Introducing EPA's Energy Savings and Impacts Scenario Tool (ESIST)

December 8, 2021, 2:00 PM Eastern

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- There are several layout options
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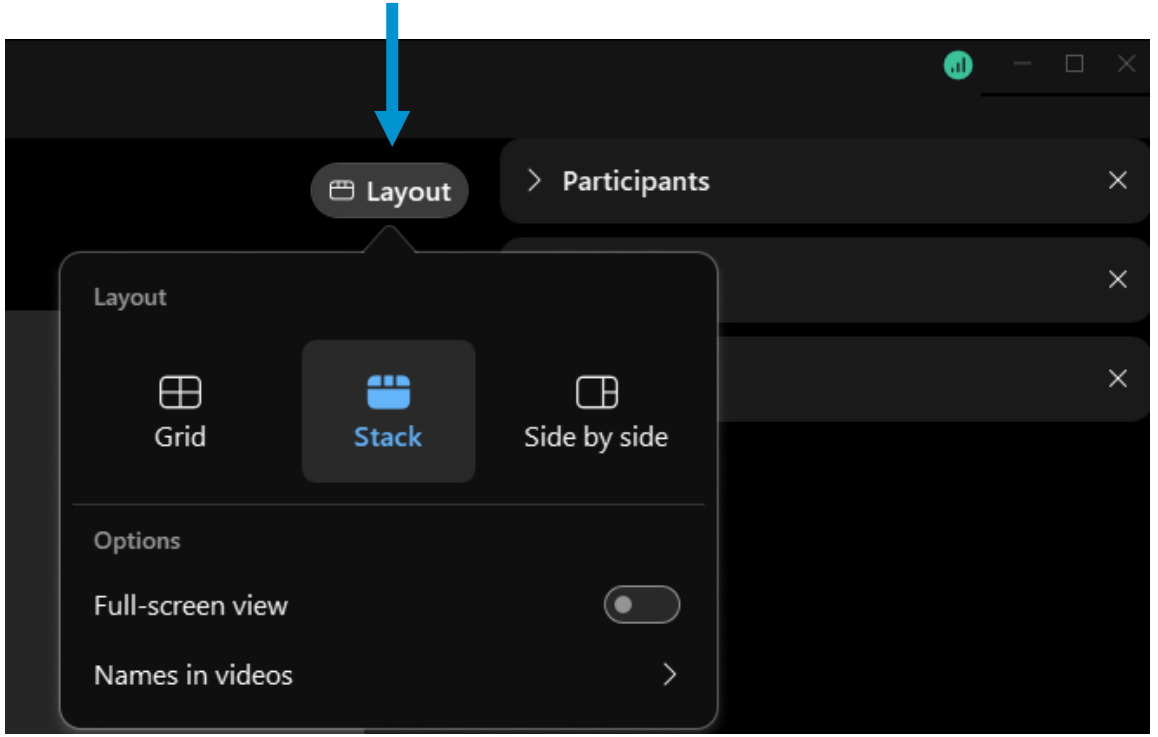

Webinar Panels

We'll use three panels

- Participants, Polling, and Question & Answer (Q&A)
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Adding Panels

- If some panels don't appear, hover over the bottom of the screen and select the desired panels
- Select More Options (…) for additional panels
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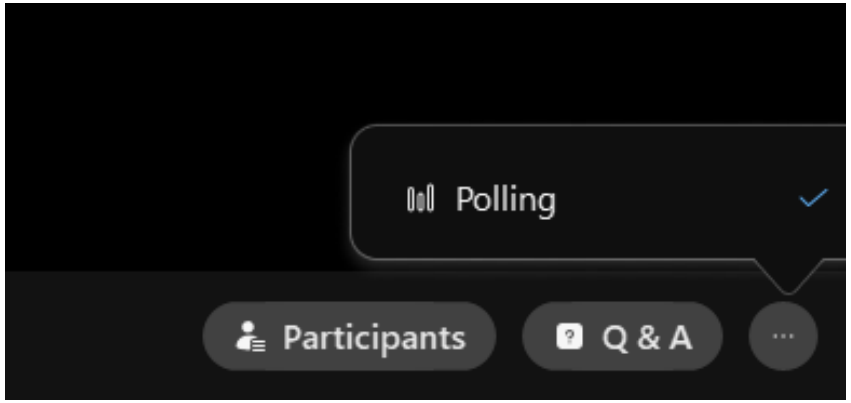


Participants **Q&A** **More Options**
Polling

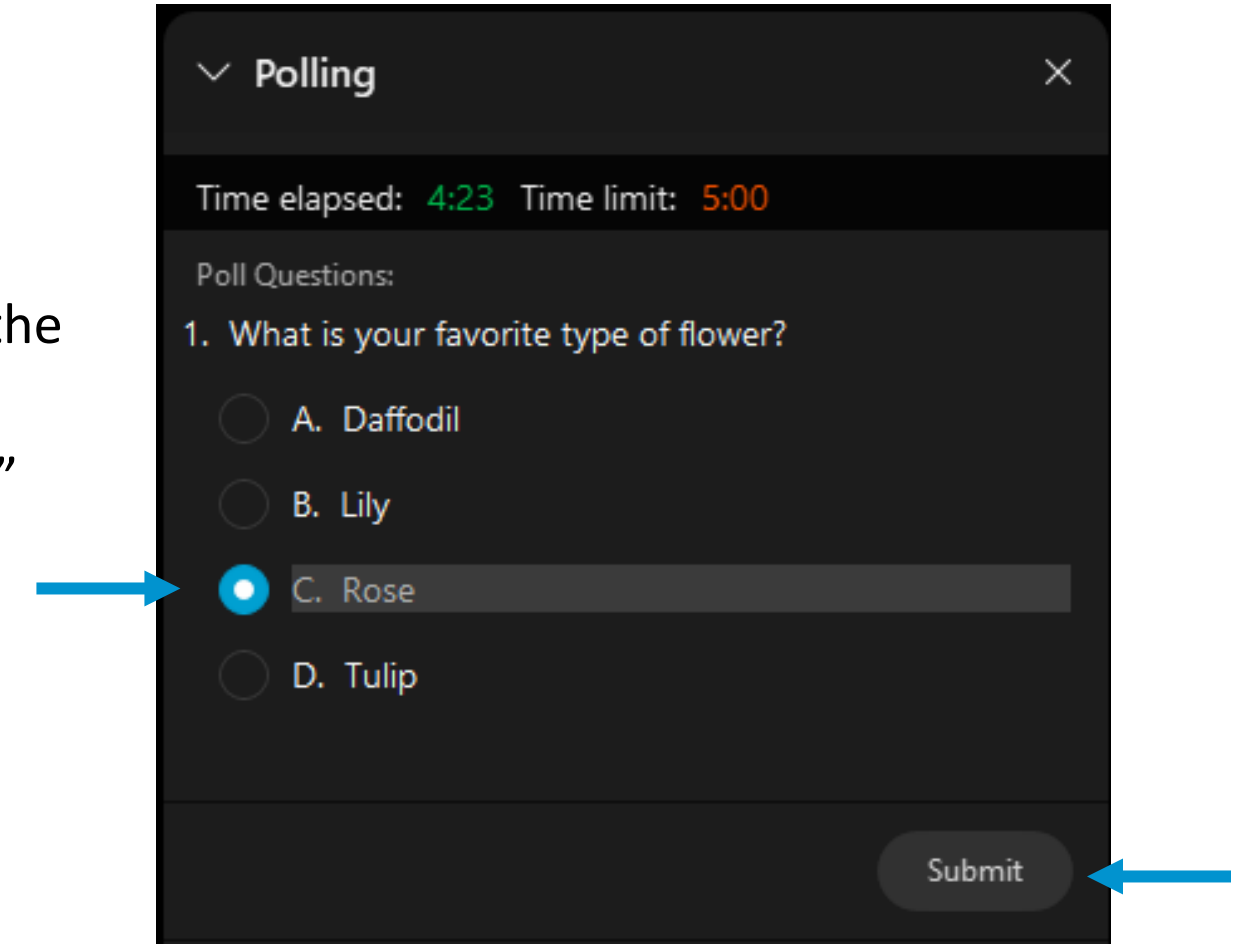
Polling and Feedback

Polling

- We'll ask a poll question during the webinar
- The polling panel will appear when we open the first poll
- Select your desired response and hit "Submit"

Webinar Feedback

- A feedback form will pop-up when you exit today's webinar

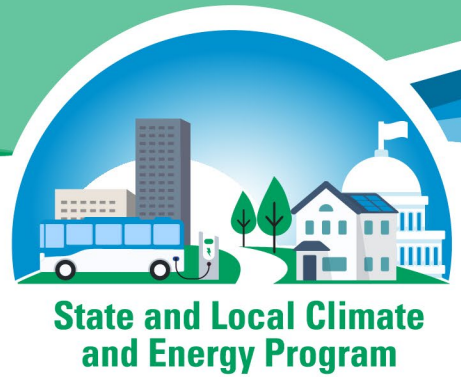


Q&A

- Participants are muted
- Questions will be moderated at the end
- To ask a question:
  1. Select “All Panelists” from the drop-down menu
  2. Enter your question in the Q&A box
  3. Hit “Enter”

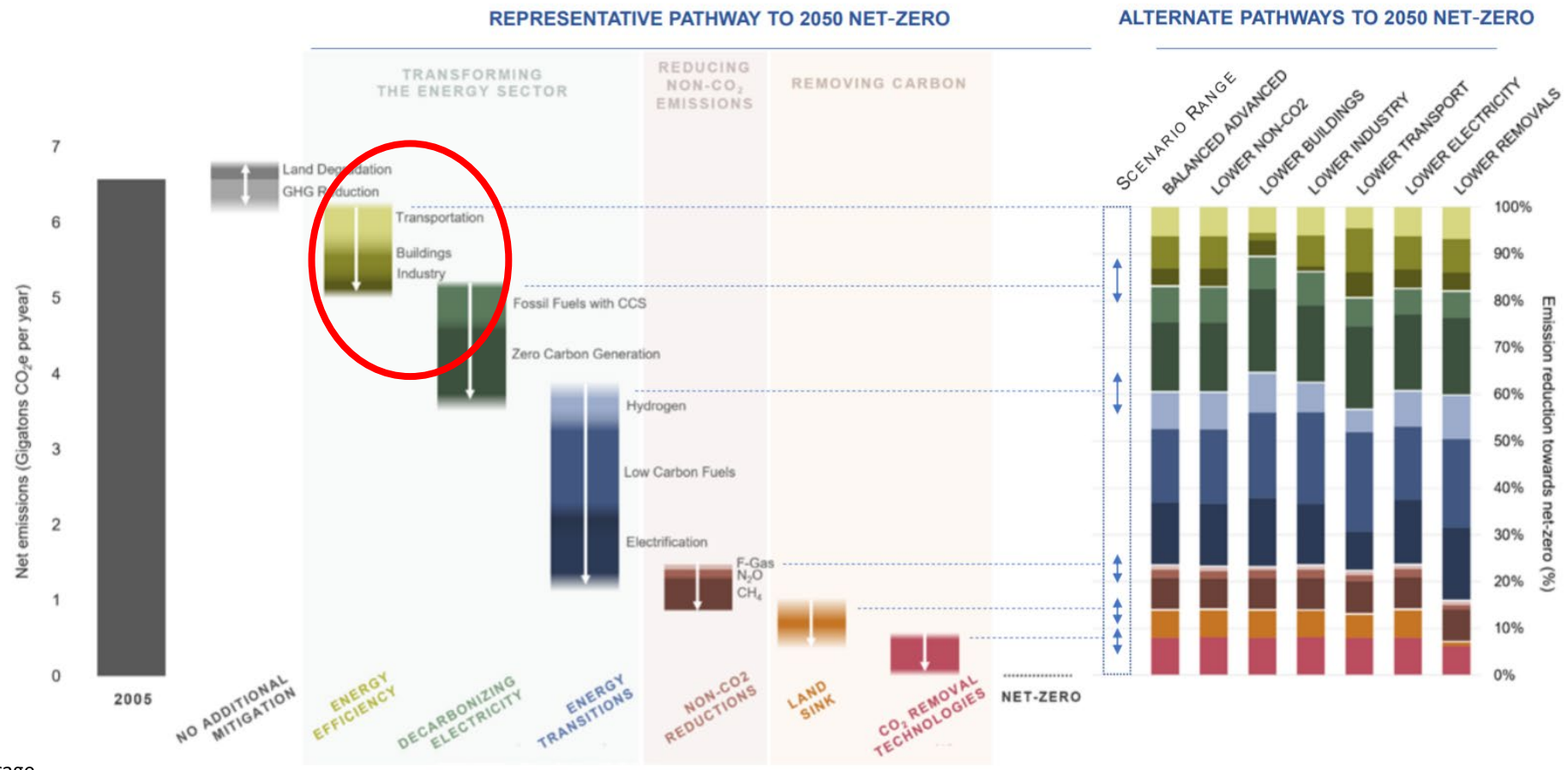
Today's Speakers

- **Maggie Molina**, State and Local Climate and Energy Program, U.S. Environmental Protection Agency (EPA)
- **Cassandra Kubes**, State and Local Climate and Energy Program, U.S. EPA
- **Patrick Knight**, Synapse Energy Economics



Introducing EPA's Energy Savings and Impacts Scenario Tool (ESIST)

Energy Efficiency (EE) Makes a Critical Contribution Towards Decarbonization

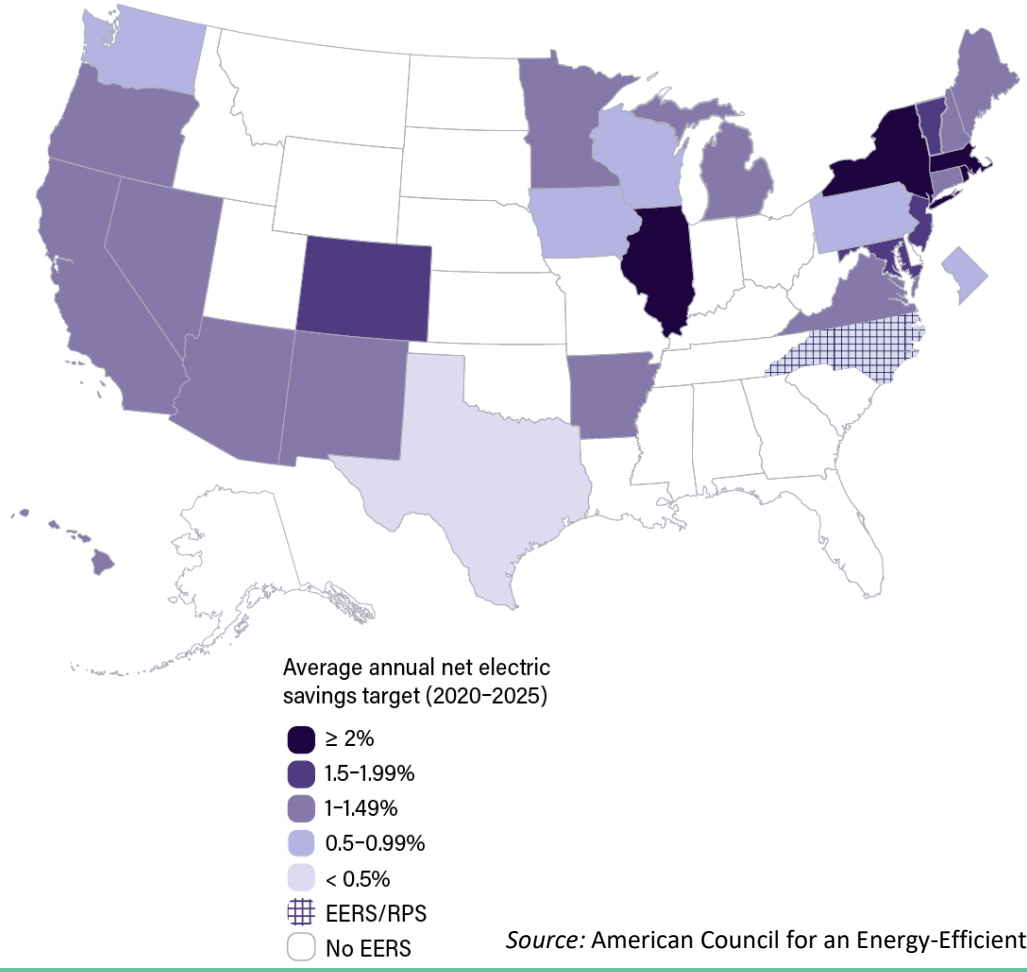


GHG: Greenhouse gas
CO_2: Carbon dioxide
F-Gas: Fluorinated gas
CCS: Carbon capture and storage
N_2O: Nitrous oxide
CH_4: Methane

Source: United States Department of State and the United States Executive Office of the President (2021) "The Long-Term Strategy of the United States: Pathways to Net-Zero Greenhouse Gas Emissions by 2050."

Utility Savings Targets are a Key Driver for Energy Efficiency

While about half of states have a savings target policy, all states have some form of utility energy efficiency programs in place.



EERS: Energy efficiency resource standard
RPS: Renewable portfolio standard

Source: American Council for an Energy-Efficient Economy (2021)

State and Local Climate and Energy Program

Our Tools and Resources Support State, Local and Tribal Stakeholders on Climate and Energy

Develop Inventories and Set Goals

State Inventory and Projection Tool
Develop and update inventories for 11 sectors. Forecast emissions through 2050

Local Inventory Tool
Develop community-wide inventories or inventories of local government operations only

Tribal Inventory Tool
Develop community-wide inventories or inventories of tribal government operations only

Design, Compare, or Evaluate Policy

AVoided Emissions and geneRation Tool
Evaluate changes in power plant emissions from energy policy

Co-Benefits Risk Assessment Health Impacts Screening and Mapping Tool
Quantify and monetize health impacts of reducing emissions

Health Benefits per kWh
Estimate the health benefits per kWh of clean energy

Energy Savings and Impacts Scenario Tool
Analyze energy savings, costs, and multiple benefits from energy efficiency programs

Communicate and Support Policy Implementation

Greenhouse Gas Equivalencies Calculator
Convert a unit of energy to the equivalent amount of CO_2 emissions from using that amount

Heat Island Reduction Program
Resources to implement heat island mitigation policies and projects

Technical Support
Provide 1-1 technical support for state, local and tribal stakeholders

Convene Stakeholders
Engage state, local and tribal decision-makers

Local Action Framework:
A Guide to Help Communities Achieve Energy and Environmental Goals

Energy and Environment Guide to Action: State Policies and Best Practices for Advancing Energy Efficiency, Renewable Energy, and Combined Heat and Power

Quantifying the Multiple Benefits of Energy Efficiency and Renewable Energy:
A Guide for State and Local Governments

Local Government Climate and Energy Strategy Series:
A Guide to Developing and Implementing Greenhouse Gas Reduction Programs

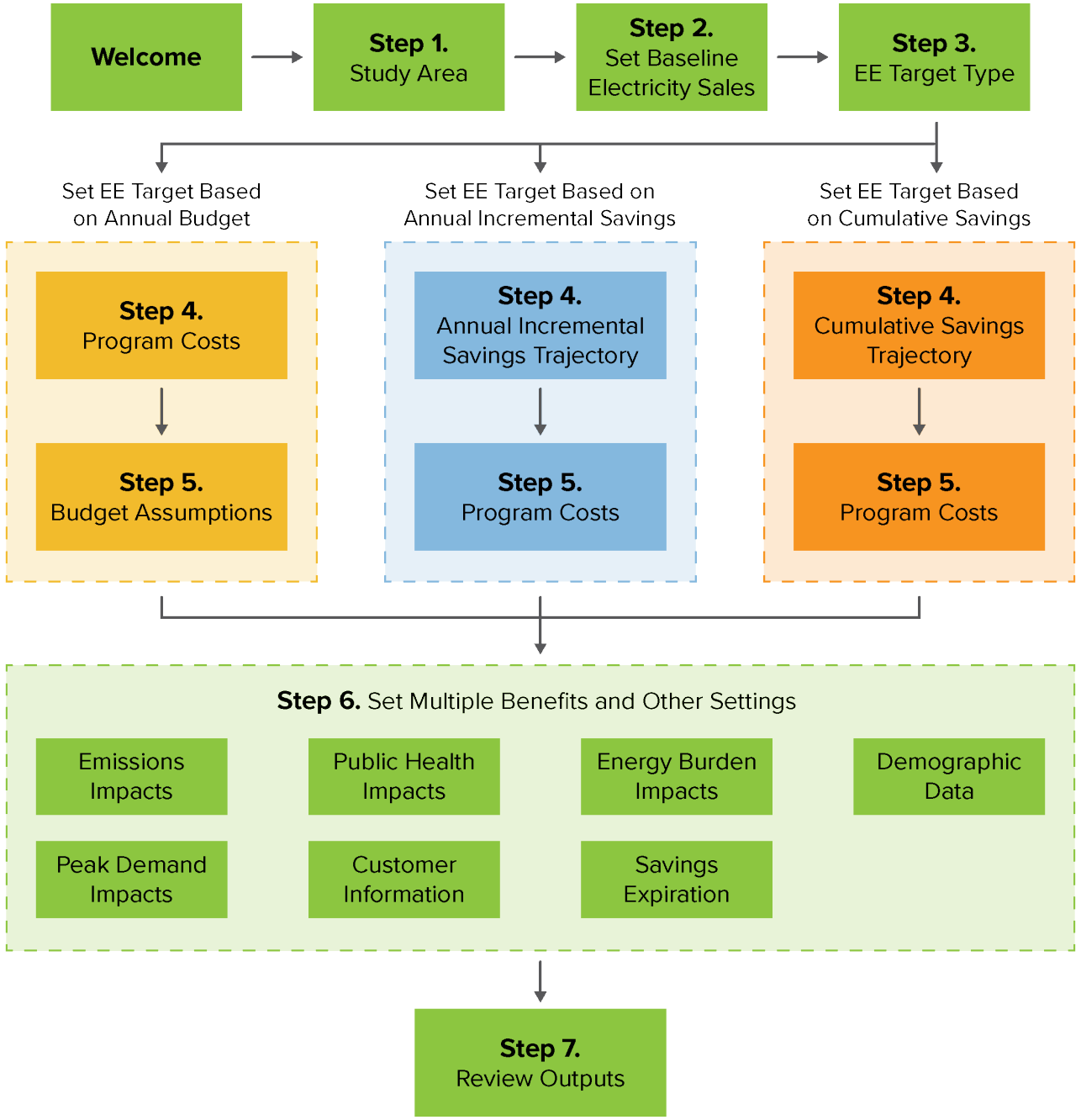
ESIST
Energy Savings and
Impacts Scenario Tool

ESIST Overview

- ESIST is a customizable and transparent Excel-based planning tool for analyzing the energy savings and costs from electric customer-funded energy efficiency programs and their impacts on emissions, public health, and equity.
- Combines several publicly available and peer-reviewed data sets to support analyses that would otherwise be significantly more time-consuming and resource-intensive.
- Provides users with the flexibility to rely on default values or to customize input assumptions.

ESIST Overview cont.

- ESIST can be used to:
  - Inform energy efficiency planning and decision-making by generating scenarios based on a state, utility, and sector, or assess national-level spanning 2010-2040.
  - Support novice and advanced users in their efforts to design energy efficiency policy goals and increase investments in energy efficiency programs.
  - Estimate a set of multiple benefits from efficiency, including avoided emissions, public health benefits, energy burden impacts, and peak demand impacts.
- ESIST: Pilot Gas Version is a standalone version of the tool to support analyses of natural gas savings.


Welcome
Step 1. Study Area
Step 2. Set Baseline Electricity Sales
Step 3. EE Target Type
Set EE Target Based on Annual Budget
Set EE Target Based on Annual Incremental Savings
Set EE Target Based on Cumulative Savings
Step 4. Program Costs
Step 5. Budget Assumptions
Step 4. Annual Incremental Savings Trajectory
Step 5. Program Costs
Step 4. Cumulative Savings Trajectory
Step 5. Program Costs
Step 6. Set Multiple Benefits and Other Settings
Emissions Impacts
Public Health Impacts
Energy Burden Impacts
Demographic Data
Peak Demand Impacts
Customer Information
Savings Expiration
Step 7. Review Outputs

ESIST Key Outputs (2010-2040)

Output	Description
Energy savings	Cumulative savings; annual incremental savings; expired savings
Efficiency program costs	First-year costs; levelized cost of saved energy; utility and participant costs
Avoided emissions	CO_2, fine particulate matter ($PM_{2.5}$), sulfur dioxide (SO_2), and nitrogen oxides (NO_x) annual and ozone season
Public health benefits	Benefit-per-ton monetized values for $PM_{2.5}$ and ground-level ozone
Energy burden impacts	Target energy burden for low-income households; program spending and participation to reach energy burden reduction
Demographic data	Household data by income, ownership status, race and ethnicity, structure type, primary heating fuel type, household age, housing size, and household language
Peak demand impacts	Cumulative peak savings; system peak demand

Potential Use Cases

- **State agency officials and public utility commission staff** examining policy implications, including costs and benefits, of changes to efficiency investments.
- **Analysts and academics** exploring different resource planning scenarios with varying levels of energy efficiency investment.
- **Nongovernmental organizations** assessing the energy burden impacts of energy efficiency programs and monetary assistance targeted to reach low-income households.
- **Air quality planners and public health officials** seeking to quantify the emissions and public health benefits of energy efficiency programs.
- **Utilities** reviewing demographic data of households in their utility service territory to reach with energy efficiency programs.

ESIST Data Sources

- Key data sources in ESIST include:
  - U.S. Energy Information Administration
  - Lawrence Berkeley National Laboratory
  - U.S. Environmental Protection Agency
  - U.S. Department of Energy
  - U.S. Census Bureau's American Community Survey
- ESIST can be used by itself or in tandem with other tools and analyses for further exploration of results.

Limitations

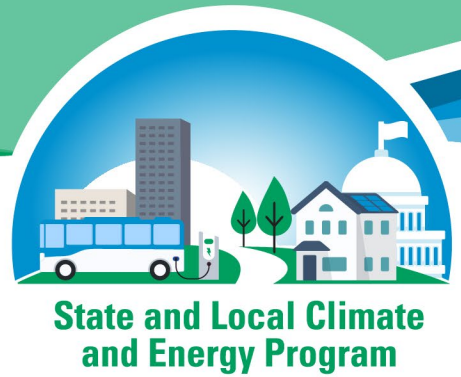
- ESIST is a scenario planning tool designed to balance complexity and relative ease-of-use.
- Users should be aware of its limitations and appropriate uses and describe these when discussing scenarios and communicating results with stakeholders.
- One important caveat to consider when using ESIST is that it provides annual values on costs and benefits for some but not all categories that are commonly assessed in benefit-cost testing of energy efficiency resources.
- Consult resources such as the National Standard Practice Manual for best practices for benefit-cost analysis of energy efficiency.
  - www.nationalenergyscreeningproject.org/wp-content/uploads/2020/08/NSPM-DERs_08-24-2020.pdf

Tool Demonstration: Getting Started

Example Scenario

Study question: What are the impacts of increasing energy efficiency in Arkansas' residential sector?

Setting	**Input**
Geography	Arkansas, all utilities
Sector	Residential
Energy savings target	Achieve annual incremental savings of 2 percent of sales by 2040, starting in 2022 and ramping up by 0.2% annually
Program costs	First-year costs are equal to those observed in most recent historical year



Question and Answer Session

How do you plan to use ESIST (multiple answer)?

- Support design of new policies
- Support design of changes to existing policies
- Estimate multiple benefits of efficiency
- Inform decarbonization planning efforts
- Other (please specify in the Q&A box)

Poll

State and Local Climate and Energy Program

Register for upcoming ESIST Office Hours Thursday, December 16, 1:00-2:00 PM ET:

www.eventbrite.com/e/us-epa-energy-savings-and-impacts-scenario-tool-office-hours-tickets-221469791107

For questions about ESIST contact:

esist@epa.gov

ESIST Energy Savings and Impacts Scenario Tool

Access ESIST:

www.epa.gov/statelocalenergy/energy-savings-and-impacts-scenario-tool-esist

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