Maine Distributed Generation Successor Program Study

Distributed Generation Stakeholder Group

Workshop #1: Project Kick-Off and Discussion of the Maine BCA Test

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Today's Agenda

1. Introductions
2. Overview of the distributed generation (DG) successor program study
3. Overview of the schedule
4. Developing the Maine cost-effectiveness test
   a) Summary of the National Standard Practice Manual (the NSPM) and process for developing a jurisdiction-specific test.
   b) Discussion of the key Maine energy policy goals relevant to DG.
   c) Straw proposal for a Maine Test
5. Next DG Stakeholder meeting
   a) Next DG stakeholder meeting in mid-September
   b) Homework assignment for the next meeting

Project team

Synapse Energy Economics

- Synapse is a research and consulting firm specializing in energy, economic, and environmental topics.
- For over 25 years Synapse provided rigorous analysis of the electric power sector for public interest and governmental clients.
- Synapse's staff of over 40 experts address a wide range of topics including electricity industry regulation and planning, technical and economic analyses of electricity industry systems, distributed energy resources, renewable resource technologies and policies, performance-based regulation, and many aspects of consumer and environmental protection.
- Synapse has extensive experience with all aspects of benefit-cost analysis and was the lead author of the NSPM.
- Synapse has been the lead author of six versions of the New England Avoided Energy Supply Cost (AESC) study.

Sustainable Energy Advantage (SEA)

- SEA is a consulting and advisory firm specializing in renewable energy market, policy, financial, and strategic analysis.
- For over 20 years, SEA has been a national leader on the analysis of renewable energy policy and markets supporting the decision-making of hundreds of clients, including over 40 governmental entities.
- By providing market, policy, strategic, and financial analysis and support, SEA helps its clients develop wholesale and retail renewable electricity businesses and projects, public policies and incentive programs, and market infrastructure.
- SEA has a particular focus on and unapparelled expertise in the clean energy policies, markets, and technologies deployed throughout the Northeast U.S.
- SEA has been a contributing author to several of the New England AESC studies.

Study Objectives

The ultimate goal, consistent with legislative direction, is to develop a new program design for DG of 2-5 MW in size.

The successor program should:

- Be implemented between 2024 and 2028
- Be as cost-effective as possible, considering state policy goals
- Minimize rate impacts and cost shifting
- Consider strategies for maximizing the value of DG
- Consider different types and combinations of offtakers
- Consider combinations of PV and storage
- Consider an alternative program target of 7% of total load
- Reflect input from the DG Stakeholder Group

The deliverable will be a report for the Governor's Energy Office.

- To be filed with the legislature

Successor Program Designs

As per the *DG Stakeholder Interim Report,* the types of program designs to be considered include:

- Procurement-based (which would involve procurement at a specific time and be based on competitive bidding)
  - e.g., CT NRES, RI REG (large)
- Feed-in tariff (which would be more likely based on administrative price-setting and first come, first served capacity availability)
  - e.g., NJ TREC program, RI REG (small)
- Combination of the first two options in a single program
  - e.g., SMART, RI REG

- Program component choices examples:
  - Predictability of annual market scale
  - Incentive access, queuing
  - Price-setting and adjustments
  - Attributes purchased, hedged
  - Diversity / equity favoring mechanisms
  - EDC installation diversity
  - Crediting program

DG Technologies

- Solar PV
  - Single-offtaker greenfield ground-mounted solar PV
  - Hybrid corporate and residential offtaker shared greenfield ground-mounted solar PV
  - Hybrid corporate and low and moderate income residential offtaker shared greenfield ground-mounted solar PV (front-of-meter only)
  - Disturbed land parcel (front-of-meter only)
  - Canopies
- Small-scale hydroelectric

Technologies not studied will still be able to participate in the program. They will be described qualitatively in the report.

Evaluation of successor programs

We will be using two types of analyses to evaluate programs

1. Benefit-cost analysis (BCA)
   - Compares impacts on all customers on average
   - Does not address distributional impacts
2. Rate impact analysis
   - Considers impacts on customers' rates and bills
   - Identifies the impact of cost-shifting

BCAs and rate impact analyses should be conducted separately

- A key principle from the NSPM
- This means the Rate Impact Measure test should not be used

BCA relative to rate impact analysis

	Benefit-Cost Analysis	Rate Impact Analysis
Purpose	To identify which distributed energy resources (DERs) utilities should invest in or otherwise support on behalf of their customers	To identify how DERs will affect rates, in order to assess customer equity concerns
Questions Answered	What are the future costs and benefits of DERs?	Will customer rates increase or decrease, and by how much?
Results Presented	• Cumulative costs (present value $) • Cumulative benefits (present value $) • Cumulative net benefits (present value $) • Benefit-cost ratios (present value $)	• Rate impacts (c/kWh, %) • Bill impacts ($/month, %) • Participation rates (#, %)

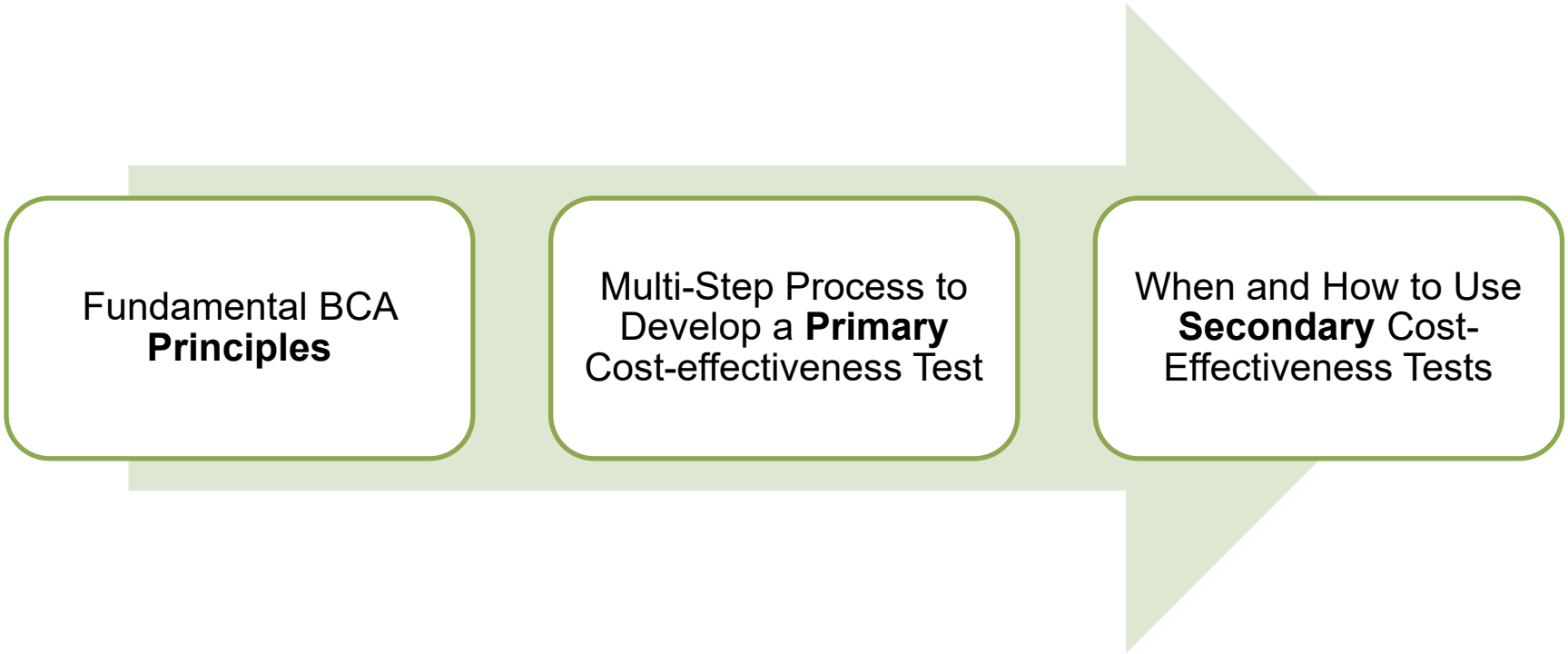
What is included in BCA and Rate Impacts

	Include in Benefit-Cost Analysis	Include in Rate, Bill, Participant Analysis
Utility system impacts	Yes	Yes
Host customer impacts	Maybe Depends on policy goals	No These do not affect rates
Social impacts	Maybe Depends on policy goals	No These do not affect rates
Lost revenues	No These do not affect future costs These do affect cost-shifting	Yes These do affect rates

Presentation of Results

Program Type	DG Penetration	Cost-Effectiveness Using the Maine Test		Rate Impacts	
	Capacity (MW)	Net Benefits	Benefit-Cost Ratio	¢/kWh	% of rate
Extend existing program					
Successor program #1					
Successor program #2					
Successor program #3					
Successor program #4					

National Standard Practice Manual: Framework

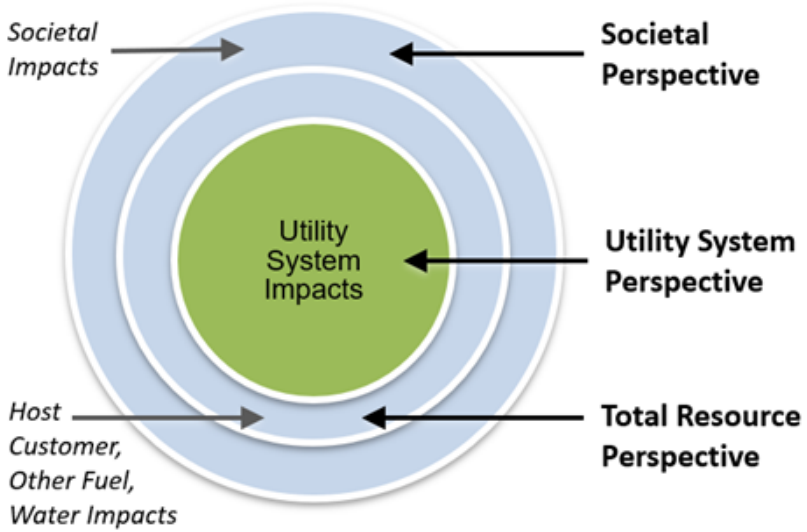


NSPM: Principles

1. Recognize that DERs can provide energy system needs and should be compared with other energy resources and treated consistently for BCA.
2. **Align cost-effectiveness test with jurisdiction's applicable policy goals**.
3. Ensure symmetry across costs and benefits.
4. Account for all relevant, material impacts (based on applicable policies), even if hard to quantify.
5. Conduct a forward-looking, long-term analysis that captures incremental impacts of DER investments.
6. Avoid double-counting through clearly defined impacts.
7. Ensure transparency in presenting the benefit-cost analysis and results.
8. **Conduct BCAs separate from Rate Impact Analyses.**

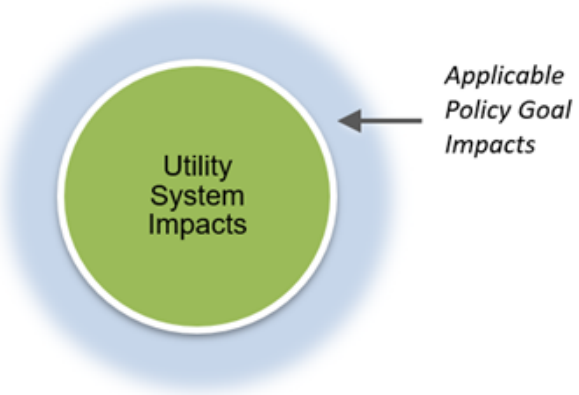
NSPM: Cost-effectiveness perspectives

Traditional Perspectives



- Three perspectives define the scope of impacts to include in the most common traditional cost-effectiveness tests.

Regulatory Perspective



- Perspective of public utility commissions, legislators, muni/coop boards, public power authorities, and other relevant decision-makers.
- Accounts for utility system plus impacts relevant to a jurisdiction's applicable policy goals (which may or may not include host customer impacts).
- Can align with one of the traditional test perspectives, but not necessarily.

NSPM: Process for determining primary test

STEP 1 **Articulate Applicable Policy Goals**

Articulate the jurisdiction's applicable policy goals related to DERs.

STEP 2 **Include All Utility System Impacts**

Identify and include the full range of utility system impacts in the primary test.

STEP 3 **Decide Which Non-Utility System Impacts to Include**

Identify those non-utility system impacts to include in the primary test based on applicable policy goals identified in Step 1:

STEP 4 **Ensure that Benefits and Costs are Properly Addressed**

Ensure that the impacts identified in Steps 2 and 3 are properly addressed, where:

- Benefits and costs are treated symmetrically;
- Relevant and material impacts are included, even if hard to quantify;
- Benefits and costs are not double-counted; and
- Benefits and costs are treated consistently across DER types

STEP 5 **Establish Transparent Documentation**

Establish comprehensive, transparent documentation and reporting, whereby:

- The process used to determine the primary test is fully documented; and
- Reporting requirements for presenting assumptions and results are developed.

Energy policy goals

Policy goals and implementation come in many forms:

- Statutes
- Commission orders
- Energy plans
- Executive orders
- Stakeholder proposals

Legislature provided flexibility for stakeholders

Policy goals can evolve over time

- Especially with new legislation

Utility system impacts

These are foundational to all cost-effectiveness tests:

- Included in Utility, TRC, Societal, and jurisdiction-specific tests
- The only exception is the Participant Cost test

These include all impacts that will affect revenue requirements

These impacts indicate whether utility costs (revenue requirements) will increase or decrease over the study period

NSPM guidance:

- A jurisdiction's primary test should include all utility system impacts
- For some impacts, the value might be small and not worth quantifying
- For some impacts, the value might be hard to quantify, but they should be included in the test nonetheless.

Non-utility system impacts

Type of Impact	Impact	Description
Participant	Participant impacts	Host customer portion of DER costs & host customer non-energy impacts
Other fuels	Other fuels	Impacts on fuels that are not provided by the relevant utility, for example gas (for an electric utility), oil, propane, gasoline, or wood
Low-income	Low-income	Impacts on low- and moderate-income customers
Societal	GHG emissions	Greenhouse gas emissions avoided or created by the DER
	Other environmental	Air emissions, land use, water emissions, solid waste emissions
	Macroeconomic	Jobs created or lost as a result of the DER
	Energy security	Reduced reliance on fuel or energy imports from outside the state, region, or country
	Energy equity	Impacts on vulnerable or disadvantaged populations, as defined in each state
	Resilience	The ability to avoid or reduce the duration of outages, including during “black sky” days or extreme weather events

Goal of this exercise: Fill in the blanks for DG

Type of Impact	Impact	Include in Maine Test?	Rationale / Justification
Utility System	All	Yes	NSPM guidance
Participant	Participant impacts		
Other fuels	Other fuels		
Low-income	Low-income		
Societal	GHG emissions		
	Other environmental		
	Macroeconomic		
	Energy security		
	Energy equity		
	Resilience		

Impacts currently accounted for: utility system

Type of Impact	Impact	Energy Efficiency	NWA
Generation	Energy	Yes	Yes
	Capacity	Yes	Yes
	Environmental Compliance	Yes	x
	RPS Compliance Costs	x	x
	Market Price Effects	Yes	Yes
Transmission	Transmission	Yes	Yes
Distribution	Distribution	Yes	Yes
General	Financial Incentives	Yes	x
	Program Administration	Yes	Yes
	Utility Performance Incentives	x	x
	Credit and Collection	x	x
	Risk, Reliability, Resilience	x	x

EE source: 95-648 Chapter 3§4
NWA source: 35-A MRS §3132-C

Impacts currently accounted for: non-utility system

Type of Impact	Impact	Energy Efficiency	Non-Wires Alternatives (NWAs)
Participant	Participant costs	Yes	No
	Participant benefits	Yes	x
Other fuels	Other fuels	Yes	x
Water	Water	Yes	x
Low-income	Low-income		x
Societal	GHG emissions	Yes	When the cost-effectiveness of the identified NTAs [NWAs] are reasonably equal, the commission shall give preference to the alternatives that produce the lowest amount of local air emissions, including greenhouse gas emissions.
	Other environmental	Yes	When the cost-effectiveness of the identified NTAs [NWAs] are reasonably equal, the commission shall give preference to the alternatives that produce the lowest amount of local air emissions, including greenhouse gas emissions.
	Macroeconomic	Yes	x
	Energy Security	x	x
	Energy Equity	x	x
	Resilience	x	x

EE source: 95-648 Chapter 3§4
NWA source: 35-A MRS §3132-C

Participant impacts: Description

Participant Impact	Description
Participant portion of DER costs	Costs incurred to install and operate DERs
Participant transaction costs	Other costs incurred to install and operate DERs
Risk	Uncertainty including price volatility, power quality, outages, and operational risk related to failure of installed DER equipment and user error; this type of risk may depend on the type of DER
Reliability	The ability to prevent or reduce the duration of host customer outages
Resilience	The ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions
Tax incentives	Federal, state, and local tax incentives provided to host customers to defray the costs of some DERs
Participant Non-Energy Impacts (NEIs)	Benefits and costs of DERs that are separate from energy-related impacts

NEIs	Description
Transaction costs	Costs incurred to adopt DERs, beyond those related to the technology or service itself (e.g., application fees, time spent researching, paperwork)
Asset value	Changes in the value of a home or business as a result of the DER (e.g., increased building value)
Productivity	Changes in a customer's productivity (e.g., changes in labor costs, operational flexibility, O&M costs)
Economic well-being	Economic impacts beyond bill savings (e.g., reduced complaints about bills, reduced terminations and reconnections, reduced foreclosures—especially for low-income customers)
Comfort	Changes in comfort level (e.g., thermal, noise, and lighting impacts)
Health & safety	Changes in customer health or safety (e.g., fewer sick days from work or school, reduced medical costs, improved indoor air quality, reduced deaths)
Empowerment & control	The satisfaction of being able to control one's energy consumption and energy bill
Satisfaction & pride	The satisfaction of helping to reduce environmental impacts (e.g., one of the reasons why residential customers install rooftop PV)

Participant impacts: Background

- NSPM principles
  - Symmetry Principle
    - If participant costs are included, then participant benefit should be too
    - If participant benefits are not included, participant costs should not be
  - Hard-to-Quantify Principle
    - Relevant impacts cannot be ignored just because they are difficult to quantify
- Participant non-energy impacts considerations
  - There can be many participant non-energy impacts
  - Most of them are participant benefits
  - Some can be very large
  - Some of them are more important to customers than energy benefits
  - They can be difficult to measure, quantify, and monetize
  - Estimates are often approximate and uncertain

Participant impacts: Discussion

Statutes do not provide much guidance on how to account for participant impacts

- Except that the NWA statute explicitly states that participant costs should not be accounted for in the cost-effectiveness tests

The current practice in the energy efficiency cost-effectiveness test is to account for participant costs and benefits

- It is best to be consistent across DER types, but not necessary

Note that in most cases participants pay for most of the DG costs

- This means that excluding participant impacts would make the results less meaningful and potentially misleading

Other non-utility system impacts

Type of Impact	Impact	Policy Goal	Source(s)
Other fuels	Other fuels	• Oil dependence reduction targets • Beneficial electrification – electrification of a technology that would otherwise require energy from a fossil fuel, and that provides a benefit to a utility, a ratepayer or the environment, without causing harm to utilities, ratepayers or the environment, by improving the efficiency of the electricity grid or reducing consumer costs or emissions, including carbon emissions	• 2 MRS §9 • 35-A MRS §10102 and 10110
Low-income	Low-income	[Identify] mechanisms that prioritize distributed generation that are sited to serve load within a low-income to moderate-income community;	• Sec. 3. 35-A MRSA §3482, sub-§1,
Societal	GHG emissions	• Gross greenhouse gas emissions 45% below 1990 level by 2030 • Carbon neutrality by 2045	38 MRS §576-A
	Other environmental	Identifying mechanisms that prioritize distributed generation that are sited to limit impacts by being located on previously developed or impacted land, including areas covered by impervious surfaces, reclaimed gravel pits, capped landfills or brownfield sites as defined by the Department of Environmental Protection;	Sec. 3. 35-A MRSA §3482, sub-§1

More non-utility system impacts

Type of Impact	Impact	Policy Goal	Source(s)
Societal	Macro-economic	• 30,000 clean energy jobs by 2030 • Support the successful development of distributed generation by small companies based in the State. • Increases solar workforce	• Governor's goal established December 1, 2020 • Sec. 3. 35-A MRSA §3482, sub-§1 • 35-A MRS §3472 et seq
	Energy Security	The goal for development of commercially operational distributed generation resources is 750 total megawatts.	Sec. 1. 35-A MRSA §3209-A, sub-§7
	Energy Equity	Explore the shift from opt-in to opt-out models for participation in cleaner and less expensive electricity projects, such as community solar	Initial Recommendation of MCC Equity Subcommittee
	Resilience	• 300 megawatts of energy storage by 2025, 400 megawatts of energy storage by 2030 • Identifying mechanisms that prioritize distributed generation that are sited to optimize grid performance or serve an NWA function	• 35-A MRS §3145 • Sec. 3. 35-A MRSA §3482, sub-§1,

Draft straw proposal

Are you ready to start filling in some blanks?

Type of Impact	Impact	Include in Maine Test?	Rationale / Justification
Utility System	All	Yes	NSPM guidance
Participant	Participant impacts		
Other fuels	Other fuels		
Low-income	Low-income		
Societal	GHG emissions		
	Criteria air emissions		
	Other environmental		
	Public health		
	Macroeconomic		
	Energy security		
	Energy equity		
	Resilience		

Next DG Stakeholder Meeting

Target date:

- September 16

Agenda for next meeting:

- Discuss the straw proposal for the Maine Test
- Finalize the Maine Test
- Discuss methods for estimating the values to use in the Maine Test

Homework assignment:

- Review straw proposal for the Maine Test
- Be prepared to provide comments on straw proposal

Acronyms

Avoided Energy Supply Cost (AESC)

Benefit-cost analysis (BCA)

Distributed energy resources (DERs)

Distributed generation (DG)

National Standard Practice Manual (NSPM)

Non-energy impacts (NEIs)

Non-wires alternative (NWA)

Sustainable Energy Advantage (SEA)