

# Toolset for Benefit-Cost Analysis (BCA) of Distributed Energy Resources (DERs) in Michigan

A review of activities from Case U-20898

## Michigan Public Service Commission

Taylor Becker  
Carmen Wagner  
Luke Dennin

January 29, 2025

# Michigan has long pursued a standardized BCA framework for DER assessments

## Summary of NSPM Process in Michigan: MPSC Case U-20898 Activities

Source: Adapted from National Energy Screening Project (2025) – [Link](#)

Steps	References
1. National Energy Screening Project presents to Commission staff and interested parties about NSPM BCA framework in the context of distribution system planning.	N/A
2. Commission staff makes recommendation to the Commission to use the NSPM to develop a consistent BCA test for all DERs.	<a href="#">U-20898-0004</a> (Report)
3. Commission issues order for utilities to develop BCA for DERs guided by the NSPM. Utilities develop BCA framework using NSPM multi-step process, recommending the proposed Michigan-specific jurisdiction specific test (JST) be applied at scale.	<a href="#">U-20898-0005</a> (Order); <a href="#">U-20898-0009</a> (Order); <a href="#">U-20898-0022</a> (Report)
4. Commission invites public comment on the utilities' proposed BCA, focusing on key questions including impacts (or value streams) to include, methodologies to account for impacts, and whether to develop a transparent BCA spreadsheet-based tool.	<a href="#">U-20898-0033</a> (Order)
5. Interested parties file comments responding to the Commission's set of questions.	<a href="#">U-20898-0034 through U-20898-0039</a> (Comments)
6. Commission issues order adopting a BCA framework based on the utilities' proposed JST with modifications per interested party comments—ensuring alignment with Michigan's broader policy goals—and initiating efforts to secure an open-source BCA for DERs tool.	<a href="#">U-20898-0040</a> (Order)
7. Commission issues order announcing partnership with E4TheFuture, ICF, Recurve, and Lawrence Berkeley National Laboratory project partners to develop the open-source BCA for DERs tool.	<a href="#">U-20898-0044</a> (Order)

**Timeframe: Fall 2021 – Fall 2024**

# At present, the primary objective is to secure a spreadsheet-based or similar open-source tool

## ■ **October 12, 2023 Order in MPSC Case U-20898**

- “IT IS ORDERED that the Commission shall launch a collaborative for the purpose of developing a spreadsheet-based or similar open source tool which will establish a new platform as a model for the required benefit cost analysis that accompanies requests for pilots, to be ready for use in 2024.” (Page 30)

## ■ **Staff efforts led to partnership with E4TF, ICF, Recurve, and LBNL team**

- Proposed an open-source BCA for DERs tool aligning with the National Standards Practice Manual and capable of modeling Michigan’s jurisdiction-specific test for DERs

## ■ **November 21, 2024 Order in MPSC Case U-20898**

- “IT IS ORDERED that the Commission Staff shall continue work on the collaborative for the purpose of developing a spreadsheet-based or similar open-source tool which will begin establishing a new platform as a model for the required benefit-cost analysis that accompanies requests for pilots, to be ready for use in 2026.” (Page 5)

# Open-Source Benefit-Cost Analysis Model (OS-BCA Model)

Michigan Benefit-Cost Analysis Tool Collaborative Meeting  
Docket U-20898

January 29, 2025

Julie Michals, E4TheFuture

David Pudleiner, ICF

Adam Scheer, Recurve

Natalie Mims-Frick, LBNL

## Meet the OS-BCA Model Project Team Leads



Adam Scheer  
Recurve  
Principal Analyst



David Pudleiner  
ICF  
BCA Modeler and Evaluator



Julie Michals  
NESP/E4TheFuture  
Director

## Meeting Agenda and Objectives

- 1. Introduction and Background (*15 minutes*)**
- 2. Open-source BCA Model Structure and Capabilities (*25 minutes*)**
- 3. Project Phases and Collaborative Input (*30 minutes*)**
  - Phase I: Input on OS-BCA Model Methodological Options
- 4. Next Steps (*5 minutes*)**
- 5. Q&A Session (*15 minutes*)**

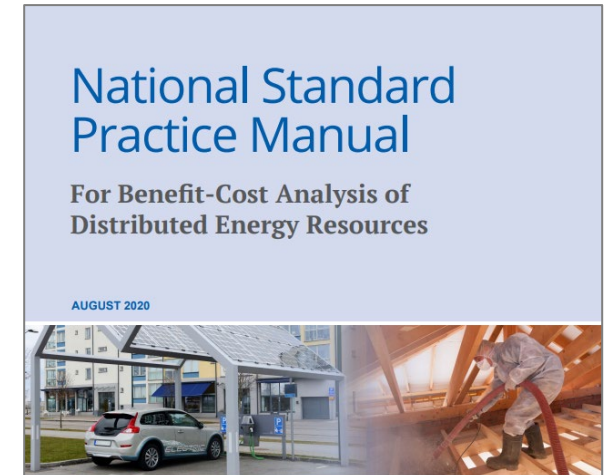
# Background: National Standard Practice Manual

## National Standard Practice Manual (NSPM) for Distributed Energy Resources (DERs)

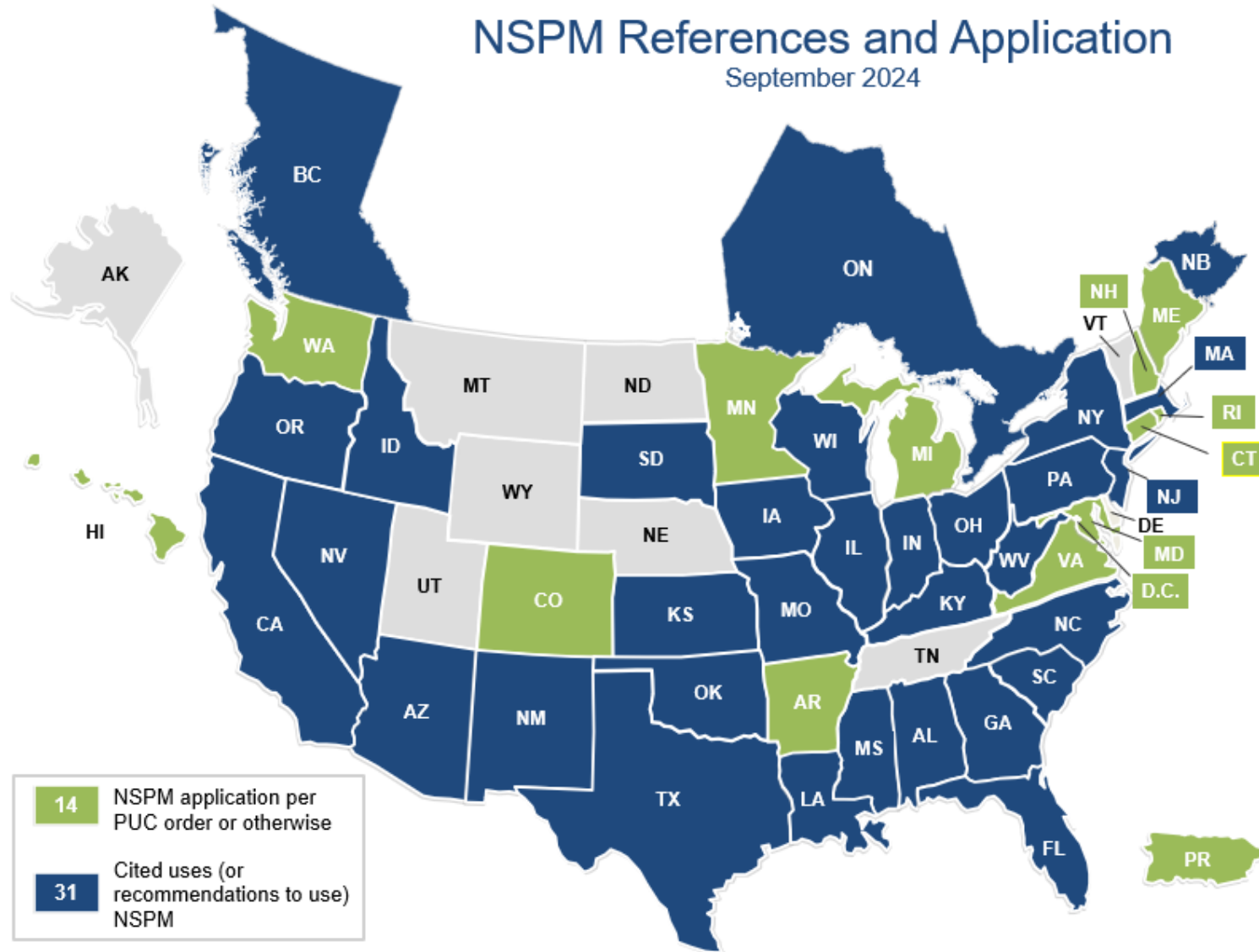
- Benefit Cost Analysis (BCA) guidance increasingly being used by states across the country (2020)
- Guided by sound economic principles
- Addresses full range of DERs

## Methods, Tools & Resources – A Handbook for Quantifying DER Impacts in BCA

- “MTR Handbook” (2022) – companion guidance to the NSPM
- NSPM provides guidance on **what** impacts to include in a jurisdiction’s cost-effectiveness test, while MTR Handbook addressed **how** to quantify DER impacts.



# NSPM Application in the U.S. and Canada





## Why this Open-Source BCA Model Project

Current BCA models are limited because they are:

1. Restricted to traditional cost tests (CA Standard Practice Manual)
2. Designed to address only 1 DER type (e.g., EE, storage, EVs)
3. Proprietary models that are ‘black box’ and lack transparency in input assumptions
  - Open-source models allow users to see algorithms and underlying methodologies
4. Spreadsheet-based models (e.g., excel-based) typically, which are slow and ‘clunky’ in their ability to analyze extensive data
  - Software-based tools have processing capabilities to analyze many measures, multiple DERs, and temporal and location impacts needed for BCA of DERs with transparency and clear presentation of BCA inputs and results
5. Not flexible to allow application of the NSPM BCA framework and use of a jurisdiction specific test (JST)

## Why this Open-Source BCA Model Project (2)

The proposed OS-BCA Model will help to:

- Create transparency for regulators and key parties to understand input assumptions and underlying methodologies.
- Ensure DER portfolios can be modernized and optimized for the mix of resource procurement and policy objectives that programs must achieve.
- Enable DER programs to be valued and procured as competitive grid and carbon-reduction resources.
- Ensure cost-effectiveness results can be compiled and compared consistently from jurisdictions across the country.

## Why this Open-Source BCA Model Project (3)

The OS-BCA tool will empower organizations of all technical abilities to:

- Conduct comprehensive and consistent BCA of DERs using a standardized and transparent platform.
- Evaluate a customized Jurisdiction-Specific Test based on their selection of relevant value streams and compare the results with traditional cost-effectiveness tests or secondary cost tests.
- Incorporate value streams and allow for evaluation at measure, program, and portfolio levels.
- Have the flexibility to customize the Jurisdiction-Specific Test and secondary tests to align with specific policy goals and objectives.
- Enhance decision-making for regulators and energy planners

## OS-BCA Model Project: Funding and Team Roles

Project is funded by US Department of Energy with support from E4TheFuture, plus in-kind services from E4TheFuture, as well as some in-kind from ICF and Recurve.

### **E4TheFuture: Coordinate project team**

- Convene and lead stakeholder input to inform model functionality and scope.
- Provide guidance and strategic direction throughout project.
- Promote, disseminate, and support open-source tool within the industry.

### **ICF: Act as overall project manager, support E4 coordination with stakeholders.**

- Develop value streams, time series calculations, and evaluation methods.
- Map DER impact categories and develop input file structure to align with NSPM.
- Lead stakeholder meetings on model functionalities, tool interactivity and feedback sessions.
- Develop validation cases to ensure compliance with methods.

### **Recurve: Design software architecture for the open-source BCA tool, building on existing FLEXvalue**

- Develop value streams, time series calculations, and evaluation methods.
- Implement user-friendly interface for seamless interaction with the BCA tool.
- Integrate tool with existing analysis frameworks using standardized CSV formats.
- Conduct thorough testing, bug fixing, and quality assurance of the tool.

### **LBNL: Manage subcontracts with ICF and Recurve**

- Identify data sources/inputs that can be leveraged from DOE and National Lab resources.
- Assist with technical assistance.

## OS-BCA Model Structure and Capabilities

## What is 'Open-Source'?

The OS-BCA tool will be a modern software system developed using Python\* and SQL\* and will offer two user pathways:

- Standalone usage and
- Integration into existing analysis frameworks.

The OS-BCA tool will:

- Provide user-friendly interfaces, Excel input templates, and formatted Excel outputs for efficient data input and extraction; and
- Develop a set of validation cases to ensure compliance with NSPM methods.

\*Python is a high-level programming language most commonly used in [website development](#), [software development](#), task automation, [data analysis](#) and [data visualization](#).

\* [SQL](#) is a full structured query computer language designed for eliciting information from databases.

## Open-Source BCA Modeling 'Pathways'

The tool will support two types of user pathways.

- **Stand-alone pathway** - will enable users to input data using a straightforward Excel input template.
  - Data Input/Output: Stand-alone tool will extract data from the input template and export summary results to a “human-readable” Excel workbook, as well as detailed results to CSV files.
- **Integrated pathway** - Users can integrate the tool into their existing analysis frameworks. The open-source tool allows users to add in or utilize the codebase to fit into their existing BCA modeling programs.
  - Data Input/Output: will support data input and output through formatted CSVs for seamless integration with existing frameworks

# How the OS-BCA Can Fit Into Your Workflow

## Establish JST Framework and Value Stream Data

Establish JST Based on Policy Requirements and NSPM Guidance

- Identify Value Streams
- Determine Cost Structure

Establish Raw Value Stream Data

- Determine \$/MWh or \$/Therm or other inputs for time value streams
- Determine any multipliers/adders etc.

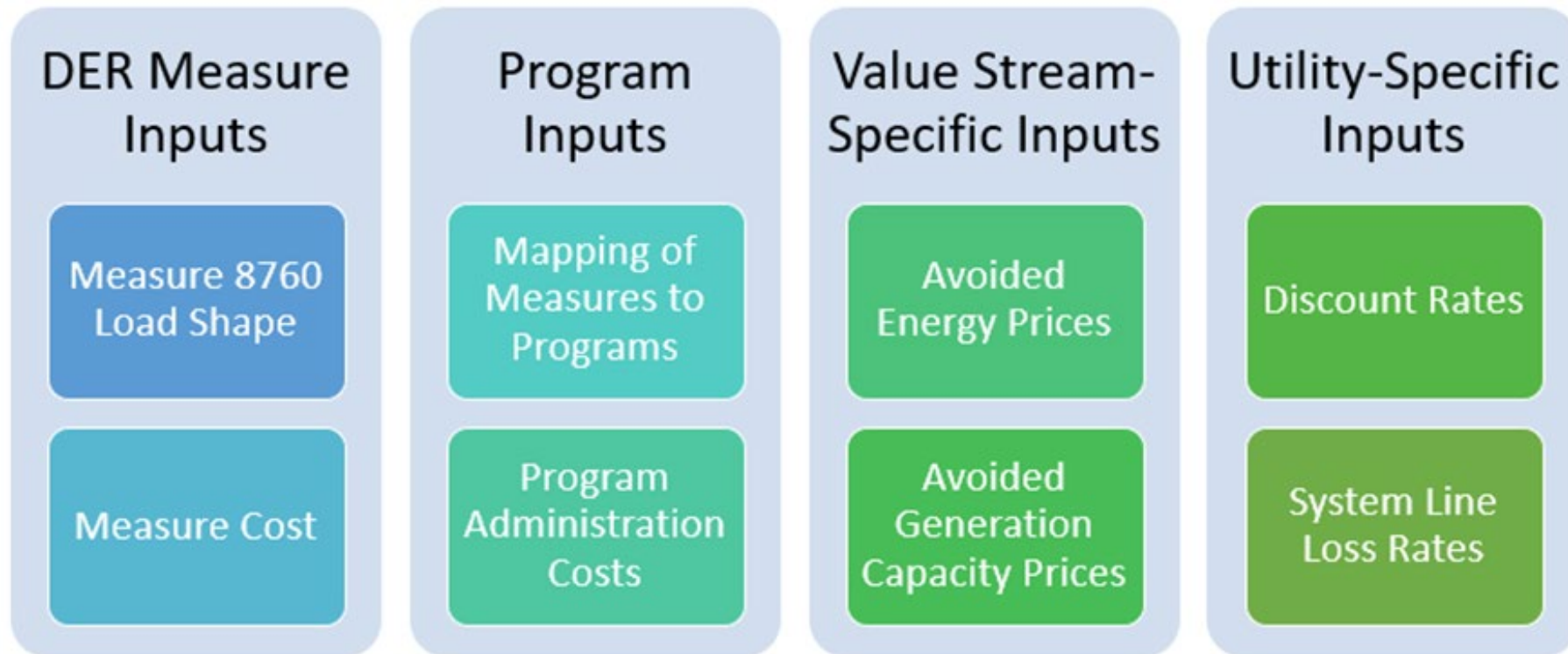
## OS-BCA Tool

Incorporate value stream data into OS-BCA software and configure JST

Execute JST via OS-BCA input template



## Categories of Input Variables (with example inputs, depending on JST)



## Example of Input Interface

	A	B	C	D	E	F	G
1	<b>Test Set Up</b>						
2	<b>Enter Value Stream Specific Information and set up your cost effectiveness tests</b>						
3							
4	Enter Nominal Discount Rates here:						
5	Utility Discount Rate (%)	6.41%					
6	Participant Discount Rate (%)	5.40%					
7	Societal Discount Rate (%)	3.10%					
8	Auxilliary Discount Rate (%)	2.80%					
9							
10							
11	Enter Analysis First Year here:						
12	Base Year:	2024					
13							
14							
15							
16							
17							
18							
19							
20							
21							

JST Setup:	
Value Stream	Include Flag
Energy Generation	Yes
Generation Capacity	Yes
Avoided Natural Gas Costs	No
Distribution Deferral and O&M	Yes
Financial Incentives	No
Utility Lost Revenue	No
Host Customer DER Costs	Yes
Program Administration Costs	Yes
Interconnection Fees	Yes
Host Customer Reliability	Yes
Host Customer - NEI	Yes
GHG Emissions	Yes
Public Health	Yes
Total Bidder Payments	Yes
Methane Emissions Impact	Yes

## Example of Input Interface (2)

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	<b>GHG Longrun Marginal Emissions Rates</b>														
2	Input Longrun Marginal Emissions Rates here (kg/kWh)														
3															
4	Hour	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037
5	1	0.225	1.173	0.805	0.688	0.870	0.604	0.247	0.347	0.343	0.249	0.348	0.000	0.351	0.000
6	2	0.225	1.171	1.133	0.912	0.746	0.602	0.247	0.348	0.343	0.248	0.000	0.000	0.000	0.000
7	3	0.225	1.171	0.803	0.912	0.868	0.602	0.249	0.346	0.347	0.248	0.000	0.000	0.350	0.000
8	4	0.225	1.172	1.127	0.692	0.868	0.601	0.469	0.346	0.347	0.249	0.000	0.000	0.344	0.000
9	5	0.225	1.173	1.135	0.689	0.752	0.602	0.470	0.347	0.348	0.251	0.349	0.000	0.345	0.352
10	6	0.247	1.177	1.140	0.919	0.874	0.603	0.472	0.344	0.350	0.250	0.343	0.000	0.351	0.352
11	7	0.225	0.850	1.105	0.252	0.886	0.600	0.250	0.346	0.352	0.252	0.349	0.349	0.353	0.354
12	8	0.270	0.696	1.129	0.251	0.250	0.613	0.418	0.253	0.252	0.588	0.350	0.344	0.348	0.354
13	9	0.239	1.008	1.129	0.251	0.883	0.608	0.473	0.347	0.348	0.252	0.000	0.000	0.354	0.349
14	10	0.000	1.156	0.823	1.011	0.614	0.000	0.353	0.000	0.000	0.350	0.000	0.000	0.000	0.000
15	11	0.000	1.155	0.489	0.766	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	12	0.000	1.155	0.488	1.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
17	13	0.000	1.041	0.488	0.997	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
18	14	0.000	0.928	0.242	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
19	15	0.000	1.154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
20	16	0.000	1.153	0.000	0.764	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
21	17	0.269	1.023	0.251	0.820	0.250	0.753	0.327	0.251	0.762	0.701	0.000	0.000	0.704	0.355
22	18	0.349	1.023	0.252	0.823	0.251	0.759	0.125	0.588	0.766	0.219	0.762	0.768	0.045	0.706
23	19	0.485	0.582	0.253	0.382	0.326	0.590	0.225	0.218	0.218	0.936	0.763	0.770	0.222	0.590
24	20	0.397	0.632	0.327	0.272	0.255	0.325	0.670	0.147	0.165	0.225	0.326	0.932	0.225	0.067

## OS-BCA Model Outputs

# DER Measure / Program / Portfolio Outputs

Net Present Value of Each Value Stream

Net Benefits

Cumulative Load Shape

Cumulative Fuel Impacts

Cumulative Emissions Impacts

JST

Traditional Cost Test Results (PAC/UCT, TRC, SCT, PCT)

Rate Impact Analysis Metrics (RIM, Percent of Rate Impact)

# OS-BCA Model Outputs: NPV Benefits

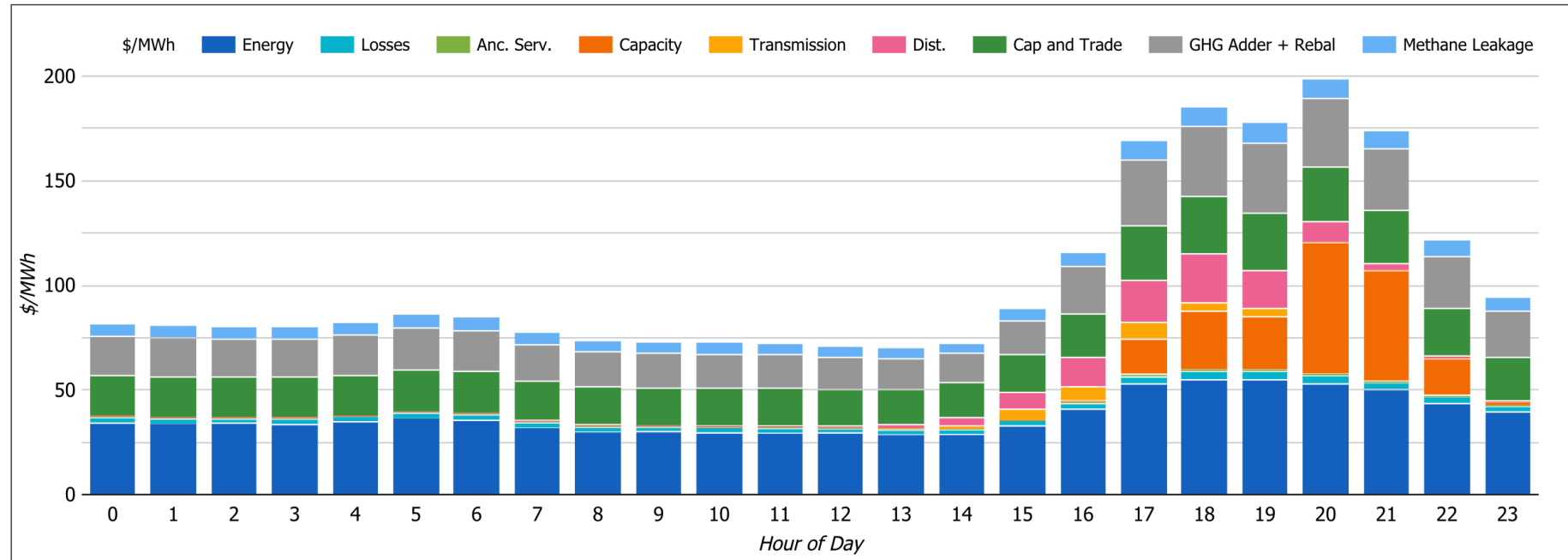
## Electricity

\$/MWh  
103.51

Peak \$/MWh  
269.32

Off Peak \$/MWh  
91.10

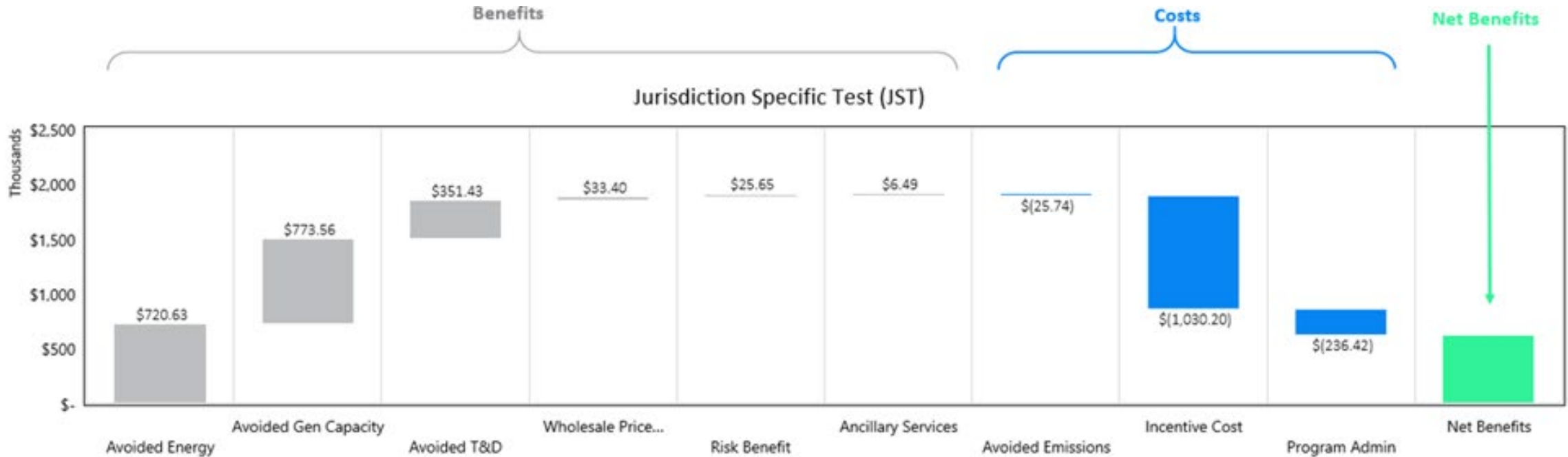
Marginal GHG Tons/MWh  
0.31



Example of BCA tool output: stacked bar chart that breaks down the contribution of each value stream included in the JST

# OS-BCA Model Outputs

## NPV Stream Benefits and Costs

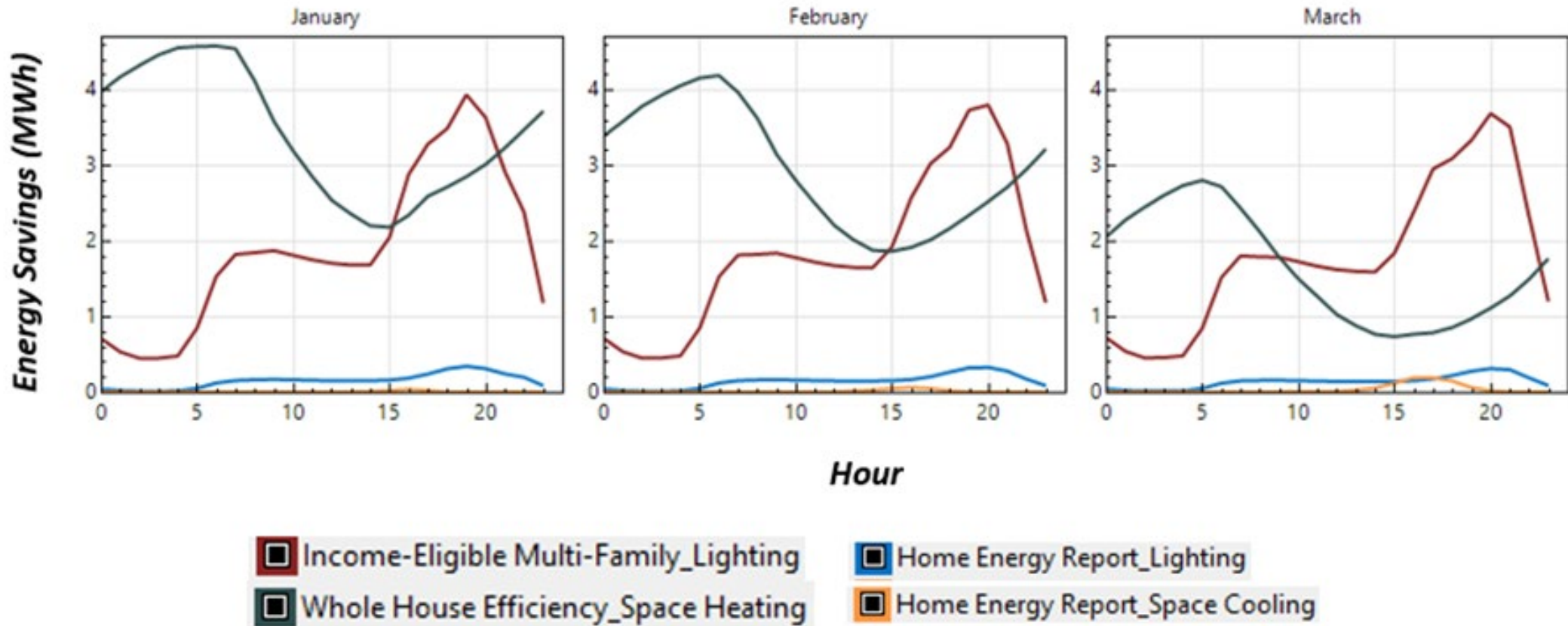


*Example of BCA tool output, waterfall chart of the net present value of each value stream included in the JST and cumulative net benefits*



# OS-BCA Model Outputs

## Hourly Load Shapes



*Example BCA tool output, program hourly savings load shapes averaged by month (only showing first 3 months of the year for example)*

# **OS-BCA Model Development Project Phases and Collaborative Input**



## OS-BCA Model Development - Project Phases and Schedule

**Phase 1: Assessment and Requirement Gathering**

**Phase 2: Enhancements and Customization**

**Phase 3: User Interface and Integration**

**Phase 4: Testing and Refinement**

**Phase 5: Documentation and Release**

**Phase 6: Continuous Improvement and Support**

**Phase 7: Outreach and Engagement with States**

### **Project Schedule:**

- Start date - January 2025
- Completion in approx. 12 months, with training and state technical assistance starting in Q1 2026

# OS-BCA Model Development

## Core model vs state specific configuration

- **OS-BCA ‘core’ model**
  - Collaborative input to proposed model capabilities, features, interface and usability, methodological options, inputs and outputs
- **State specific configuration**
  - OS-BCA model can then be configured to Michigan and other interested states -- each state to be compatible with its JST and key BCA parameters.
    - Note: this involves tailoring the model for Michigan use **using the ‘core’ model framework**, this does not include additional features that Michigan might want to add, which would require additional time and funding
  - Downloadable and usable by range of users

# Collaborative Meeting Example Topics/ Questions

- Back End Model Requirements
  - What type of calculation methodologies are required to handle each value stream?
  - What granularity of data should the tool require versus have options for?
- Front End Model Requirements
  - How should inputs be grouped for clarity?
  - What selections and questions up front could help reduce screen clutter and input overload?
- Model Mechanics and Interface
  - What's intuitive and what's clunky?
  - What improvements would you make to the tool so that it would better suit your needs?

# OS-BCA Model Development

## Collaborative (and other party) Input during Project Phases

### **Phase 1: Assessment and Requirement Gathering**

- Meeting with Michigan Collaborative to discuss required value streams and methodologies, including technical sub-group meeting (January 29 through mid-March)
- Broader state interested party engagement session possible (early April)

**Phase 2: Enhancements and Customization** – Project team to incorporate collaborative and other state feedback

### **Phase 3: User Interface and Integration**

- Meeting with Michigan Collaborative to provide ‘visioning’ session and feedback on model interface development, including technical sub-group meeting (late April / early May)
- Broader state interested party engagement session possible (early June)

### **Phase 4: Testing and Refinement**

- Beta version of tool to Michigan Collaborative for review (late October)
- Michigan Collaborative meeting to gather feedback and validate beta version of the tool and performance in the real world (early November)

**Phase 5: Documentation and Release** (December 2025-January 2026)

**Phase 6: Continuous Improvement and Support**

**Phase 7: Outreach and Engagement with States** (Q1 2026) – see next slide

## Phase 7: State Outreach and Engagement

The project team will provide a range of services to ensure that states have:

1. A basic understanding of the model, including its features, capabilities, user interface and pathways available to states, along with examples of inputs and outputs, via 2-3 webinars.
2. Tutorials and instructional videos to assist users in effectively utilizing the BCA tool.
3. In-depth training on each of the two user pathways—standalone and integrated—as described in bullet 5 of the Model Capabilities section above.
4. TBD: Access to on-demand state technical assistance offering ‘office hours’ or direct TA to assist states in configuring the tool for their jurisdiction specific test. This option could also involve providing TA for a cohort of states.

# **Phase I: Collaborative Input on OS-BCA Model Methodological Options**

## Phase I - Collaborative Input: OS-BCA Model Methodological Options

The model will be designed to provide options for how a jurisdiction accounts for its different JST value streams.

Three types of valuation options:

- **Time series value streams** (e.g., energy, capacity, line losses etc.)
- **Adders** - these values are singular \$ additional or % adders to the benefits.
- **Multipliers** - benefits are multiplied by a specific factor when a project meets a certain metric.

Methodological approaches will be based on NESP's  
[Methods, Tools, and Resources \(MTR\) Handbook](#)

# Phase I – Collaborative Input: Methodological Options for BCA Impacts

(Michigan JST / Societal Test impacts U-20898)

Impact Categories	Approach (Monetized, Quantified, and/or Qualitative)	Impact Categories	Approach (Monetized, Quantified, and/or Qualitative)
<b>ELECTRIC UTILITY SYSTEM</b>		<b>GAS UTILITY SYSTEM IMPACTS</b>	
Energy Generation	Monetized	Fuel and Variable O&M	Monetized
Capacity	Monetized	Capacity	Monetized
Environmental Compliance	Monetized*	Environmental Compliance	Monetized*
RPS Compliance	Monetized*	Market Price Effects	Monetized*
Market Price Effects	Monetized*	Financial Incentives	Monetized
Ancillary Services	Monetized	Program Administration Costs	Monetized
Transmission Capacity	Monetized	Utility Performance Incentives	Monetized
Transmission System Losses	Monetized	Credit and Collection Costs	Monetized*
Distribution Capacity	Monetized	Risk	Monetized*
Distribution System Losses	Monetized	Reliability	Monetized
Distribution O&M	Monetized	Resilience	Monetized*
Distribution Voltage	Qualitative		
Financial Incentives	Monetized		
Program Administration Costs	Monetized		
Utility Performance Incentives	Monetized		
Credit and Collection Costs	Monetized*		
Risk	Monetized*		
Reliability	Monetized		
Resilience	Monetized**		
<b>SOCIETAL IMPACTS</b>		<b>HOST CUSTOMER/PARTICIPANT IMPACTS</b>	
Resilience	Monetized*	Measure Costs	Monetized
Greenhouse Gas Emissions	Quantitative	Transaction Costs	Monetized*
Other Environmental	Monetized*	Interconnection Fees	Monetized
Public Health	Monetized*	Risk	Qualitative
Economic Development / Jobs	Monetized*	Reliability	Qualitative
Energy Security	Monetized*	Resilience	Qualitative
		Tax Incentives and Donations	Monetized
		Non-Energy Impacts (Low Income)	Monetized*
		Non-Energy Impacts (Non-Low Income)	Qualitative
		Other Fuel	Monetized

\*Quantified, if monetization is not possible \*\*Qualitative or quantified, if monetization is not possible



# Collaborative Input - OS-BCA Model Methodological Options

## Example: Energy Generation

Example Value Stream	Description	Relevant Language from MI Documentation	Assumptions	Calculation Type(s)	Calculation Methodology
Energy Generation	The production or procurement of energy (kWh) from generation resources on behalf of the customers	<p>From Joint Utility BCA Proposal (page 26): "Use the relevant utility's avoided cost (as set in an IRP or PURPA avoided cost proceeding for energy generation)."</p> <p>From Order 20898: No relevant language</p>	Hourly avoided costs available from IRP process	Time Series Value Stream	<p>Energy generation impacts calculated based on hourly avoided energy prices from IRP multiplied by 8760 load shape impacts from DER.</p> <p>General line loss figures for distribution and transmission used to go from load impacts at the meter level to at the generation level</p>

*Note: We will convene a technical subgroup to review the methods more specifically.*

# Collaborative Input - OS-BCA Model Methodological Options



## Example: RPS Compliance

Value Stream	Description	Relevant Language from MI Documentation	Assumptions	Calculation Type(s)	Calculation Methodology
Energy: RPS Compliance	Actions to comply with renewable portfolio standards or clean energy standards	<p>From Joint Utility BCA Proposal (page 32): “Impact not material across examples of pilot at scale.”</p> <p>From Order 20898 (Page 26): “The Commission finds that the BCA proposal should include the following impact categories (in addition to those presented in the BCA proposal) in future BCAs: (1) for electric utility system impacts, Generation: Environmental Compliance, RPS Compliance, and Market Price Effects</p>	<p>A) Hourly/Yearly avoided RPS prices available from IRP</p> <p>B) IRP modeling doesn’t account for RPS, avoided energy multiplier used as proxy</p>	<p>A) Time Series Value Stream</p> <p>B) Multiplier</p>	<p>A) The RPS compliance impact is determined using hourly and/or annual prices from the IRP, multiplied by the 8760 load shape impacts from DER. General line loss figures for distribution and transmission are applied to convert load impacts from the meter level to the generation level</p> <p>B) Avoided energy benefit/cost multiplied by static factor as RPS proxy</p>

*Note: We will convene a technical subgroup to review the methods more specifically.*

# Collaborative Input - OS-BCA Model Methodological Options

## Example: Participant Non-Energy Impacts (Low-Income)

Value Stream	Description	Relevant Language from MI Documentation	Assumptions	Calculation Type(s)	Calculation Methodology
Participant: Non-Energy Impacts (Low Income)	Non-energy benefits and costs that affect low-income host customers or participants	<p>From Joint Utility BCA Proposal (page 27): “Qualitative. Will vary by pilot. The MiEJScreen, when available, is an example of a tool that may be used to guide location focus for pilots.”</p> <p>From Order 20898 (Page 26): “The Commission finds that the following impact categories should be converted to monetized treatment wherever possible and quantified if monetization is not possible: ...(4) for host customer/participant impacts, Non-Energy Impacts (Low-Income).”</p>	Low-Income non-energy impacts are included in program cost-effectiveness testing based on multipliers specific to this customer demographic	Multiplier Value Stream	Non-Energy Benefits are calculated as a percentage of the total utility energy benefits. Unique multipliers allowed for each program to allow for accounting for different factors such as market rate or low-income customer participation.

*Note: We will convene a technical subgroup to review the methods more specifically.*

## Next Steps

Project team to complete value stream table, mapping out the quantification methodologies currently used for the value streams for Michigan (on slide 32), where available, as compared to the methodologies anticipated for the OS-BCA tool.

- Identify MI key contact(s) e.g., staff, utilities, who can provide information on methodologies used to calculate current BCA value streams. *Any contacts we can confirm today?*
- Identify parties interested in being on a small technical subgroup to review methodologies. *Any candidates we can confirm today?*
- Project team to circulate value stream table comparison to technical subgroup for review and comment (mid- to late February).
- Project team to review technical subgroup comments on proposed value stream methodologies and meet (if necessary) to discuss any areas where anticipated model methodologies and capabilities don't meet Michigan requirements (early to mid March)
- Report out to Michigan Collaborative on methodology approaches/options (late March)

# Q&A

# Thank you!

Julie Michals – E4TheFuture  
[jmichals@e4thefuture.org](mailto:jmichals@e4thefuture.org)

Adam Scheer - Recurve  
[adam@recurve.com](mailto:adam@recurve.com)

David Pudleiner - ICF  
[David.Pudleiner@icf.com](mailto:David.Pudleiner@icf.com)

Natalie Mims Frick - LBNL  
[nfrick@lbl.gov](mailto:nfrick@lbl.gov)