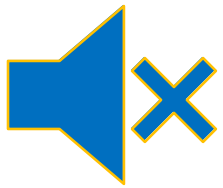
STATE & COMMUNITY ENERGY PROGRAMS

Energy Efficiency & Conservation Block Grant (EECBG) Blueprint Cohorts

Session #5: Introduction to Building Efficiency & Electrification

February 15, 2024

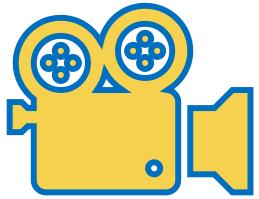
Virtual Housekeeping



Mute your audio, please!

Use the chat to ask questions during the presentation

We are working on answering your registration questions!



FYI, we're recording! We'll send out the slides and video

Agenda

- EECBG Program Announcements & Reminders
- Efficiency & Electrification 101
- Blueprint 2A Deep Dive
- Benchmarking, Audits, ESPC's, and more: A local government perspective from Kirk Vizzier
- Breakout Discussion + Q&A

Sneak Peek: Breakout Rooms

***GOAL*: We want to use this time to talk to you all about your EECBG Program projects, workshop ideas, troubleshoot challenges, and connect you to one another**

Get ready to share:

1. How you plan to use your EECBG funds and where you are in the application/implementation process
2. **One Question** you'd like to pose or a challenge you want to troubleshoot with other EECBG Program communities
3. **One Comment** in response to a peer's question or challenge

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EECBG Program Reminders

Upcoming Deadlines

1. Community Energy Fellowship application deadline: **March 5, 2024**
2. EECBG Program application deadline: **April 30, 2024**

Exciting EECBG Program Events

EECBG Blueprint Cohorts – *February's theme is Building Electrification & Efficiency!*

- *2/22 ResStock Analysis Tool Training*

DOE's Better Buildings Better Plants Summit April 2-4, 2024 | *Register now!*

- EECBG is hosting a TA workshop on April 2, 1-3 ET

Limited travel assistance is available for public sector attendees

Other Opportunities

- ✓ **Energy Savings Performance Contracting (ESPC) Campaign** is a technical assistance opportunity that engages local governments and other stakeholders to expand & enhance ESPC programs.

  If you're interested in EECBG Blueprint 2B, we encourage you to sign up!

- ✓ **Energy Efficiency Finance Foundations Training**: ***Summer '24!*** This Berkeley Lab training is for public-sector facilities managers, energy/sustainability staff, & finance officers to learn to navigate "finance speak".

  If you're interested in EECBG Blueprint 5, we encourage you to sign up!

- ✓ Pre-filing registration now available for tax exempt and governmental entities to take advantage of the IRA Clean Energy Credits.

ResStock Training – Join us on 2/22 @ 2pm ET

NEW HAMPSHIRE

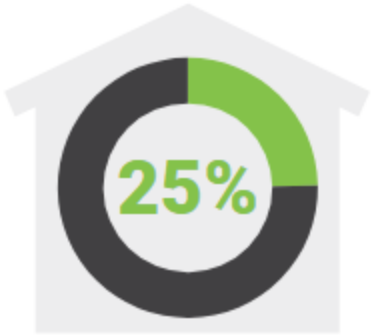
Cost-effective package savings potential in New Hampshire single-family homes

468.1 million dollars per year utility bill savings

20.0 trillion Btu per year gas, propane, and fuel oil savings

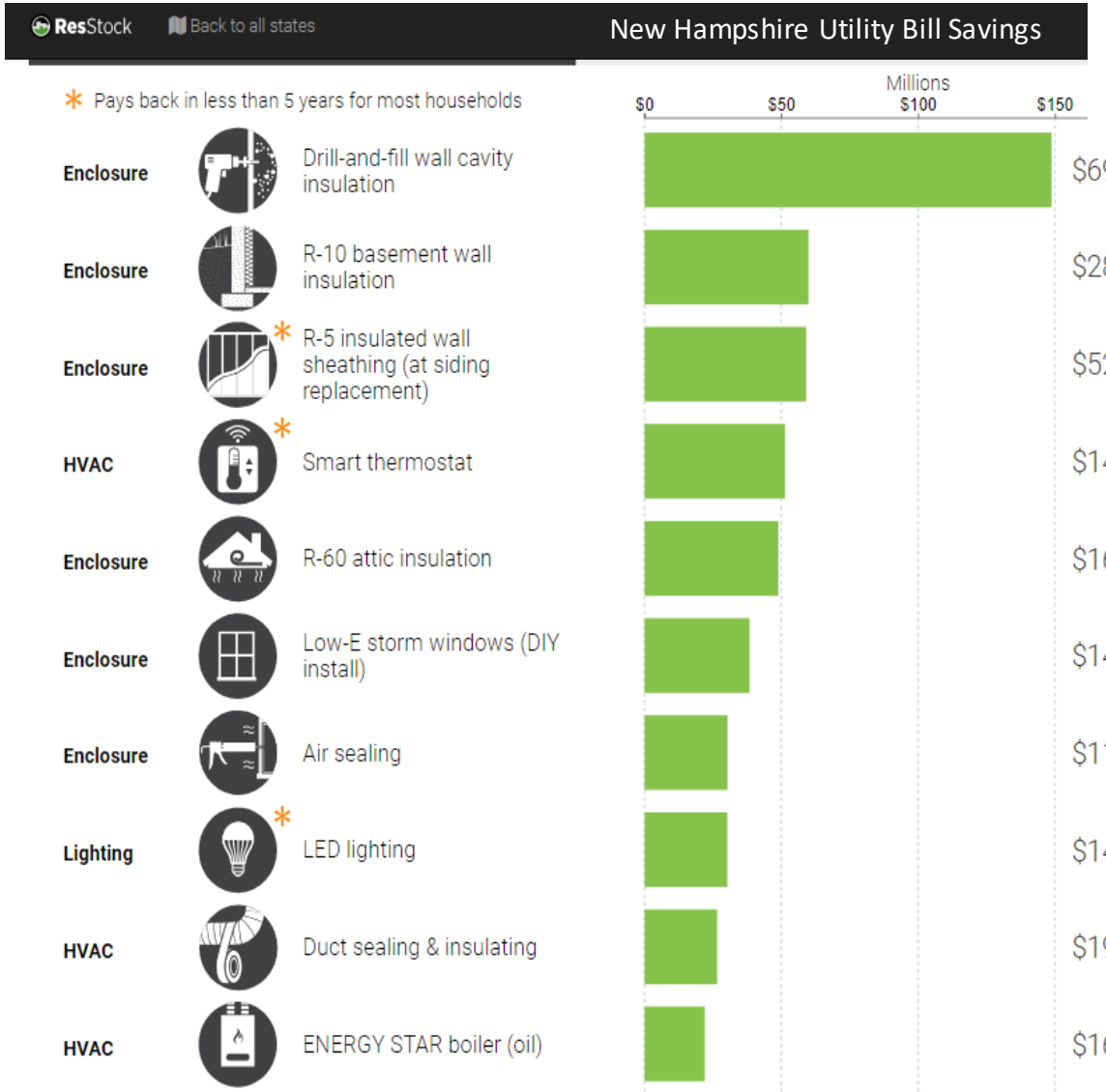
599.6 million kWh per year electricity savings

434.0 thousand cars of pollution reduction



Energy used by New Hampshire single-family homes that can be saved through cost-effective improvements

New Hampshire existing jobs in energy efficiency (2016)[1]



Your EECBG Support System | If you have questions about ....

Your application:

1. The status of your PAIS or application
2. Voucher projects & eligibility
3. Application requirements

Technical Assistance:

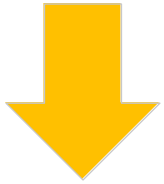
1. Blueprints & Blueprint Cohorts
   - *"Does my project fit into a blueprint?"*
2. Community Energy Fellowship
3. Other technical assistance
   - *"How do I incorporate J40 principles into my project?"*

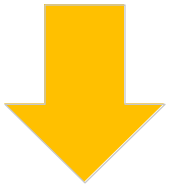
The Voucher Portal:

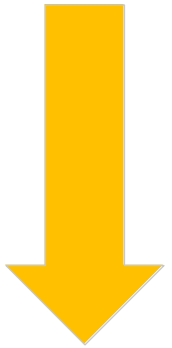
Get voucher application portal technical help

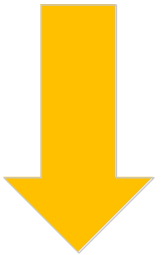
Your EECS:

Get support developing your Energy Efficiency Conservation Strategy (EECS)









Grant Management Team
EECBG@hq.doe.gov

Technical Assistance Team
TechnicalAssistance@hq.doe.gov

Attend Our Bi-weekly Office Hours! Sign up here
Every other Friday at 2:30pm ET
https://forms.office.com/g/yc3H3xQeEE

Voucher Portal Administrator (ICF)
EECBGVouchers@icf.com

National Renewable Energy Laboratory (NREL)
EECS_TA@nrel.gov
- 10-20 Hours

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- Efficiency & Electrification 101
- Blueprint 2A Deep Dive
- Benchmarking, Audits, ESPC's, and more: A local government perspective from Kirk Vizzier
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Guest Speaker | Christine Knapp

Christine Knapp

Program Manager
Community Innovation & Technical Assistance Team
Office of State and Community Energy Programs

Former Sustainability Director at the City of Philadelphia

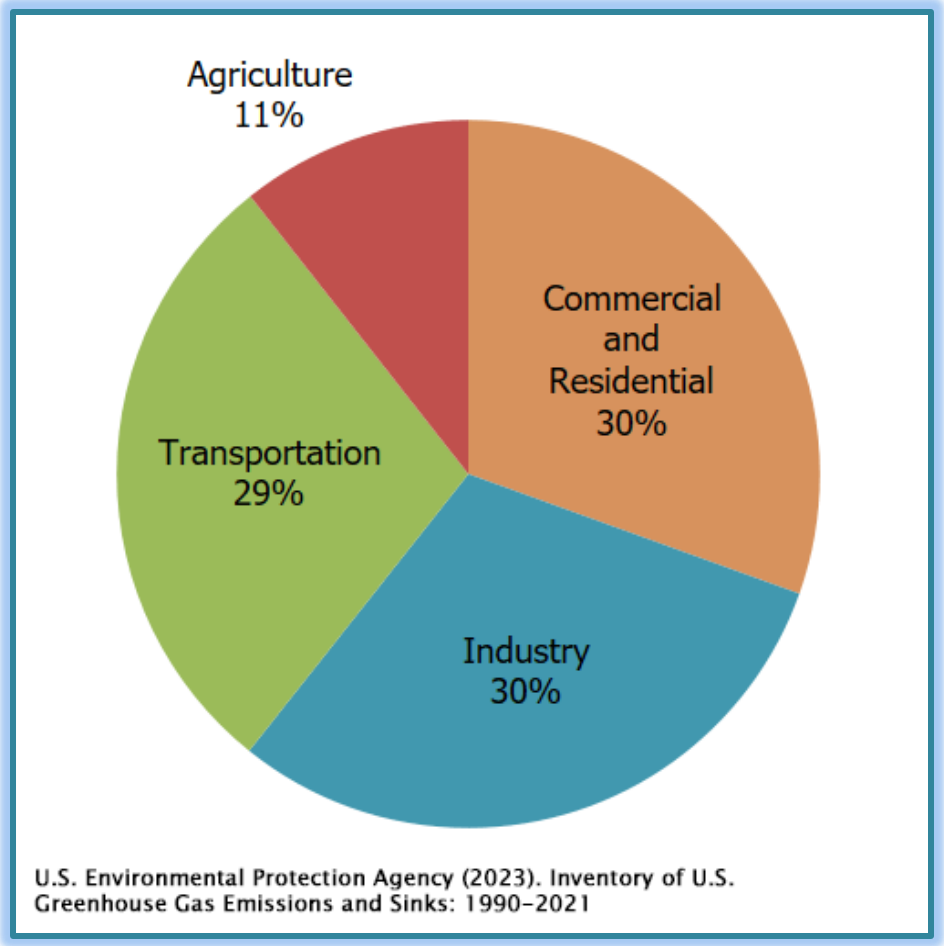
The Impact of the Built Environment on Our Shared Goals

The U.S spends over $400 billion each year to power our homes and commercial buildings

Residential and commercial buildings consume 75% of all electricity used in the United States

40% of the nation's total energy is used to power residential and commercial buildings

Total U.S. Greenhouse Gas Emissions by Economic Sector and Electricity End-Use



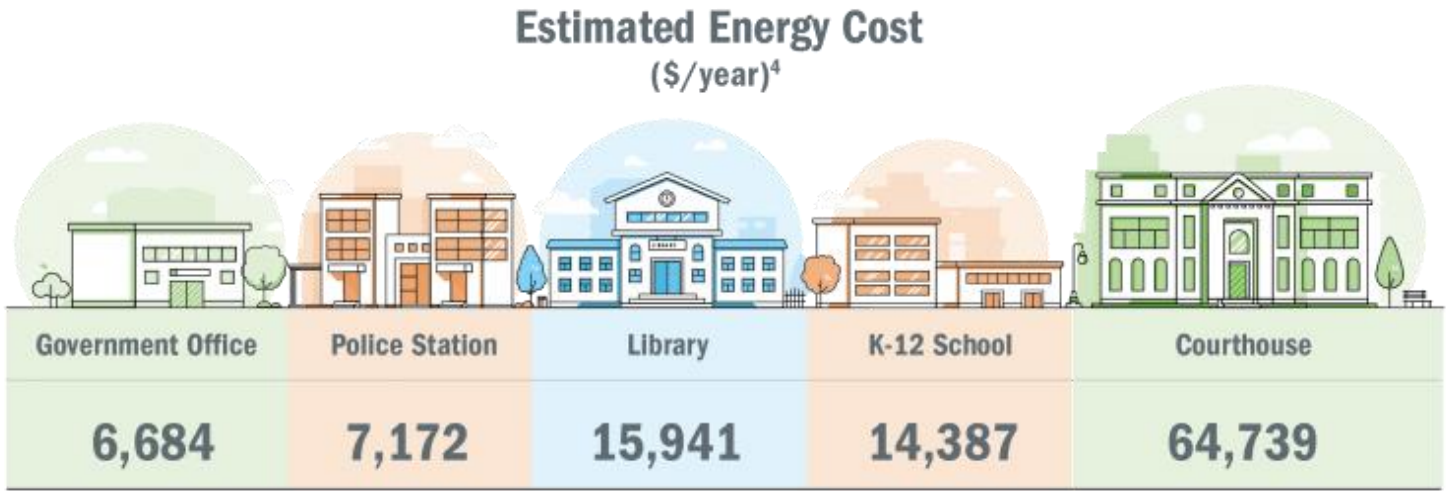
U.S. Environmental Protection Agency (2023). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990–2021

Source: [About the Building Technologies Office | Department of Energy]

Why Efficiency and Electrification Matters

The Benefits

- ✓ **Energy Savings** - reduced operating costs free up $$ that can be spent elsewhere
- ✓ **Energy Security –** reduced reliance on oil & gas
- ✓ **Healthy Buildings & People** - improved air quality, safe temperatures, reduced cost of social/health services
- ✓ **Emissions Reductions** - helps you meet your community's climate/economic development goals
- ✓ **Expanded workforce** needs result in community-wide economic development

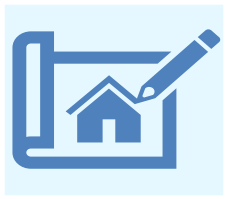


Small and medium-sized state and local government buildings are ripe for energy upgrades that can help save an estimated 20-30% in energy costs which can be leveraged to save taxpayer dollars, supplement limited budgets, and pay for other public priorities

Opportunities for Improving Efficiency & Electrifying at the Local Level

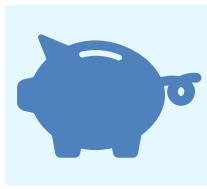
Local governments can take a huge range of approaches to promoting energy efficiency and electrification, both in their own operations and in their communities

What:



Projects & Programs

- Benchmarking
- Energy Audits
- Incentives/Rebates
- Energy Efficiency Purchasing
- Voluntary Efficiency Challenges
- Efficiency & Electrification Campaign



Financing

- Energy Savings Performance Contracting (ESPC)
- Commercial Property Assessed Clean Energy (C-PACE)

Policies

- Commercial Benchmarking Requirement
- Energy Disclosure Policies
- Building Performance Standards
- Building Energy Codes

Where:

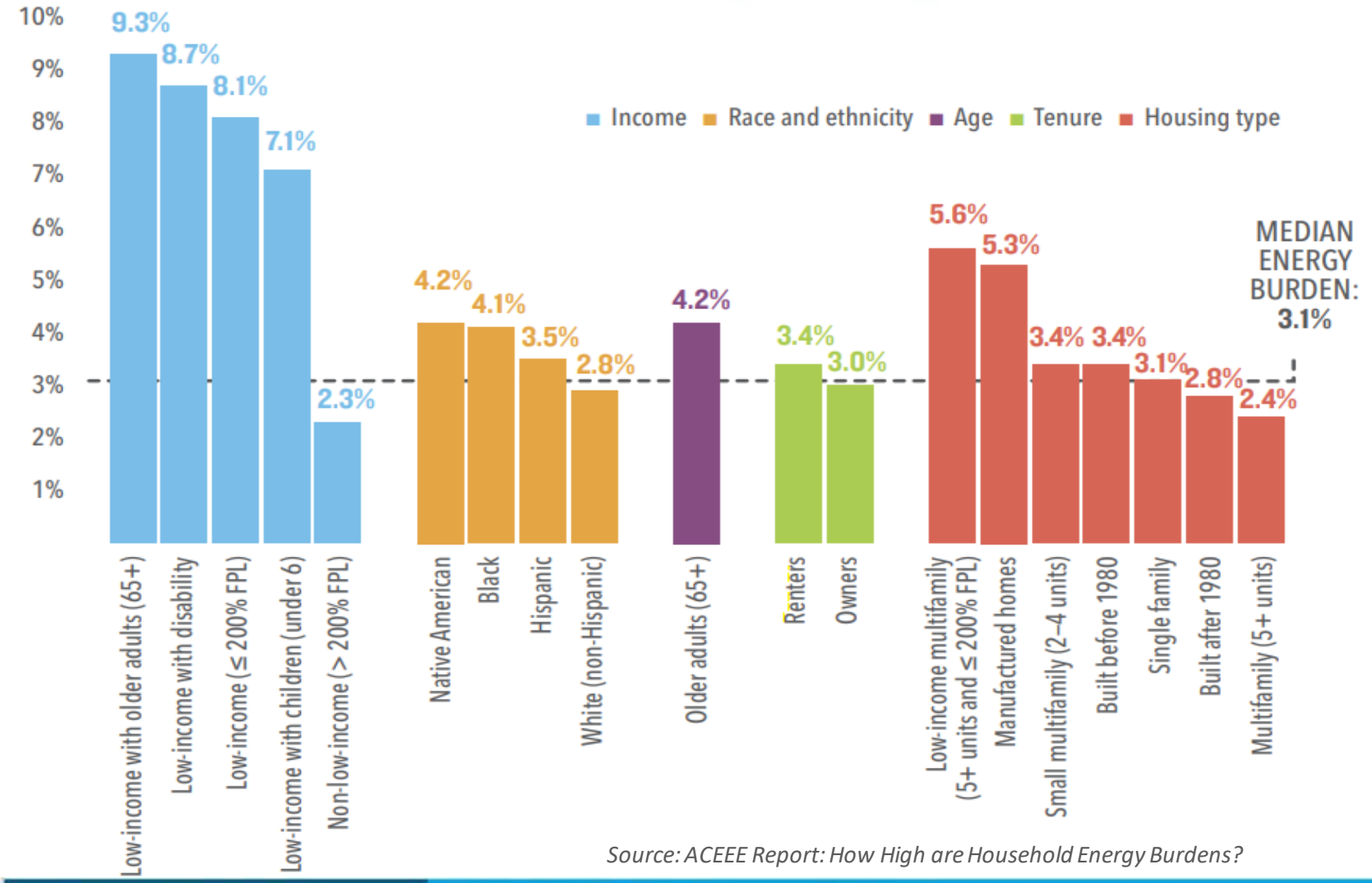
Municipal Buildings	Waste & Wastewater Facilities
	Government Offices
	Libraries & Community Centers
	Police/Fire Stations
Non-Governmental Buildings (i.e., Commercial)	Schools & Universities
	Hospitals & Healthcare Facilities
	Small Businesses & Restaurants
	Multifamily (5+ units)
Residential Homes	Single family detached
	Duplex/Triplex/Quadplex
	Townhouse
Industry + Manufacturing	

Who:

"Who might benefit the most from energy efficiency and electrification interventions in my community?"

Equitable Building Decarbonization | Energy Burden

FIGURE ES1. National energy burdens across subgroups (i.e., income, race and ethnicity, age, tenure, and housing type) compared to the national median energy burden



Source: ACEEE Report: How High are Household Energy Burdens?

Investigate your community's energy burden using [DOE's Low Income Energy Affordability Data (LEAD) Tool]

- ✓ *Energy burden*
- ✓ *Energy cost*
- ✓ *Area median income*
- ✓ *Building age*
- ✓ *Heating fuel type*
- ✓ *Building type*
- ✓ *Ownership*

An Example "Journey" of Building Decarbonization

1 Lead by example

- ✓ Benchmark municipal buildings
- ✓ Conduct audits & implement retrofits in a few municipal buildings
- ✓ Engage key stakeholders with tangible impacts and value propositions

2 Encourage efficiency and electrification

- ✓ Conduct an efficiency and electrification outreach campaign
- ✓ Set up a rebate or incentive program targeting LMI homes
- ✓ Host a competition to inspire savings

3 Require data transparency

- ✓ Pass a commercial benchmarking policy
- ✓ Adopt a Residential Energy Conservation Ordinance (RECO)
- ✓ Work with utilities to expand data sharing

4 Enforce standards for efficiency & electrification

- ✓ Pass building performance standards
- ✓ Adopt the most updated building energy code, a stretch code, or net zero code

Equity: "Who might benefit the most?

***Note**: This is NOT a one size fits all journey. You should make sure to take into account: 1) Your state's regulatory landscape, 2) The level of buy-in you have from leadership (e.g., Mayor, Council), 3) The amount of funding you have, and 4) Justice40 and equity*

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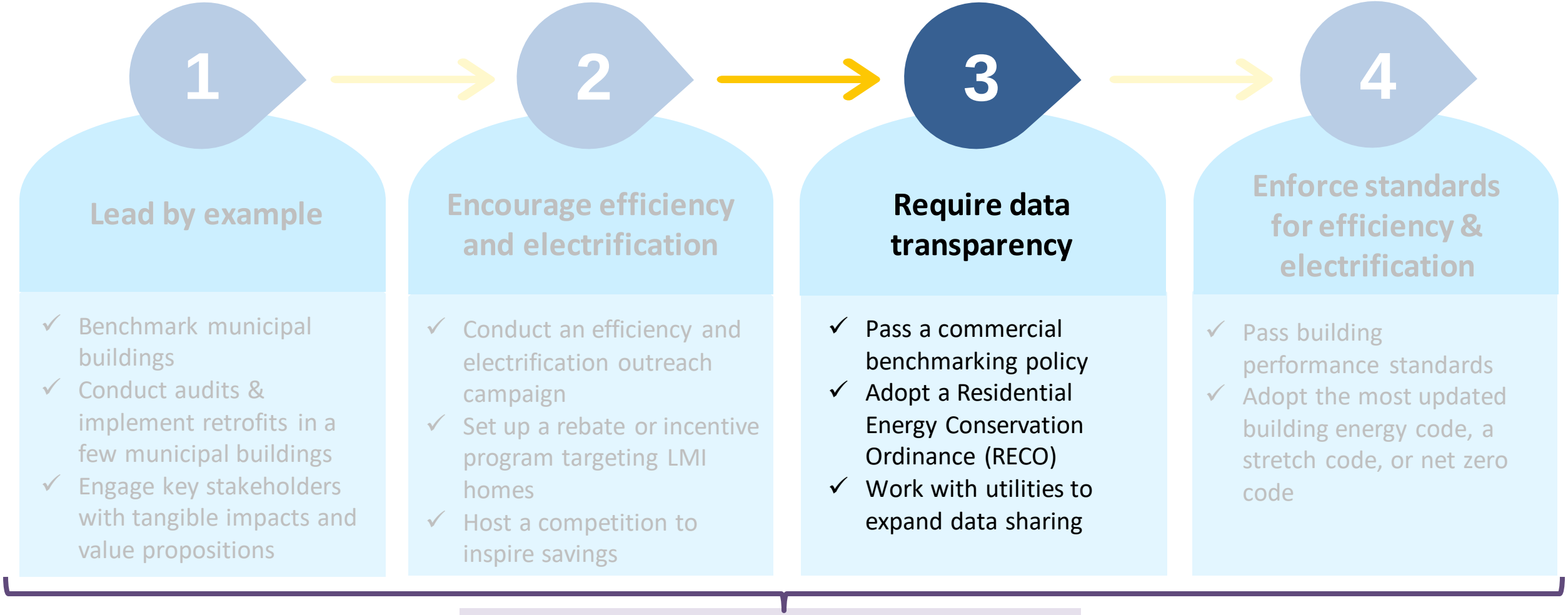

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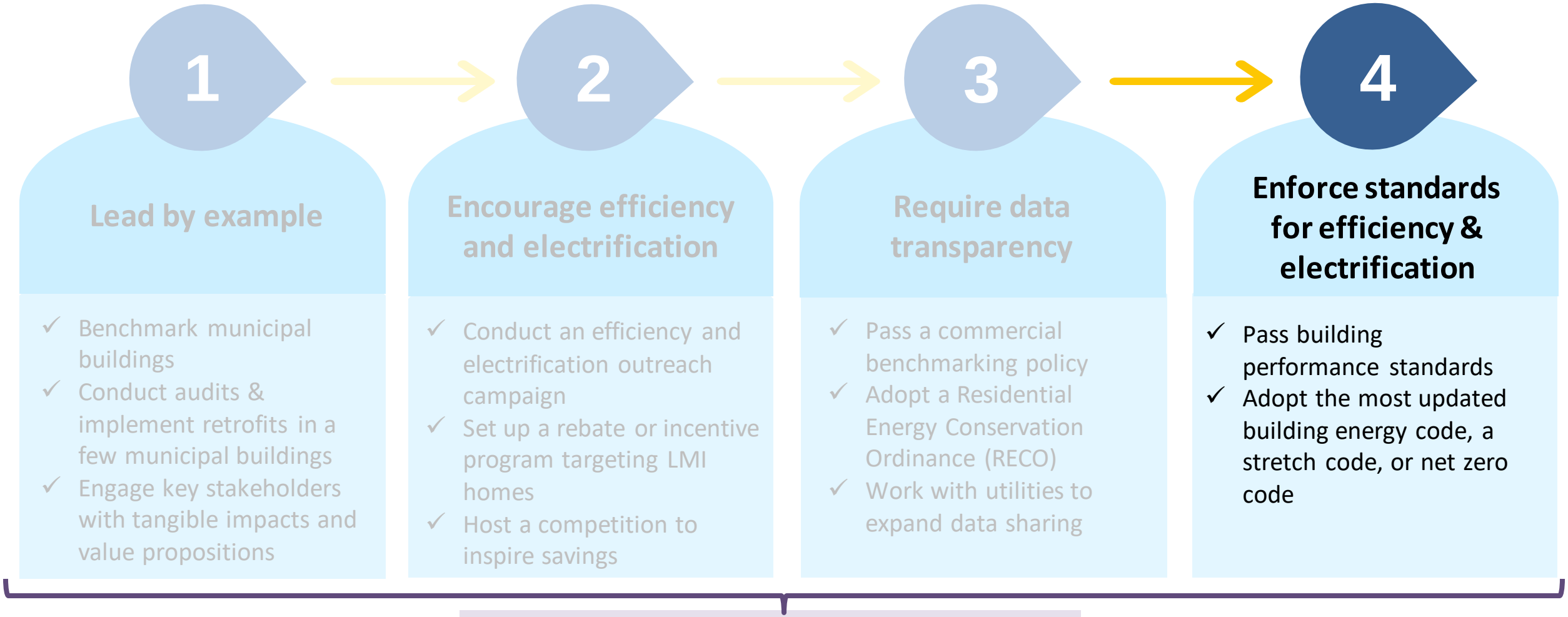

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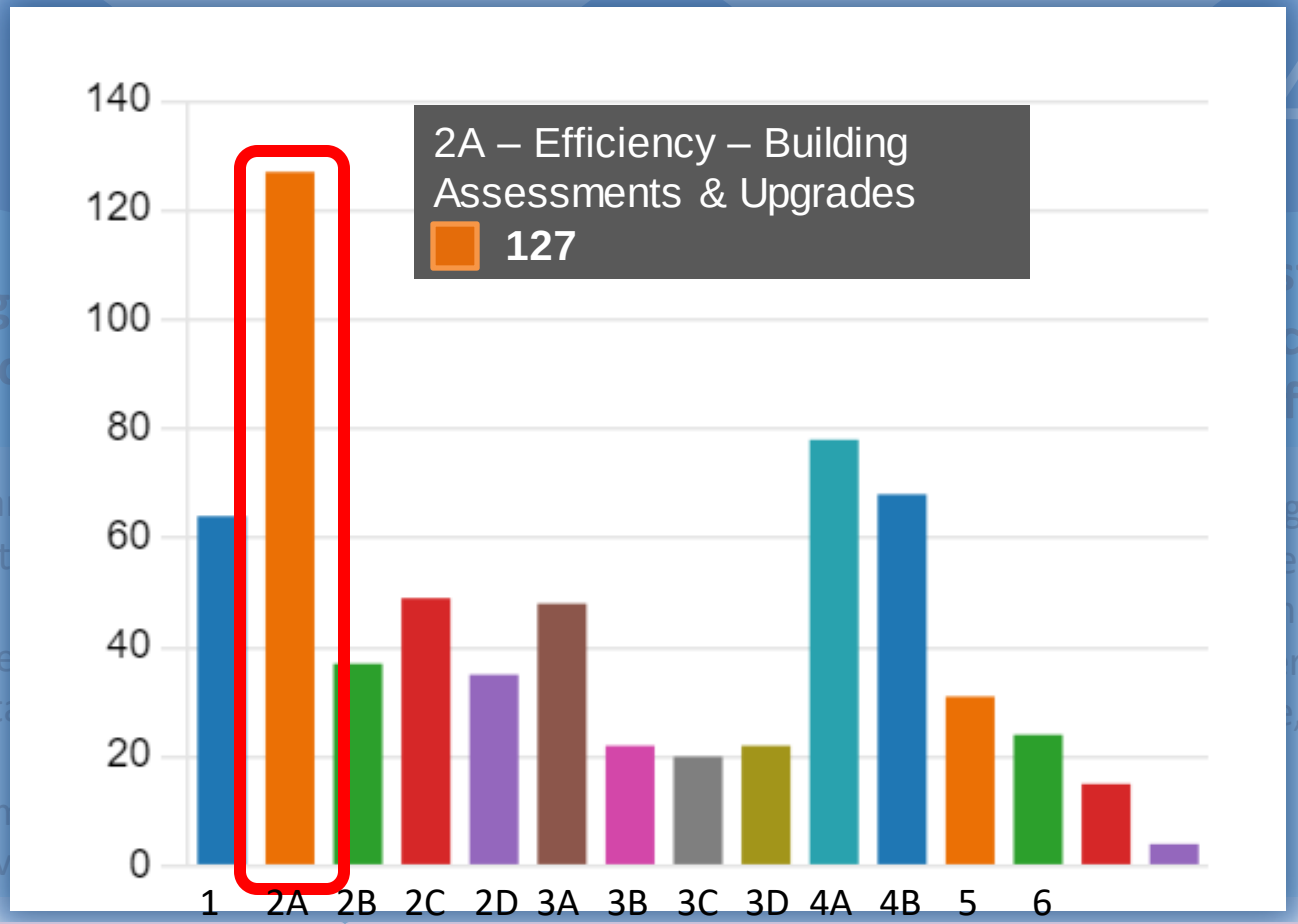

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- EECBG Program Announcements & Reminders
- Efficiency & Electrification 101
- **Blueprint 2A Deep Dive**
- Benchmarking, Audits, ESPC's, and more: A local government perspective from Kirk Vizzier
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Blueprint How-To-Guides | Dive deeper into key activities

Blueprints

- ✓ Model projects and programs that EECBG participants can pursue
- ✓ Outline several high-level key activities that serve as suggested steps participants can take
- ✓ Provide inspiration for communities who aren't sure where to begin with their EECBG Program funds

VS.

Blueprint How-To-Guides

- ✓ "Companion" documents to the Blueprints that align with the key activities
- ✓ Provide more granular steps, recommendations, and resources within each key activity than the Blueprints
- ✓ Support practitioners as they move from planning to implementing their EECBG Program projects

We plan on releasing How-To-Guides for the following Blueprint topic areas:

- 1 – Energy Planning
- 2A – Efficiency: Energy Audits and Building Upgrades
- 2C – Building Electrification Campaign
- 3A – Solar & Storage: Power Purchase Agreements and Direct Ownership
- 4A – Electric Vehicles and Fleet Electrification
- 4B – EV Charging Infrastructure for the Community

https://www.energy.gov/scep/energy-efficiency-and-conservation-block-grant-program-blueprints

Blueprint 2A | Key Activity Summary

KEY ACTIVITY #1

BUILDING ENERGY ASSESSMENTS

- Gather utility bills and building data
- Select a benchmarking platform and set up an account
- Benchmark your buildings to see how they're performing

KEY ACTIVITY #2

ENERGY AUDITS

- Hire an energy auditor
- Coordinate with Facilities staff to support the energy audits with information and building access
- Determine funding sources

KEY ACTIVITY #3

BUILDING UPGRADES

- Review and prioritize energy audit results with key building stakeholders
- Consider project benefits and the ideal sequence of upgrades
- Measure and track the results

Blueprint 2A | Key Activity #1 Overview

BUILDING ENERGY ASSESSMENTS

- Gather utility bills and building data
- Select a benchmarking platform and set up an account
- Benchmark your buildings to see how they're performing

GOAL:

Identify buildings in need of an energy audit

Blueprint 2A | Key Activity #1 – Building Energy Assessments (I/III)

BUILDING ENERGY ASSESSMENTS

- Gather utility bills and building data
- Select a benchmarking platform and set up an account
- Benchmark your buildings to see how they're performing

Identify which buildings to focus on

- ✓ All municipal buildings
- ✓ A specific subset of buildings you want to target

Gather 12+ months of utility bill data

- ✓ Find out who receives/pays utility bills
- ✓ Some utilities provide benchmarking data
- ✓ Check in with your utility's customer representative

Gather building specific data

- ✓ Year built
- ✓ Building size
- ✓ % floor area occupied
- ✓ Irrigated area

This will depend on the benchmarking platform you select

Other Considerations:

- Collecting data can be time consuming and might require walk-throughs.
- Utility bills can be confusing & hard to read. This presentation might help.
- If you are collecting data for a few buildings, it might be worth doing it for all buildings

Blueprint 2A | Key Activity #1 – Building Energy Assessments (II/III)

BUILDING ENERGY ASSESSMENTS

- Gather utility bills and building data
- Select a benchmarking platform and set up an account
- Benchmark your buildings to see how they're performing

Select your benchmarking platform

✓ Free options:

ENERGY STAR Portfolio Manager

DOE's Building Energy Asset Score

Facility Energy Decision System (PNNL)

Familiarize yourself with the platform

✓ Create an account
✓ Review training materials

Review required benchmarking data

The data you'll need depends on:

✓ The benchmarking platform you select
✓ Building type

ENERGY STAR's Data Collection Worksheet is a great place to start

Other Considerations:

- Make sure to consider budget and energy management goals when selecting a platform
- Some energy database products sync with ENERGY STAR! If you already have a energy database software, you might be able to benchmark more easily

Blueprint 2A | Key Activity #1 – Building Energy Assessments (III/III)

BUILDING ENERGY ASSESSMENTS

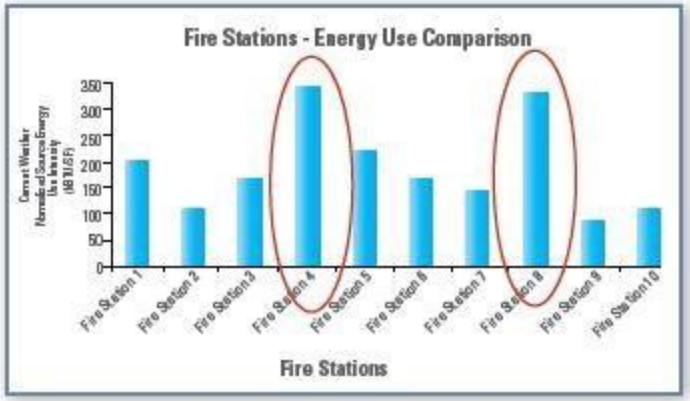
- Gather utility bills and building data
- Select a benchmarking platform and set up an account
- Benchmark your buildings to see how they're performing

Enter utility bill data and building data

Review the results and identify buildings that are underperforming

✓ Have someone check your work for data entry errors and to confirm building equipment and energy use info

✓ Check out this guidance on how to analyze benchmarking results from ENERGY STAR



Other Considerations:

- Entering data into a benchmarking platform takes time (1-2 hours for a single building)
- Save time by uploading multiple properties at once, using bulk upload spreadsheets
- Tap into existing resources! ENERGY STAR offers training guides and demonstrations

Blueprint 2A | Key Activity #2 Overview

GOAL:

Develop a list of potential energy upgrades to pursue

Blueprint 2A | Key Activity #2 – Energy Audits (I/II)

ENERGY AUDITS

- Hire an energy auditor
- Determine funding source(s)

Check with your utility first

- ✓ Do they offer no- or low-cost energy audits?
- ✓ If not, check in with ESCOs, energy consultants, & engineering firms

If needed, map out your procurement process

This might include:

- ✓ Identifying individuals/firms
- ✓ Defining the scope
- ✓ Requesting bids
- ✓ Reviewing qualifications
- ✓ Considering J40 & inclusion goals

Finalize and run your procurement process

- ✓ An RFP might not be required (instead, an RFQ may be an option)

Other Considerations:

- Review sample RFPs & contracting documents from other organizations.
- If you haven't by now, loop in the facilities management team
- Don't forget about building operation practices. Ask auditors to specifically consider how to optimize building operations as part of the audit

Blueprint 2A | Key Activity #2 – Energy Audits (II/II)

- Hire an energy auditor
- Determine funding source(s)

Estimate a budget to complete audits

- ✓ Audit costs vary by the level of detail & analysis conducted and the intended use of the results
- ✓ Estimated cost ranges = $0.12-$0.50 per square foot

Decide how audits will be funded

- ✓ Fund audits individually?
- ✓ Fund audits in combination with future energy upgrades (e.g. an ESPC)?
- ✓ Involve your facilities, procurement and budget offices to decide on an approach

Make your EECBG dollars go further!

- ✓ Check with your utility and state energy office for incentives, resources, etc.

Other Considerations:

- Check out DOE's Guide to Energy Audits to dive into the different audit levels
- Decide if an ESPC is right for you! Check out this guide from DOE, and EECBG Blueprint 2B
- ENERGY STAR has a rebate finder you can use

Blueprint 2A | Key Activity #3 Overview

BUILDING UPGRADES

- Review and prioritize energy audit results with key building stakeholders
- Consider project benefits & the ideal sequence of upgrades
- Measure and track the results

GOAL:

Select and conduct upgrades identified through energy audits

Blueprint 2A | Key Activity #3 – Building Upgrades

BUILDING UPGRADES

- Review and prioritize energy audit results with key building stakeholders
- Consider project benefits & the ideal sequence of upgrades
- Measure and track the results

Review and prioritize energy audit results

- ✓ Prepare by reviewing examples of energy audit results (e.g. City of Mountain Village, AK) and use DOE's Audit Template tool
- ✓ Look for upgrades that compliment one another
- ✓ This guide can help you prioritize

Consider project benefits & the idea sequence of upgrades

- ✓ Discuss benefits such as improved comfort, cost savings, energy savings, resilience, etc.
- ✓ Some upgrades may be better to complete first (E.g., weatherization measures can reduce the heat load and size of new HVAC equipment) or may need further study

Measure and track results

- ✓ Quantify the cost and energy savings you see to make the case for future upgrades
- ✓ Use results to showcase the benefit of more widespread efficiency interventions such as a benchmarking policy

Blueprint 2A | Recap

Step 1: Energy Assessments	Step 2: Energy Audits	Step 3: Building Upgrades
Purpose: Obtain actionable information. Understand energy usage patterns across a portfolio of buildings and benchmark performance against similar buildings.	**Purpose:** Obtain information that can support a financial investment. Identify building components with most opportunity for energy savings.	**Purpose:** Execute building upgrades to capture energy savings, improve comfort, etc.
Scope: All buildings and facilities in your portfolio.	**Scope:** Only facilities with the highest potential for energy savings based on Step 1 results.	**Scope:** Targeted buildings and building components based on Step 2 results (i.e., audit).
Confidence in Energy Savings: Low confidence.	**Confidence in Energy Savings:** Medium confidence based on results of energy assessments (Step 1).	**Confidence in Energy Savings:** High confidence based on results of energy audits (Step 2).
Cost: No or low cost supported with staff and available energy usage data.	**Cost:** Low to high cost depending on the scope of the energy audit.	**Cost:** Higher costs that vary depending on project scope, technology, etc.
Financing Options: Not applicable.	**Financing Options:** ESPCs, Utility- and State-Supported Programs, Internal Funding.	**Financing Options:** Internal Funding, Leases, Loans, ESPCs, Bonds, ESAs.
Outcome: A reduced set of buildings meriting further exploration through an energy audit.	**Outcome:** A specific set of energy conservation measures and projected energy savings.	**Outcome:** Energy and cost savings, improved building performance and comfort.

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Guest Speaker | Kirk Vizzier

Kirk Vizzier

Energy Management Coordinator
City of Charlottesville, VA

What questions do you have for Kirk?

Put them in the chat or be ready to come off mute at the end of the discussion

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Breakout Rooms

GOAL: We want to use this time to talk to you all about your EECBG Program projects, workshop ideas, troubleshoot challenges, and connect you to one another

STEP 1: INTRODUCTIONS

Everyone will take turns to introduce yourself, where you're from, how you plan to use your EECBG funds, and where you are in the application/implementation process

STEP 2: PEER DISCUSSION

We will open the floor for you all to share a question or challenge with other EECBG Program communities. An example question might look like:

- ✓ *I would like to split my allocation between some energy audits/facility assessments and creating a Climate Action Plan. Are other cities doing this?*
- ✓ *For those pursuing energy audits, how are you financing them? Which building types are you focusing on?*
- ✓ *My utility doesn't share benchmarking data. How do I get the data I need?*
- ✓ *Leadership doesn't see the value in efficiency projects. How do I convince them?*

You'll be expected to share a response or comment to a peer's question or challenge.

Thank You !!

Your EECBG Support System | If you have questions about ....

Your application:

1. The status of your PAIS or application
2. Voucher projects & eligibility
3. Application requirements

Technical Assistance:

1. Blueprints & Blueprint Cohorts
   - *"Does my project fit into a blueprint?"*
2. Community Energy Fellowship
3. Other technical assistance
   - *"How do I incorporate J40 principles into my project?"*

The Voucher Portal:

Get voucher application portal technical help

Your EECS:

Get support developing your Energy Efficiency Conservation Strategy (EECS)

Grant Management Team
EECBG@hq.doe.gov

Technical Assistance Team
TechnicalAssistance@hq.doe.gov

Attend Our Bi-weekly Office Hours! Sign up here
Every other Friday at 2:30pm ET
https://forms.office.com/g/yc3H3xQeEE

Voucher Portal Administrator (ICF)
EECBGVouchers@icf.com

National Renewable Energy Laboratory (NREL)
EECS_TA@nrel.gov
- 10-20 Hours