U.S. DEPARTMENT OF ENERGY

Office of ENERGY EFFICIENCY & RENEWABLE ENERGY

Acceleration Station: Boosting Building Performance Standards through Federally Funded Projects

Billierae Engelman

US Department of Energy

2024 National Energy Codes Conference

AIA and ICC Continuing Education Provider

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RESNET RESIDENTIAL ENERGY SERVICES NETWORK

Learning Objectives

Learn about the federal landscape of funding opportunities for Building Performance Standards (BPS).

Explore the variety of innovative approaches to scaling BPS and other existing buildings policies and programs.

Hear from four leading organizations supporting the implementation of BPS across the US.

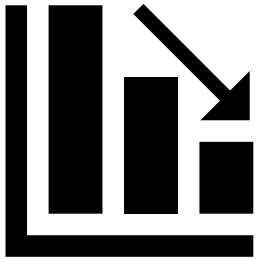
Understand critical opportunities and challenges in embedding equity into BPS.

Session Roadmap

- Building Performance Standards (BPS) Intro
- Federal Support for BPS
- Institute for Market Transformation
- Clearly Energy
- University of Cincinnati
- Southeast Energy Efficiency Alliance (SEEA)

Building Performance Standard 101

State & local policies regulating existing building energy/emissions use through mandated performance requirements over lifecycle of building.



Metric Selection

EUI, GHGI, and more

Covered Buildings

Building sqft, use type

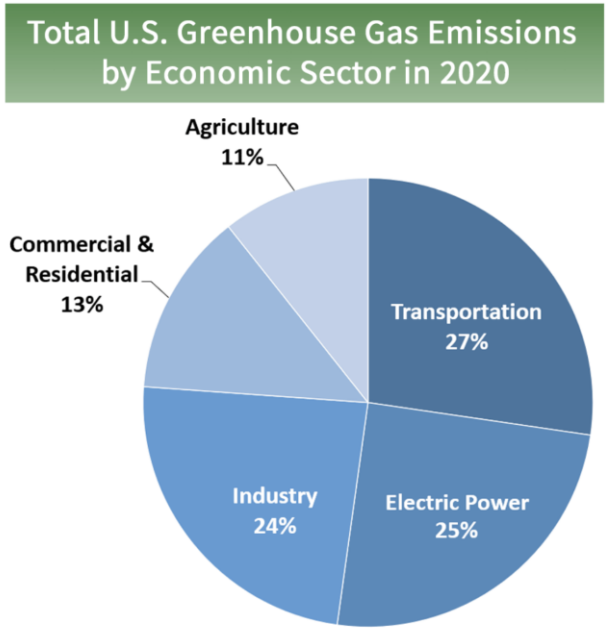
Compliance Timeline

One long-term target
interim step-down targets

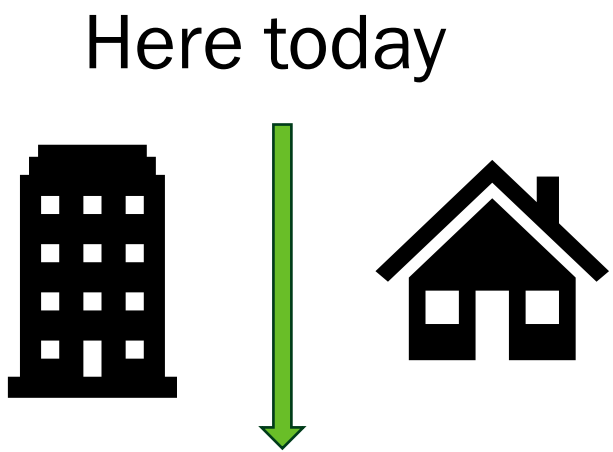
Alternative Compliance Pathways

Flexibility for equitable implementation (e.g., audit requirements, timeline extensions, etc.)

Why Existing Buildings?



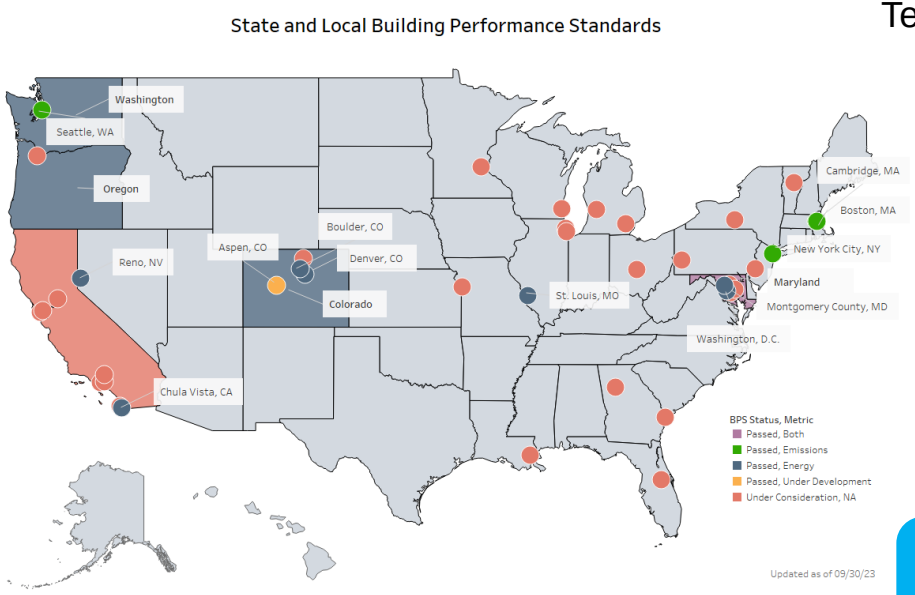
>70% of electricity used in buildings



Landscape of BPS

- 14 policies adopted, 40+ considering
- BPS for federally owned/leased buildings
- Federal support for BPS through TA, funding, resources

DOE & EPA Building Performance Standards Technical Assistance Network



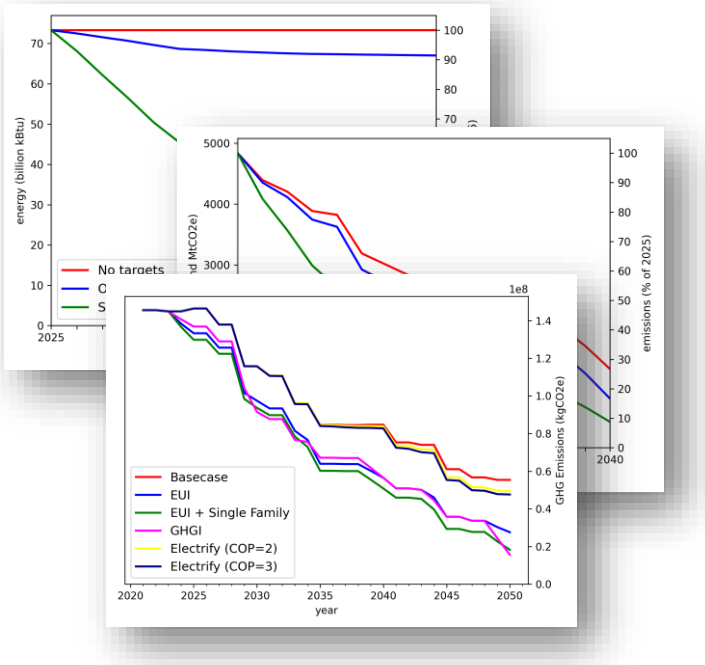
Source: DOE Building Performance Standards Technical Assistance Program

Technical Assistance Network support includes:

- Technical analysis – Building stock, energy & emissions impacts, economic impacts
- Compliance pathways tools & support
- Performance target-setting and savings trajectories
- Program design & administrative structure support, including data tools implementation
- Stakeholder engagement best practices & equitable policy design support
- And more!

To request Technical Assistance or to learn more about BPS, visit energycodes.gov/BPS

Example TA – Baseline & Scenario Planning



- Baselining - Building Stock
  - **Leverage all existing data**, regardless of format or quality
  - **Fill the gap of unknown energy+GHG data** for existing buildings
  - Support jurisdictions at **any phase of policy development**
- Scenarios - Impact Analysis
  - **Model policy-driven scenarios** for energy/GHG reduction for any jurisdiction, **tailored to their policy framework**
  - **Support policy standardization** without sacrificing accuracy of scenario simulation

Guidance documentation for stakeholders engaged with BPS design and implementation

Visit energycodes.gov/BPS/Resources for more!

BPS Implementation Support – Software Tools

Clear, accessible, standardized building energy & asset data ecosystem designed to result in action.

ENERGY STAR Portfolio Manager - enables the reporting of a building's energy and water use, square footage, and operational details in a consistent format.

SEED – central database for tracking building related information

Audit Template – standard format for asset-based building data collection & persistency

UBID – unique building identifier based on geospatial location supporting data use

Visit energycodes.gov/BPS/Implementation for more!

Bipartisan Infrastructure Law Funding Section 40511 (RECI)

Title: Cost-effective Codes Implementation for Efficiency and Resilience

Funding: $225M through FY26

To date, 27 projects awarded across 26 states & District of Columbia

Biden-Harris Administration Announces $90 Million To Support Resilient and Efficient Building Energy Codes and Save American Families Money | Department of Energy

RECI2 - Areas of Interest and Targeted Outcomes

> RECI2 includes one overarching topic area with nine AOIs

Key Areas of Interest

- State and Local Code Adoption
- High Impact State and Local Govs
- Rural Communities
- Tribal Nations
- Workforce Development
- Innovative Approaches
- Implementation and Compliance
- Utility Data
- Equity, Energy and Environmental Justice
- Partnerships

Targeted Outcomes

- Develop next-generation workforce
- Facilitate energy code updates
- Improve energy code compliance
- Advance new and innovative polices and tools
- Increase equity in code-related policies and planning

IRA Codes FOA: Overview

Section 50131 of the Inflation Reduction Act provides funding *$1 billion*:

- **To adopt:**
  - LMC
    - a building energy code (or codes) for residential buildings that meets or exceeds the **2021 International Energy Conservation Code**, or achieves equivalent or greater energy savings
    - a building energy code (or codes) for commercial buildings that meets or exceeds the **ANSI/ASHRAE/IES Standard 90.1-2019**, or achieves equivalent or greater energy savings
  - ZEC
    - a building energy code (or codes) for residential and commercial buildings that meets or exceeds the **zero energy provisions in the 2021 International Energy Conservation Code** or an equivalent stretch code
- **To implement** a plan for the jurisdiction to achieve full compliance with any building energy code adopted […] which shall include active training and enforcement programs and measurement of the rate of compliance each year

IRA Codes FOA: Deadlines

Full Applications for Round 1 (Must have submitted concept paper)	April 30, 2024 (5pm ET)
Concept Papers Round #2	May 31, 2024 (5 pm ET)
Second Round Full Application	Late Summer 2024
Third Round (pending funding availability):	Spring 2025

More Info: energy.gov/scep/technical-assistance-adoption-building-energy-codes

Thank you!

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Energycodes.gov/BPS

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Supporting Equitable Building Performance

National Energy Codes Conference
May 2024

Supporting Equitable Building Performance Overview

The goal of Supporting Equitable Building Performance (SEBP) is to create relationships and shared goals between state and local governments and community members that produce equitable building performance policies and supporting programs.

The project supports seven cities and two states in various stages of developing or implementing an existing building decarbonization policy. Ten organizations (in addition to IMT) will provide technical support for policy and program development alongside at least one CBO in each location.

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Community Climate Shift and SEBP

- **IMT and People's Climate Innovation Center (PCIC) launched CCS** in 2021 in the wake of the National BPS Coalition with the goal of ensuring residents and CBOs have the resources necessary to fully participate in the policymaking process.
- We worked together to **align networks of partner organizations** across the country and codesign a model to deploy community-led, building decarbonization policy and program design and implementation at scale.
- In 2023, IMT applied for and received a **RECI grant to support work applying the principles of CCS** in nine locations across the US.

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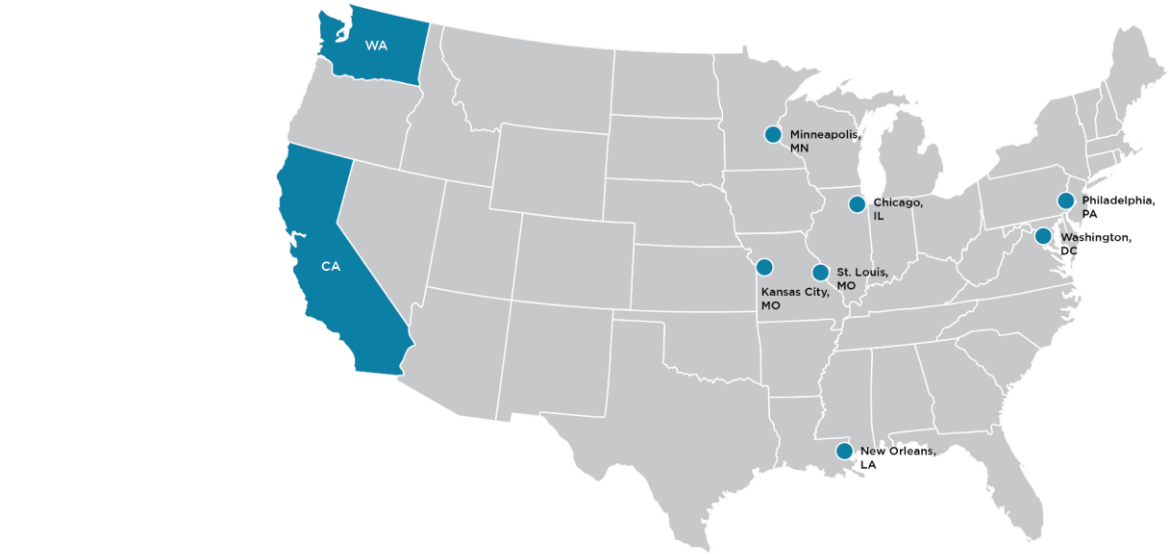
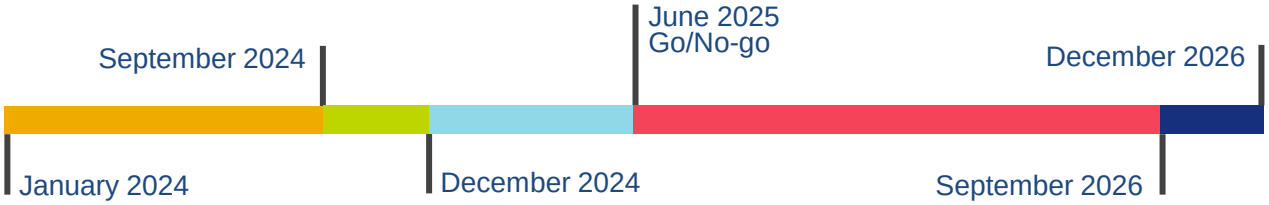
Locations and Partners

Community Climate Shift + SEBP Partners

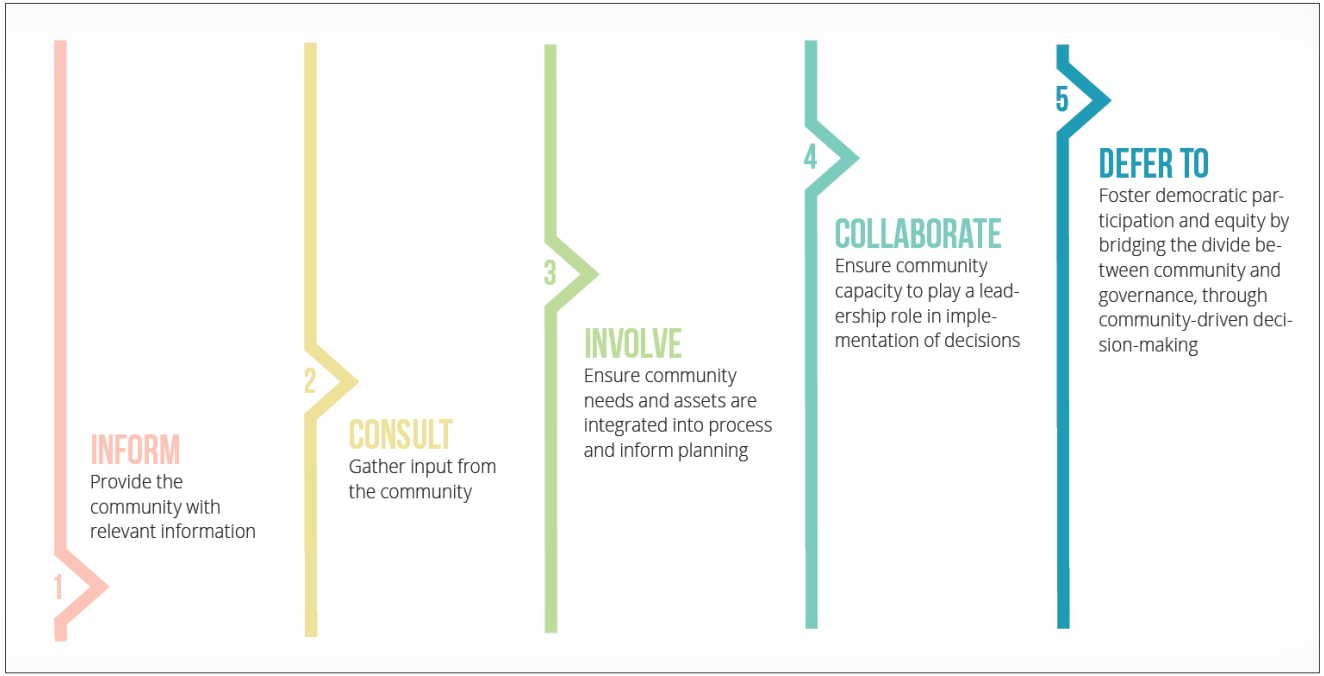
SEBP Partners



Timeline and Tasks



Community Engagement



Developmental Stages on the Spectrum of Community Engagement to Ownership (Facilitating Power)

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Project Breakdown

Community Engagement Needs Assessment

Begin the process of policy co-creation and relationship-building between government and community

- Conduct a baseline assessment of the state/local government's prior community engagement work using Facilitating Power's *Spectrum of Community Engagement to Ownership* framework
- Map equity issues on a neighborhood-scale to identify where policies related to building performance are correlated with specific equity issues
- Independently identify governmental and community-based priorities

Project Breakdown

Create Scopes and Timelines

Understand what is needed from policies and programs to ensure benefits flow to everyone

- Establish mutually agreed-upon priorities across government and community partners to inform policies, program development, and/or implementation policies
- Compile individual plans into overall project plan and make accommodations as necessary
- Create rules and norms for engagement on which all parties sign-off

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Project Breakdown

Data Collection / Analysis

Understand the needs, challenges, and potential implications associated with creating a building decarbonization policy

- Conduct market segmentation and building stock assessments
- Survey stakeholder (owners, designers, and contractors, etc.) to determine technical, financial, and logistical requirements
- Conduct economic development impact and skilled labor resource gap analyses
- Identify impacts on load projections, grid capacity, rate changes, and incentive opportunities/requirements
- Conduct affordable housing segmentation and impact analyses

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Project Breakdown

Policy & Program Development

Draft policies and programs that meet the goals as well as the concerns of governments and community

- Establish policy and program parameters such as covered buildings, priority building types for resource deployment or flexible policy mechanisms, workforce development and economic inclusion requirements, etc.
- Develop plans for high-performance building resource centers to provide assistance to owners, designers, and community members for compliance
- Establish Community Accountability Boards (CABs) to evaluate progress on community needs and contribute to creation of alternative compliance paths

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Project Breakdown

Evaluation

Review progress against goals and share lessons learned regarding community engagement, particularly for state-level policies

- Conduct a final assessment of community engagement progress throughout the project using Facilitating Power's *Spectrum of Community Engagement to Ownership* framework
- Create guidance documents that reflect unique challenges of working with multiple CBOs across a state and tackle how to bring a community-led process to more traditional state regulatory processes
- Evaluate policies and programs created for anticipated impacts and adherence to CCS principles

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Thank you!

For more information:

IMT.org/BPS

CommunityClimateShift.org

Amy.Boyce@imt.org

CLEARLYENERGY

Designing & Implementing Building Performance Standards in Small, Rural, and Justice40 Communities

Carolyn Sarno Goldthwaite
Vice President, Customer Engagement

About ClearlyEnergy

ClearlyEnergy works at the nexus of public policy and software solutions using data-driven analytics and reporting to facilitate the energy transition.

ClearlyEnergy for Homes
Home energy cost, consumption and greenhouse gas modeling, labeling, and finance

ClearlyEnergy for Buildings
Data driven building analytics and reporting to facilitate the energy transition

ClearlyEnergy Targeted Assistance
Targeted energy efficiency projects, software development, and policy implementation support

ClearlyEnergy for Climate Finance
Help lenders measure the GHG footprint of loan portfolios, including residential mortgages, commercial building and auto loans

CLEARLYENERGY

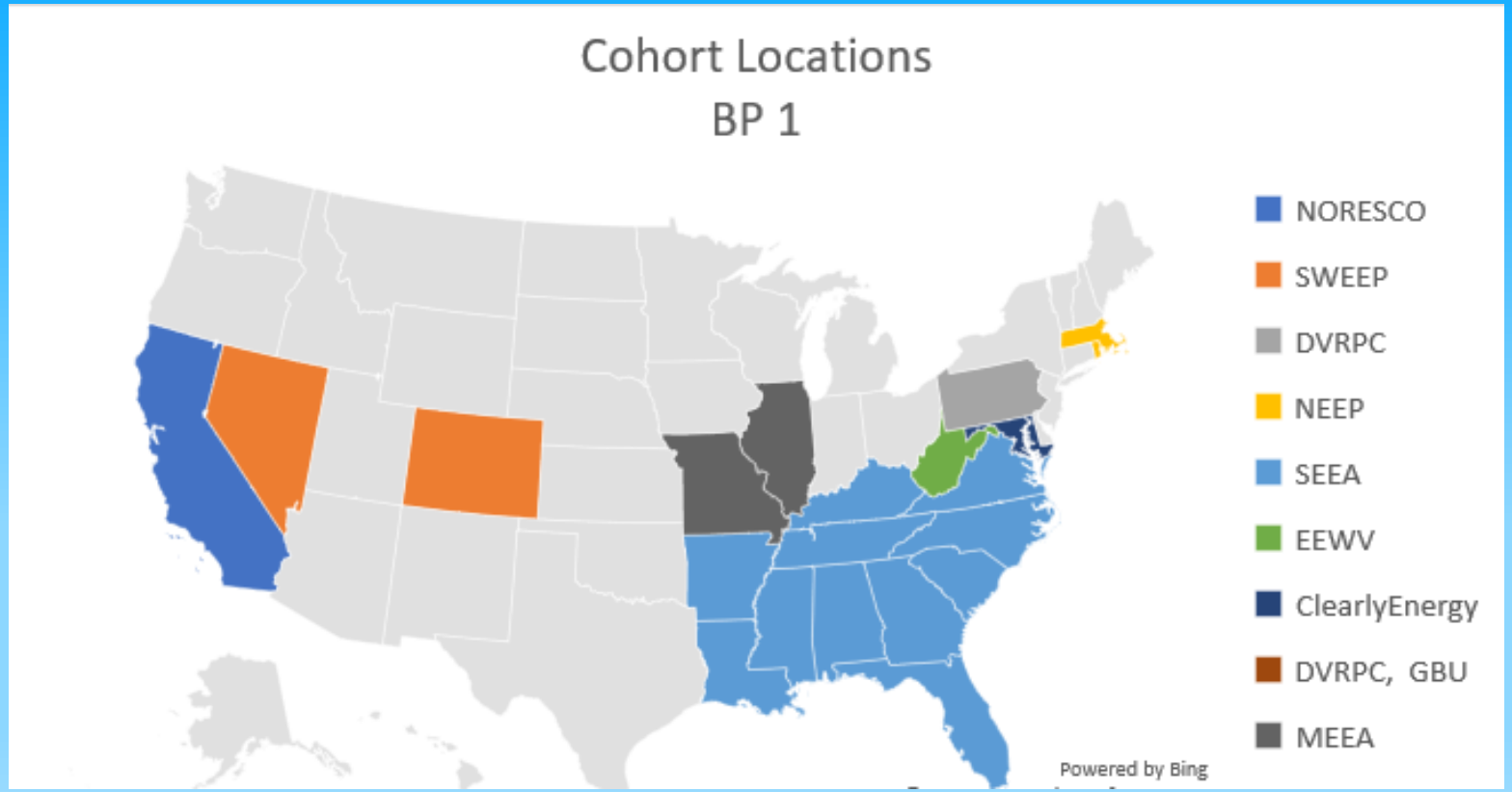
Designing & Implementing Building Performance Standards in Small, Rural, and Justice40 Communities

- **Technical Assistance**
  - Increase administrative capacity
  - Engage stakeholders
  - Support local job growth
    - Shared Energy Analysis
    - BPS Circuit Rider
- **Peer-to-Peer Exchange**
  - Engage with other communities to help inform efforts, identify needs
- **Innovative Funding Models**
  - Utility Attribution BPS
- **Software Access**
  - Access to the BEAM (or SEED) platform to help implement the policy

CLEARLYENERGY

This Project is supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Building Technologies Office - DE-FOA-0002813 - Bipartisan Infrastructure Law Resilient and Efficient Codes Implementation

Cohort Locations*



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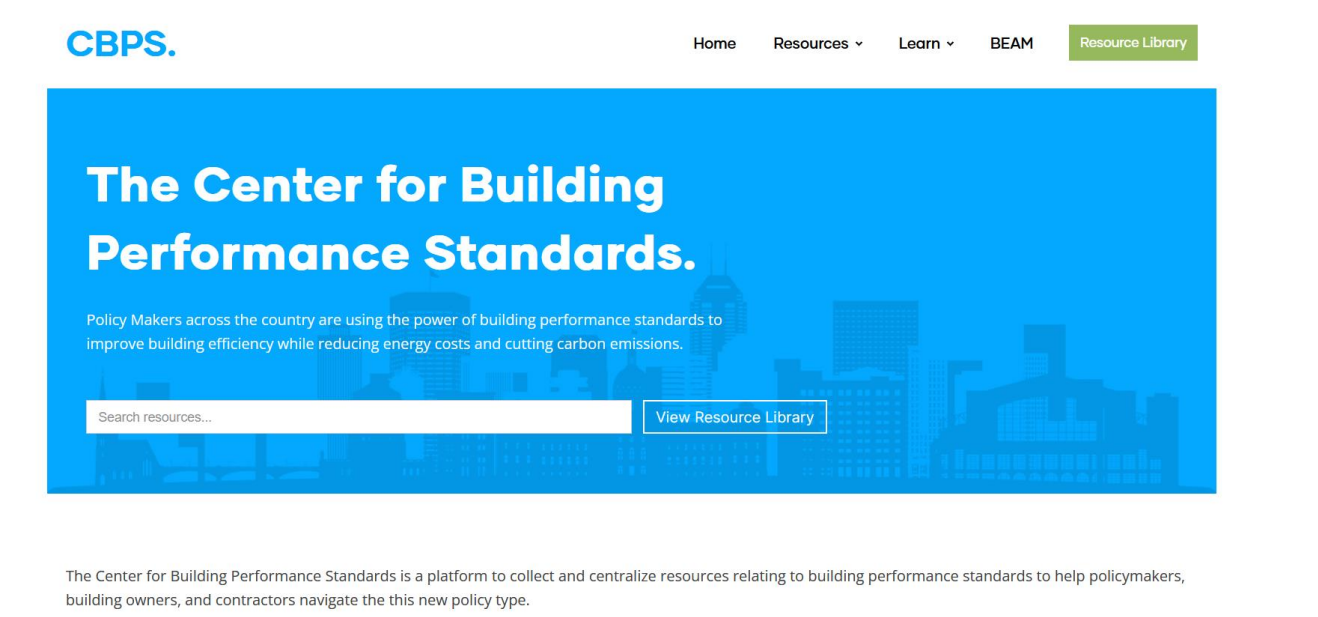
** New cohorts will be added for BP2*

Resources

https://beam-portal.org/



Measuring the Climate Impacts of Building Performance Standards

https://clearlyenergy.com/bps-impact-report

CLEARLYENERGY

**CBPS Developed with funding from the US Department of Energy Small Business Innovation Research Award*

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THANK YOU

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ClearlyEnergy.com

Developing a cost-optimal, equitable approach to building performance standards in Ohio's large cities

Amanda Webb, PhD

Department of Civil and Architectural Engineering and Construction Management

University of Cincinnati

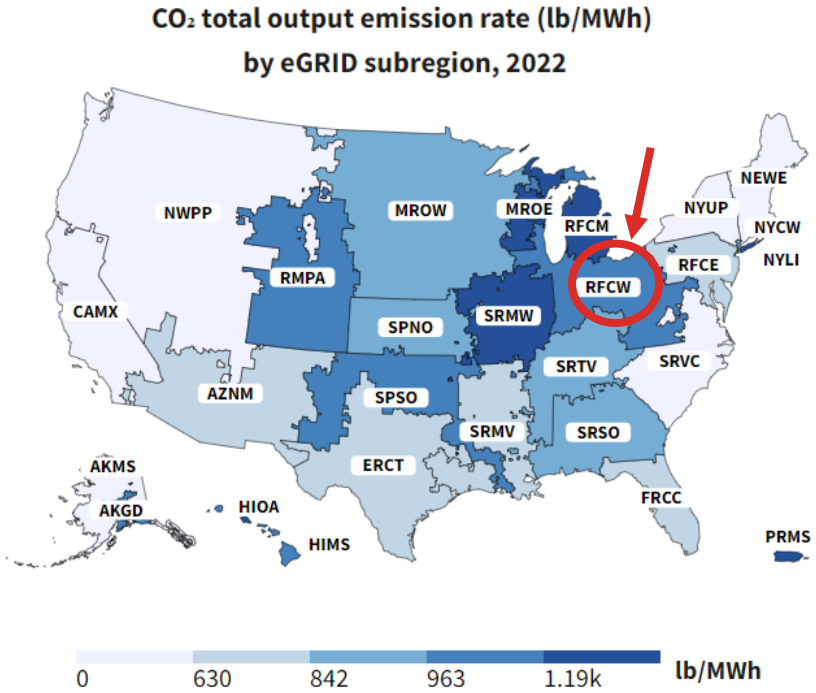
2024 National Energy Codes Conference
Sacramento, CA
May 8, 2024

University of CINCINNATI

Reducing emissions in Ohio is critical to meeting the climate goals of the U.S.

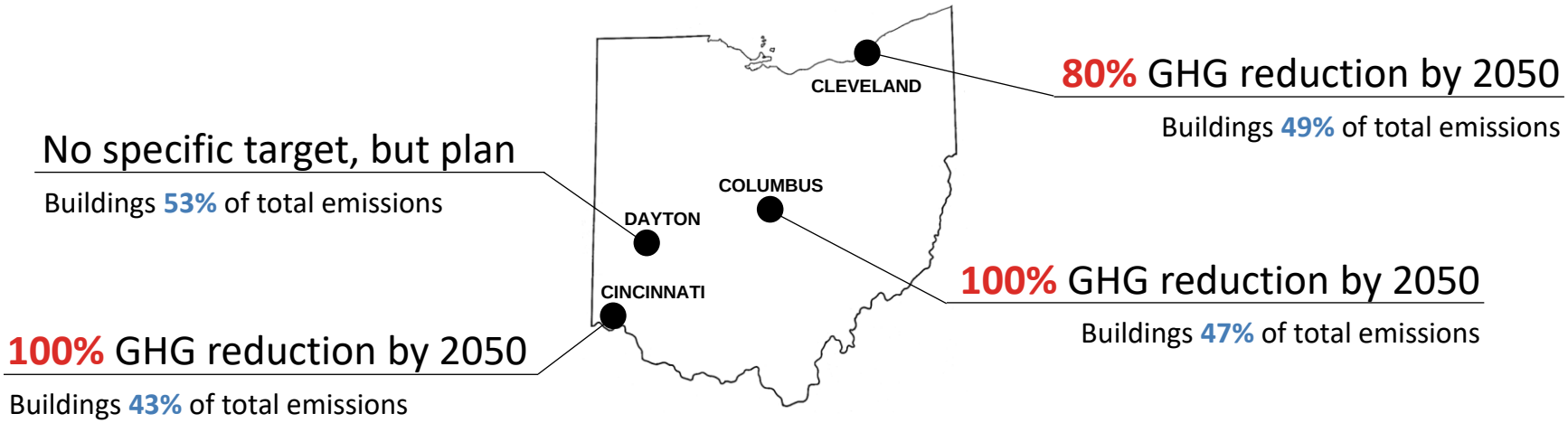
Why Ohio?

- **7th largest** state by population
- **5th largest** CO_2 emissions[1]
- 64% of Ohio homes use **natural gas** for heating[2]
- Heavy reliance on **fossil fuels** for electricity generation[3]
- 9th (Cincinnati), 11th (Cleveland), and 16th (Columbus) **worst energy burden** among U.S. cities[4]



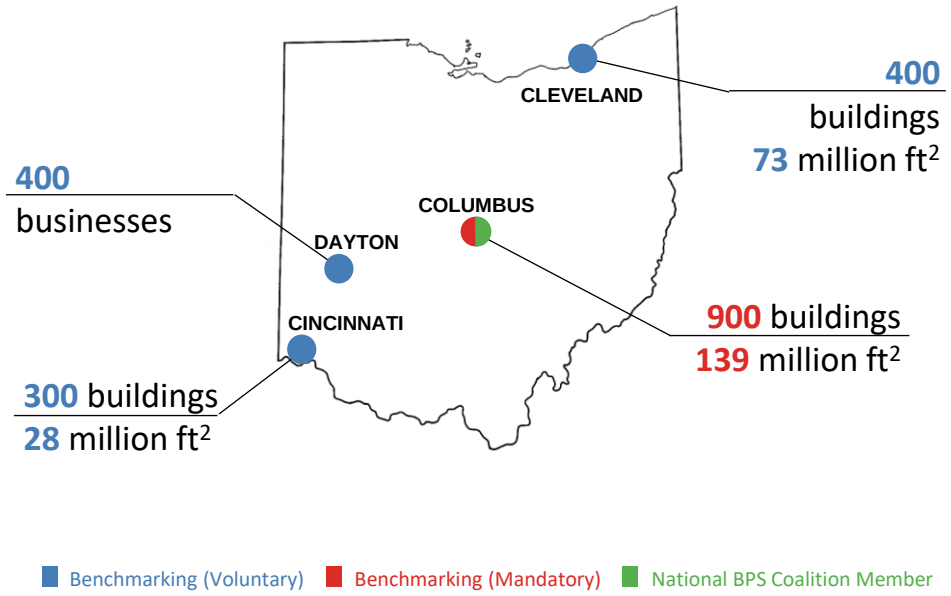
[1]U.S. EIA, State Profile and Energy Estimates: Ohio, https://www.eia.gov/state/?sid=OH
[2]U.S. EIA, 2020 Residential Energy Consumption, Highlights for space heating fuel in U.S. homes by state, 2020
[3]U.S. EPA, eGRID Data Explorer, https://www.epa.gov/egrid/data-explorer
[4]A. Drehobl, L. Ross, Lifting the High Energy Burden in America's Largest Cities: How Energy Efficiency Can Improve Low-Income and Underserved Communities, Washington, DC, 2016

Addressing existing buildings is critical to meeting the climate goals of Ohio's large cities



Sources: Cleveland Climate Action Plan; Columbus Climate Action Plan; Green Cincinnati Plan; Strategy for a Sustainable Dayton

Ohio's cities have successful existing buildings programs, but BPS faces major barriers



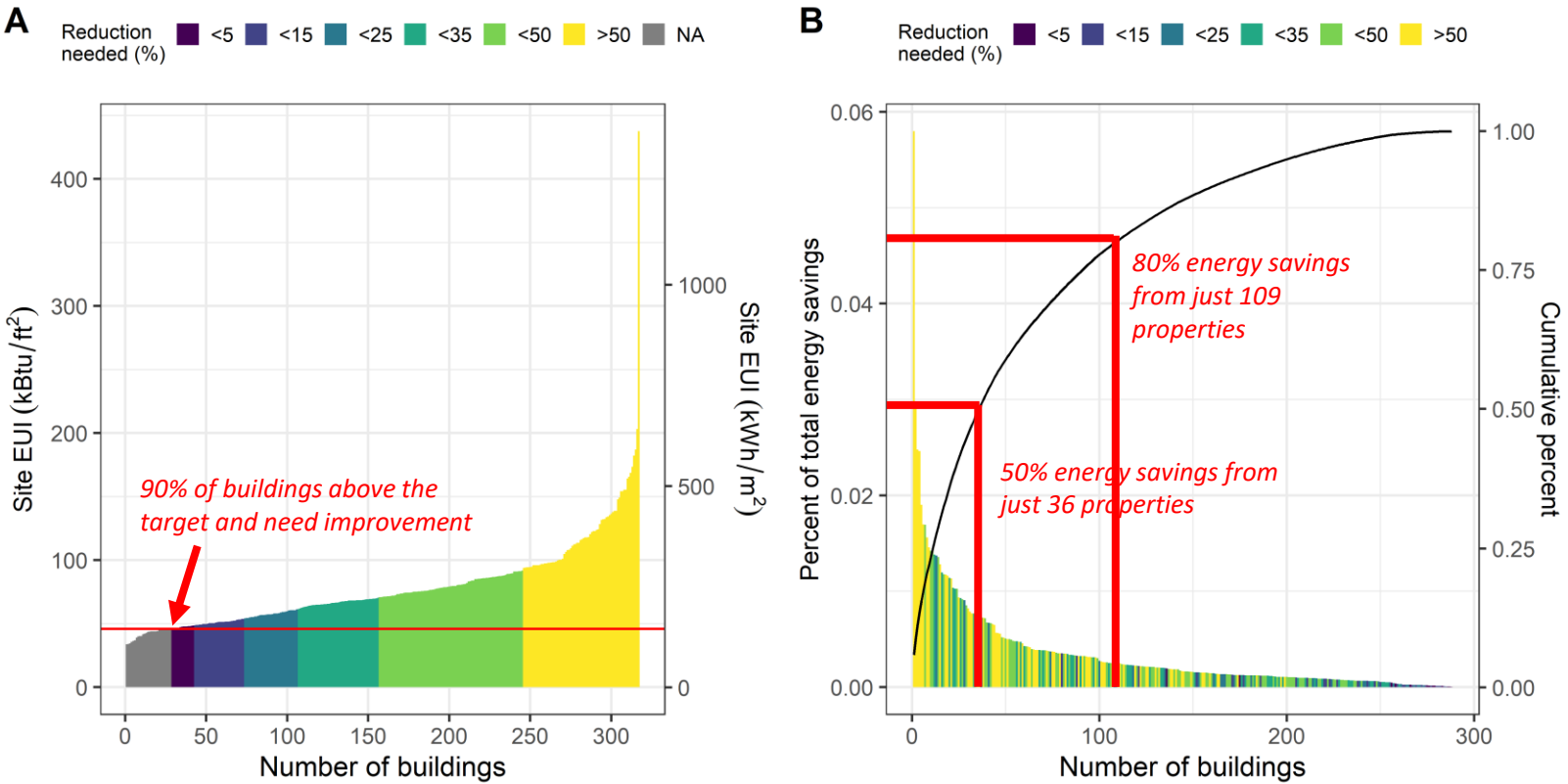
Barriers

- Limited appetite for **broad mandates**
- Misalignment with **local priorities** (especially energy equity)
- **Limited resources** to support BPS
- Challenges accessing **utility data**

The goal of this RECI project is to develop cost-optimal, equitable BPS in Ohio's large cities

Barrier	Solution
Limited interest in **broad mandates**	Develop a **cost-optimal** approach to BPS with **strong incentives** that focuses on a few buildings with the greatest savings potential
Misalignment with **local priorities** (especially energy equity)	Develop an **equity-centered** approach to BPS that is based on an equity metric, rather than an environmental metric
Limited resources to support BPS	Establish a **collaborative**, statewide **network of partners** that shares knowledge and resources
Challenges accessing **utility data**	Collaborative approach to creating a **seamless flow of data**

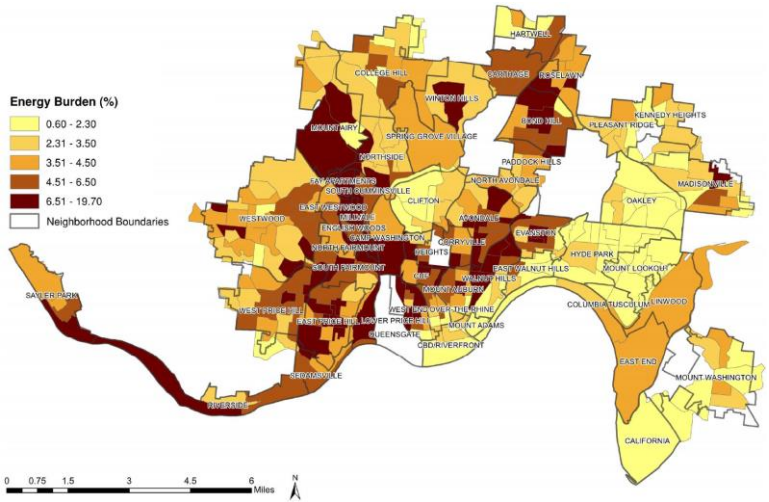
What do we mean by cost-optimal BPS?



A.L. Webb, C. McConnell, Evaluating the feasibility of achieving building performance standards targets, Energy and Buildings. (2023) 112989. https://doi.org/10.1016/j.enbuild.2023.112989.

What do we mean by equity-centered BPS?

$$\text{Energy burden}(\%) = \frac{\text{Utility costs (\$)}}{\text{Household income (\$)}}$$



How to quantify equity?

- What **dimension of equity** are you measuring? (e.g., affordability, resilience, access and opportunity, health and environmental exposure[1])
- What is the **scale of measurement**? (e.g., household, census tract, neighborhood)
- What **measurement process** is being used? (e.g., target population ID, investment decision-making, program impact assessment[2])
- Is the necessary **data available**?

MAP: D. Moore, A.L. Webb, Evaluating energy burden at the urban scale: A spatial regression approach in Cincinnati, Ohio, Energy Policy 160 (2022) 112651. https://doi.org/10.1016/j.enpol.2021.112651.

[1]W. McNamara, H. Passell, M. Montes, R. Jeffers, I. Gyuk, Seeking energy equity through energy storage, Electr. J. 35 (2022) 107063. https://doi.org/10.1016/j.tej.2021.107063.

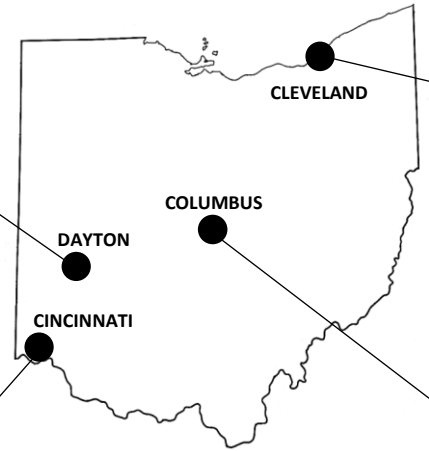
[2]B.W. Tarekegne, G.R. Pennell, D.C. Preziuso, R.S. O'Neil, Review of Energy Equity Metrics, Pacific Northwest National Laboratory, 2021. https://www.pnnl.gov/publications/review-energy-equity-

The project is built on an Ohio-based, statewide collaborative partnership

REGIONAL ENERGY EFFICIENCY ORGANIZATION (REEO)
Midwest Energy Efficiency Alliance (MEEA)

Cleveland Neighborhood Progress
Cleveland 2030 District
Cleveland ASHRAE Chapter
City of Cleveland

Dayton Regional Green
City of Dayton



IMPACT Community Action
City of Columbus
Ohio Air Quality Development Authority (OAQDA)
Go Sustainable Energy (Go)
Power a Clean Future Ohio (PCFO)
Ohio Environmental Council (OEC)

Groundwork Ohio River Valley
Cincinnati State Technical and Community College
Cincinnati 2030 District
City of Cincinnati
University of Cincinnati (UC)

FUNDING AGENCY
U.S. Department of Energy

Technical Providers | Local Government and State Agency | Building Owners and Design Professionals | Community-Based Organizations and Workforce Development

Four months in, there are already many lessons learned

Successes

- Expanded **city-to-city dialogue**
- Strong **momentum** and **excitement**
- Increased education and **literacy** about benchmarking and BPS
- Learning through **listening**

Challenges

- **Balancing** all partners' needs and interests
- **Different processes** in each city
- **Personnel turnover** limits institutional memory
- Difficult problems remain, especially **data access** and **buy-in**

Key takeaway: A **strong local partnership network** holds great promise in under-resourced jurisdictions

Questions?

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Acceleration Station: Boosting Building Performance Standards through Federally Funded Projects

Maggie Kelley Riggins
Senior Program Manager,
Southeast Energy Efficiency Alliance

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

OUR MISSION

To optimize the use and impact of energy to enhance the quality of life in the Southeast.

OUR VISION

All people in the Southeast live and work in healthy and resilient buildings, utilize clean and affordable transportation, and thrive in a robust and equitable economy.

OUR VALUES

Take Initiative

We take responsibility for realizing a better quality of life in the Southeast.

Value Others

We seek, respect, and promote diverse perspectives.

Earn Trust

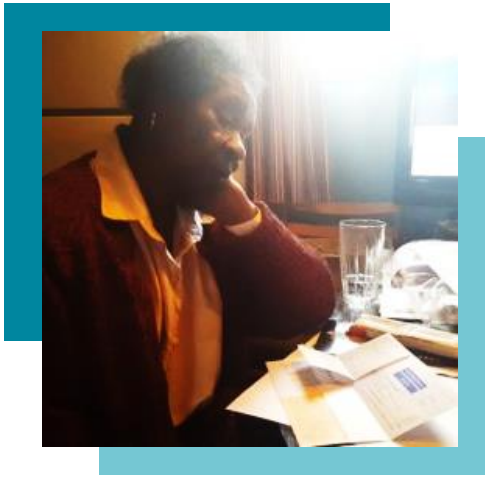
We pursue our work with benevolence, competence, and reliability.

Pursue Equitable Solutions

We recognize, acknowledge, and account for a history of prejudice and inequality in Southeastern communities.

Pursuing Equitable Solutions

We recognize, acknowledge, and account for a history of prejudice and inequality in Southeastern communities and the role it plays in the issues we address.



Nashville grandmother and retired librarian Annie Pearl Patton considers her NES electric bill.
Source: Southern Alliance for Clean Energy

01

Procedural Equity
All affected communities have a voice in the decision-making process

02

Distributional Equity
Programs and policies are designed to equally distribute its benefits and burdens to the entire community

03

Intergenerational Equity
Programs and policies consider how future generations will be impacted by the decisions being made today

SEEA
SOUTHEAST ENERGY EFFICIENCY ALLIANCE

Closing Equity Gaps to Advance Codes and Standards

Measure and evaluate the impact of disinvestment on the equitable implementation of building performance standards in commercial buildings, and identify program strategies that bring existing buildings to equitable readiness and invest in disadvantaged communities.

- Data analysis model analyzing the impact of disinvestment on the equitable implementation of BPS
- Geospatial analysis of commercial and multi-family properties including sociodemographic trends, environmental justice indicators, and impacts
- Menu of strategies highlighting cost-effective upgrades bringing existing buildings to an equitable readiness level for BPS and code implementation

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People-Centered Design

Partners
- National Renewable Energy Laboratory
- City of Atlanta, Georgia
- City of Savannah, Georgia,
- Georgia Environmental Finance Authority

Community Advisory Board
- Building/business owners
- Landlords
- Tenants and homeowners
- Community organizations and advocate
- Majority of members are BIPOC residents of disinvested neighborhoods in Atlanta and Savannah

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

RESURGENS 1871 1865 ATLANTA, GA

CITY OF Savannah

GEFA

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Additional Considerations

Community Benefits Plan
Designing agreements alongside community members to have intentional impact

Compensation
Providing ample compensation for community expertise

People-centered metrics
Community-led data collection and analysis; human-centric metrics

Demographic data collections
Collecting demographic data from engaged stakeholders, trained workforce, etc., to measure and close gaps in access

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Thank You

SMART ENERGY. STRONG ECONOMY. FOR ALL.

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