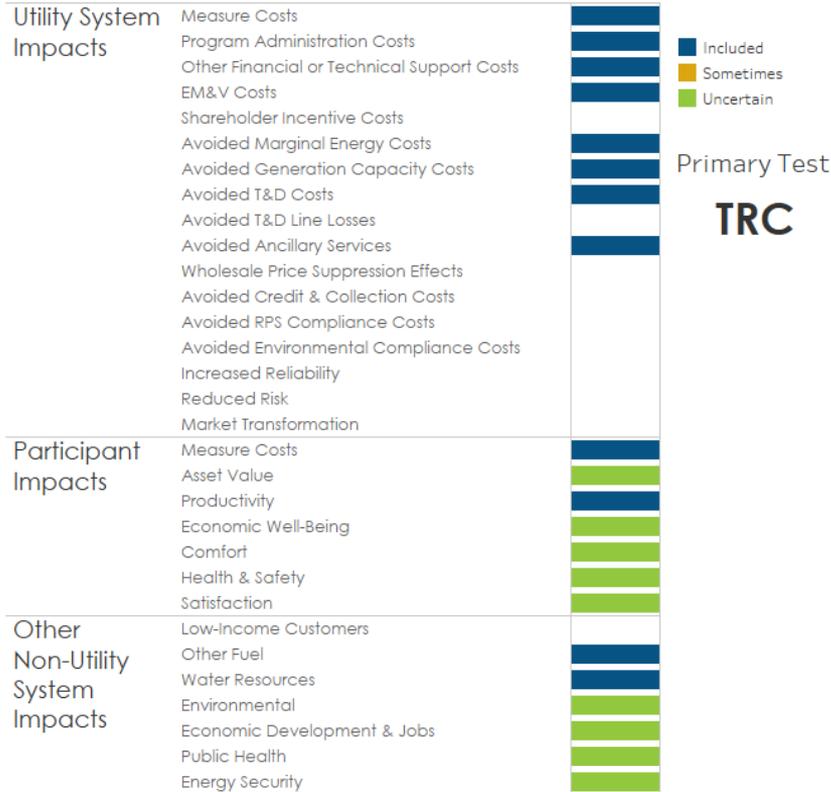


Data Source: DSESP

State Cost-Effectiveness Profiles

Ohio

Cost Effectiveness Impacts - OH Profile



- Low-income programs are required but do not have specific CET treatment
- The “Uncertain” impacts are noted as impacts that could be included under testing protocols that allow certain programs with substantial non-energy benefits to be exempt from TRC

Data Source: DSESP



State Cost-Effectiveness Profiles

South Dakota

Cost Effectiveness Impacts - SD Profile

Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	
	Shareholder Incentive Costs	
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	
	Wholesale Price Suppression Effects	
	Avoided Credit & Collection Costs	
	Avoided RPS Compliance Costs	
	Avoided Environmental Compliance Costs	
	Increased Reliability	
	Reduced Risk	
Market Transformation		
Participant Impacts	Measure Costs	Included
	Asset Value	Included
	Productivity	
	Economic Well-Being	
	Comfort	
	Health & Safety	
Satisfaction		
Other Non-Utility System Impacts	Low-Income Customers	
	Other Fuel	
	Water Resources	
	Environmental	
	Economic Development & Jobs	
	Public Health	
Energy Security		

■ Included
■ Sometimes
■ Uncertain

Primary Test

TRC

- No formal policy standardization of CET requirements
- Calculations are not always consistent between utilities

Data Source: DSESP



State Cost-Effectiveness Profiles

Wisconsin

Cost Effectiveness Impacts - WI Profile

Impact Category	Impact Item	Status
Utility System Impacts	Measure Costs	Included
	Program Administration Costs	Included
	Other Financial or Technical Support Costs	Included
	EM&V Costs	Included
	Shareholder Incentive Costs	Uncertain
	Avoided Marginal Energy Costs	Included
	Avoided Generation Capacity Costs	Included
	Avoided T&D Costs	Included
	Avoided T&D Line Losses	Included
	Avoided Ancillary Services	Uncertain
	Wholesale Price Suppression Effects	Uncertain
	Avoided Credit & Collection Costs	Uncertain
	Avoided RPS Compliance Costs	Uncertain
	Avoided Environmental Compliance Costs	Uncertain
	Increased Reliability	Uncertain
	Reduced Risk	Uncertain
	Market Transformation	Uncertain
Participant Impacts	Measure Costs	Included
	Asset Value	Uncertain
	Productivity	Uncertain
	Economic Well-Being	Uncertain
	Comfort	Uncertain
	Health & Safety	Uncertain
Other Non-Utility System Impacts	Satisfaction	Uncertain
	Low-Income Customers	Uncertain
	Other Fuel	Uncertain
	Water Resources	Uncertain
	Environmental	Included
	Economic Development & Jobs	Uncertain
Public Health	Uncertain	
Energy Security	Uncertain	

Primary Test
TRC

- An expanded version of the TRC is used as a secondary test
- The small number of non-Focus utilities may have different practices

Data Source: DSESP



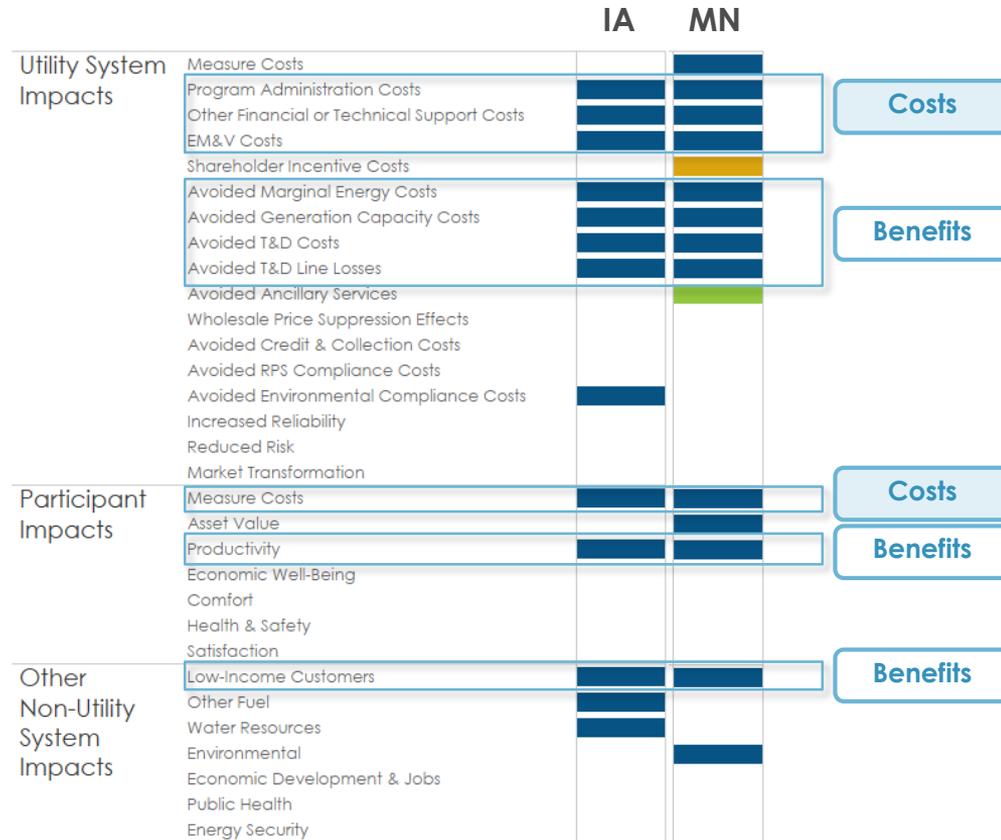
Impacts in Common – “PAC” States

		MI	NE	
Utility System Impacts	Measure Costs	■	■	Costs
	Program Administration Costs	■	■	
	Other Financial or Technical Support Costs	■		
	EM&V Costs	■		
	Shareholder Incentive Costs	■		
	Avoided Marginal Energy Costs	■	■	Benefits
	Avoided Generation Capacity Costs	■	■	
	Avoided T&D Costs	■	■	
	Avoided T&D Line Losses	■	■	
	Avoided Ancillary Services			
	Wholesale Price Suppression Effects			
	Avoided Credit & Collection Costs			
	Avoided RPS Compliance Costs			
	Avoided Environmental Compliance Costs		■	
	Increased Reliability			
Reduced Risk				
Market Transformation	■			
Participant Impacts	Measure Costs			
	Asset Value			
	Productivity			
	Economic Well-Being			
	Comfort			
	Health & Safety			
	Satisfaction			
Other Non-Utility System Impacts	Low-Income Customers	■	■	Benefits
	Other Fuel			
	Water Resources			
	Environmental			
	Economic Development & Jobs			
	Public Health			
	Energy Security			

Impacts in Common – “TRC” States

		IL	IN	KS	KY	MO	OH	SD	WI	
Utility System Impacts	Measure Costs	█	█	█	█	█	█	█	█	Costs
	Program Administration Costs	█	█	█	█	█	█	█	█	
	Other Financial or Technical Support Costs	█	█		█	█	█		█	
	EM&V Costs	█	█			█	█		█	
	Shareholder Incentive Costs		█			█	█		█	
	Avoided Marginal Energy Costs	█	█	█	█	█	█	█	█	Benefits
	Avoided Generation Capacity Costs	█	█	█	█	█	█	█	█	
	Avoided T&D Costs	█	█	█	█	█	█	█	█	
	Avoided T&D Line Losses	█	█	█		█	█	█	█	
	Avoided Ancillary Services	█				█	█			
	Wholesale Price Suppression Effects					█				
	Avoided Credit & Collection Costs									
	Avoided RPS Compliance Costs									
	Avoided Environmental Compliance Costs	█	█			█				
	Increased Reliability									
Reduced Risk										
Market Transformation										
Participant Impacts	Measure Costs	█	█	█	█	█	█	█	█	Costs
	Asset Value						█	█	█	
	Productivity	█					█			Benefits
	Economic Well-Being					█	█			
	Comfort						█			
	Health & Safety						█			
Other Non-Utility System Impacts	Satisfaction						█			
	Low-Income Customers	█				█				
	Other Fuel	█					█			
	Water Resources	█					█			
	Environmental	█					█			
	Economic Development & Jobs						█		█	
	Public Health						█			
Energy Security						█				

Impacts in Common – “SCT” States



What does this all mean?

Key takeaways

Each state includes different impacts, even when they are using the “same” test

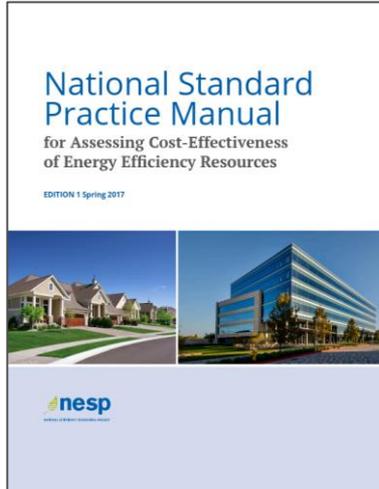
Half of the core utility system impacts that could be in any primary test are not being monetized & included

Participant costs are considered but not much consideration of participant *benefits*

Non-utility impacts are often considered for low-income customers, but most others are not included

Which impacts **should be included** in our test, then?

*There is no single answer that works everywhere –
but there is **a framework to figure it out***



Universal
Principles

RVF 7-step
process

Primary
Test (RVT)

- STEP 1** Identify and articulate the jurisdiction's applicable policy goals.
- STEP 2** Include all the utility system costs and benefits.
- STEP 3** Decide which non-utility impacts to include in the test, based on applicable policy goals.
- STEP 4** Ensure that the test is symmetrical in considering both costs and benefits.
- STEP 5** Ensure the analysis is forward looking and incremental.
- STEP 6** Develop methodologies to account for all relevant impacts, including hard to quantify impacts.
- STEP 7** Ensure transparency in presenting the inputs and results of the cost-effectiveness test.

Coming in 2020

NSPM for Distributed
Energy Resources
(DERs)

Additional DSESP
updates from user
feedback

ACEEE report on the
“3 Rs” (Risk, Reliability
and Resilience) in EE
cost-effectiveness
testing

Ongoing research &
guidance on how
states are
quantifying the
impacts they include

SAVE THE DATE

2020
MIDWEST
ENERGY
SOLUTIONS
CONFERENCE

FEBRUARY 26-28, 2020

CHICAGO, IL

Thank you!



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