National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources (NSPM for DERs)

EXPLORING OPTIMIZATION THROUGH BENEFIT-COST ANALYSIS

NCEP Special Session

Julie Michals – E4TheFuture

February 25, 2021

About NESP

The National Energy Screening Project (NESP) is a stakeholder organization that is open to all organizations and individuals with an interest in working collaboratively to improve cost-effectiveness screening practices for energy efficiency and other distributed energy resources (DERs).

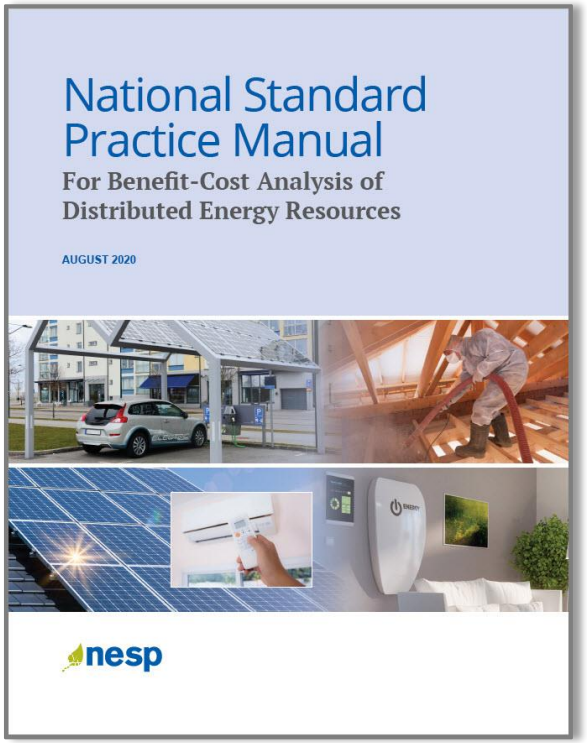
Products include:

- NSPM for EE (2017)
- NSPM for DERs (2020)
- Database of Screening Practices (DSP)

NESP work is managed by E4TheFuture, with coordinated state outreach via key partners.

NESP work is funded by E4TheFuture and in part by US DOE.

https://nationalenergyscreeningproject.org/



Why an NSPM for DERs?

- Traditional cost-effectiveness tests often do not address pertinent jurisdictional/state policies.
- Traditional tests are often modified by states in an ad-hoc manner, without clear principles or guidelines.
- DERs are treated inconsistently in many BCAs or valuations (i.e., in context of programs, procurement, pricing mechanisms, distribution planning, IRP, etc.)
- DERs are often not accurately valued.
- There is a lack of transparency on why tests are chosen and how they are applied.

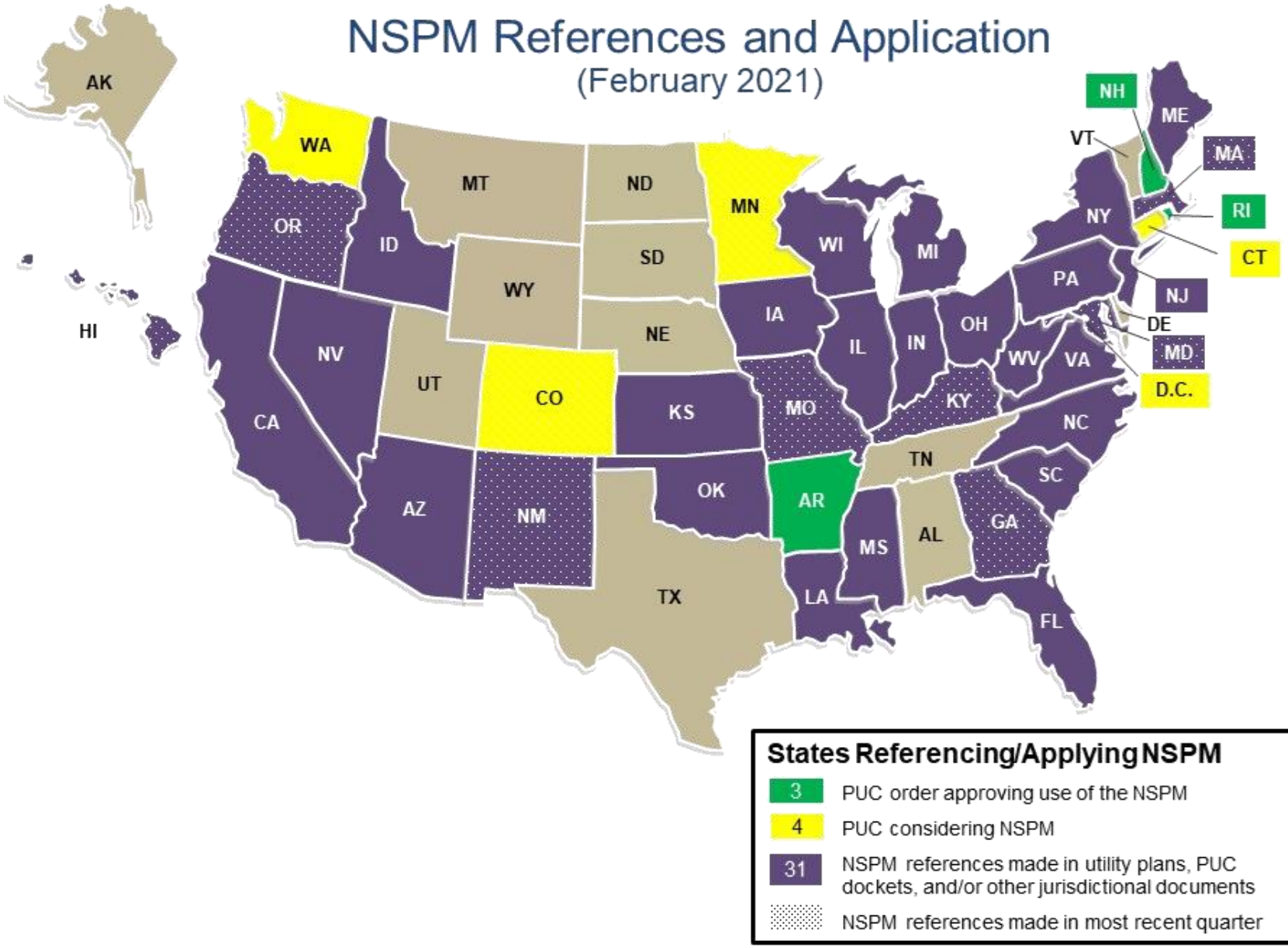
NSPM for DERs – Audience and Uses

Audience: All entities overseeing/guiding DER decision - PUCs, SEOs, utilities, DER reps, evaluators, consumer advocates, others

Purpose: Guidance for valuing DER opportunities to inform policies and strategies such as:

- Expanding EE/DR plans, strategies, and programs to broader set of DERs
- Evaluating and planning for non-wires/pipes solutions
- Incorporating DERs into distribution system planning
- Achieving jurisdictional policy goals and objectives, e.g.
  - Environmental and carbon emission reductions
  - Electrification goals, including in buildings and EVs
  - Economic development
  - Energy security
  - etc.

NSPM References and Application
(February 2021)



NSPM for DERs – TOC

NSPM BCA Framework

NSPM provides a ‘process’ that jurisdictions can use to develop (or modify existing) CE testing practices for a range of DERs or some combination of them.

Why Consistency in BCA across DERs?

- Consistent BCA framework reduces risk of either over or under-investing in a resource (or combination thereof)
- Siloed approach to valuing different DERs can be complex and overwhelming for commissions, utilities and stakeholders
- Allows for comparison and prioritizing of DER investment options to answer questions such as:

1. *Which DERs should be implemented, and which should be rejected based on key objectives?*
2. *Will key policy goals be met by investing in the DER(s)?*
3. *How can we ensure that customers are not paying too much for policy goals?*

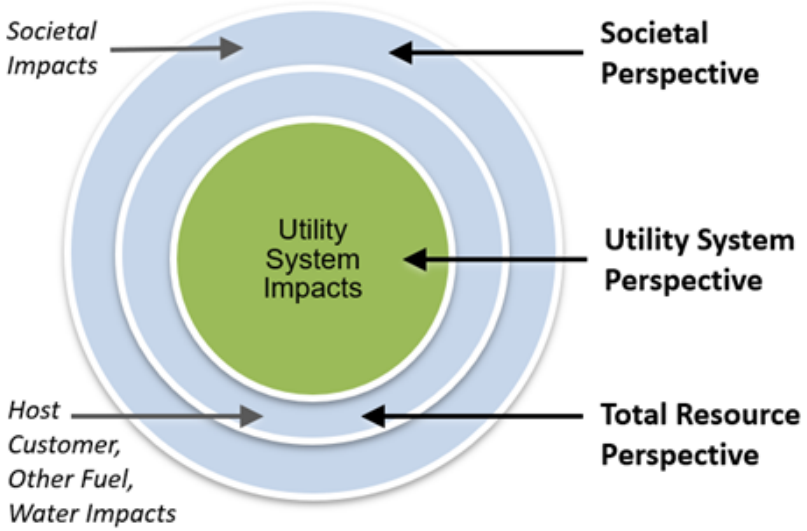
NSPM BCA Principles

1. Recognize that EE and other DERs can provide energy or power system needs, and therefore should be compared with other energy resources and treated consistently for benefit-cost analyses.
2. Align primary test with 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 the DER investment.
6. Avoid double-counting through clearly defined impacts.
7. Ensure transparency in presenting the analysis and the results.
8. Conduct BCA separate from Rate Impact Analyses because they answer different questions.

Cost-Effectiveness Perspectives

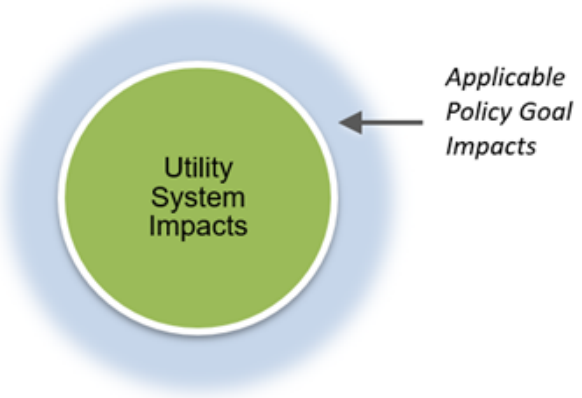
NSPM for DERs

Traditional Perspectives



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

Regulatory Perspective

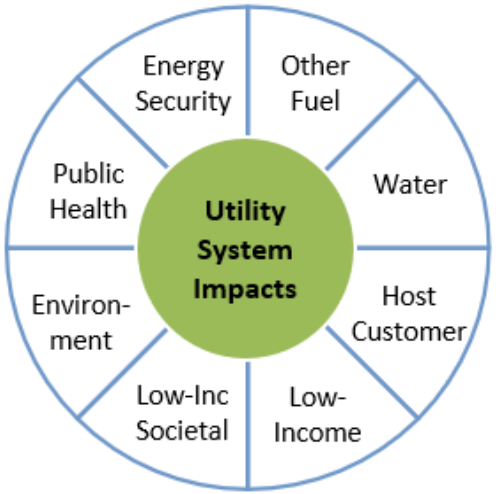


- Perspective of public utility commissions, legislators, muni/coop boards, public power authorities, and other relevant decision-makers.
- Accounts for utility system plus impacts relevant to a jurisdiction's applicable policy goals (which may or may not include host customer impacts).
- Can align with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

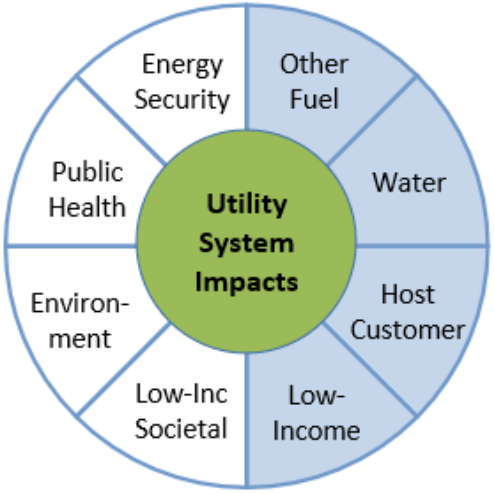
Primary Test = Jurisdiction Specific Test (JST)

Hypothetical JSTs as compared to traditional tests

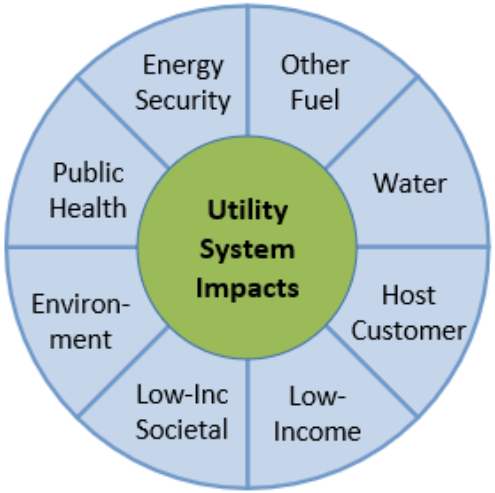
JST 1 = UCT/PACT



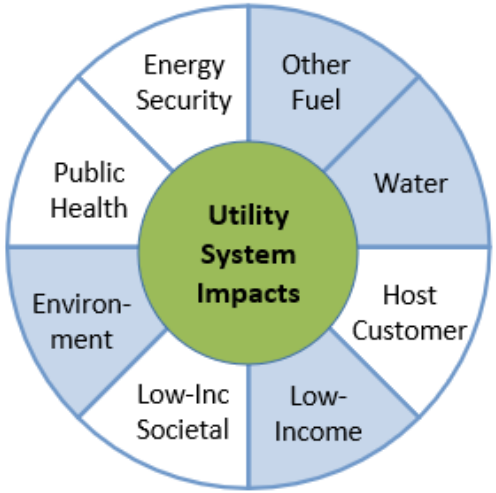
JST 2 = TRC Test



JST 3 = SCT



JST 4 ≠ traditional CE test *



UCT = Utility Cost Test (or PACT = Program Admin Cost Test)
TRC = Total Resource Cost Test
SCT = Societal Cost Test

All utility system impacts included

Non-utility system impacts included

Non-utility system impacts *not* included

*JST 4 includes a different set of non-utility system impacts based on *its applicable policies.*

JSTs may or may not align with traditional tests.

BCA Alignment with Applicable Policy Goals

- Alignment with a jurisdiction's policy goals is necessary to help ensure policy goals are met
- Policies evolve and are dynamic, not static – as such BCAs need updating/refinement to account for relevant impacts
- Where inconsistencies in policies exist across DERs, determination may be needed to broadly or narrowly interpret policies and associated relevant impacts to account for in BCA primary test

Use of Secondary Tests

NSPM provides guidance on **when and how to use secondary tests.**

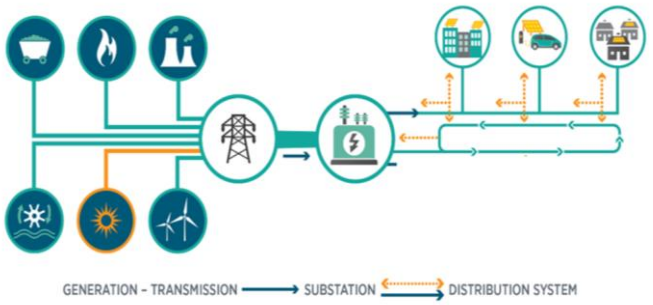
While a jurisdiction's primary test informs a resource merits acquisition, secondary tests can help to:

- To address situations where there are inconsistent policy goals across different DER types.
- To address DERs that are marginally cost-effective.
- To assess implications of achieving policy goals.

Three Tiers of DER Analysis
(NSPM covers levels 1-2 primarily)

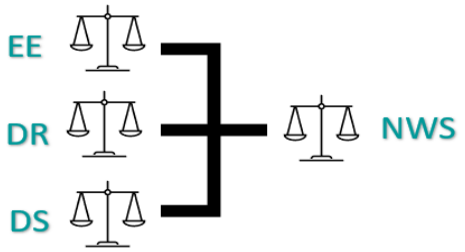
Level Three: Multiple DERs + Utility System

- Assessing ***multiple DER types*** relative to a ***dynamic set*** of alternative resources; goal to optimize both DERs and utility-scale resources



Level Two: Multiple DERs

- Assessing ***more than one DER type*** at the same time, relative to a ***static or dynamic*** set of alternative resources



Level One: Single DER

- Assessing ***one DER type*** in isolation from other DER types, relative to a ***static*** set of alternative resources

Adapted from LBNL 2020 and US DOE Solar Energy Technologies Office

EE and Other DER Benefits & Costs

Utility-system Impacts are foundational – Always include

Type	Utility System Impact
Generation	Energy Generation
	Capacity
	Environmental Compliance
	RPS/CES Compliance
	Market Price Effects
	Ancillary Services
Transmission	Transmission Capacity
	Transmission System Losses
Distribution	Distribution Capacity
	Distribution System Losses
	Distribution O&M
	Distribution Voltage
General	Financial Incentives
	Program Administration
	Utility Performance Incentives
	Credit and Collection
	Risk
	Reliability
	Resilience

Non-Utility System Impacts – Inclusion depends on applicable policy goals & objectives

Type	Host Customer Impact
Host Customer	Host portion of DER costs
	Host transaction costs
	Interconnection fees
	Risk
	Reliability
	Resilience
	Tax incentives
	Non-energy Impacts
	Low-income non-energy impacts

Type	Societal Impact
Societal	Resilience
	GHG Emissions
	Other Environmental
	Economic and Jobs
	Public Health
	Low Income: Society
	Energy Security

DER BCA – Utility System Impacts

Potential Benefit, Cost or Depends?

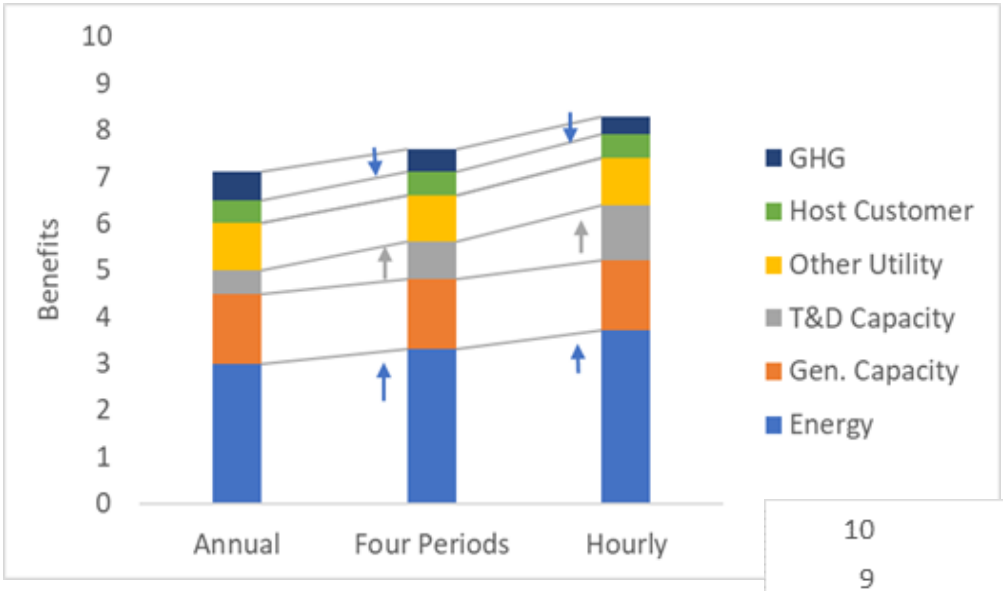
Type	Utility System Impact	EE	DR	DG	Storage	Electrification
Generation	Energy Generation	●	●	●	●	●
	Capacity	●	●	●	●	●
	Environmental Compliance	●	●	●	●	●
	RPS/CES Compliance	●	●	●	●	●
	Market Price Effects	●	●	●	●	●
	Ancillary Services	●	●	●	●	●
Transmission	Transmission Capacity	●	●	●	●	●
	Transmission System Losses	●	●	●	●	●
Distribution	Distribution Capacity	●	●	●	●	●
	Distribution System Losses	●	●	●	●	●
	Distribution O&M	●	●	●	●	●
	Distribution Voltage	●	●	●	●	●
General	Financial Incentives	●	●	●	●	●
	Program Administration Costs	●	●	●	●	●
	Utility Performance Incentives	●	●	●	●	●
	Credit and Collection Costs	●	●	●	●	●
	Risk	●	●	●	●	●
	Reliability	●	●	●	●	●
	Resilience	●	●	●	●	○

● = *typically a benefit*
● = *typically a cost*
● = *either a benefit or cost depending upon the application*
○ = *not relevant*

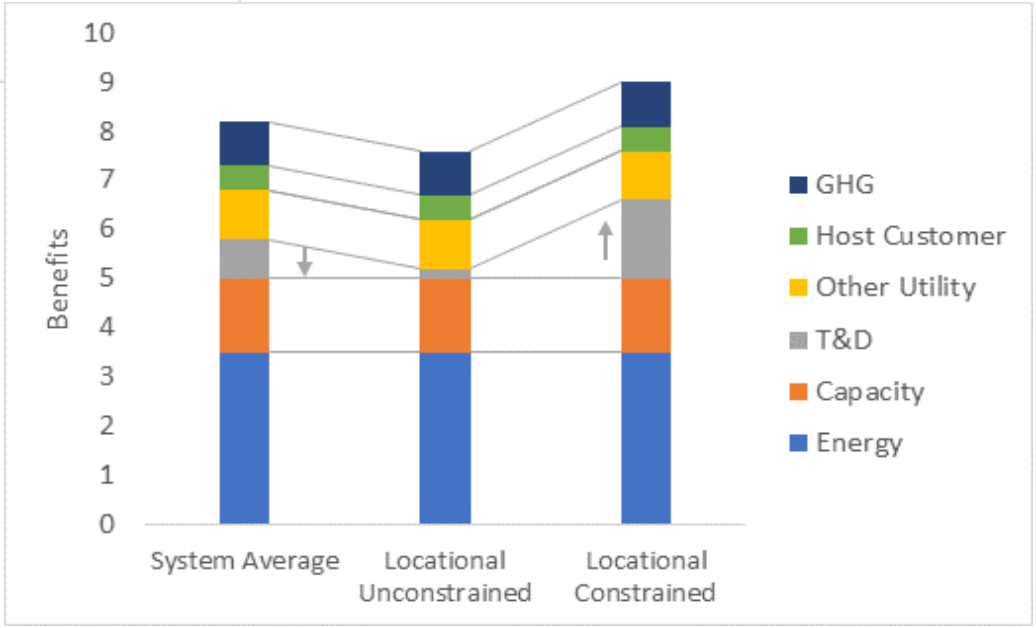
Factors that can affect DER Impacts
Examples

- Types of DERs deployed – *specific use cases*
- DER capabilities and operational profiles
- Who owns and operates the DERs
- Specific locational and temporal impacts
- Potential interactive effects between DERs

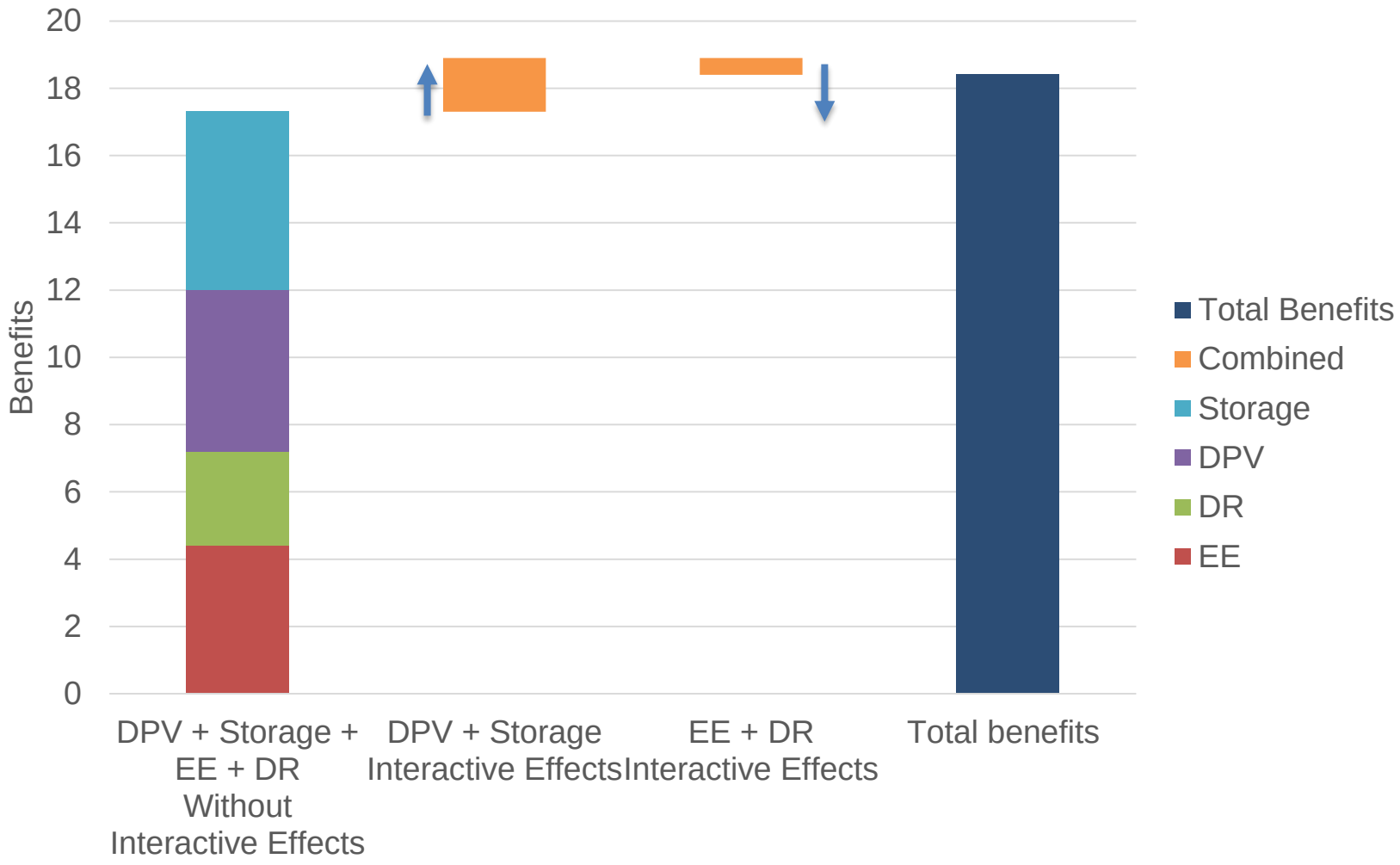
Temporal Impacts on EE Benefits
Hypothetical Example



Location Impacts on DR Benefits
Hypothetical Example



Multiple DER BCA
Example of Interactive Effects



Additional topics/slides from NCEP Dec 9, 2020 Deep Dive Session on BCA

1. Developing a Jurisdiction's **Primary Test** for all DERs
2. Use of **Secondary Tests** and **Prioritizing DERs**
3. Addressing **Rate Impacts**

Kerry – can you add link please? I can't find on NCEP website

NSPM 2021 Planned Efforts

- Repository of methods, tools and techniques for quantifying utility and non-utility system impacts
- BCA algorithm catalog
- ‘Real world' DER BCA use case examples
- BCA on-line training for regulators, evaluators, others
- Technical assistance to support application of the NSPM in selected states

For more information:

NSPM for DERs and supporting resources:

http://www.nationalenergyscreeningproject.org/

Stay informed with the *NESP Quarterly* newsletter:

https://nationalenergyscreeningproject.org/national-standard-practice-manual/news/

Questions?

Julie Michals, Director of Valuation – E4TheFuture

jmichals@e4thefuture.org