

# Workshop: State and Local Planning for Energy (SLOPE) Training

Midwest Building Energy Codes Conference  
November 8, 2022



# Housekeeping

- Enter all questions you have for speakers in the Q&A feature
- Enter any other questions or comments in the chat
- Slides and recordings will be made available to participants after the conference
- Continuing Education Credits are available to participants – information will be shared at the end of the presentation
- Email Corie Anderson, Building Policy Associate, at [canderson@mwalliance.org](mailto:canderson@mwalliance.org) with questions

# Agenda

- Introductions
- SLOPE Training
- Q&A Session

# Speakers



**Shannon Zaret**

*Energy Technology Program  
Specialist  
U.S. Department of Energy*



**Rachel Scroggins**

*ORISE Fellow  
U.S. Department of Energy*



**Katie Richardson**

*Group Manager  
Innovation and  
Entrepreneurship Center, NREL*

# The State and Local Planning for Energy (SLOPE) Platform: *The Ultimate Toolbox for Planning Your Clean Energy Future*

November 8th 2:00 – 3:30pm ET



# Agenda



## How SLOPE Can Help Your Jurisdiction

**Welcome & Introduction to  
the State and Local  
Planning for Energy (SLOPE)  
Platform**

**01**

**SLOPE Demo: 'Scenario  
Planner' Tool,  
Transportation Data, and  
EEJ Data**

**02**

**SLOPE Demo: Integrating  
Other DOE Tools**

**03**

**How States and Local  
Governments Are Using  
SLOPE**

**04**

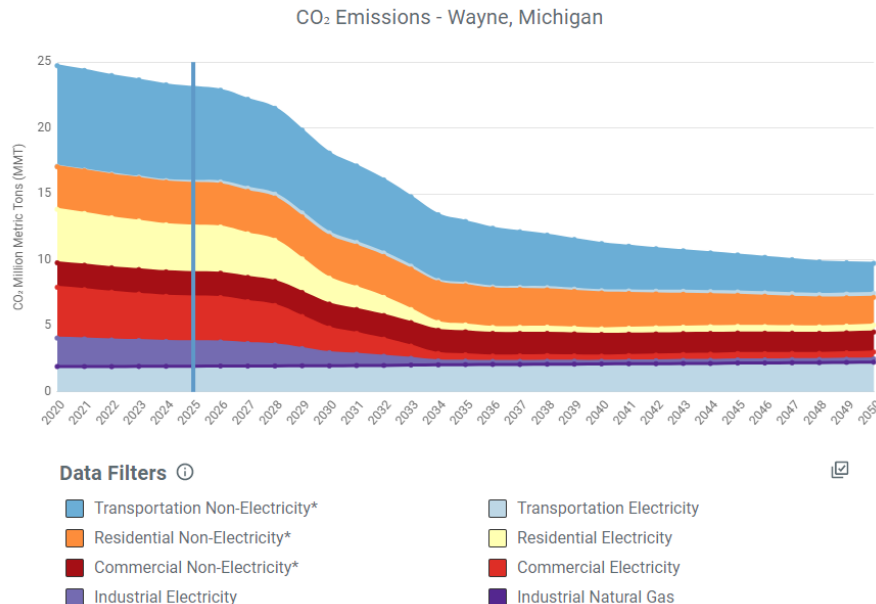
**Q&A**

**05**

# State and Local Planning for Energy (SLOPE) Platform

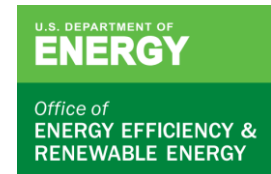
SLOPE is a free, easy-to-use online platform to support data-driven state and local energy and decarbonization planning.

## Scenario 1: 95% Grid Decarbonization by 2035 & Widespread Electrification



\* Non-electric energy demand includes solid, liquid, and gaseous fuels and steam consumed within the buildings, industrial, and transportation sectors

- Integrates **energy data and tools in one place** to help jurisdictions understand the various cost-effective options to meet their clean energy and climate goals
- Enables data-driven **economy-wide decarbonization planning**
- Delivers state-, county-, city-, and/or census tract-level data, depending on the data set

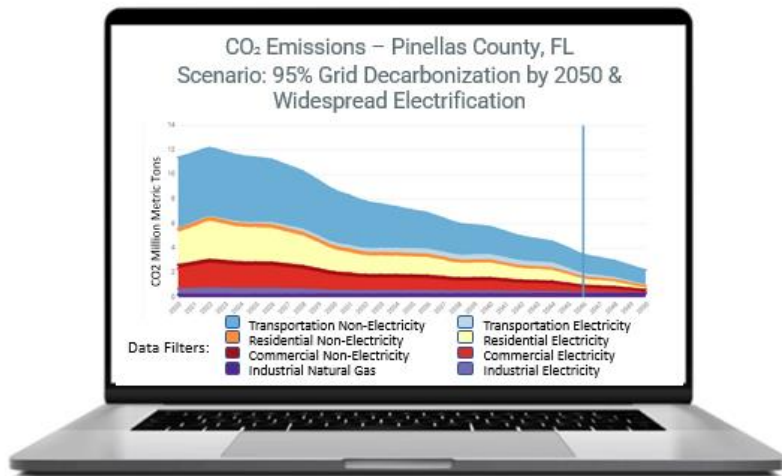


Visit SLOPE: [maps.nrel.gov/slope](https://maps.nrel.gov/slope)

# Two Tools Within SLOPE to Support Planning

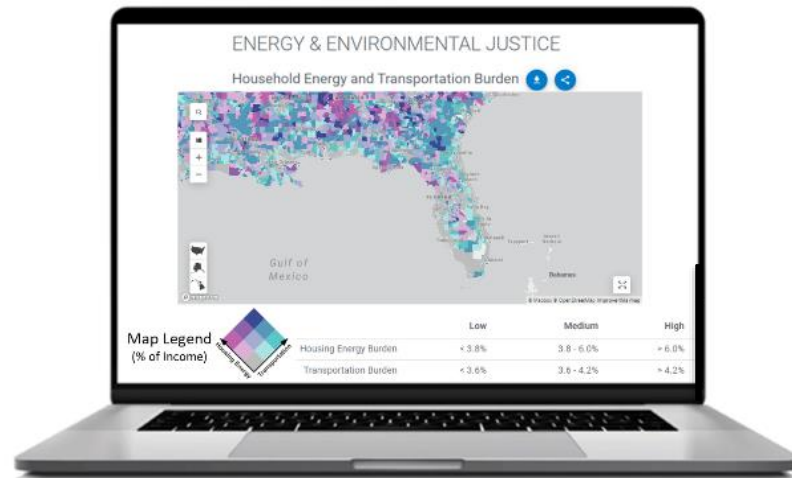
## Scenario Planner

Build, visualize, and compare the impacts of different energy scenarios for your state or county's future energy consumption, CO2 emissions, and system costs. The scenarios available reflect different clean energy strategies like energy efficiency deployment, grid decarbonization, and electrification.



## Data Viewer

Explore interactive maps and charts of energy efficiency, renewable energy, sustainable transportation, energy equity, energy cost data, and more at the state-, county-, city-, and census tract-levels.





# 'Scenario Planner' Tool

A ground-breaking planning tool that visualizes scenarios for future energy consumption, CO<sub>2</sub> emissions, and system costs of a selected county or state. Users can select and explore various energy planning pathways in isolation and in combination.

Functionality will allow users to layer the following scenarios to showcase how these scenarios interact:

- Level of Electric Grid Decarbonization
- Presence of Transmission Constraints
- Level of Building Energy Efficiency
- Level of Electrification
- Level of Demand-Side Flexibility

Control Panel

Comparison View

SCENARIO 1SCENARIO 2

Location

Search for a state

Florida State

Energy System Metrics

☐ Energy Consumption

☐ CO<sub>2</sub> Emissions

☒ System Costs (state only)

Scenario Selections

Electricity Supply Scenarios

☒ Reference Case

☐ 95% grid decarbonization by 2035

☐ 95% grid decarbonization by 2050

☐ Transmission Constraints

Energy Demand Scenarios

Level of Electrification

☐ Reference

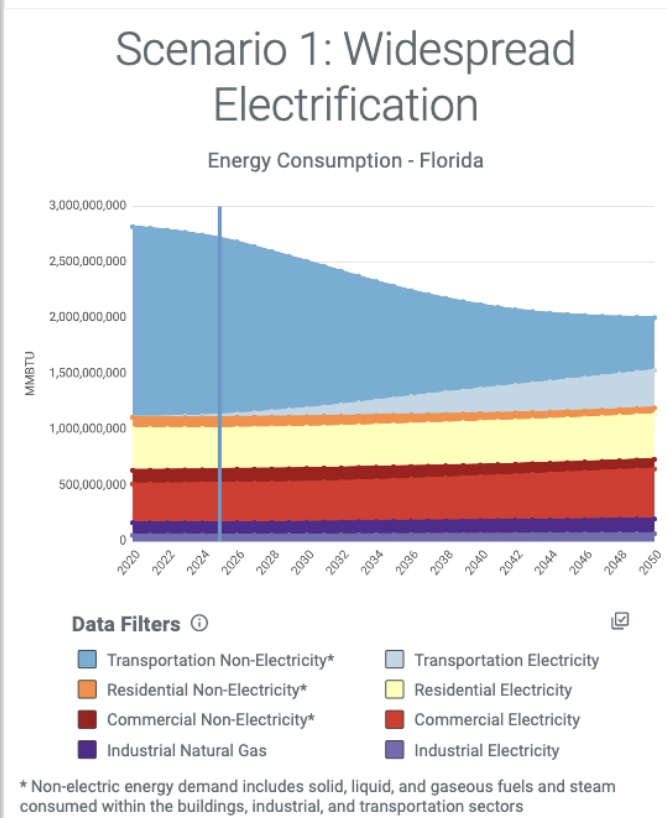
☐ Medium

☒ High

Level of Demand-Side Flexibility

☒ Reference

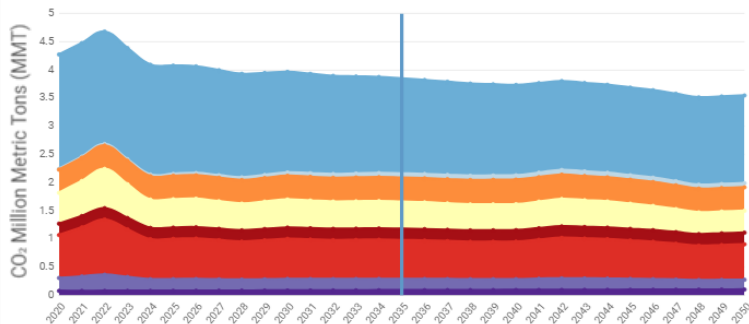
☐ Enhanced



# Example 'Scenario Planner' Application

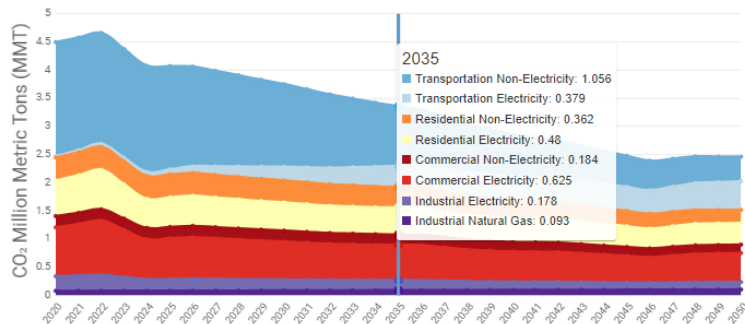
## Scenario 1: Reference Case

CO<sub>2</sub> Emissions - Hamilton, Indiana



## Scenario 2: Widespread Electrification

CO<sub>2</sub> Emissions - Hamilton, Indiana



### Data Filters ⓘ

- Transportation Non-Electricity\*
- Residential Non-Electricity\*
- Commercial Non-Electricity\*
- Industrial Natural Gas
- Transportation Electricity
- Residential Electricity
- Commercial Electricity
- Industrial Electricity

2035  
Planning Metrics ⓘ  
State-level data only



5.727%

Share of Space  
Heating Services  
Supplied by Electricity  
(%)



9.004%

BEV and PHEV  
Share of Light-  
Duty Vehicles (%)

2035  
Planning Metrics ⓘ  
State-level data only



23.01%

Share of Space  
Heating Services  
Supplied by Electricity  
(%)



47.14%

BEV and PHEV  
Share of Light-  
Duty Vehicles (%)

# Datasets Available on the Scenario Planner

Projected Outputs (2020-2050)	Description
Energy Consumption	Energy consumption if your jurisdiction were to pursue significant investments in building energy efficiency, electrification, and/or demand-side flexibility (e.g., load shifting).
CO <sub>2</sub> Emissions	CO <sub>2</sub> emissions if your jurisdiction were to pursue significant investments in grid decarbonization, building energy efficiency, electrification, and/or demand-side flexibility.
System Costs	Capital and operational costs and savings if your state were to pursue significant investments in grid decarbonization. building energy efficiency electrification, and/or demand-side flexibility.

# Data Available in SLOPE's 'Data Viewer' Tool

## Energy Consumption\*

- Electricity and natural gas consumption and expenditures: projected in a business-as-usual case for the residential, commercial, and industrial sectors through 2050

## Transportation

- Current and projected on-road vehicle fuel consumption and vehicle miles traveled
- Current and projected vehicle registration data by fuel type

## Energy Efficiency

- Electricity savings potential for residential, commercial, and industrial sectors through 2035
- Electricity and fuel savings potential from cost-effective energy improvements for single-family homes and commercial buildings

## Solar

- Utility-scale photovoltaic (PV), floating PV, residential rooftop PV, and commercial rooftop PV technical potential
- Concentrating solar power utility-scale technical potential

## Wind

- Land-based, offshore, and distributed wind technical potential

## Bioenergy

- Biopower technical potential

## Geothermal

- Utility-scale geothermal technical potential
- Geothermal district heating economic potential in new construction and existing buildings
- Geothermal heat pump economic potential

## Hydropower

- Utility-scale hydro generation potential
- New stream reach and non-powered dam generation potential

## Generation Scenarios

- Modeled current and projected electricity generation mix through 2050 by state under 12 scenarios

## Cost of Energy

- Levelized cost of energy: projected electricity costs for 16 generation technologies plus battery storage through 2050
- Program administration cost of saved electricity

## Demographics\*

- Population: past and projected population from 2015-2050

## Commercial Buildings\*

- Commercial building count and area by size and property type for 2020

## Energy & Environmental Justice^

- Energy burden from housing and transportation energy expenditures
- LMI Energy Efficiency Bill Savings Potential
- CDC's Social Vulnerability Index



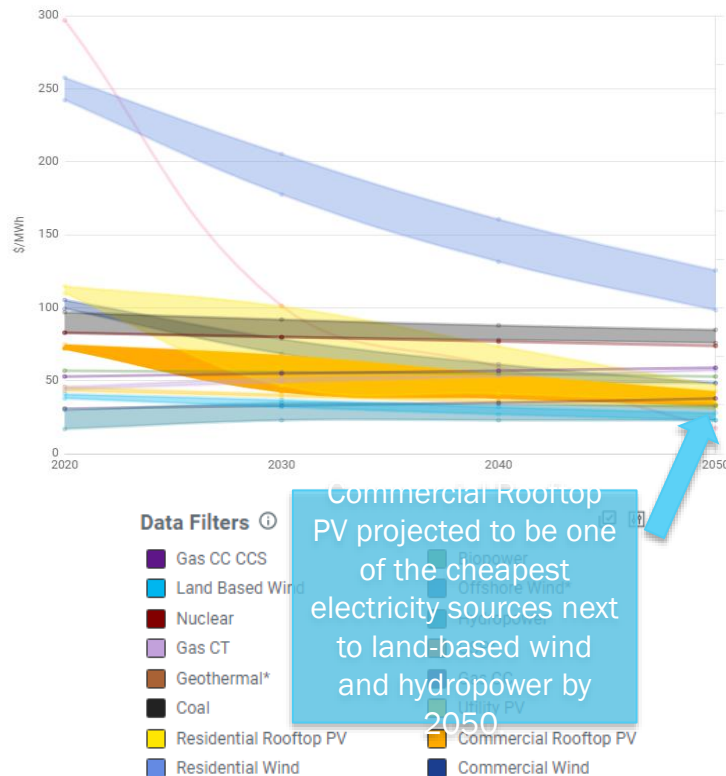
*\*City-level data available for ~6,000 cities*

*^Census-tract level data*

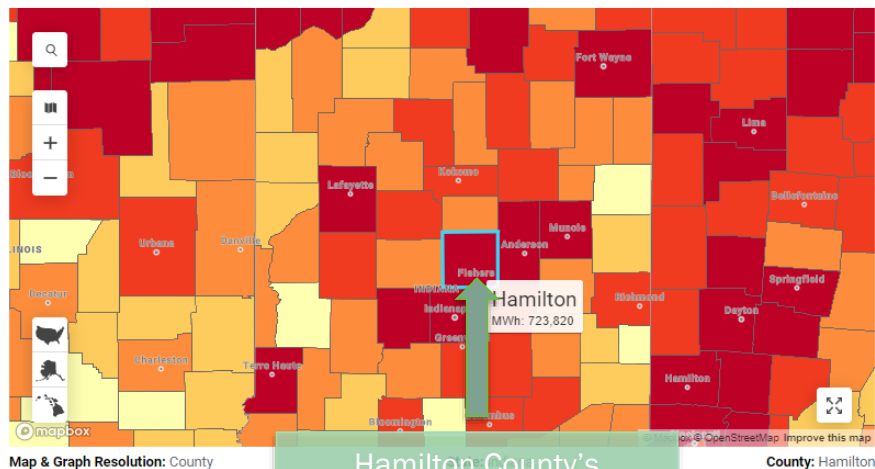
*Other datasets provide state- and/or county-level data*

# Example 'Data Viewer' Application

Projected Levelized Cost of Energy by Technology - Hamilton County, IN



Modeled Annual Technical Generation Potential - Commercial Rooftop PV

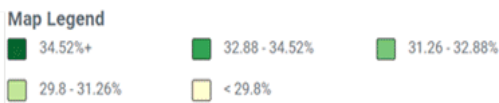
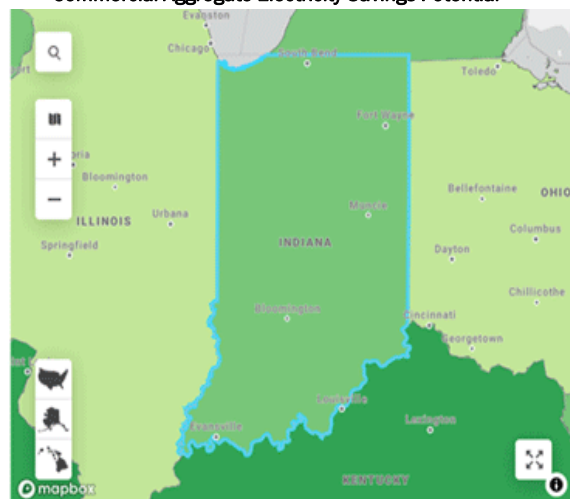


- Hamilton County, IN

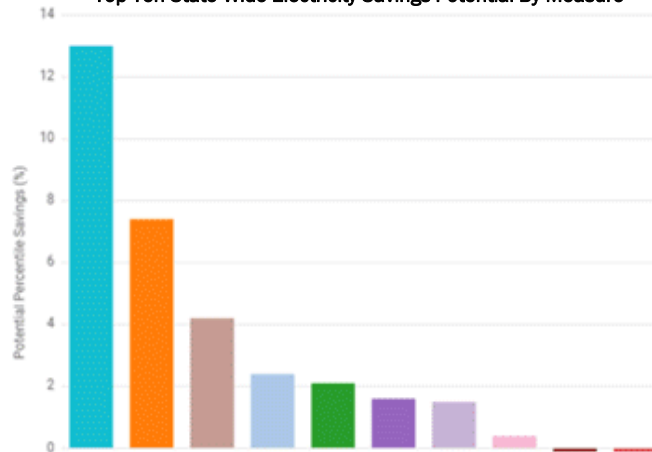
# New Energy Efficiency Data

Energy efficiency scenarios enable users to visualize the impacts of “aggressive” energy efficiency improvements.

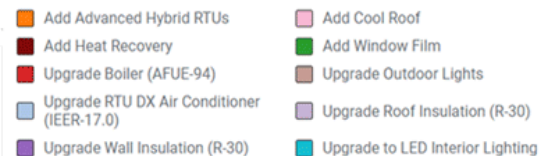
Commercial Aggregate Electricity Savings Potential



Top Ten State-Wide Electricity Savings Potential By Measure



Data Filters



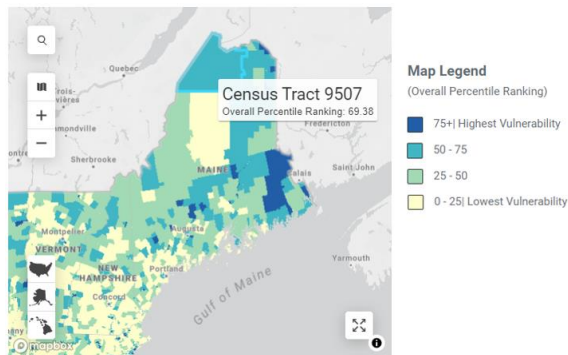
- Allows users to view the projected changes, systems-wide costs, and savings in energy consumption and CO2 emissions if their selected state or county pursues a high level of energy efficiency deployment within their building stock (**Scenario Planner**)
- Statewide commercial energy efficiency savings potential additions help users understand the total energy savings potential available within their commercial building stock for electricity and natural gas sources (**Data Viewer**)
- Provides the top ten savings measures within a state such as LED lighting, window films, or boiler upgrades for the residential sector

# New Energy and Environmental Justice Data

## CDC's Social Vulnerability Index (SVI)

SVI scores census tracts based on their relative social vulnerability. Each score is based on 15 social factors (e.g., unemployment rate, minority status, vehicle access). Users can also view vulnerability scores within certain sub-categories (e.g., socioeconomic status, housing type).

Social Vulnerability Index by Census Tract

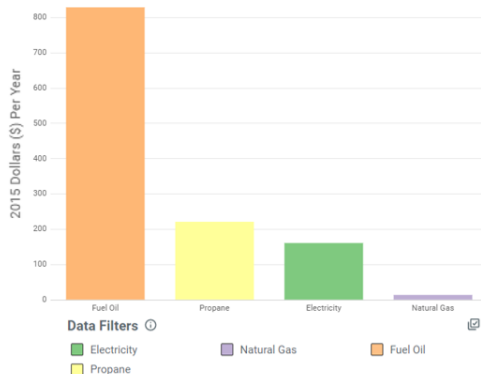


If a jurisdiction wants to target their clean energy programs, policies, or deployment to communities that may benefit the most, they can use SVI as a proxy to identify disadvantaged communities.

## LMI Single Family Homes Bill Savings Potential

This layer displays the average bill savings (as a percent) that Low-to-Moderate Income (LMI) households would realize if they got an energy efficiency retrofit.

Average Annual Bill Savings Per LMI Single Family Home

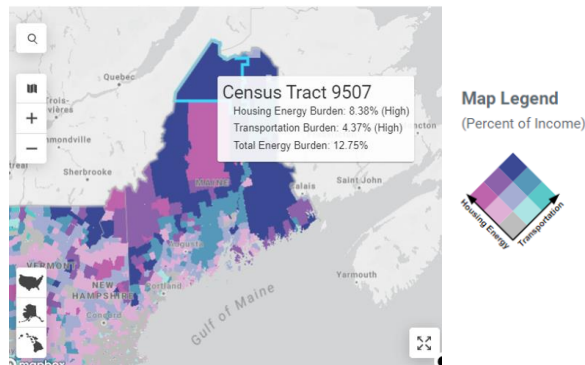


Jurisdictions considering energy efficiency programs or deployment can use SLOPE data to conceptualize the monetary benefits that LMI households would realize if retrofitted.

## Household Energy and Transportation Burden

Energy burden represents the percentage of household income spent on energy costs. SLOPE provides energy burden data on housing energy costs and transportation energy costs.

Household Energy Burden by Census Tract

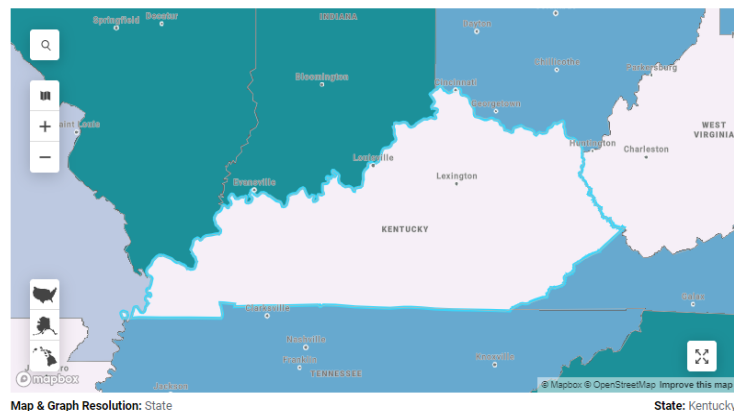


Energy burden data can be leveraged to help target programs, policies, or deployment that can reduce energy costs to communities that are in greatest need.

# New Clean Energy Job Estimates

- The graphs below show a range of potential jobs for four key clean energy technology sectors: solar, wind, battery energy storage (BES), and energy efficiency measures.
- This information was published in a 2022 NREL Report on [State-Level Employment Projections for Four Clean Energy Technologies in 2025 and 2030](#).

Job Estimates for Clean Energy Technologies

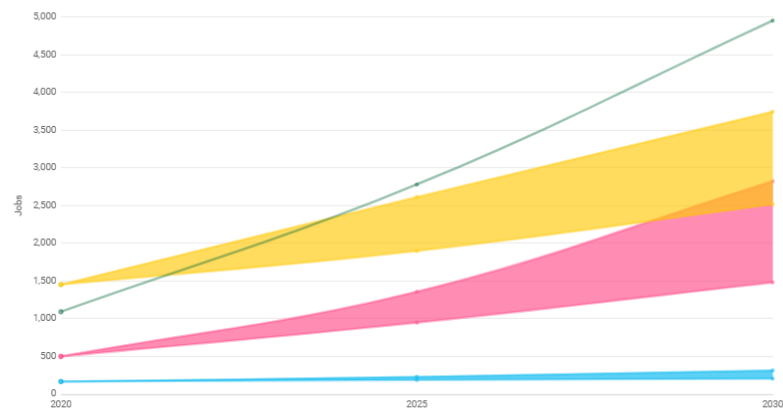


## Map Legend

(Business-as-usual jobs total for clean energy technologies - 2020)



Clean Energy Jobs Estimates by Technology - Kentucky



## Data Filters





# **SLOPE Demonstration:**

## **‘Scenario Planner’ Tool, Building and Efficiency Data, Energy and Environmental Justice Data**

# Standard Energy Efficiency Data (SEED) Platform: How SLOPE Integrates with Other DOE Tools

# SEED: Background Understanding



## Benefits:

- **Portfolio-level & program-level building characteristics and energy data management tool**
  - Combines, cleans, validates, and generates reports on data from multiple sources
  - Easy, flexible, and cost-effective method to improve data quality and help manage building-related programs
  - Interconnects with various DOE and external tools (e.g., Salesforce)
- **Web-based platform**
- **Open source and community-driven development focused**

## Acknowledgments:

Many people have contributed to this work, including:

- NREL: Nicholas Long, Alex Swindler, Katherine Fleming, Lauren Adams, Alex Chapin, Hannah Eslinger, Isabel Langlois-Romero
- LBNL: Robin Mitchell, Paul Mathew, Carolyn Szum, Han Li
- PNNL: Mark Borkum, Supriya Goel
- Devetry: Ryo Schultz, Ross Perry, Ted Summer
- Former Project Members: Adrian Lara, Lin Ainsworth, Austin Viveiros, Daniel McQuillen, Sarah Newman



# SEED Demonstration: Uploading Data


The screenshot displays the SEED Platform™ interface. At the top, the header includes the SEED PLATFORM™ logo on the left and 'Current Organization: BPS Test' with a plus icon on the right. A vertical sidebar on the left contains various icons for navigation. The main content area features a large banner with the title 'The SEED Platform™' and a descriptive paragraph: 'The DOE developed the Standard Energy Efficiency Data (SEED) Platform™ as a free software tool that provides a standardized format for collecting, storing and analyzing building energy performance information about large portfolios.' Below this, three columns highlight key features: 'Upload your data' (with a cloud upload icon), 'Match your data' (with a double-headed arrow icon), and 'Manage compliance' (with a checkmark icon). Each column contains a brief description of the feature. At the bottom, the 'Getting Started' section contains four buttons: 'Getting Started Guide' (orange), 'Download Sample Data' (light blue), 'Upload your Buildings List' (dark blue, circled in red), and 'Auto-Populate Sample Data' (green).

SEED PLATFORM™


Current Organization: BPS Test +

## The SEED Platform™


The DOE developed the Standard Energy Efficiency Data (SEED) Platform™ as a free software tool that provides a standardized format for collecting, storing and analyzing building energy performance information about large portfolios.

 **Upload your data**

Get started using SEED Platform™ by uploading your buildings list (city tax assessor data) and then your EPA Portfolio Manager data. Make sure these files are each in .csv, .xls, .xlsx, or .xml format. The SEED Platform will help you map and validate your data in the process of loading.


 **Match your data**


Match-up your buildings list with the Portfolio Manager dataset to tie building records together. SEED Platform will help you by auto-matching high confidence pairings and then provide you with tools to match the rest of your dataset.


 **Manage compliance**


Use SEED Platform's flexible, easy-to-use labeling system and inventory groupings to track the status of data submission, review, and compliance.

### Getting Started

 Getting Started Guide

 Download Sample Data

 Upload your Buildings List

 Auto-Populate Sample Data

# SEED Demonstration: Importing from ESPM

SEED PLATFORM™

Current Organization: BPS Test

Uploading your data.

Property and Tax Lot Data **Meter Data**

Cycle: 2023  
[Manage available cycles.](#)

File types supported: .csv, .xls, .xlsx, .xml, .zip, .geojson, and .json.

**Note:** only the first sheet of multi-sheet Excel files will be imported.

[Upload a Spreadsheet](#)

[Upload a GeoJSON File](#)

[Upload BuildingSync Data](#)

**Import Portfolio Manager Data**

[Dismiss](#)

Portfolio Manager Import

Property and Tax Lot Data **Meter Data**

File types supported: .csv, .xls, .xlsx, .xml, .zip, .geojson, and .json.

**Note:** only the first sheet of multi-sheet Excel files will be imported.

[Upload Portfolio Manager Meter Usage](#)

[Dismiss](#)

Portfolio Manager Import

Property and Tax Lot Data **Meter Data**

Cycle: 2023  
[Manage available cycles.](#)

File types supported: .csv, .xls, .xlsx, .xml, .zip, .geojson, and .json.

**Note:** only the first sheet of multi-sheet Excel files will be imported.

[Upload a Spreadsheet](#)

[Upload a GeoJSON File](#)

[Upload BuildingSync Data](#)

Portfolio Manager Username: SEED\_City\_Test

Portfolio Manager Password: \*\*\*\*\*

[Get Report Templates](#)

Report Template Name (18): SEED City Benchmarking Report

[Cancel](#) [Submit](#)

[Dismiss](#)

# Dashboard

## Program Overview

Program Overview Property Insights Custom Reports

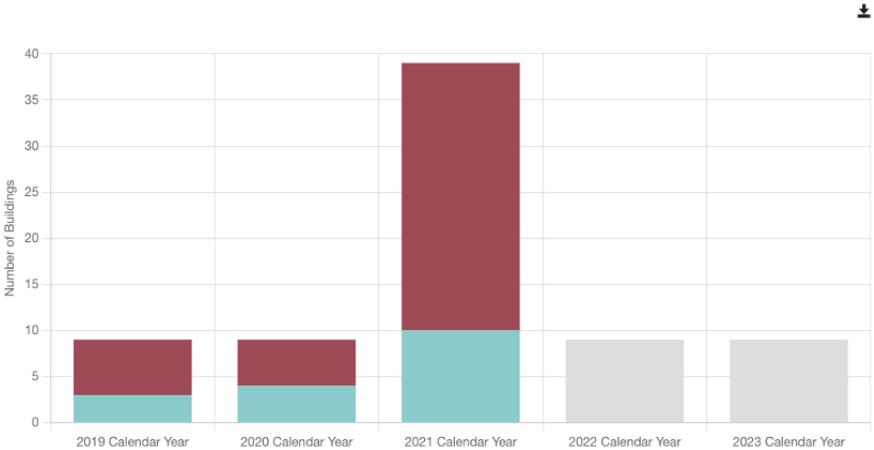
### Program Overview

Need to  
configure your  
Program  
Metrics?  
[Program Metric  
Configuration  
page.](#)

### Chart Legend

- Compliant
- Not  
Compliant
- Unknown

### BPS Compliance



CYCLES	2019 CALENDAR YEAR	2020 CALENDAR YEAR	2021 CALENDAR YEAR	2022 CALENDAR YEAR	2023 CALENDAR YEAR
Compliant	3	4	10	0	0
Non-Compliant	6	5	29	0	0
Unknown	0	0	0	9	9

# SEED Demonstration: Data Quality

SEED PLATFORM™

Organizations

Settings

Sharing

Column Settings

Column Mappings

Data Quality

Cycles

Labels

Sub-Organizations

Members

Email Templates

Derived Columns

Current Organization: nrel

Reset All Rules

Save Changes

Modifying Data Quality Rules

From the table below, select the rules that you want to: 1) enable/disable within your organization, 2) modify the minimum/maximum values to validate against on file upload, and 3) optionally assign or remove a label if the condition is not met. Reset All Rules: delete all rules and reinitialize the default set of rules.

Create a new rule

View by Property 25

View by Tax Lot 2

CONDITION CHECK	FIELD	DATA TYPE	MINIMUM	MAXIMUM	UNITS	SEVERITY LEVEL	LABEL	DELETE
<input checked="" type="checkbox"/> Not Null	Address Line 1	Text				Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Average Annual CO2 (kgCO2e)	Number	(no minimum)	1000000		Warning	High GHG	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	BETTER Potential Electricity Cost Savings (USD)	Number	(no minimum)	100000		Warning	BETTER Potential Savings	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Conditioned Floor Area (ft²)	Area	(no minimum)	7000000	square feet	Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Conditioned Floor Area (ft²)	Area	100	(no maximum)	square feet	Warning		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Not Null	County	Text				Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Not Null	Custom ID 1		(no minimum)	(no maximum)		Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	ENERGY STAR Score	Number	(no minimum)	100		Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	ENERGY STAR Score	Number	10	(no maximum)		Warning		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Fractional EUI (kBtu/sqft)	Number	(no minimum)	100	kBtu/sq. ft./year	Warning	High EUI	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Fractional EUI (kBtu/sqft)	Number	25	(no maximum)	kBtu/sq. ft./year	Warning	Low EUI	<input checked="" type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Gross Floor Area (ft²)	Number	100	7000000	square feet	Error		<input type="checkbox"/> <input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Range	Occupied Floor Area (ft²)	Number	100	7000000	square feet	Error		<input type="checkbox"/> <input checked="" type="checkbox"/>

U.S. DEPARTMENT OF ENERGY OFFICE OF ENERGY EFFICIENCY &amp; RENEWABLE ENERGY

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# SEED Demonstration: BETTER Results

## BETTER V1.0 Building Summary Report

Campos, Flynn and Douglas

Generated at

### Overview

Building Type: Office  
Gross Floor Area (ft<sup>2</sup>): 229,512.7

Building Location: 3827 West Chapman Avenue, Orange, California  
Closest Weather Station: Station: 722977-93184 : J. Wayne Apt-Orange Co Apt

Potential Cost Savings: \$1,109,555  
80.9%

Potential Energy Savings: 30,195,347 kBTU  
83.1%

Electricity Energy/Cost Savings: 80.2%

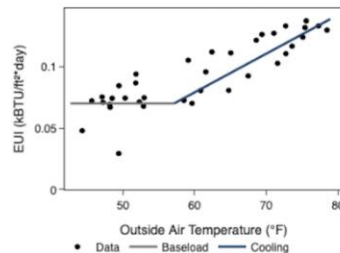
Fossil Fuel Energy/Cost Savings: 92.8%

GHG Emissions Reduction (MTCO<sub>2</sub>e): 1,899.8  
82.7 %

GHG Emissions Intensity Reduction (MTCO<sub>2</sub>e/ft<sup>2</sup>): 0.008

**Electricity Model:** Your consistent baseload is 0.07 kBTU/(ft<sup>2</sup>)\*day ,or 25.6 kBTU/(ft<sup>2</sup>)\*yr ,[Baseload]. The building's energy consumption start to increase as the outside air temperature goes above 57.1 °F [Cooling Change-Point]. Beyond the cooling change-point, the daily energy consumption increases by 115 (kBTU) when outdoor air temperature increases by 1 °F [Cooling Sensitivity].

### Electricity Change-point Model ( $R^2 = 0.83$ )



### Electricity Consumption Benchmarking

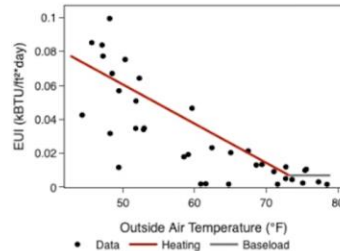


Note: % indicates the percentage of buildings your building is superior to.

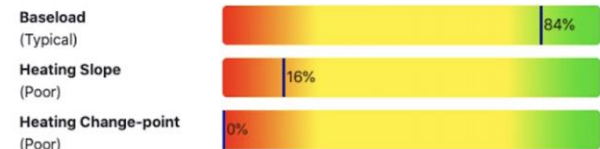
**Fossil Fuel Model:** Your consistent baseload is 0.007 kBTU/(ft<sup>2</sup>)\*day , or 2.6 kBTU/(ft<sup>2</sup>)\*yr , [Baseload]. The building's energy consumption start to increase as the outside air temperature goes below 73.2 °F [Heating Change-Point]. Below the heating change-point, the daily energy consumption increases by 84.5 (kBTU) when outdoor air temperature decreases by 1 °F [Heating Sensitivity].

### Fossil Fuel Change-point Model

( $R^2 = 0.82$ )



### Fossil Fuel Consumption Benchmarking



Note: % indicates the percentage of buildings your building is superior to.



# SEED Demonstration: BETTER Results

The screenshot displays the 'Properties' section of the SEED application. A sidebar on the left contains various icons, with the 'Properties' icon circled in red. The main interface includes a 'Properties List' tab, a 'Filter by label' search bar, and a 'Cycle' dropdown set to '2020 Calendar Year'. A 'Column List Profile' dropdown is set to 'BETTER ESPM Property File', with a red arrow pointing to it from a box labeled 'BETTER Results'. Below these are 'View by Property' and 'View by Tax Lot' tabs. The main table lists properties with columns for PM Property ID, Property Name, Address Line 1, City, and three BETTER metrics: Potential Cost, Potential Energy, and Potential GHG. The table is filtered to show 40 properties. A red box highlights the last 10 rows of the table.


PM Property ID	Property Name	Address Line 1	City	BETTER Potential Cost	BETTER Potential Energy	BETTER Potential GHG
17145817	Allison-Webb	894 Mills Fork	Manteca	4537.72	62290.61	12254.92
53122797	Anthony, Cabrera and ...	24632 Gregory Vista	Susanville	67027.96	923393.58	181584.84
66670865	Bender-Johnson	945 Lynch Ramp Suite ...	Crescent City	47627.69	386751.78	98673.4
62521116	Brown-Savage	089 Rogers Crossroad	El Monte	166984.02	1649788.02	340563.16
21283284	Byrd-Mejia	733 Daniel Common	Stockton	291634.9	2563610.4	540187.35
82965112	Campos, Flynn and Do...	3827 West Chapman A...	Orange	1109555.86	8849382.83	1899820.15
58891421	Carter LLC	49858 Janice Plaza Apt...	San Jose	137291.47	1366976.93	281818.18
98976218	Chapman, Gonzalez an...	2064 West Columbia W...	Hanford	280080.96	3772061.3	743916.27
66378228	Cline Inc	108 Phillip Hollow	Los Angeles	392192.62	3490937.88	733902.13
45506420	Collins, Hall and Brown	224 Mary Skyway Suite...	Yuba City	97860.08	965554.09	199362.61
95595481	Davis-Mccall	8764 Alexander Pass S...	Long Beach	523095.96	4312678.86	920017.62
4277132	Davis-Smith	6243 Robin Spring Apt...	Martinez	2017.11	46079.54	13408.35
84613073	Floyd PLC	806 Brad Junction	Riverside	23307.26	263000.09	53159.17

# SEED Demonstration: BETTER Results

[← Properties](#)

## Property Detail


[Property Detail](#) [Meters](#) [Notes](#) [Column List Profiles](#) [Cross-Cycles](#) [Analyses](#)

 **Property : 894 Mills Fork** [Edit](#)

Actions ▼

**Cycle:** 2020 Calendar Year


**Labels:** (no labels applied)

**BETTER analysis - 41 records** Run #2056 **Completed** 

**\$4,537.72**  
Potential Cost Savings (USD)

**62,290.61**  
Potential Energy Savings (kWh)

09-15-2021 16:20 (2 minutes, 20 seconds)  
LBNL 404, Robin

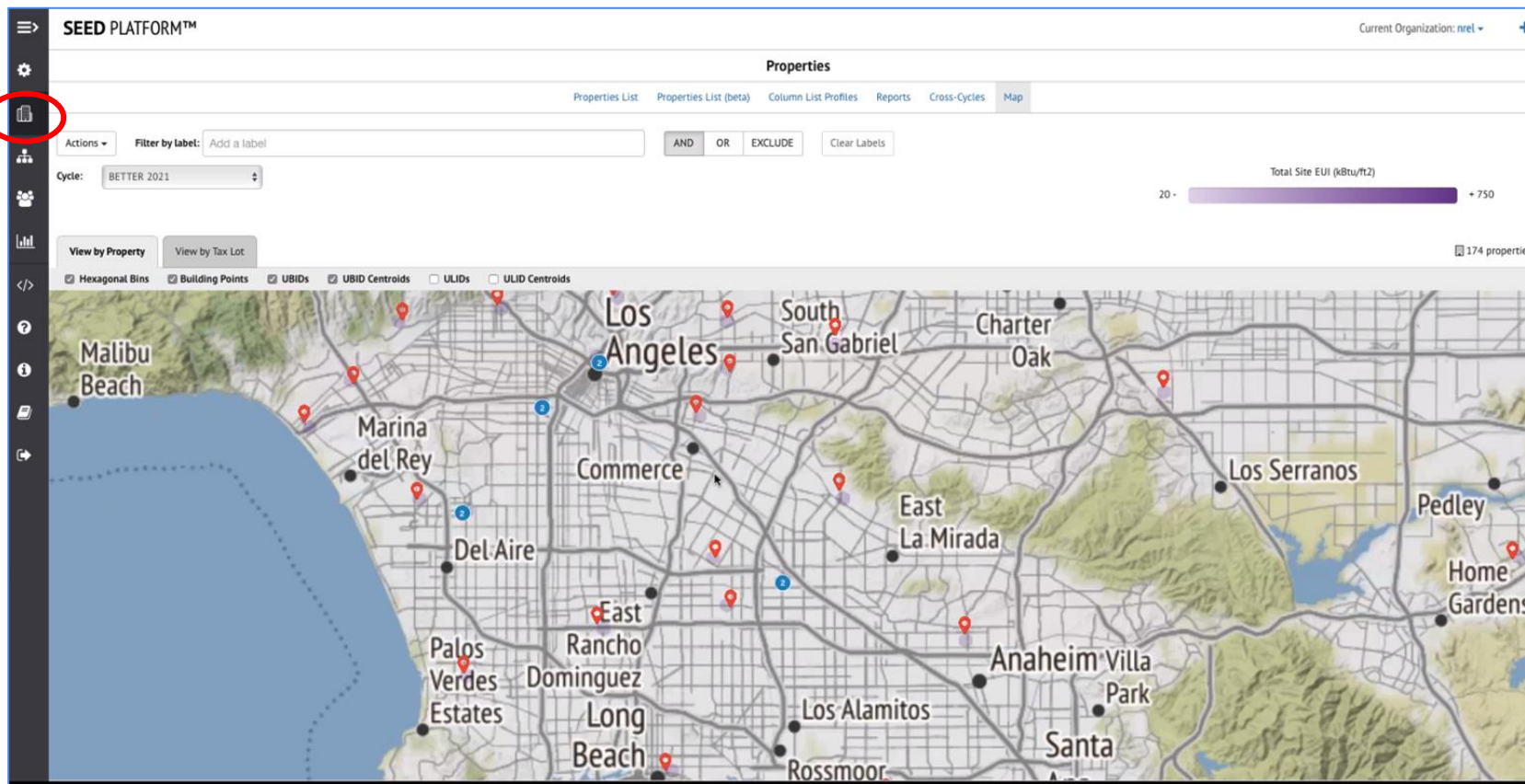
**Full Analysis** 

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U.S. DEPARTMENT OF ENERGY    OFFICE OF ENERGY EFFICIENCY & RENEWABLE ENERGY

40

# Map Analysis & Justice40 Tracking



# How States and Local Governments Are Using SLOPE

# How States and Local Governments Are Using SLOPE

## Milwaukee, Wisconsin

- Identify the sectors with the biggest impact on reducing costs and emissions
- Determine what renewable technologies are most cost-effective over time
- Assess how much of Milwaukee's energy consumption could be met by locally generated renewable energy

## New Mexico

- Determine potential for local, distributed generation and energy efficiency to meet NM's energy needs
- Identify technologies that can help support energy affordability
- Assess impacts that vehicle electrification will have on electricity demand and how NM can prepare for this transition

## Sarasota, Florida

- Set incremental targets to reach ambitious greenhouse gas emissions reduction goals
- Assess the impacts of electrification on their building and transportation sectors' energy consumption and CO<sub>2</sub> emissions
- Ensure that LMI communities have access to electric vehicle charging infrastructure

Geothermal Heat Pump Economic Potential by County

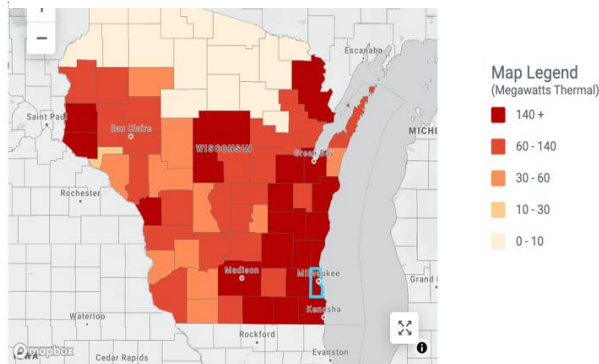


Figure 1: Geothermal heat pump economic potential by county in Wisconsin in 2020 (SLOPE 2021)

Personally Owned Light-Duty Vehicle Stock by Vehicle

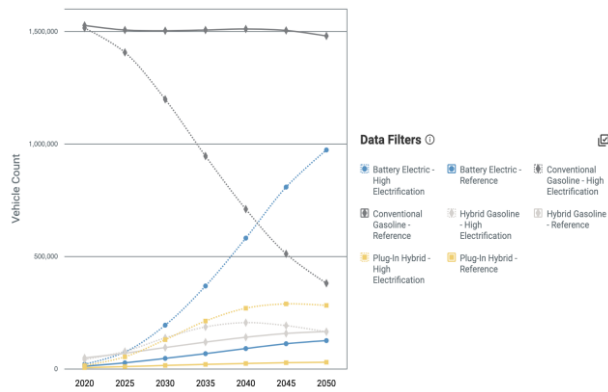


Figure 2: Personally owned light-duty vehicle stock in New Mexico 2020-2050 (SLOPE 2021)

CO<sub>2</sub> Emissions – Widespread Electrification Scenario

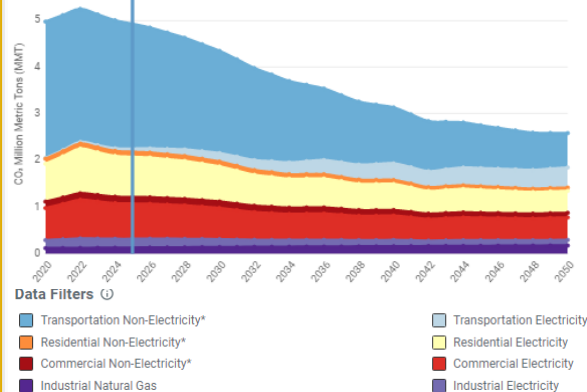
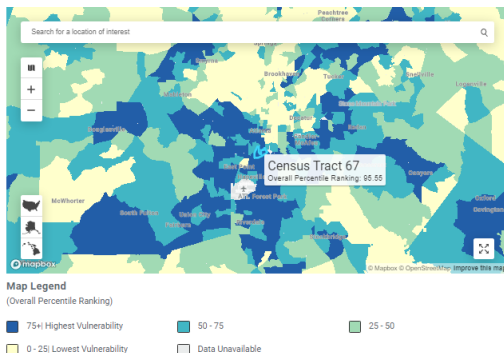


Figure 3: CO<sub>2</sub> Emissions Under a Widespread Electrification Scenario in Sarasota, FL 2020-2050 (SLOPE 2022)

# Case Study – Atlanta Regional Commission

Atlanta Regional Commission (ARC) is using SLOPE to inform and integrate equity considerations into planning surrounding its transition to electric vehicles (EVs)

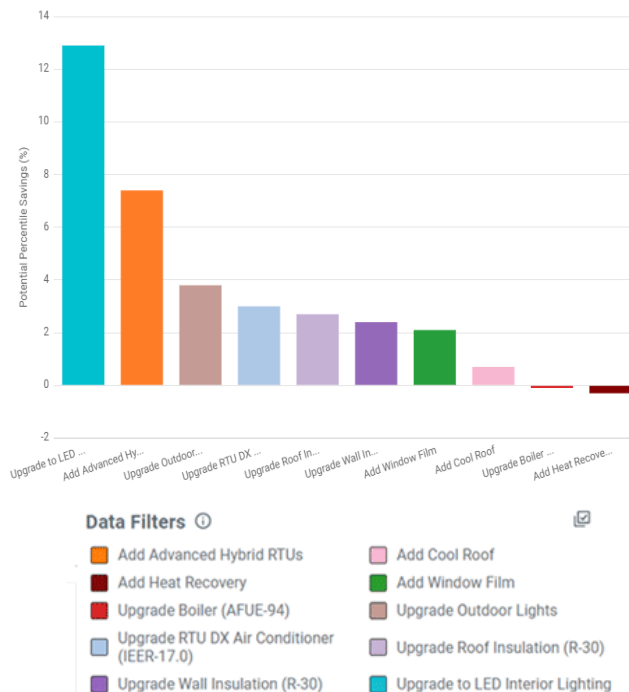
Overall Social Vulnerability Index



Social Vulnerability Index Rankings



Top Ten State-Wide Electricity Savings Potential By Measure



## SLOPE Helped Atlanta Regional Commission:

- Understand multifamily housing and opportunities to co-locate charging infrastructure while ensuring equitable access.
- Explore opportunities to help the region reach carbon reduction milestones.
- Explore possible rates of adoption of electric vehicles (EVs) while considering the transportation burden of underserved populations.

# Types of Questions SLOPE Can Answer



## **Consumption**

What sectors (e.g., commercial, industrial, residential) should my city focus on to have the biggest impact on reducing GHG emissions?



## **Efficiency**

What is the energy efficiency savings potential in my jurisdiction and what are the most cost-effective savings measures in my state?



## **System Costs and CO<sub>2</sub> Emissions**

How do the system cost and emission impacts of various energy strategies compare?



## **Buildings**

How many commercial buildings over 20,000 ft<sup>2</sup> are in my city and what is the total square footage broken down by property type?



## **Renewables**

How much of my county's energy consumption can be met by locally generated renewable energy?



## **Sustainable Transportation**

How might the number of EV, conventional gasoline, hybrid gasoline, and PHEV personal vehicles change in the future?



## **Cost of Energy**

How do the costs of utility-scale and distributed renewables, fossil fuels, energy storage, and efficiency compare in my jurisdiction?



## **Decarbonization Planning**

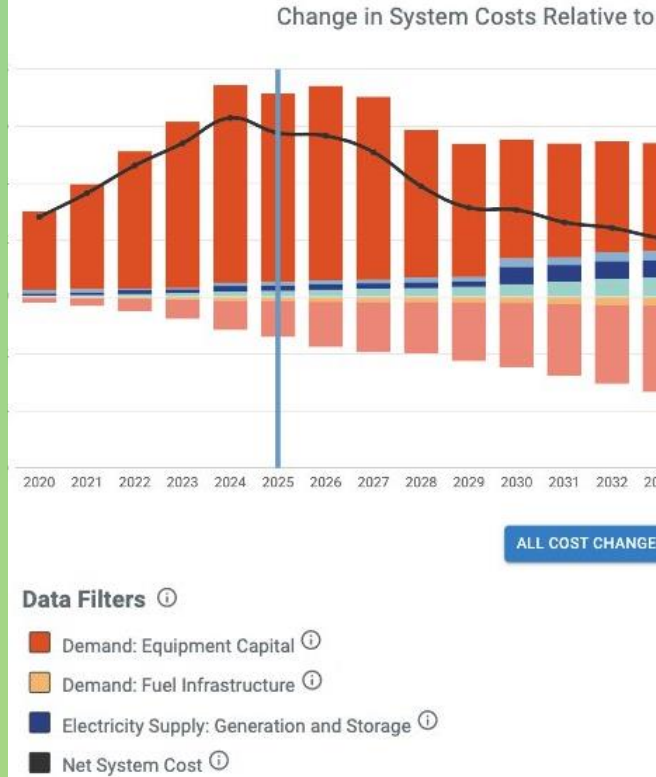
How can various energy strategies help my community achieve its decarbonization goals?

# Defining SLOPE in the Era of BIL

SLOPE can play an integral role in the pre-implementation stage of deployment.

In the era of the Bipartisan Infrastructure Legislation, SLOPE fills the role of identifying high-impact technologies, sectors, and communities to help prioritize investments and planning strategies that present the greatest opportunities to reduce emissions, costs, and consumption. SLOPE allows for the creation of customized maps, charts, and scenario models that can be easily shared with key decision makers while integrating over 25 leading data sources.

## Scenario 1: 95% Grid Decarbonization Barriers & Widespread Electrification



## Office of State & Community Energy Programs

SLOPE can be leveraged to explore priority data sets for BIL grantees.

The new Office of State & Community Energy Programs (SCEP) presents an opportunity to work with communities to understand their needs and the types of data and analysis that can support them with implementation. SLOPE has the capability to support decarbonization, renewable energy integration, electrification applications, and energy planning both locally and state-wide.



# How Can SLOPE Help Your Jurisdiction?

- Saves you time and resources by providing a free, web-based tool to support your energy planning
- Identifies high-impact technologies, sectors, and communities to help you prioritize investments and planning strategies that present the greatest opportunities to reduce emissions, costs, and consumption
- Offers additional tools and resources you can leverage in developing policies and programs to meet your energy and climate goals

## Check Out Our “SLOPE Stories”

<https://maps.nrel.gov/slope/stories>

*SLOPE Informs Climate and Equity  
Planning in Milwaukee, Wisconsin*

*SLOPE Informs Grid Modernization and  
Transportation Planning in New Mexico*

*(Coming Soon!) SLOPE Informs  
Equitable Transition to Electric Vehicle  
Infrastructure in the Atlanta  
Metropolitan Area*

**If you have used SLOPE and are willing to share your experiences with our team OR if you think your jurisdiction would benefit from additional outreach or assistance:**

**please enter your email in the chat or reach out to us at [slope@nrel.gov](mailto:slope@nrel.gov) so we can follow-up and learn more.**

# Questions?

# Thank you for your interest in SLOPE!

## Additional Questions?

Contact Us at [slope@nrel.gov](mailto:slope@nrel.gov)

Visit SLOPE at [maps.nrel.gov/slope](https://maps.nrel.gov/slope)

And check out SLOPE's new energy and  
environmental justice data!



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# Upcoming MEEA Events



**Early Bird Registration  
Now Open!**

January 31 - February 2, 2023  
Chicago, IL  
[www.meeaconference.org](http://www.meeaconference.org)