OpenBCA Step by Step Guide

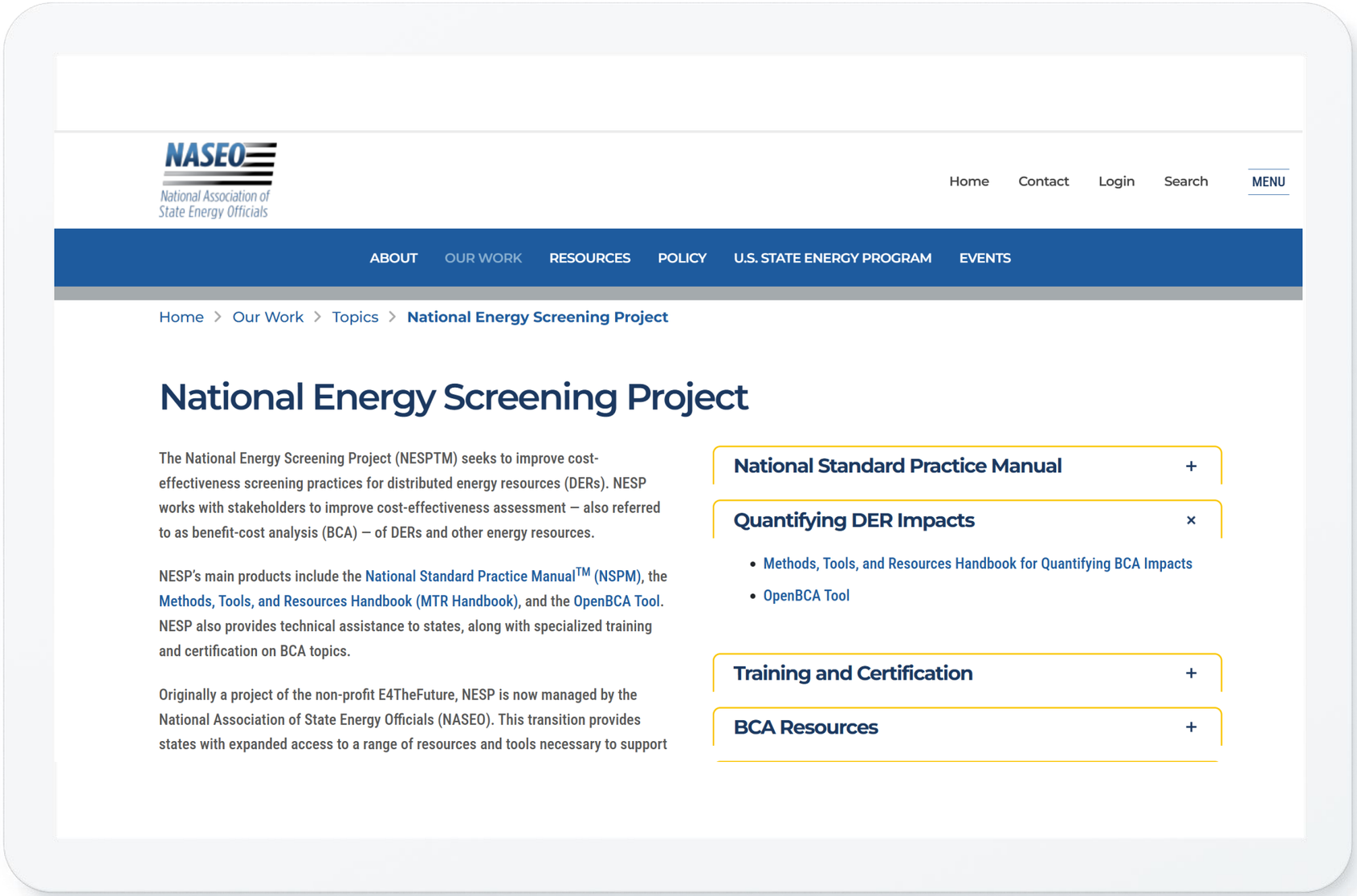
An NSPM-Based Benefit-Cost Analysis Tool for Grid-Edge Resources

Developed by NESP™ with support from the U.S. Department of Energy • NASEO• ICF • Recurve • Lawrence Berkeley National Laboratory

National Energy Screening Project Webpage – NESP | NASEO

The National Energy Screening Project (NESP) webpage serves as the central hub for resources supporting best practices in benefit-cost analysis (BCA) of distributed energy resources (DERs).

Hosted by NASEO, the NESP webpage provides access to NESP's core tools and guidance, including the National Standard Practice Manual (NSPM), the Methods, Tools & Resources (MTR) Handbook, and the OpenBCA Tool.



NSPM Background - National Standard Practice Manual | NASEO

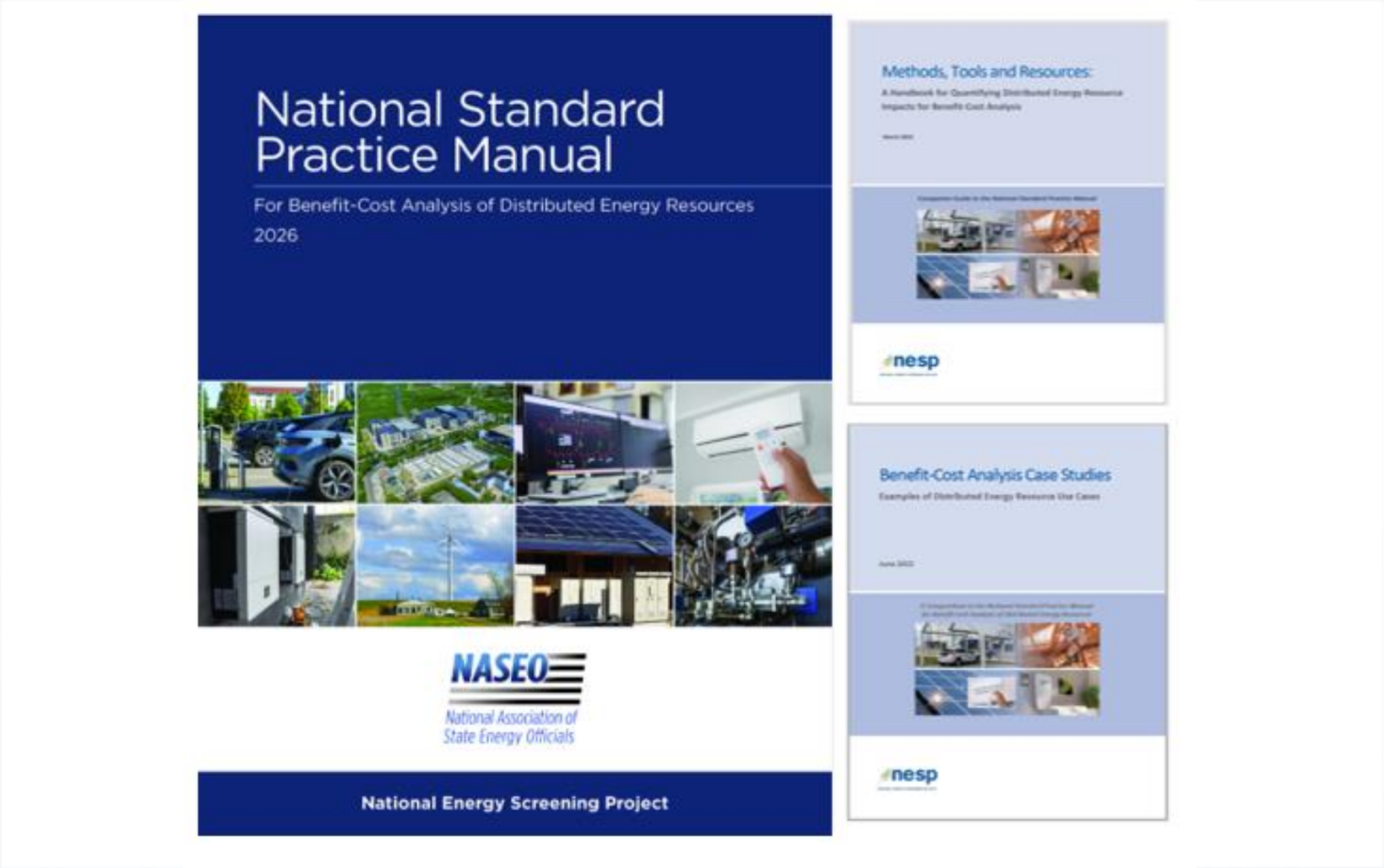
The National Energy Screening Project (NESP) is a stakeholder organization that works to improve cost-effectiveness screening practices for distributed energy resources (DERs).

The NSPM for DERs is a:

- Comprehensive framework for cost-effectiveness assessment of DERs
- Set of policy-neutral, non-biased, and economically-sound principles, concepts, and methodologies to support single- and multi-DER benefit-cost analysis (BCA)
- Guide for determining which inputs and impacts should be included in BCA tests

The MTR Handbook provides guidance on how to determine inputs to BCA tests

BCA Case Studies demonstrate application of NSPM and MTR Handbook guidance

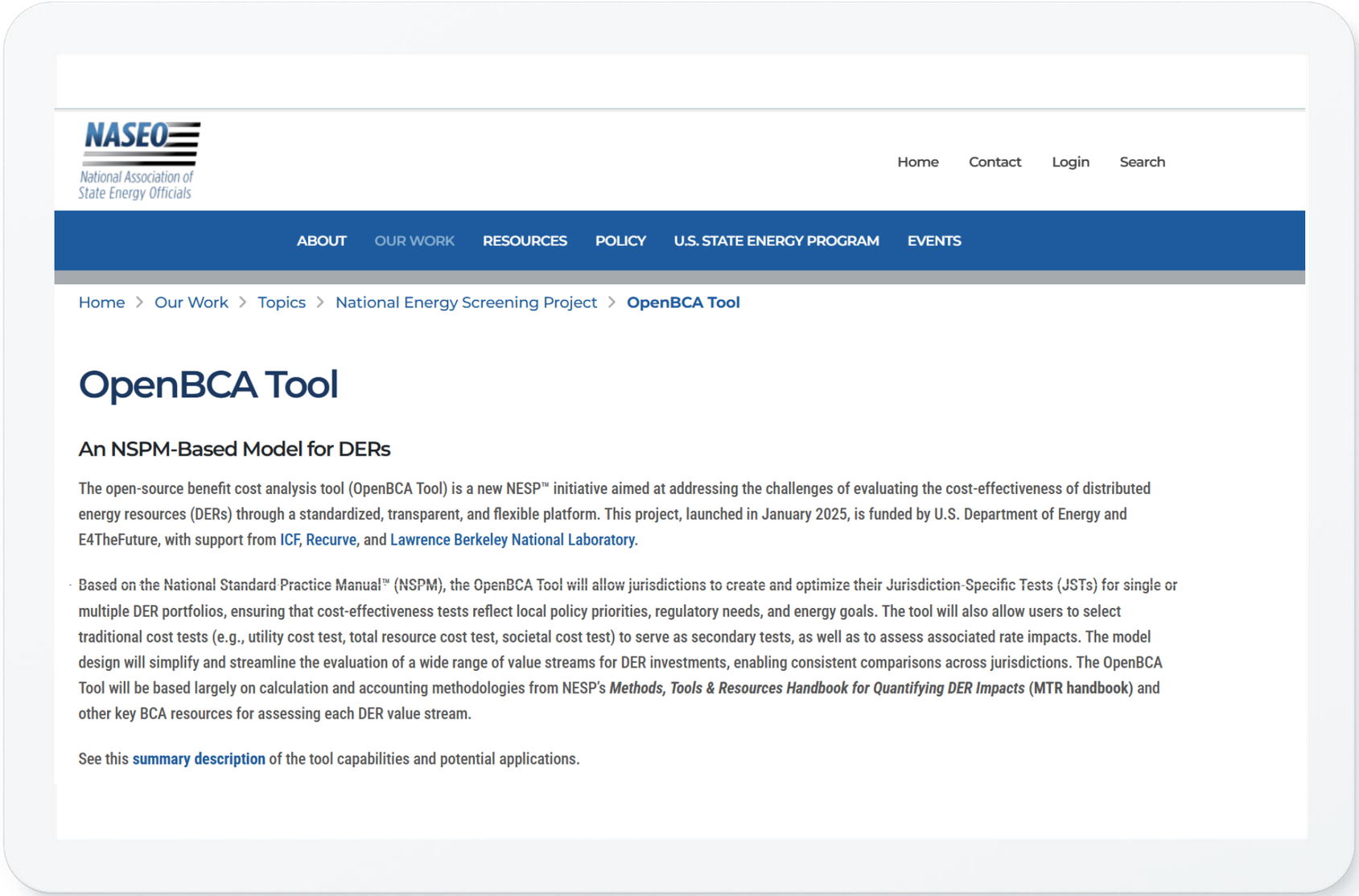


Tool Overview - OpenBCA Tool | NASEO

Users can access the OpenBCA Tool webpage by navigating to:

Our Work → Topics → National Energy Screening Project, and selecting OpenBCA Tool, or directly under the "Quantifying DER Impacts" subsection.

The webpage provides a high-level overview of the OpenBCA Tool's purpose, scope, and key capabilities, including its alignment with the National Standard Practice Manual (NSPM) and its role in supporting jurisdiction-specific benefit-cost analysis of DERs.



NASEO
National Association of State Energy Officials

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Home > Our Work > Topics > National Energy Screening Project > OpenBCA Tool

OpenBCA Tool

An NSPM-Based Model for DERs

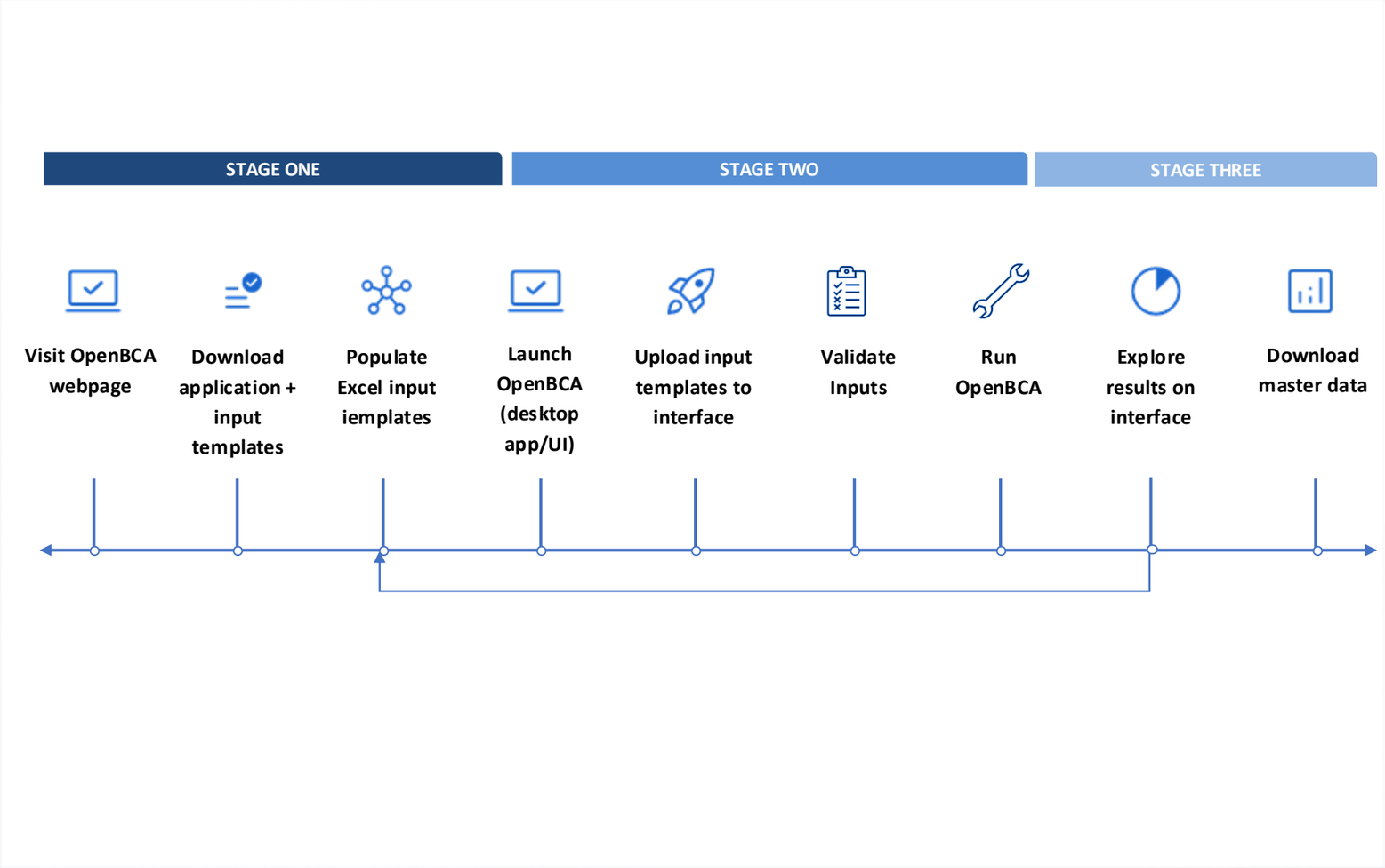
The open-source benefit cost analysis tool (OpenBCA Tool) is a new NESP™ initiative aimed at addressing the challenges of evaluating the cost-effectiveness of distributed energy resources (DERs) through a standardized, transparent, and flexible platform. This project, launched in January 2025, is funded by U.S. Department of Energy and E4TheFuture, with support from ICF, Recurve, and Lawrence Berkeley National Laboratory.

Based on the National Standard Practice Manual™ (NSPM), the OpenBCA Tool will allow jurisdictions to create and optimize their Jurisdiction-Specific Tests (JSTs) for single or multiple DER portfolios, ensuring that cost-effectiveness tests reflect local policy priorities, regulatory needs, and energy goals. The tool will also allow users to select traditional cost tests (e.g., utility cost test, total resource cost test, societal cost test) to serve as secondary tests, as well as to assess associated rate impacts. The model design will simplify and streamline the evaluation of a wide range of value streams for DER investments, enabling consistent comparisons across jurisdictions. The OpenBCA Tool will be based largely on calculation and accounting methodologies from NESP's ***Methods, Tools & Resources Handbook for Quantifying DER Impacts*** **(MTR handbook)** and other key BCA resources for assessing each DER value stream.

See this **summary description** of the tool capabilities and potential applications.

OpenBCA User Flow

OpenBCA User Flow: Download the application and Excel input templates, populate the Configuration and Program Input workbooks, then launch OpenBCA to upload files, run validations, explore results, and export downloadable output tables for reporting and further analysis.



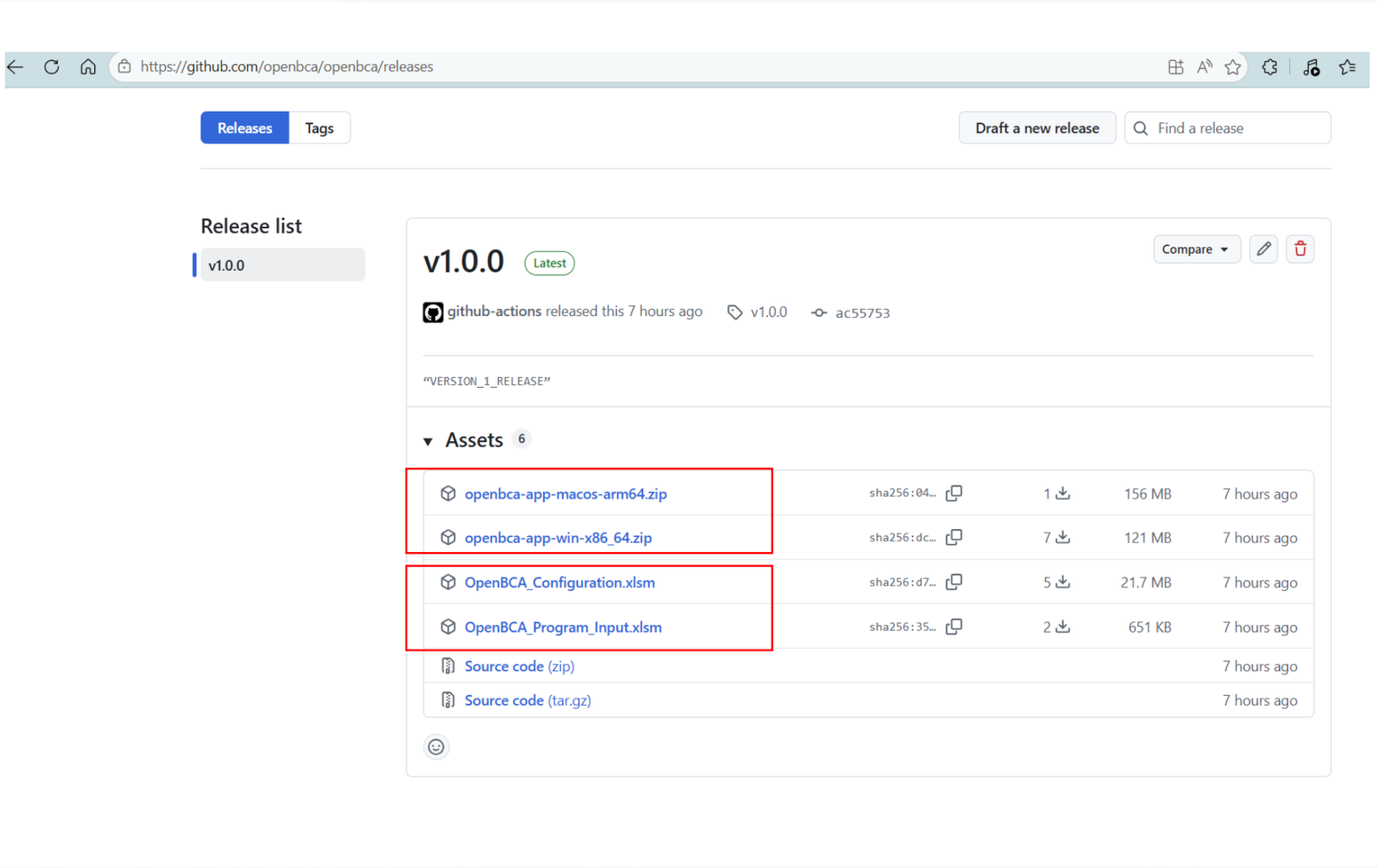
Iterative workflow: OpenBCA is designed to be re-run as assumptions, avoided costs, or program data change. Users should expect to move back and forth between input preparation and results review.

Step 1: Getting Started - Download OpenBCA from GitHub Repository

The OpenBCA webpage is the primary download hub for the application, input templates, and supporting resources.

Download steps:

- From the Download Software section, select the installer for your operating system (Windows or macOS)
- Download the required Excel input templates for preparing analysis inputs



Important note:
Depending on your organization's security policies, you may need IT approval to install or run the OpenBCA application

Step 1: Getting Started - Extract zip file and run tool

The installer folder contains two subfolders and one executable file:

- openbca-app.exe
  Launches the application.

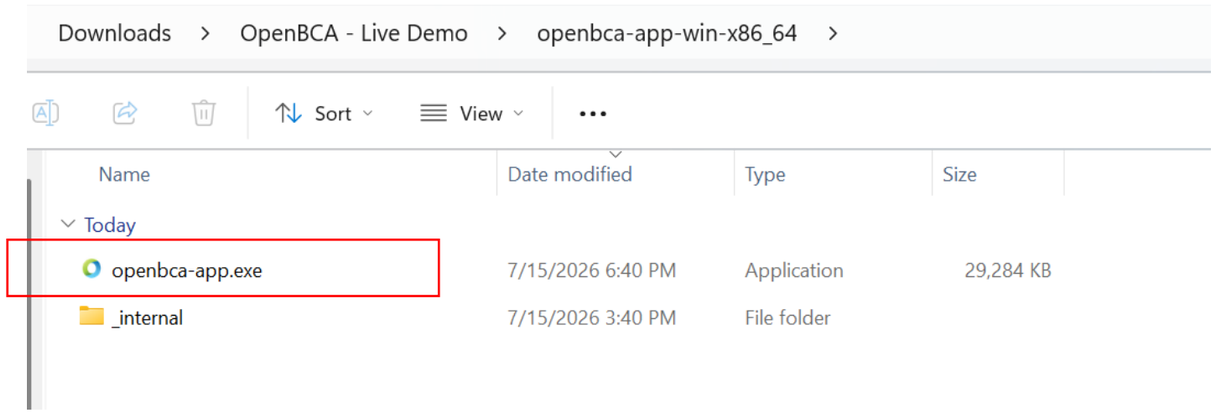
- _internal
  Contains system files and dependencies required for OpenBCA to run.

  Do not modify this folder unless you have technical expertise.

Input Templates
Contains the two input files required to run the model.

Next Step
To start the application, double-click openbca-app.exe.

Important note:
Depending on your organization's security policies, you may need IT approval to install or run the OpenBCA application



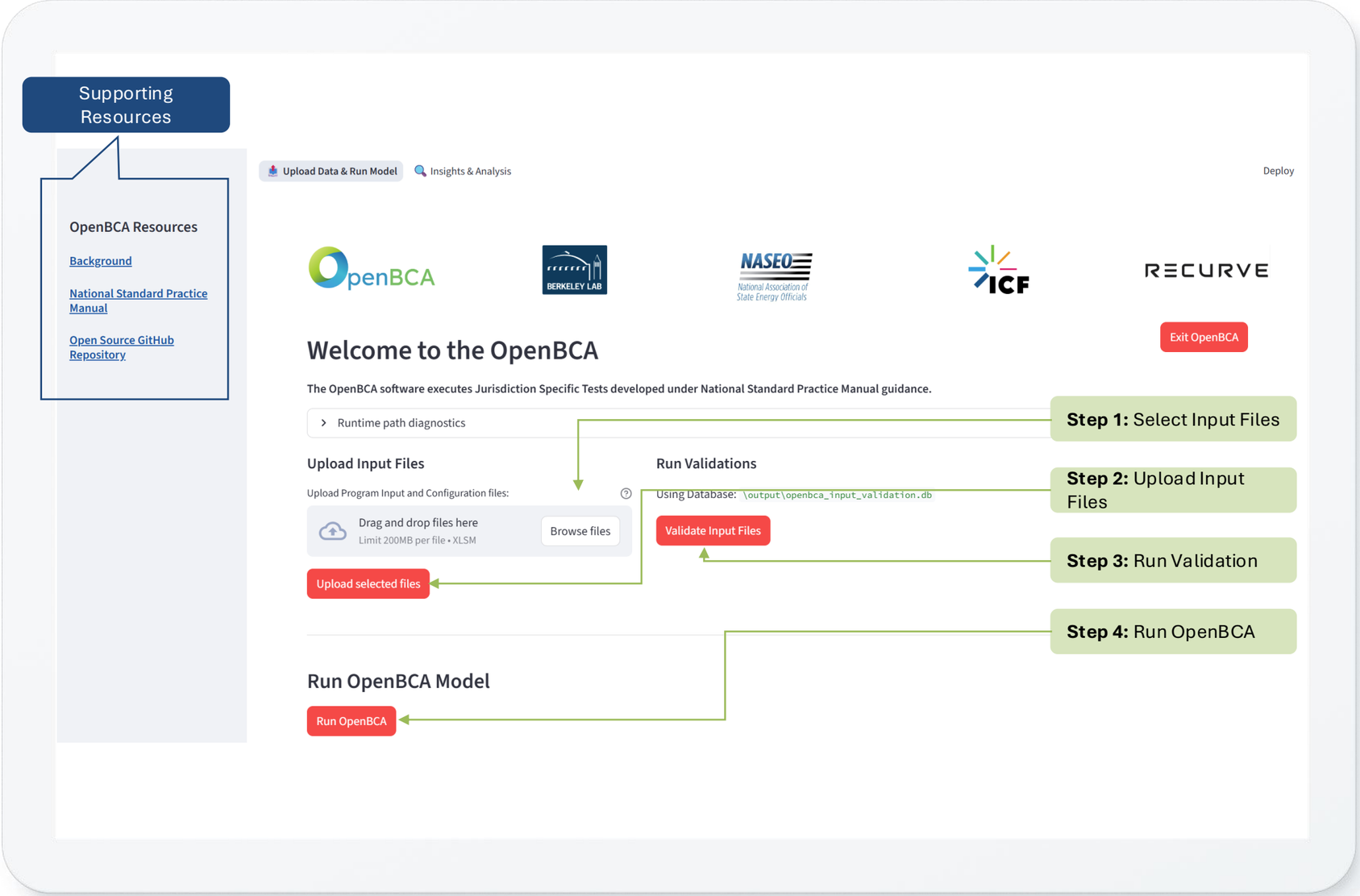
Step 1: Getting Started - Home Page

The OpenBCA Home Page is the central workspace for running an analysis. From this page, users upload prepared input files, validate inputs, run the OpenBCA model, and access results.

This page supports the following workflow steps:

- Upload Configuration and Program input files
- Run automated input validations
- Run the OpenBCA model
- Review outputs and download master data
- Accessing supporting resources and documentation

Important note:
Input files must be uploaded and validated before running the model



Step 1: Getting Started - Input Files

OpenBCA requires two Excel input files to run an analysis:

- Configuration File
  - Defines system-level assumptions and Jurisdiction-Specific Test (JST) settings (*e.g.*, value streams, discounting, line losses).
- Program Input File
  - Contains program- or measure-level data, including participation, savings, and costs.

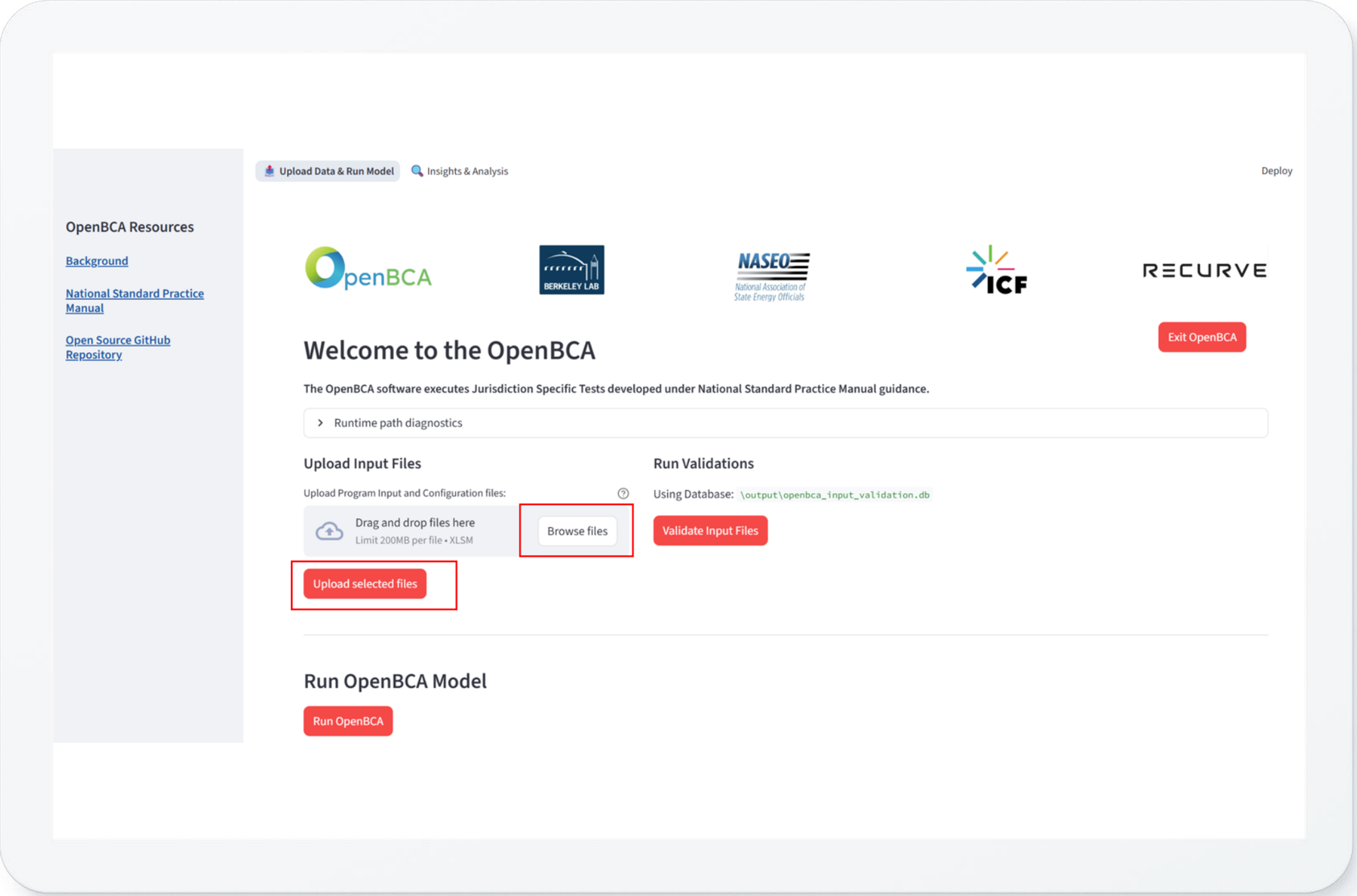
Before uploading:

- Use the blank template provided in the input templates folder or download from the OpenBCA webpage
- Populate both files using jurisdiction-specific policies and program data

To upload files in OpenBCA:

- Select Browse files or drag and drop both input files
- Click Upload selected files to load them into the tool

Both input files must be uploaded before proceeding to validation and model execution.



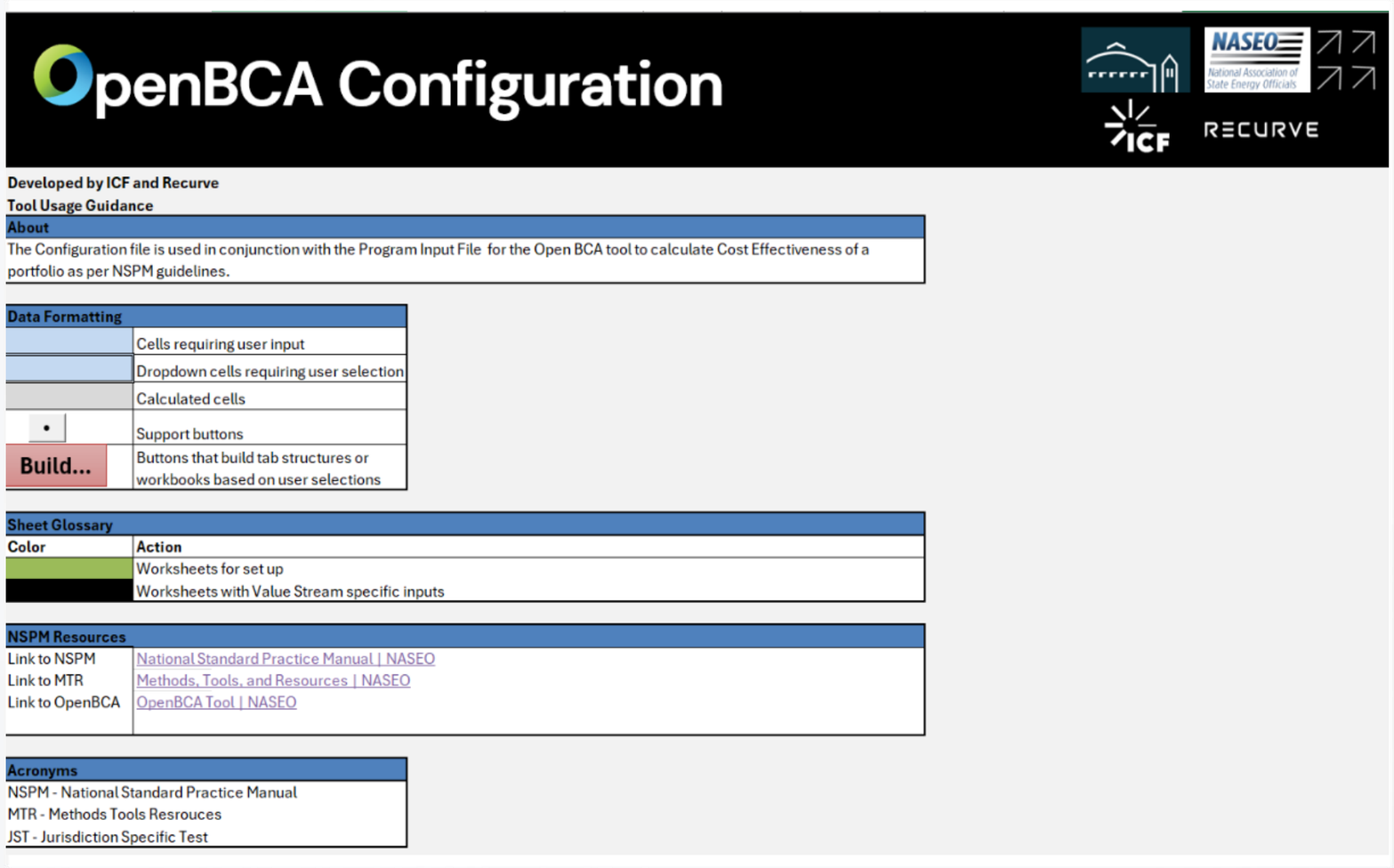
Step 2: Prepare Inputs: Configuration File – Front Page

Begin by reviewing the Front Page of the Configuration File. This page provides essential guidance for completing the workbook correctly.

The Front Page includes:

- A brief description of how the Configuration File is used in OpenBCA
- A glossary explaining cell formatting and color coding (*e.g.*, user inputs, dropdowns, calculated fields)
- Navigation and support buttons used to build worksheet structures
- Links to reference materials, including the National Standard Practice Manual (NSPM) and Methods, Tools, & Resources (MTR) Handbook

Users should review this page before entering data to understand how the file is structured and how inputs should be provided.



OpenBCA Configuration

Developed by ICF and Recurve

Tool Usage Guidance

About
The Configuration file is used in conjunction with the Program Input File for the Open BCA tool to calculate Cost Effectiveness of a portfolio as per NSPM guidelines.

Data Formatting	
	Cells requiring user input
	Dropdown cells requiring user selection
	Calculated cells
•	Support buttons
Build...	Buttons that build tab structures or workbooks based on user selections

Sheet Glossary	
Color	**Action**
	Worksheets for set up
	Worksheets with Value Stream specific inputs

NSPM Resources	
Link to NSPM	National Standard Practice Manual | NASEO
Link to MTR	Methods, Tools, and Resources | NASEO
Link to OpenBCA	OpenBCA Tool | NASEO

Acronyms
NSPM - National Standard Practice Manual
MTR - Methods Tools Resrouces
JST - Jurisdiction Specific Test

Step 2: Prepare Inputs: Configuration File - Global Parameters

Enter global parameters in the Common Data tab of the Configuration File.

These inputs establish system-level assumptions that apply across the entire OpenBCA analysis.

Global parameters include:

- Results dollar year and analysis period
- Program start year and end year
- Inflation and discount rate assumptions (including cadence)
- Electric and gas line losses
- Cost treatment framework

These values are used throughout the model and affect all calculated results.

This step should be completed once per analysis or portfolio version.

Step 1. Enter common data for portfolio

Support/NSPM Definitions	INPUTS AND ASSUMPTIONS	Units	Value
	Analysis Period		
•	Results Dollar Year	Year	2025
•	Program Year 1	Year	2026
•	Analysis End Year (30-Year)	Year	2041
•	Inflation Rate	%	2.20%
	Discounting		
•	Discount Rate (%)	Nominal	5.80%
•	Discount Cadence	Quarterly	
	Line Losses		
•	Average Line Losses - kWh	%	2.27%
•	Average Line Losses - kW	%	3.65%
•	Average Pipeline Losses - Natural Gas therm	%	1.13%
•	**Cost Treatment**	USI + Non-USI	

	Version & Subset Setup	Enter Individual Version and Subset Names Below	
•	Version	*ex: 2024 Annual Report*	2025
•	Subset (0-3 per Version)	*ex: Climate Zone 1*	North Bramble
		ex: Climate Zone 2	South Junction
		ex: Climate Zone 3	

Step 2: Prepare Inputs: Configuration File - Version and Subset

The Version and Subset fields in the Configuration File are used to label and compare OpenBCA analyses.

Version

- Use Version to identify different modeling run vintages (e.g., based on avoided cost updates or reporting years).

Subset

- Each Version includes a default subset labeled System Default, which represents the primary set of assumptions.
- Users may define up to three additional Subsets, if spatially differentiated data or scenario-based variations exist for a given value stream.
- Additional Subsets are commonly used for: Geographic variations (e.g., climate zones or balancing areas) Sensitivity scenarios (e.g., low, medium, and high avoided cost cases)

Step 1. Enter common data for portfolio

Support/NSPM Definitions	INPUTS AND ASSUMPTIONS	Units	Value
	Analysis Period		
•	Results Dollar Year	Year	2025
•	Program Year 1	Year	2026
•	Analysis End Year (30-Year)	Year	2041
•	Inflation Rate	%	2.20%
	Discounting		
•	Discount Rate (%)	Nominal	5.80%
•	Discount Cadence	Quarterly	
	Line Losses		
•	Average Line Losses - kWh	%	2.27%
•	Average Line Losses - kW	%	3.65%
•	Average Pipeline Losses - Natural Gas therm	%	1.13%
•	**Cost Treatment**	USI + Non-USI	

Version & Subset Setup	Enter Individual Version and Subset Names Below	
• Version	*ex: 2024 Annual Report*	2025
• Subset (0-3 per Version)	*ex: Climate Zone 1*	North Bramble
	ex: Climate Zone 2	South Junction
	ex: Climate Zone 3	

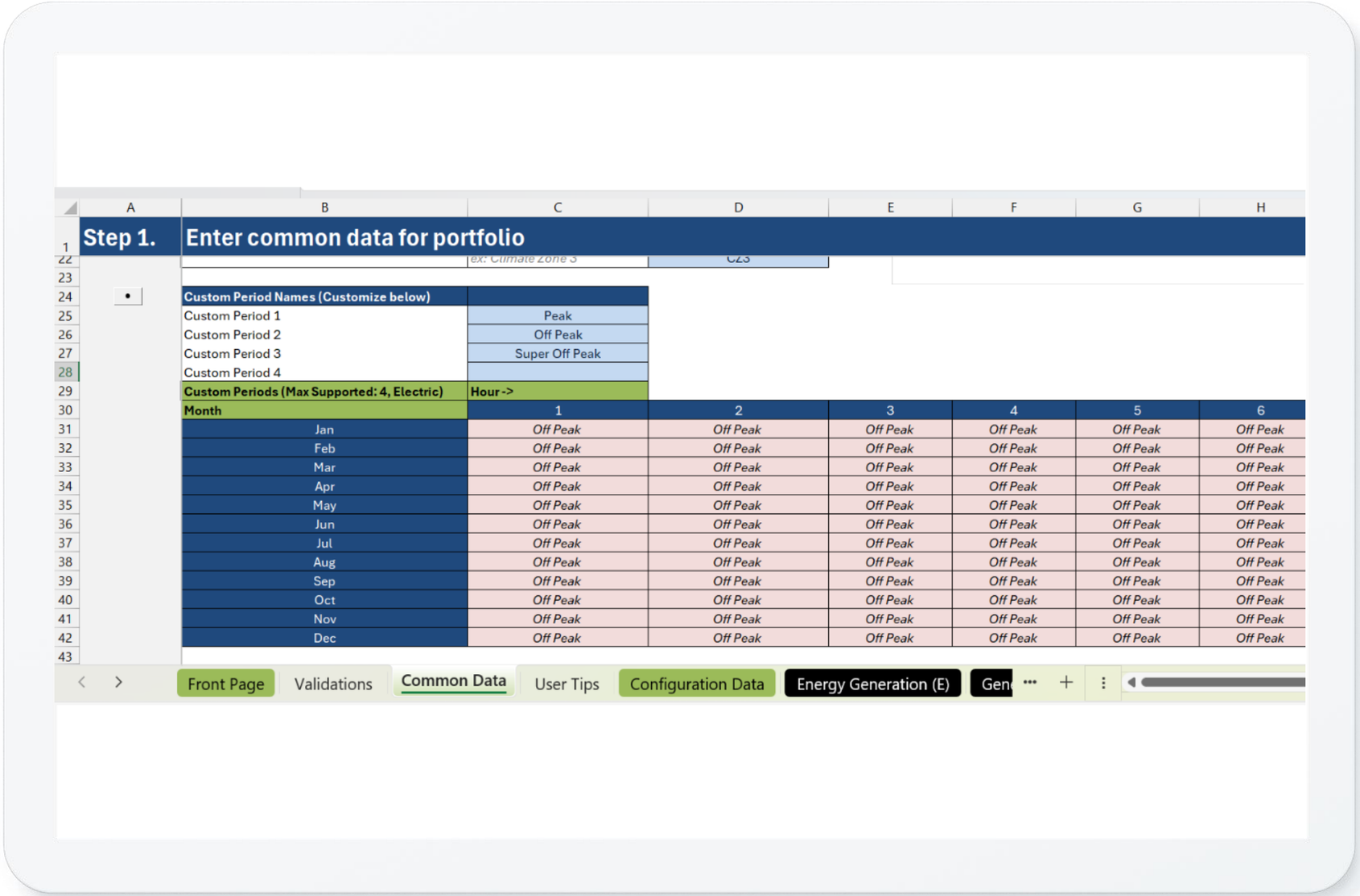
Step 2: Prepare Inputs: Configuration File – Custom Period

When to Use Custom Periods

- Use when inputs vary across seasons, time-of-use (TOU) periods, or tariff structures
- Appropriate when hourly data is not available, but time differentiation is still needed
- Common examples:
  - Peak / Off-Peak / Super Off-Peak
  - Summer vs. Winter periods

Define up to four custom period names and map each hour of the year to a custom period

- All hours of the year must be assigned to a period (no gaps or overlaps)
- Custom periods represent a mid-level granularity between annual and hourly inputs



Step 1.	Enter common data for portfolio						
	ex: Climate Zone 3	CZ3					
	Custom Period Names (Customize below)						
	Custom Period 1	Peak					
	Custom Period 2	Off Peak					
	Custom Period 3	Super Off Peak					
	Custom Period 4						
	Custom Periods (Max Supported: 4, Electric)	Hour ->					
	Month	1	2	3	4	5	6
	Jan	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Feb	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Mar	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Apr	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	May	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Jun	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Jul	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Aug	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Sep	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Oct	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Nov	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak
	Dec	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak	Off Peak

Front Page | Validations | Common Data | User Tips | Configuration Data | Energy Generation (E) | Gen

Step 2: Prepare Inputs: Configuration File - Set up JST

In the Configuration tab of the Configuration File, define the Jurisdiction-Specific Test (JST) by specifying which value streams are included in the analysis and how each will be treated.

For each value stream, enter the following information:

- Value stream name
- Impact Category (*e.g.*, electric, gas, non-system)
- Unit, where applicable
- Whether the value stream is included in the JST
- Whether multiple subsets apply (if spatial or scenario-based data are used)
- Calculation type and data granularity (*e.g.*, single value, annual, hourly)

These selections determine how each value stream is modeled, what data are required, and how results are presented in OpenBCA.

Important note:
Only value streams marked for inclusion in the JST will be calculated and appear in results.

Step 2. Configure value streams for JST

Support/ NSPM D

Test Set Up:

	Value Stream	Impact Category	Unit (Suggested)	Include in Test	Multiple Subsets	Data Granularity / Calculation Type	Adder (%)
General	Utility Financial Incentives	Non-System	$	Yes		Program-specific	
General	Utility Program Admin Costs	Non-System	$	Yes		Program-specific	
General	Utility Performance Incentive	Non-System	$	No			
General	Utility Credit & Collection	Electric	$	Yes		Single Value - First Year [Measure Specific]	
Electric Utility System	Energy Generation (E)	Electric	$/kWh	Yes	Yes	Time Series - Hourly	
Electric Utility System	Generation Capacity (E)	Electric	$/kW	Yes			
Electric Utility System	Transmission Capacity (E)	Electric	$/kW	Yes			
Electric Utility System	Distribution Capacity (E)	Electric	$/kW	Yes	Yes		
Electric Utility System	Environmental Compliance (E)	Electric	$/kWh	No			
Electric Utility System	RPS Compliance (E)	Electric	$/kWh	Yes		Time Series - Annual	
Electric Utility System	Energy Market Price Effect (E)	Electric	$/kWh	Yes			
Electric Utility System	Capacity Market Price Effect (E)	Electric	$/kW	No			
Electric Utility System	Ancillary Services (E)	Electric	$/kWh	Yes	No	Time Series - Day of Year	

Time Series - Hourly
Time Series - Day of Year
Time Series - Monthly
Custom Period
Time Series - Annual
Single Value - Bulk System

Step 2: Prepare Inputs: Configuration File - Build out input tabs

After completing the JST setup in the Configuration File, use the macro buttons to generate the required input worksheets.

Follow these steps in order:

Build Value Stream

- Creates individual input worksheets for each value stream selected in the JST, based on the chosen calculation type and data granularity.

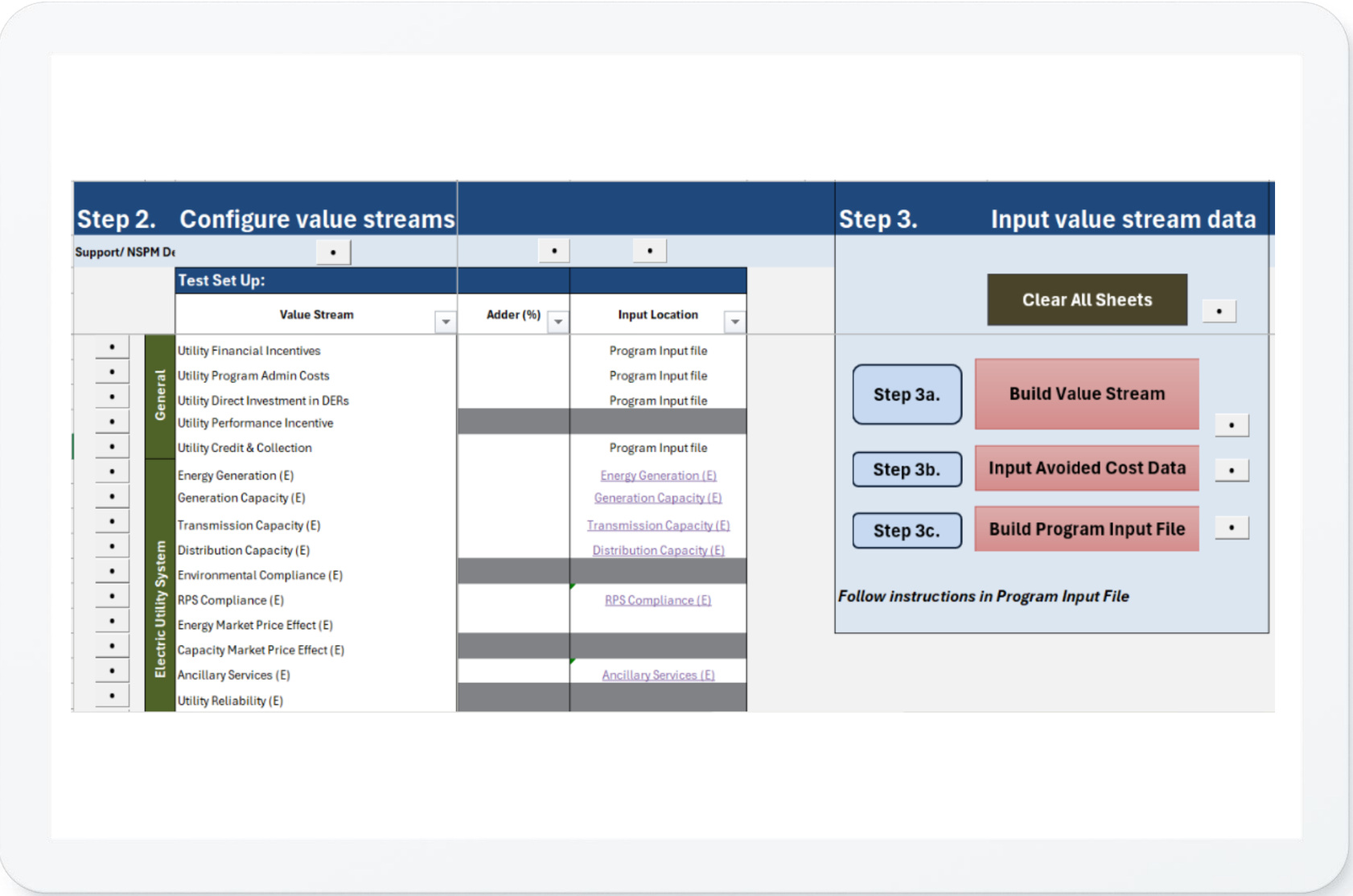
Input Avoided Cost Data

- Navigates to the avoided cost input sheets generated for included value streams.

Build Program Input File

- Creates the Program Input File and automatically generates load profile sheets for electric and natural gas savings.
- All load profile sheets are created at the most granular calculation level selected for each commodity.

Important note:
These macros must be run after the JST is finalized. Re-running macros may overwrite previously entered data.



Step 2: Prepare Inputs: Configuration File - Sample Value Stream

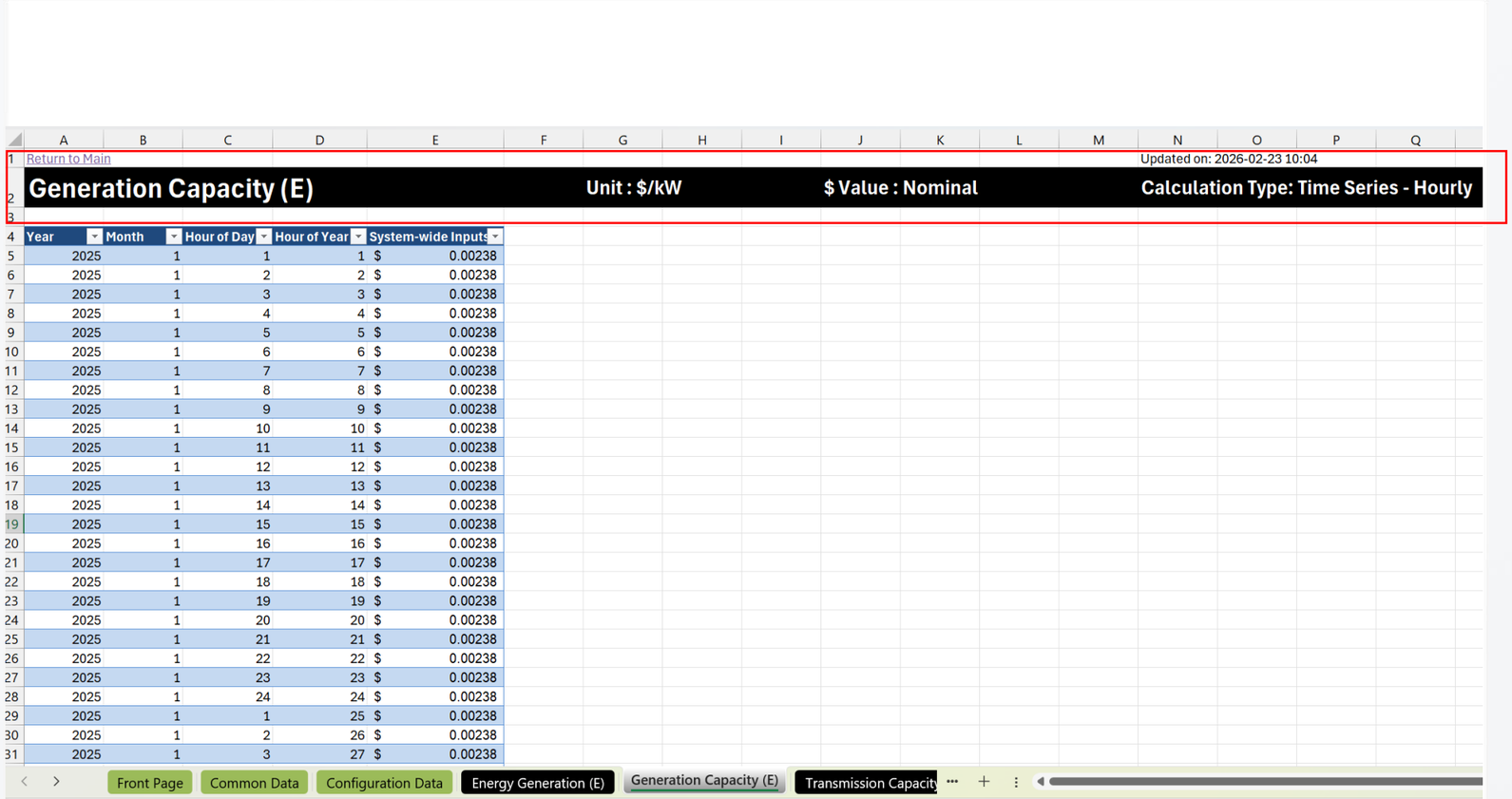
This example illustrates a Generation Capacity (Electric) value stream input tab generated by the "Build Value Stream" macro.

Key characteristics of this value stream:

- Configured using a time-series, hourly calculation type
- The input table is automatically generated by OpenBCA
- Time fields (year, month, hour, hour-of-year) are pre-populated based on the selected granularity

User input requirements:

- Enter the system value for each time interval
- Follow the units and dollar type (real or nominal) indicated in the table header
- Each value stream input tab includes a timestamp indicating when the sheet was generated or last updated, helping users track changes across model runs.



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Updated on: 2026-02-23 10:04

Generation Capacity (E) | **Unit : $/kW** | **$ Value : Nominal** | **Calculation Type: Time Series - Hourly**

Year	Month	Hour of Day	Hour of Year	System-wide Inputs
2025	1	1	1	$ 0.00238
2025	1	2	2	$ 0.00238
2025	1	3	3	$ 0.00238
2025	1	4	4	$ 0.00238
2025	1	5	5	$ 0.00238
2025	1	6	6	$ 0.00238
2025	1	7	7	$ 0.00238
2025	1	8	8	$ 0.00238
2025	1	9	9	$ 0.00238
2025	1	10	10	$ 0.00238
2025	1	11	11	$ 0.00238
2025	1	12	12	$ 0.00238
2025	1	13	13	$ 0.00238
2025	1	14	14	$ 0.00238
2025	1	15	15	$ 0.00238
2025	1	16	16	$ 0.00238
2025	1	17	17	$ 0.00238
2025	1	18	18	$ 0.00238
2025	1	19	19	$ 0.00238
2025	1	20	20	$ 0.00238
2025	1	21	21	$ 0.00238
2025	1	22	22	$ 0.00238
2025	1	23	23	$ 0.00238
2025	1	24	24	$ 0.00238
2025	1	1	25	$ 0.00238
2025	1	2	26	$ 0.00238
2025	1	3	27	$ 0.00238

Front Page | Common Data | Configuration Data | Energy Generation (E) | Generation Capacity (E) | Transmission Capacity

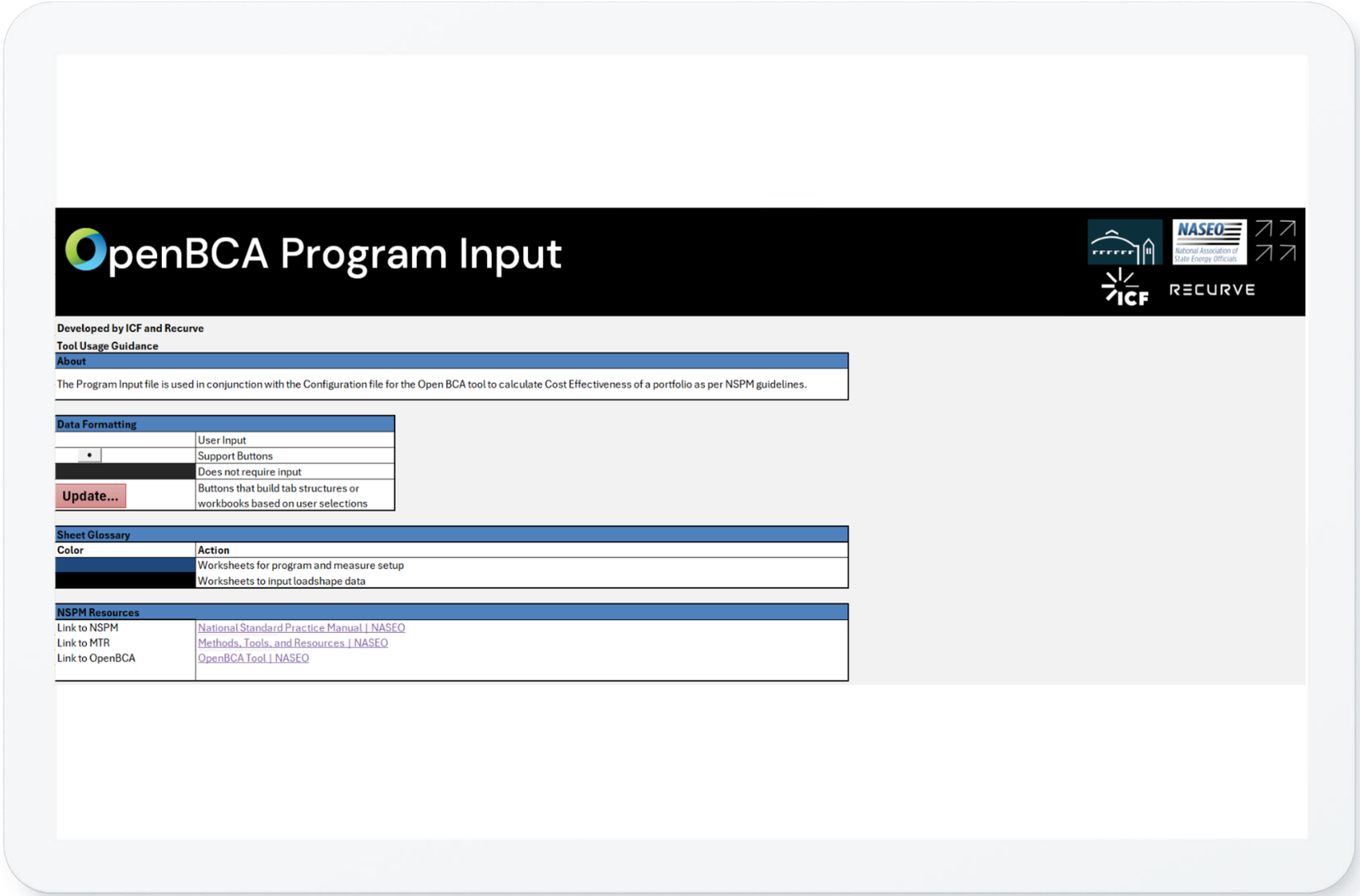
Step 2: Prepare Inputs: Program File - Front Page

The Program Input file opens automatically when you use the "Build Program Input File" macro.

Begin by reviewing the front page. This page provides orientation and reference information for completing program-level inputs correctly.

The Front Page includes:

- A brief description of how the Program Input File is used alongside the Configuration File
- A data-formatting legend explaining color-coding and cell types (user input, dropdowns, calculated fields)
- A sheet glossary describing the purpose of each worksheet
- Links to supporting documentation, including the National Standard Practice Manual (NSPM) and Methods, Tools, & Resources (MTR) Handbook



OpenBCA Program Input

Developed by ICF and Recurve

Tool Usage Guidance

About
The Program Input file is used in conjunction with the Configuration file for the Open BCA tool to calculate Cost Effectiveness of a portfolio as per NSPM guidelines.

Data Formatting	
	User Input
•	Support Buttons
	Does not require input
Update...	Buttons that build tab structures or workbooks based on user selections

Sheet Glossary	
Color	Action
	Worksheets for program and measure setup
	Worksheets to input loadshape data

NSPM Resources	
Link to NSPM	National Standard Practice Manual | NASEO
Link to MTR	Methods, Tools, and Resources | NASEO
Link to OpenBCA	OpenBCA Tool | NASEO

Step 2: Prepare Inputs: Program File - Program input

Use the Program Inputs tab to enter program-level data that apply across all measures within a program.

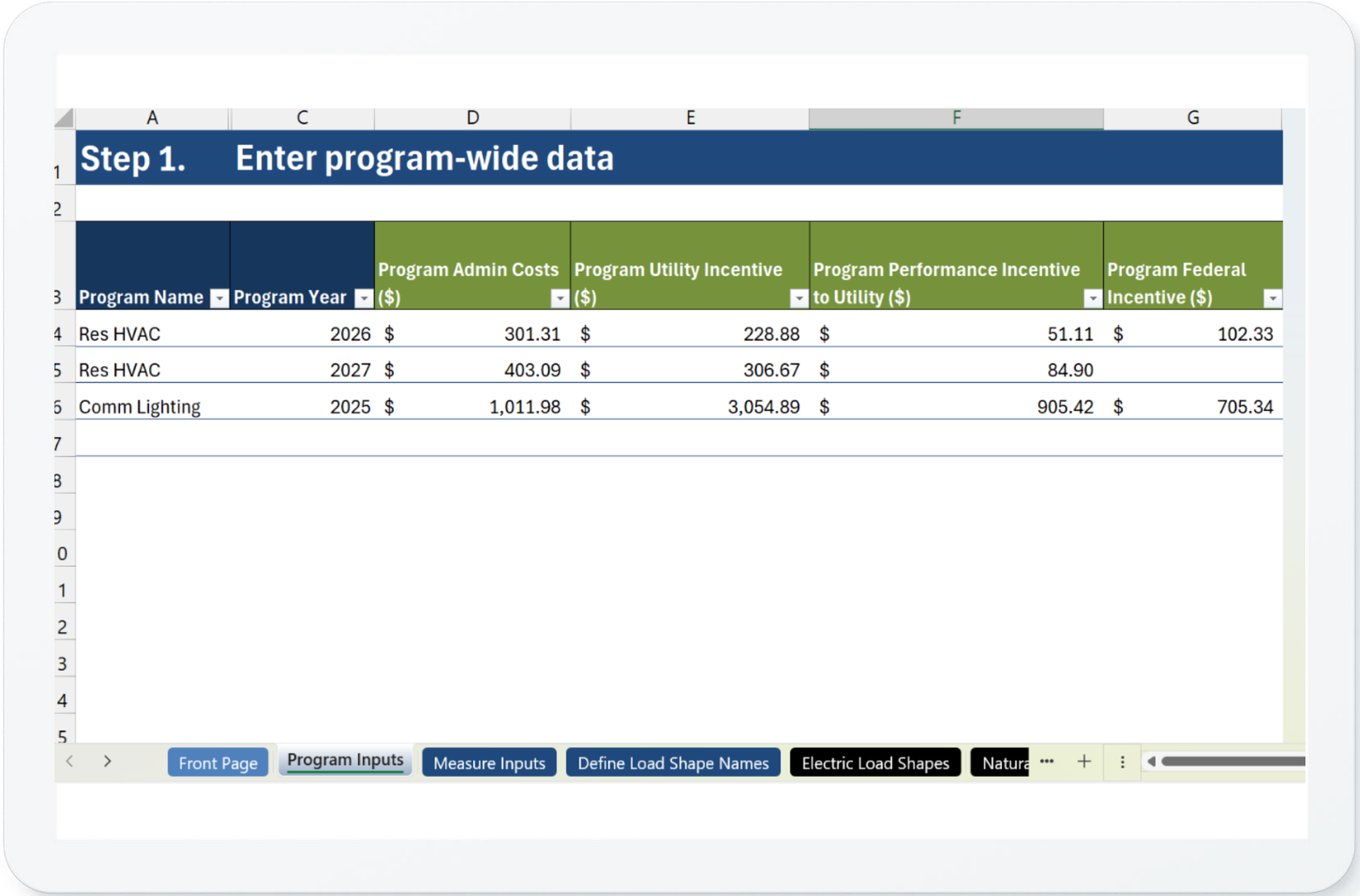
The structure of this tab is similar to the Measure Inputs tab; however, all values entered here represent program-wide totals or attributes, rather than measure-specific inputs.

Common program-level inputs include:

- Program name and program year
- Program administration costs
- Utility and federal incentive totals
- Program performance incentives

Important requirement:

- The Program Name must **exactly match** the corresponding Program Name used in the Measure Inputs tab.
- Consistent naming ensures that results aggregate correctly across measure, program, and portfolio levels.



Step 1. Enter program-wide data

Program Name	Program Year	Program Admin Costs ($)	Program Utility Incentive ($)	Program Performance Incentive to Utility ($)	Program Federal Incentive ($)
Res HVAC	2026	$ 301.31	$ 228.88	$ 51.11	$ 102.33
Res HVAC	2027	$ 403.09	$ 306.67	$ 84.90	
Comm Lighting	2025	$ 1,011.98	$ 3,054.89	$ 905.42	$ 705.34

Front Page | Program Inputs | Measure Inputs | Define Load Shape Names | Electric Load Shapes | Natura

Step 2: Prepare Inputs: Program File - Measure input

Use the Measure Inputs tab to enter all measure-level information required for the analysis.

Each row represents a single measure included in a program.

Required measure inputs include:

- Measure name and unique ID
- Effective Useful Life (EUL)
- Net-to-Gross (NTG) ratio
- Participation or installation quantity
- Start year and discount rate
- Host customer impacts, such as:
  - Incremental costs
  - Non-energy impacts (NEIs), where applicable

Data entry guidance:

- Enter one measure per row
- Assign a unique ID to each measure
- Populate all relevant fields based on program design and available data

Step 2. Input measure-specific data

Required Labels		Custom Labels					Details					
Unique ID	Program Name	Label 1	Label 2	Label 3	Label 4	Label 5	Measure ID	Project ID	Measure Name	Avoided Cost Subset	Start Year	Start Quarter
1	Heat Pump HVAC	Residential					Unitary		HVAC Electrificat	North Bramble	2026	3
2	Heat Pump HVAC	Residential					Unitary		HVAC Electrificat	South Junction	2027	2
3	Heat Pump HVAC	Residential					Unitary		HVAC Electrificat	North Bramble	2025	1
4	Heat Pump HVAC	Residential					Unitary		HVAC Electrificat	South Junction	2025	4
5	Heat Pump HVAC	Residential					Unitary		HVAC Electrificat	South Junction	2025	2
6	Heat Pump HVAC	Residential					Mini Split		HVAC Electrificat	South Junction	2025	4
7	Heat Pump HVAC	Residential					Mini Split		HVAC Electrificat	South Junction	2025	1
8	Heat Pump HVAC	Residential					Mini Split		HVAC Electrificat	South Junction	2026	3
9	Heat Pump HVAC	Residential					Mini Split		HVAC Electrificat	North Bramble	2025	4
10	Heat Pump HVAC	Residential					Mini Split		HVAC Electrificat	South Junction	2026	4
11	Cool Home Comfort	Residential					SEER 17		AC Efficiency	North Bramble	2027	4
12	Cool Home Comfort	Residential					SEER 17		AC Efficiency	North Bramble	2027	2
13	Cool Home Comfort	Residential					SEER 17		AC Efficiency	North Bramble	2025	2
14	Cool Home Comfort	Residential					SEER 17		AC Efficiency	South Junction	2027	1
15	Cool Home Comfort	Residential					SEER 17		AC Efficiency	South Junction	2026	3

Step 2: Prepare Inputs: Program File - Defining Load Shapes

Use the Define Load Shape Names tab to specify the electric and natural gas load shapes used in the analysis.

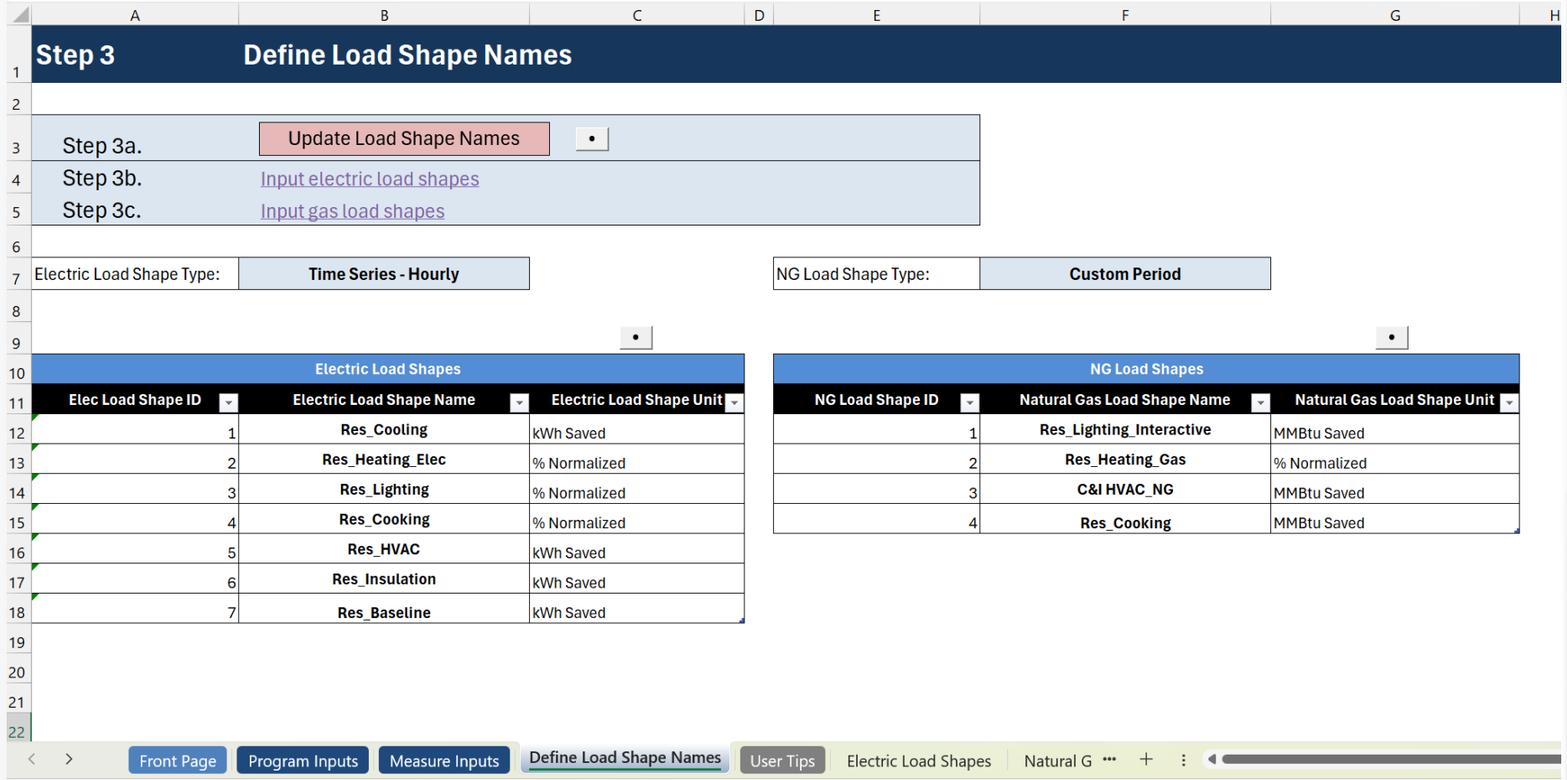
These load shape names are later selected in the Measure Inputs tab.

For each load shape, specify:

- A descriptive load shape name
- Whether the load shape represents:
  - Absolute savings (e.g., kWh or therms), or
  - % normalized profile (summing to 1)
- If a % normalized load shape is used:
  - Enter the corresponding annual electric and/or natural gas savings in the Measure Inputs tab
  - OpenBCA multiplies the annual savings by the normalized profile to calculate time-series savings

Load shape types (required granularity) are **automatically populated** based on the Configuration File settings.

Use **the Update Load Shape Names** button to refresh the load shape tables after adding or modifying names.



Step 3 **Define Load Shape Names**

Step 3a. Update Load Shape Names

Step 3b. Input electric load shapes

Step 3c. Input gas load shapes

Electric Load Shape Type: **Time Series - Hourly**

NG Load Shape Type: **Custom Period**

Electric Load Shapes

Elec Load Shape ID	Electric Load Shape Name	Electric Load Shape Unit
1	Res_Cooling	kWh Saved
2	Res_Heating_Elec	% Normalized
3	Res_Lighting	% Normalized
4	Res_Cooking	% Normalized
5	Res_HVAC	kWh Saved
6	Res_Insulation	kWh Saved
7	Res_Baseline	kWh Saved

NG Load Shapes

NG Load Shape ID	Natural Gas Load Shape Name	Natural Gas Load Shape Unit
1	Res_Lighting_Interactive	MMBtu Saved
2	Res_Heating_Gas	% Normalized
3	C&I HVAC_NG	MMBtu Saved
4	Res_Cooking	MMBtu Saved

Front Page | Program Inputs | Measure Inputs | Define Load Shape Names | User Tips | Electric Load Shapes | Natural G

Step 2: Prepare Inputs: Program File - Electric & NG Load Shape

Use the Electric Load Shapes and Natural Gas Load Shapes tabs to enter load shape values for each load shape defined in the Define Load Shape Names tab.

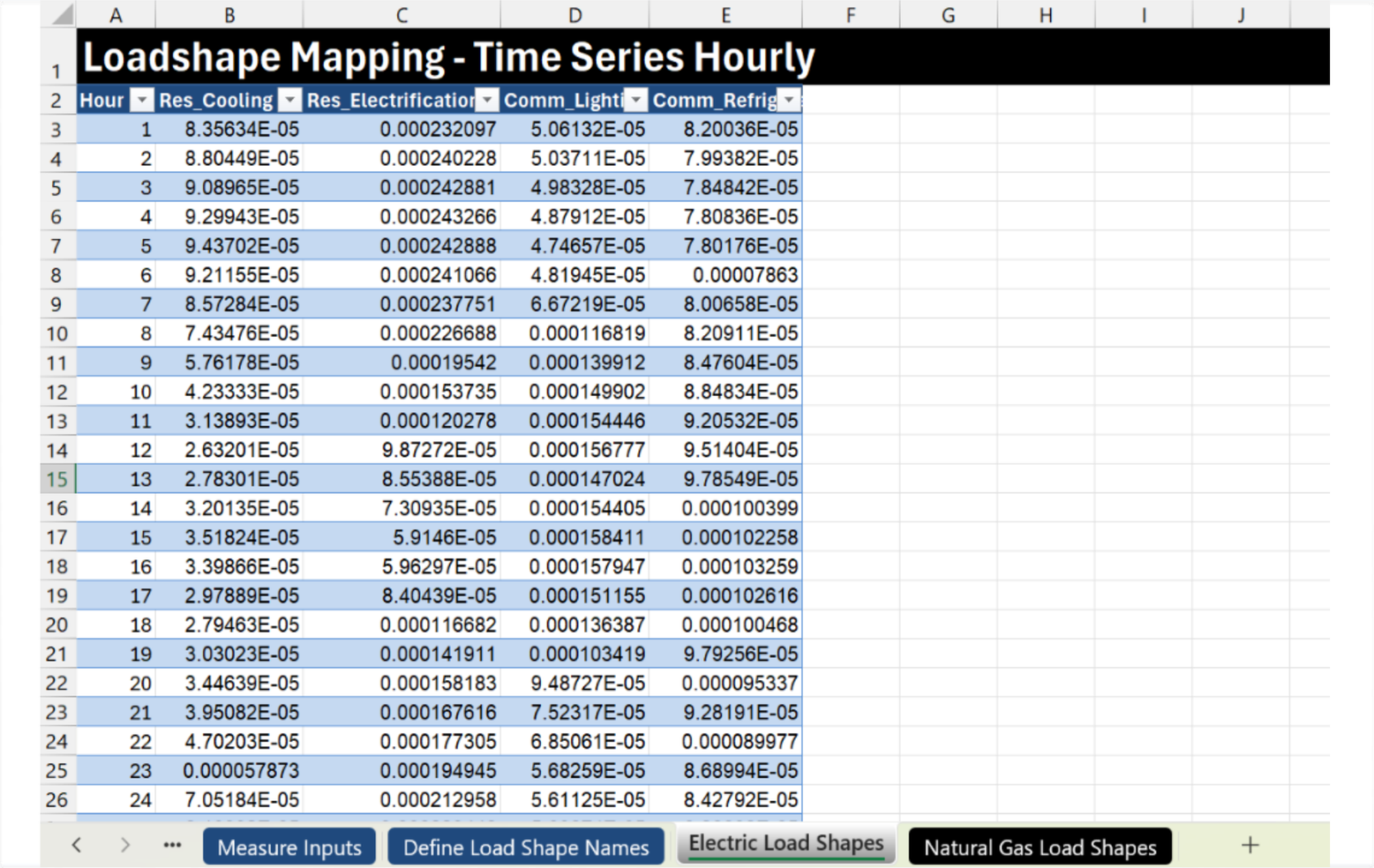
These tabs are generated automatically using a macro from the Configuration File and include only the load shapes that existed at the time the macro was run.

To complete load shape inputs:

- Enter load shape values for each defined electric and/or natural gas load shape
- Populate values according to the required time granularity shown on the tab (e.g., hourly)

Adding or modifying load shapes:

- Use the **Update Load Shape Names** button to refresh the load shape tables after adding or modifying names, or
- Manually add a new column and enter values



Loadshape Mapping - Time Series Hourly

Hour	Res_Cooling	Res_Electrificatior	Comm_Lighti	Comm_Refrig
1	8.35634E-05	0.000232097	5.06132E-05	8.20036E-05
2	8.80449E-05	0.000240228	5.03711E-05	7.99382E-05
3	9.08965E-05	0.000242881	4.98328E-05	7.84842E-05
4	9.29943E-05	0.000243266	4.87912E-05	7.80836E-05
5	9.43702E-05	0.000242888	4.74657E-05	7.80176E-05
6	9.21155E-05	0.000241066	4.81945E-05	0.00007863
7	8.57284E-05	0.000237751	6.67219E-05	8.00658E-05
8	7.43476E-05	0.000226688	0.000116819	8.20911E-05
9	5.76178E-05	0.00019542	0.000139912	8.47604E-05
10	4.23333E-05	0.000153735	0.000149902	8.84834E-05
11	3.13893E-05	0.000120278	0.000154446	9.20532E-05
12	2.63201E-05	9.87272E-05	0.000156777	9.51404E-05
13	2.78301E-05	8.55388E-05	0.000147024	9.78549E-05
14	3.20135E-05	7.30935E-05	0.000154405	0.000100399
15	3.51824E-05	5.9146E-05	0.000158411	0.000102258
16	3.39866E-05	5.96297E-05	0.000157947	0.000103259
17	2.97889E-05	8.40439E-05	0.000151155	0.000102616
18	2.79463E-05	0.000116682	0.000136387	0.000100468
19	3.03023E-05	0.000141911	0.000103419	9.79256E-05
20	3.44639E-05	0.000158183	9.48727E-05	0.000095337
21	3.95082E-05	0.000167616	7.52317E-05	9.28191E-05
22	4.70203E-05	0.000177305	6.85061E-05	0.000089977
23	0.000057873	0.000194945	5.68259E-05	8.68994E-05
24	7.05184E-05	0.000212958	5.61125E-05	8.42792E-05

Measure Inputs | Define Load Shape Names | Electric Load Shapes | Natural Gas Load Shapes

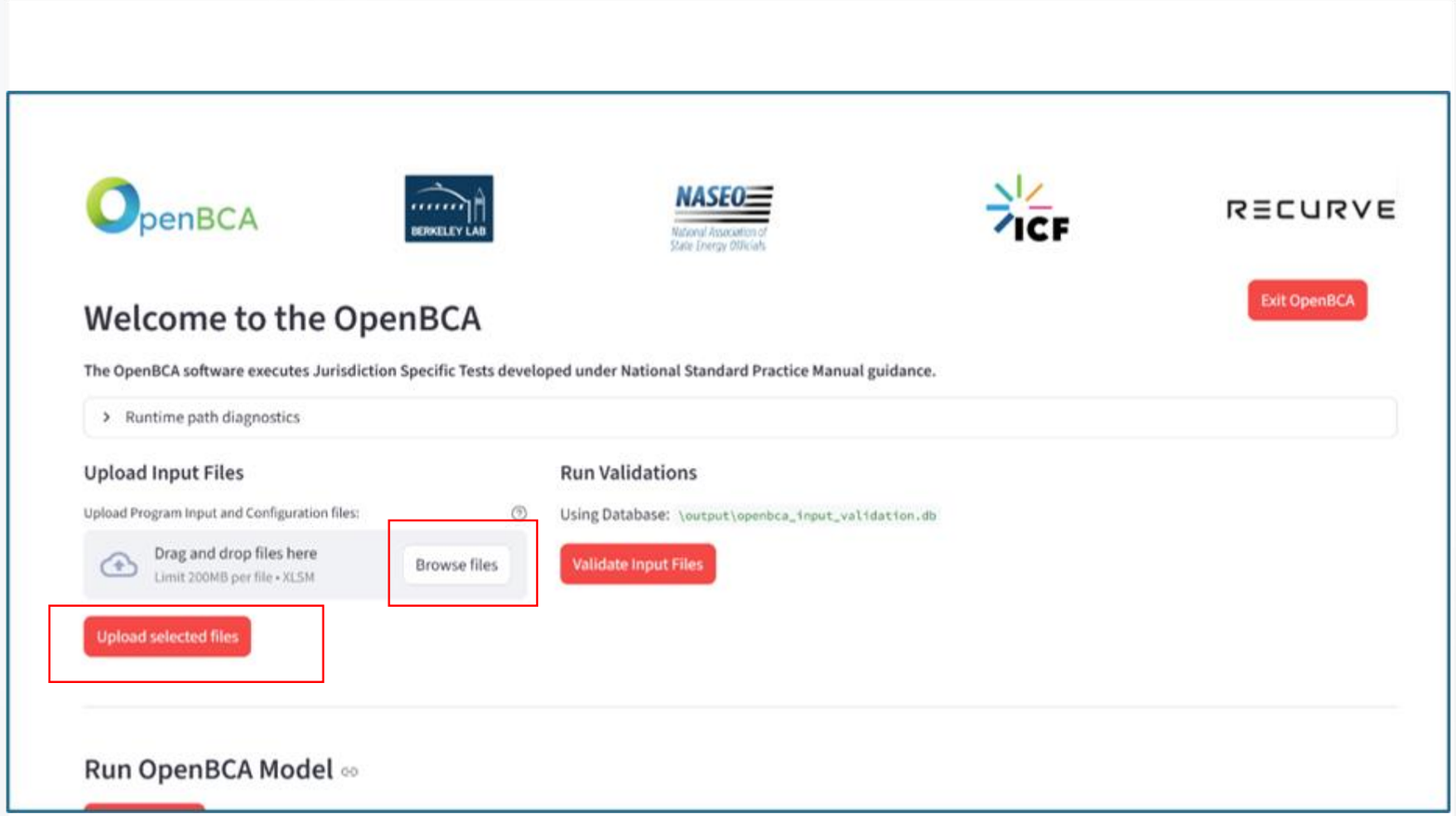
Step 3: Run OpenBCA – Upload Input Files

Once all Configuration and Program Input files have been completed, return to the OpenBCA Application Home Page to upload the input files.

To upload input files:

- Select Browse Files and choose the completed:
  - OpenBCA Configuration File
  - OpenBCA Program Input File
- Click Upload Selected Files to load the files into the application.
- After the files are successfully uploaded, proceed to Validate Input Files before running the model.

Important note:
Uploaded files must retain their original filenames (OpenBCA Configuration.xlsm & OpenBCA Program Input.xlsm) and structure for OpenBCA to recognize and process them correctly.



Step 3: Run OpenBCA – Validate Input Files

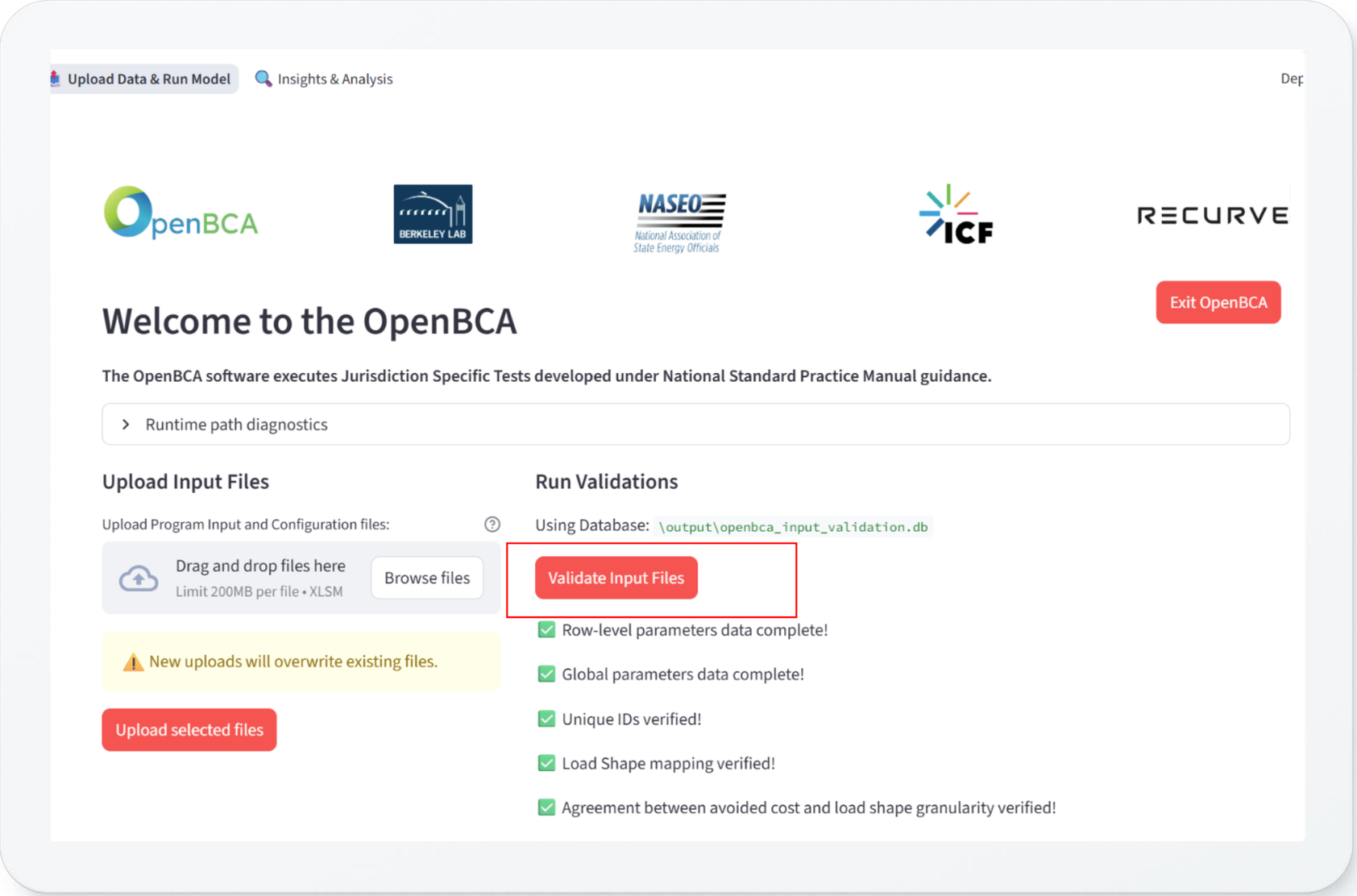
Once the Configuration File and Program Input File have been uploaded to the OpenBCA application, use the Validate Input Files function to check that inputs are complete and internally consistent.

During validation, OpenBCA checks for:

- Completion of required global and row-level parameters
- Use of unique IDs across programs and measures
- Correct mapping between load shapes and measures
- Consistency between avoided cost data and load shape granularity

If validation errors are identified, return to the corresponding Excel input files, correct the issues, and re-upload the files before proceeding.

Important note:
Passing validation does not run the model; it confirms that inputs are ready for execution.



Step 3: Run OpenBCA – Run Model

After input files have been uploaded and successfully validated, run the OpenBCA model to generate results.

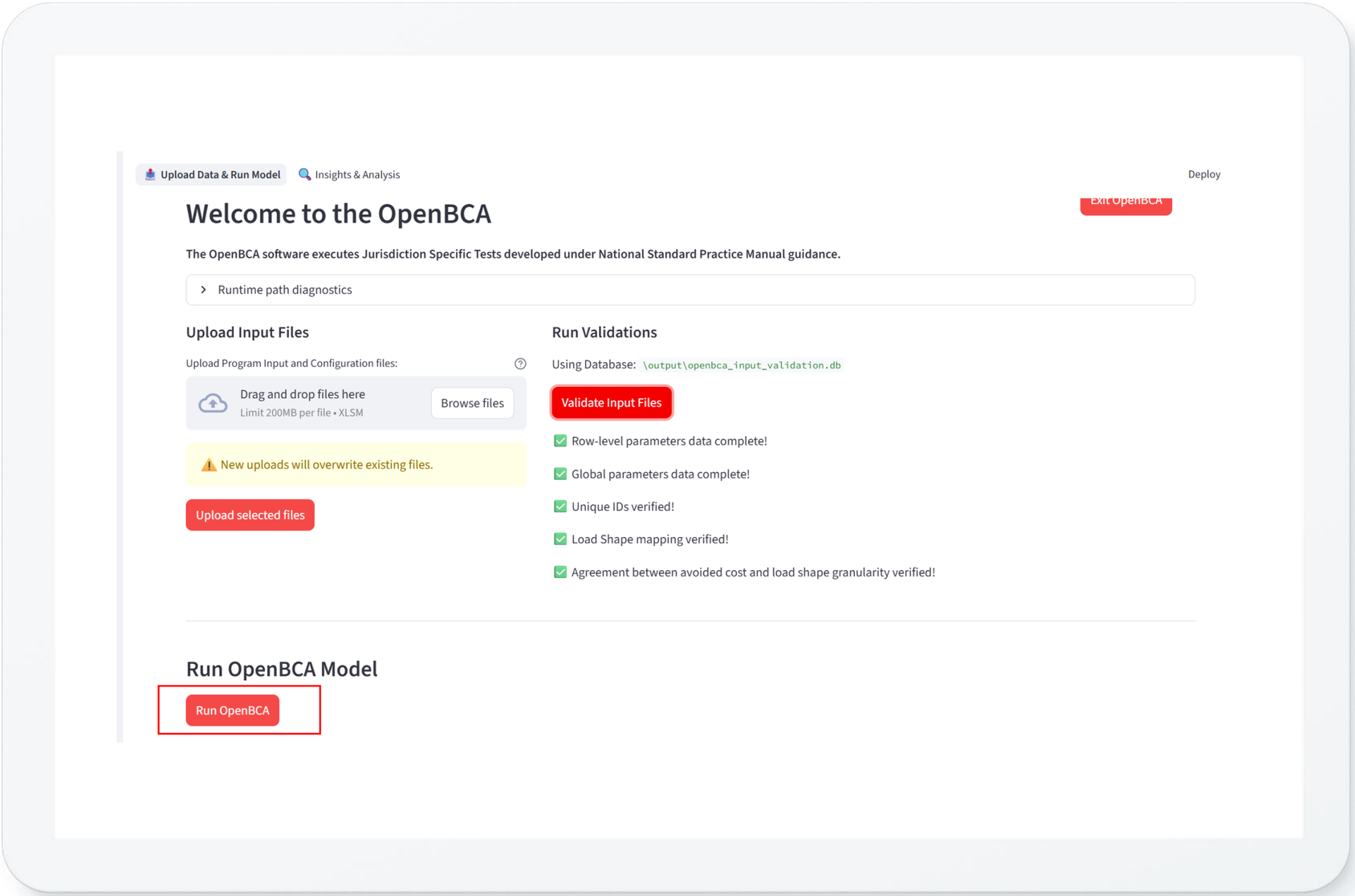
To run OpenBCA:

- Confirm that input file validation has completed without errors.
- Select Run OpenBCA to execute the model.

During execution, OpenBCA processes all configured value streams, program inputs, and load shapes according to the defined JST.

Once the model run is complete, results are available in the Insights & Analysis section for review and export.

Important note:
If validation errors remain, correct them in the input files, re-upload, and re-validate before running the model.



Step 3: Run OpenBCA – Confirm Successful Run

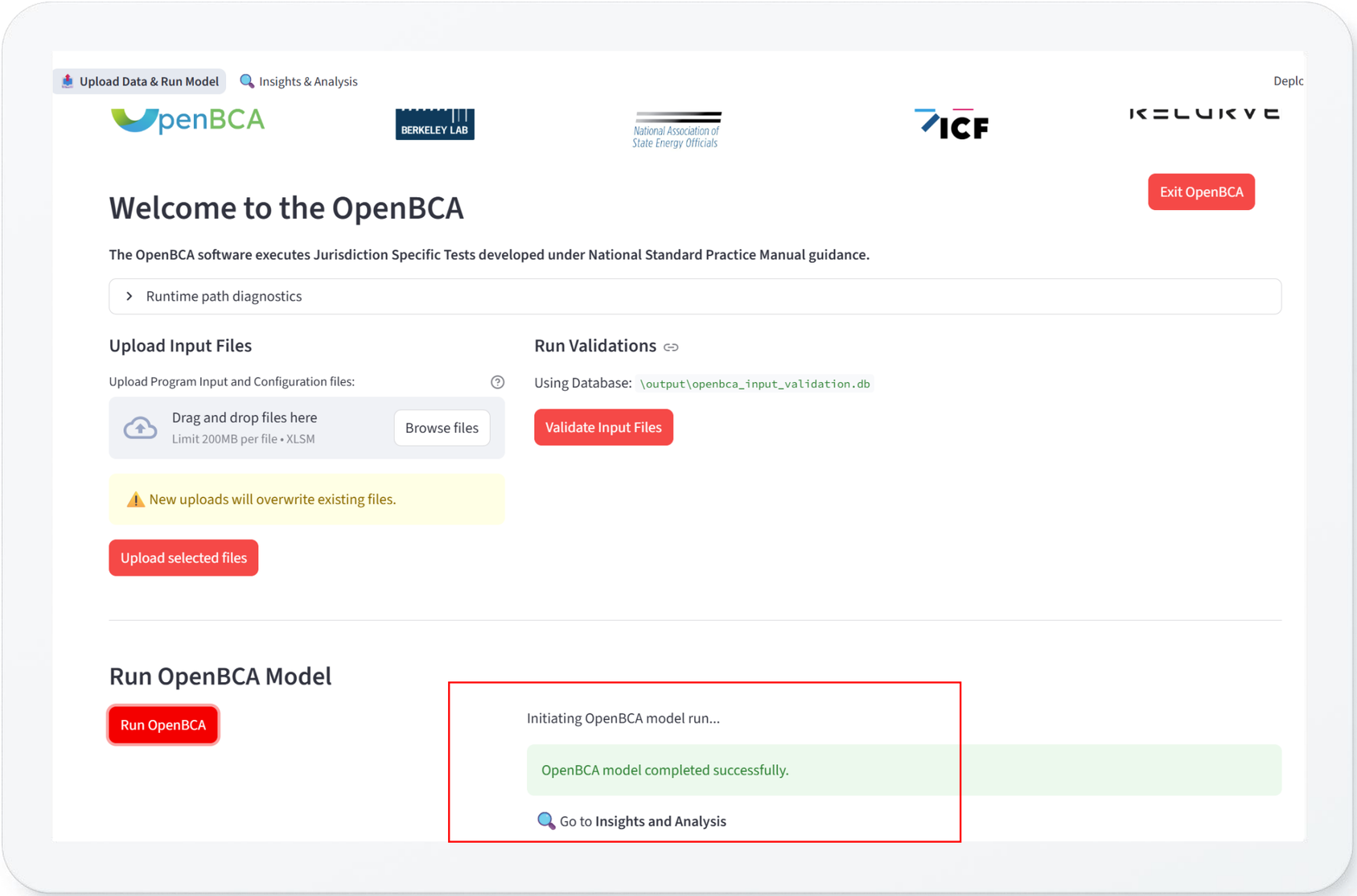
After selecting Run OpenBCA, the application displays a confirmation message when the model run completes successfully.

A successful run is indicated by:

- A confirmation message stating that the OpenBCA model completed successfully
- A link to proceed to the Insights & Analysis section

Once this message appears, the model execution is complete, and results are ready for review.

If the model run does not complete successfully, review the error messages displayed by the application and refer to the next slide for troubleshooting guidance.



Step 3: Run OpenBCA – Resolve Unsuccessful Run

If the OpenBCA model does not complete successfully, the application will display an error message indicating that the model run failed.

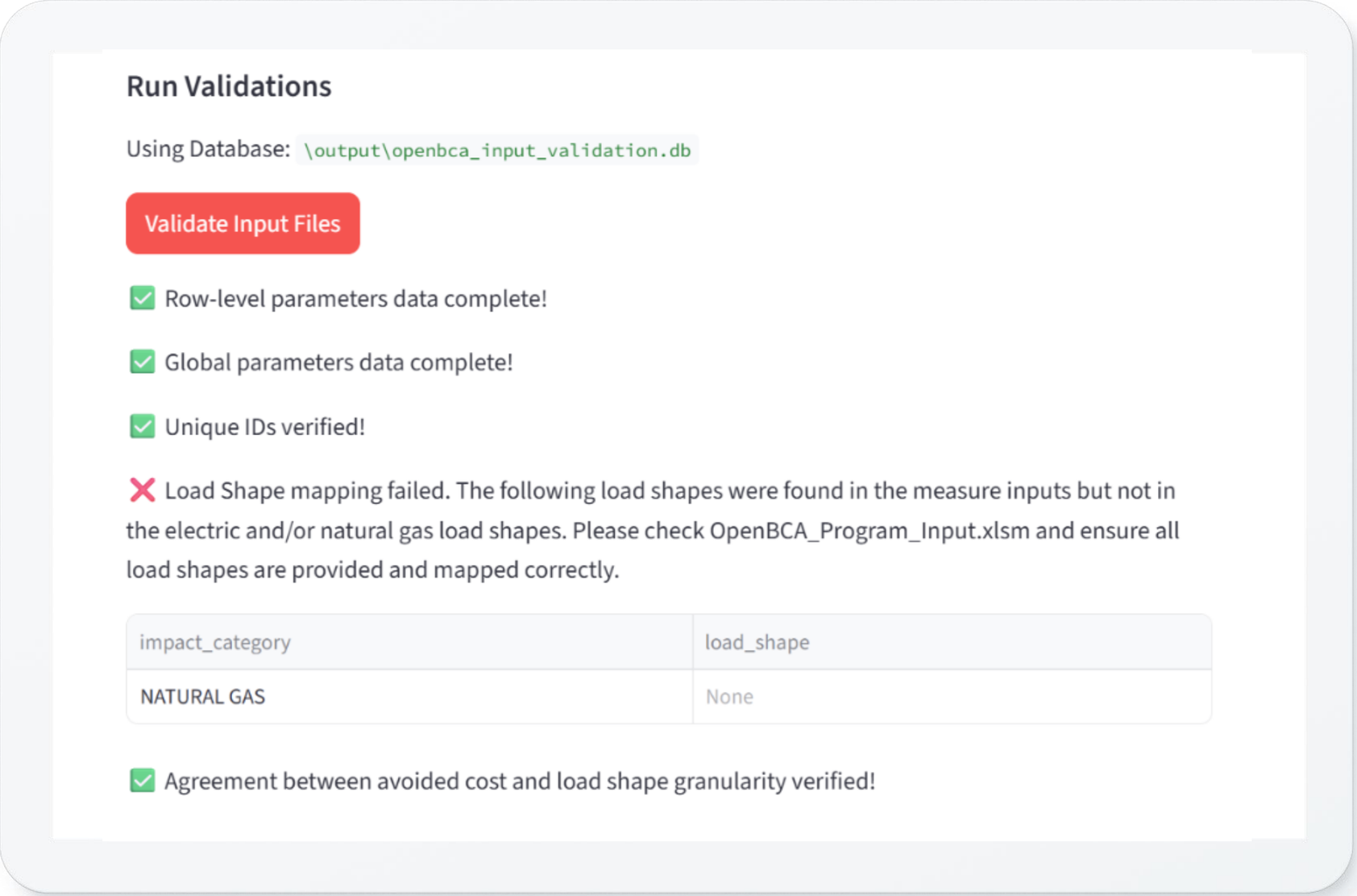
When this occurs:

- Review the error message displayed in the application.
- Return to the Configuration File or Program Input File to correct the identified issue.
- If the error cannot be resolved – download the templates from the website and start anew.

- Re-upload the updated input files and re-run validation before attempting to run the model again.

Error messages often indicate issues such as missing data, inconsistent inputs, or mismatches between value streams, load shapes, and program data.

Refer to the previous validation step or supporting documentation to help diagnose and resolve errors before re-running OpenBCA.



Step 4: Results and Outputs – Interpreting Results

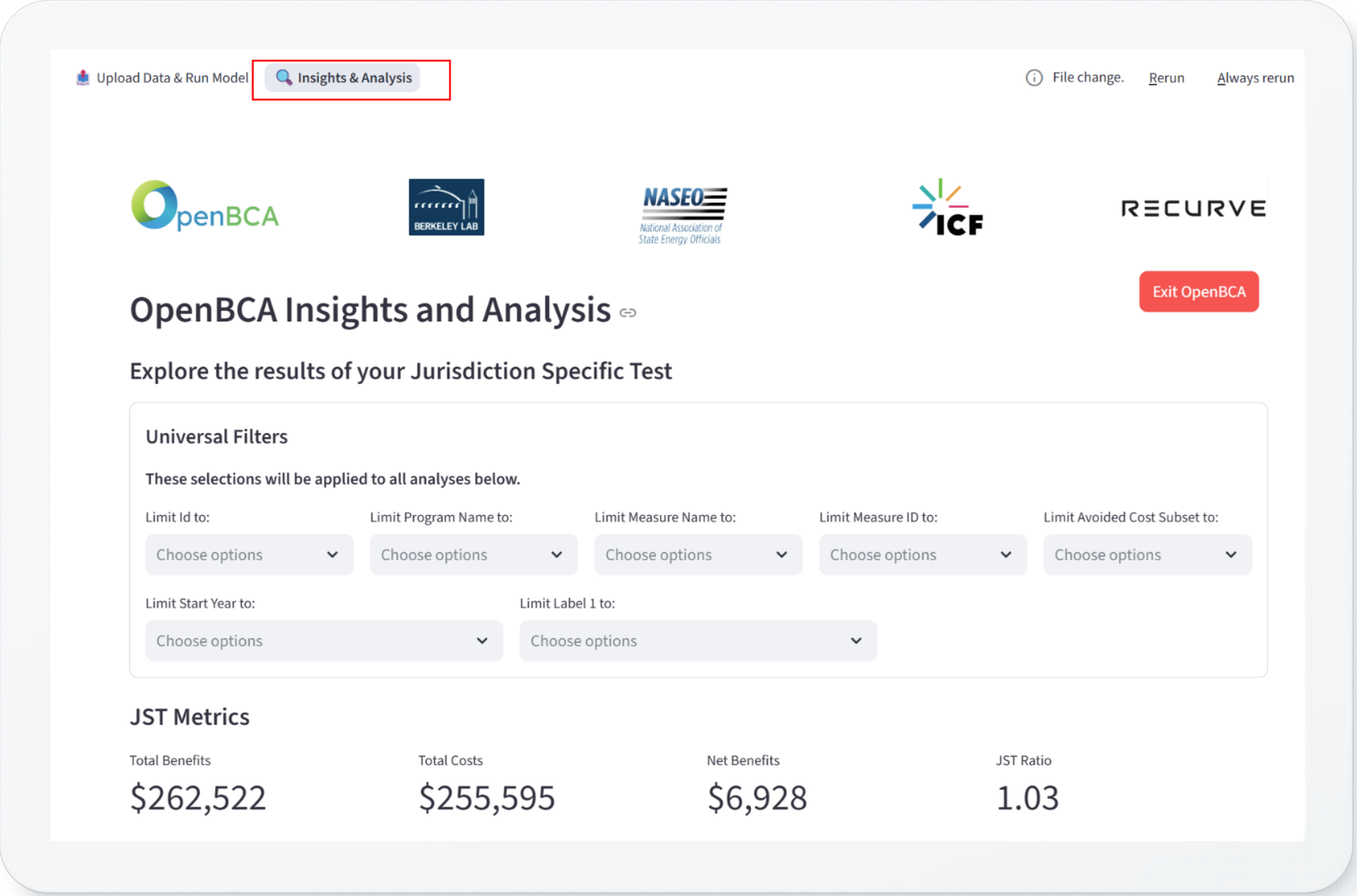
After a successful model run, navigate to the Insights & Analysis tab to review the results of the OpenBCA Jurisdiction-Specific Test (JST).

The **Insights & Analysis** section allows users to:

- Review summary JST metrics, including total benefits, total costs, net benefits, and benefit-cost ratios
- Apply filters to view results by program, measure, avoided cost subset, or other dimensions
- Explore and download results using tables and visualizations to support interpretation and comparison

All results shown in this section are based on the inputs and assumptions defined in Steps 1–3.

Use this page to validate results before exporting outputs or performing further analysis.



Step 4: Results and Outputs – Value Stream Breakdowns

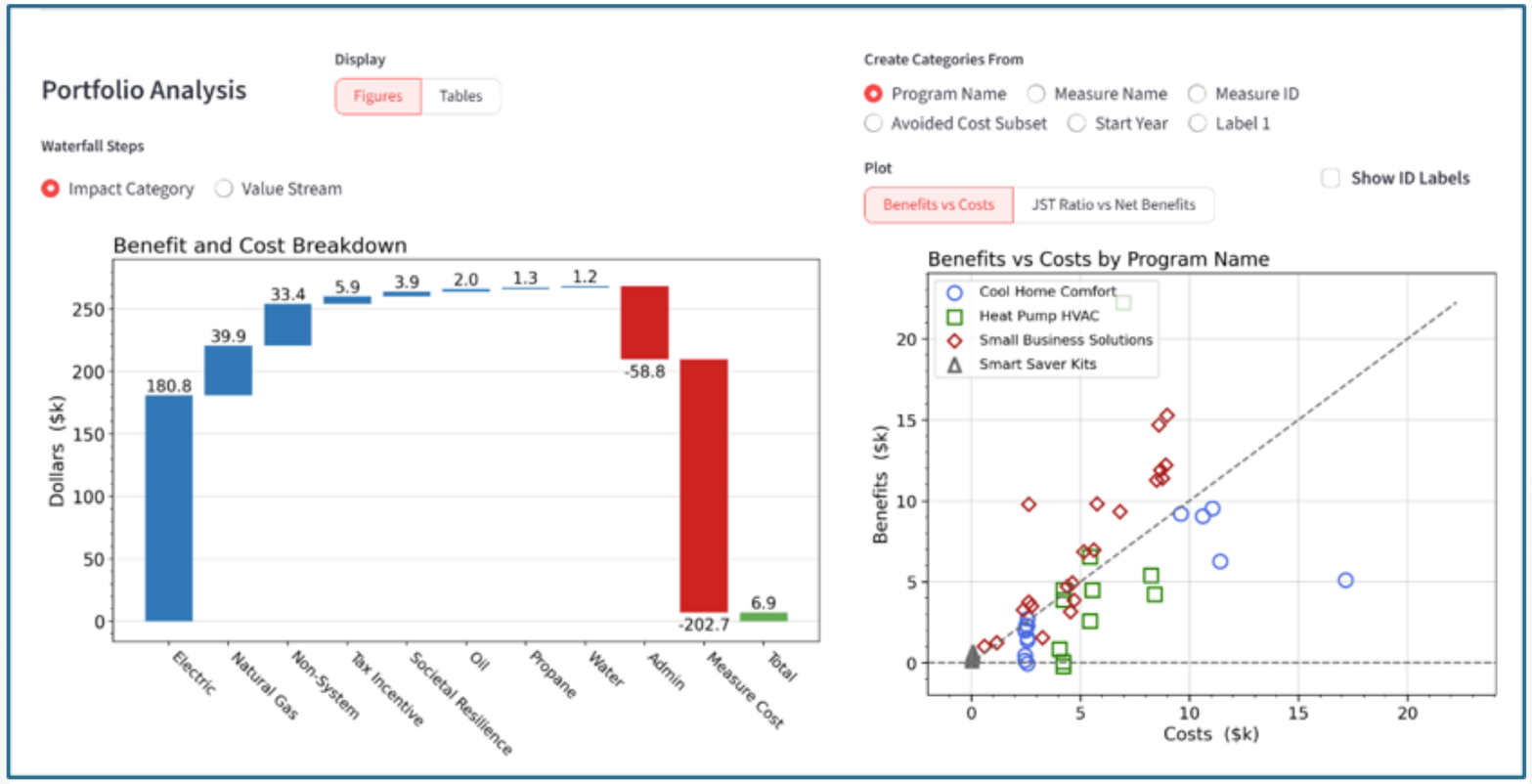
OpenBCA provides **benefit and cost breakdowns by value stream**, enabling users to understand what drives total benefits, total costs, and overall cost-effectiveness. Results can be broken out and explored using filters such as:

- Program name
- Measure name
- Measure ID
- Program start year
- Avoided cost subset

Reviewing value stream contributions helps users assess:

- Which value streams contribute most significantly to total benefits and costs
- Whether results are broadly supported or driven by a small number of assumptions
- How sensitive results may be to changes in specific value stream inputs

Value stream breakdowns are a key diagnostic tool for interpreting results and understanding the underlying drivers of cost-effectiveness.



Step 4: Results and Outputs – Time and Impact Category Detail

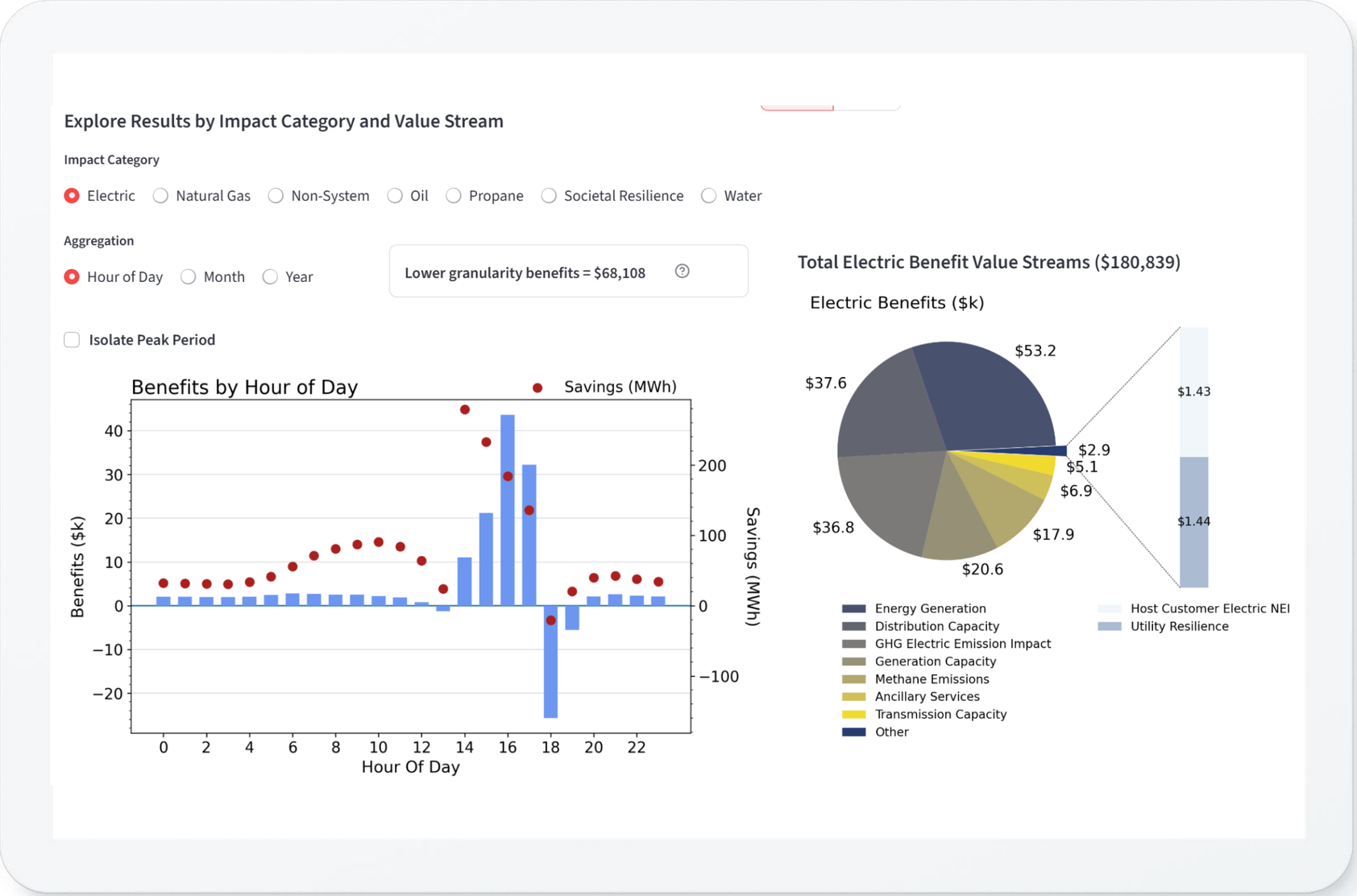
This view allows users to explore when benefits occur over time and how those benefits are distributed across individual value streams within each impact category.

Users can examine results at different time granularities—such as hourly, monthly, or annual—to identify:

- Which hours of the day or months of the year contribute the most benefits
- How the timing of benefits aligns with system peaks or policy objectives

Available time-based views are determined by the inputs provided in the Configuration File.

- For example, value streams configured with hourly inputs can be explored by hour of day, while value streams with coarser inputs are limited to monthly or annual views.



Step 4: Results and Outputs – Summary table

The Summary Results Table consolidates all key model outputs into a row-by-row tabular format, providing a comprehensive view of results across measures, programs, and scenarios.

Each row captures collected results such as:

- Total benefits and total costs
- Electricity savings (kWh)
- Natural gas and other fuel savings
- Additional identifiers such as program name, measure name, labels, start year, and avoided cost subset

This table serves as the primary data export view for OpenBCA results.

Users can download the summary table as a CSV file to:

- Perform additional calculations or aggregations
- Integrate OpenBCA results into regulatory filings, dashboards, or other workflows

Summary Results Table:

type	id	program_name	start_year	measure_id	measure_name	project_id	avoided_cost_subset	net_to_gross_ratio	estimated_useful_life	unit_quantity	label_1	label_
Measure	1	Heat Pump HVAC	2026	Unitary	HVAC Electrification	None	North Bramble	0.9	10	1	Residential	None
Measure	10	Heat Pump HVAC	2026	Mini Split	HVAC Electrification	None	South Junction	0.9	10	2	Residential	None
Measure	11	Cool Home Comfort	2027	SEER 17	AC Efficiency	None	North Bramble	0.8	12	1	Residential	None
Measure	12	Cool Home Comfort	2027	SEER 17	AC Efficiency	None	North Bramble	0.8	12	1	Residential	None
Measure	13	Cool Home Comfort	2025	SEER 17	AC Efficiency	None	North Bramble	0.8	12	1	Residential	None
Measure	14	Cool Home Comfort	2027	SEER 17	AC Efficiency	None	South Junction	0.8	12	1	Residential	None
Measure	15	Cool Home Comfort	2026	SEER 17	AC Efficiency	None	South Junction	0.8	12	1	Residential	None
Measure	16	Cool Home Comfort	2025	SEER 18	AC Efficiency	None	South Junction	0.8	12	1	Residential	None
Measure	17	Cool Home Comfort	2025	SEER 18	AC Efficiency	None	North Bramble	0.8	12	1	Residential	None
Measure	18	Cool Home Comfort	2025	SEER 18	AC Efficiency	None	North Bramble	0.8	12	1	Residential	None

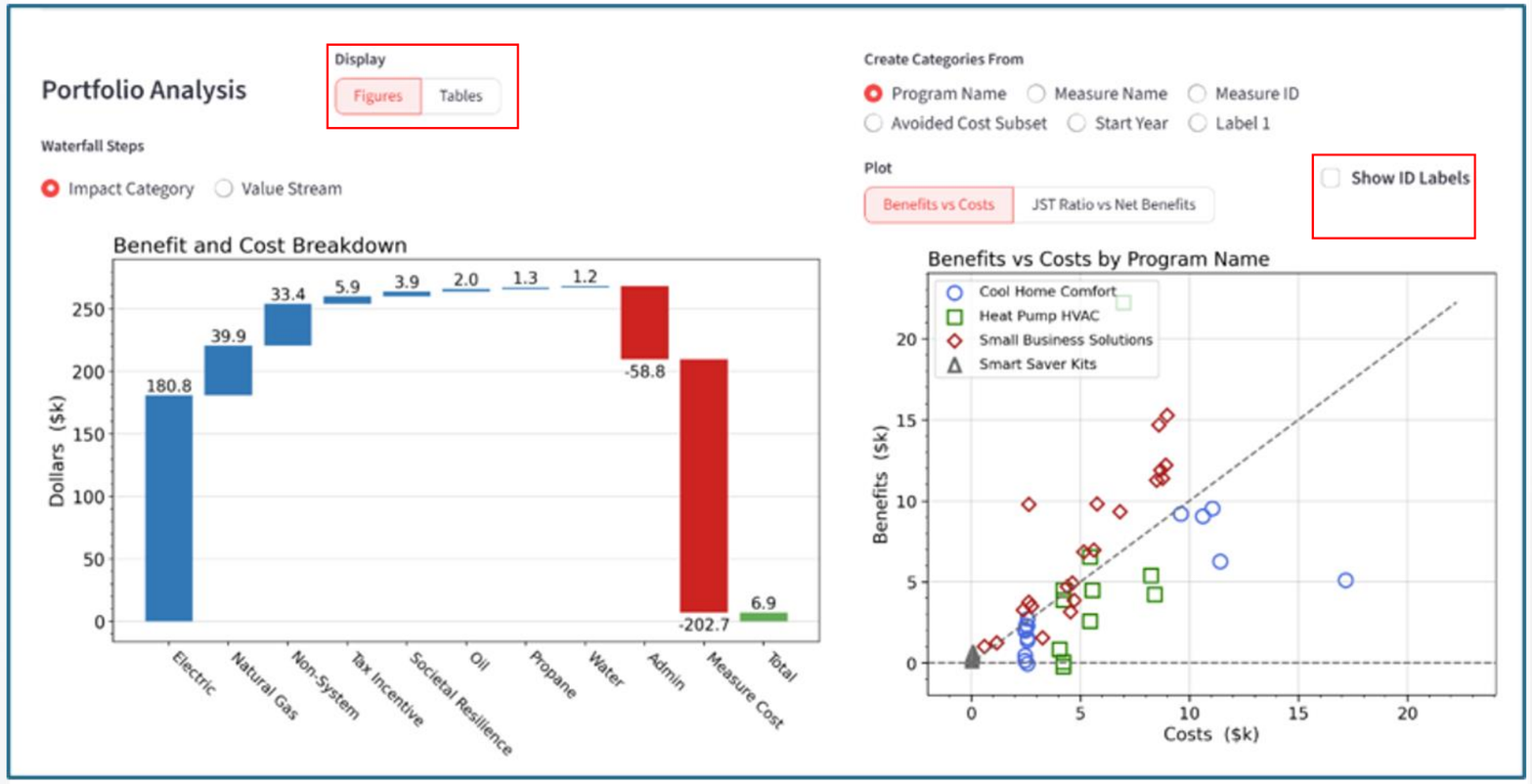
Additional Tips – Downloading Figures and Tables

OpenBCA allows users to easily download data underlying figures and tables displayed in the Insights & Analysis section.

Key tips:

- Use the Display toggle to switch between Figures and Tables for any view.
- When viewing data in table format, select Download as CSV to export the results.
- Downloaded CSV files can be used for:
  - Additional calculations
  - Custom visualizations
  - Reporting and documentation purposes

Important note:
Downloaded CSV files reflect the current filters and selections applied in the interface.

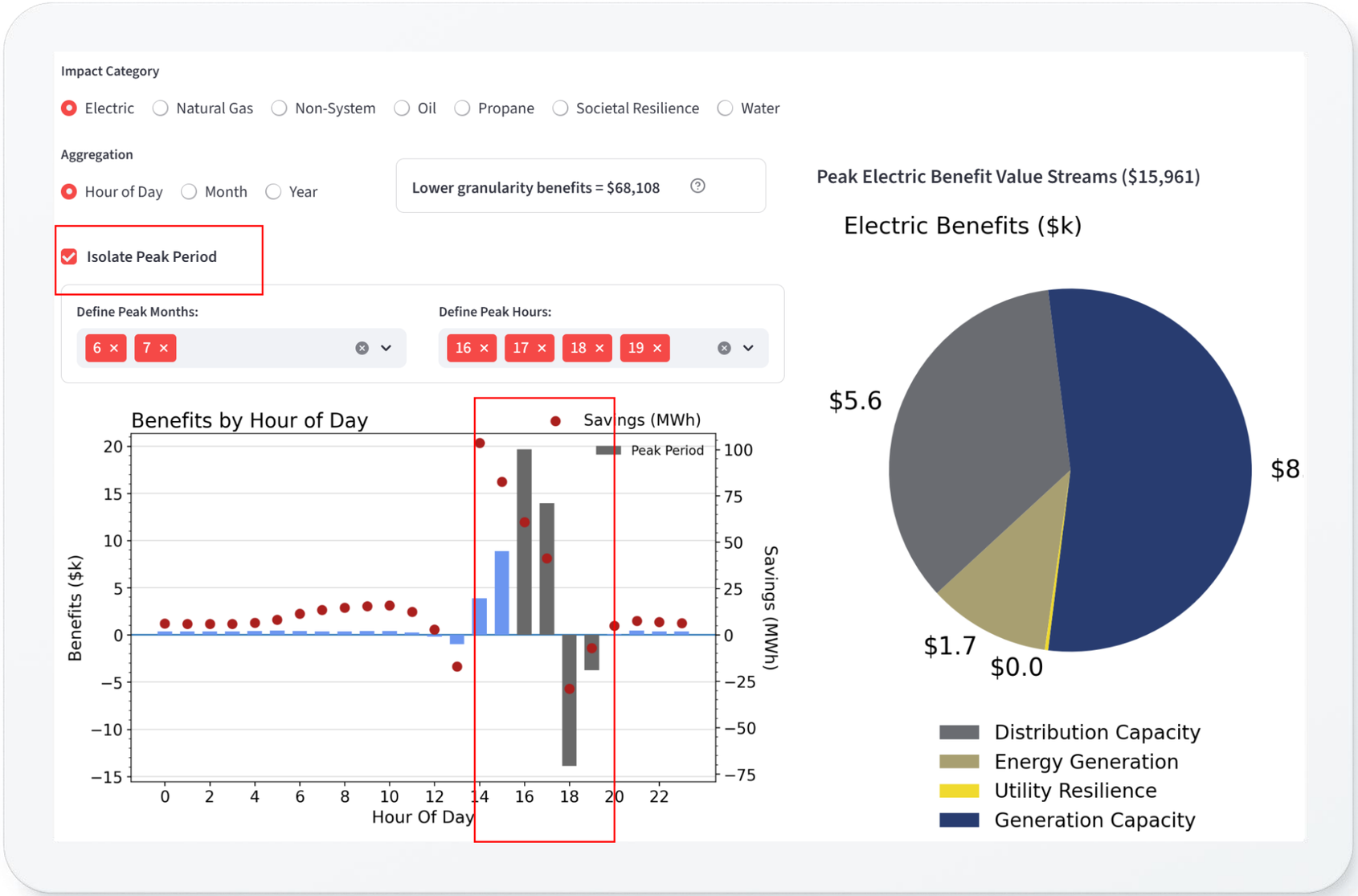


Additional Tips – Peak Period Selection

Users can optionally define peak periods (by month or hour of day) to highlight when benefits or costs occur during selected time windows.

Peak period selection:

- Allows users to visually isolate and examine results during specific hours or months
- Helps illustrate how benefits and costs align with system peak periods
- Is intended for exploratory and diagnostic purposes only

Peak period views are most useful for understanding when value is realized and for communicating results related to peak demand, system stress periods, or policy-relevant time windows.

Important note:
Defining peak periods does not change any model calculations or results. It only affects how results are displayed in figures and tables.