

Welcome!



Chula Vista's Building Ordinances - Bringing Energy Savings to Existing Buildings

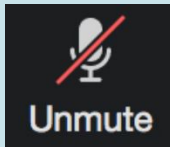
Thursday, July 1 | 2 - 3 PM

Visit us!
lgsec.org

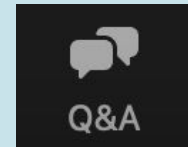
Contact us!
lgsec@lgc.org



Keep yourself **muted**
so that we can hear
our speakers clearly



Use the **Q&A** function
to send questions
throughout webinar





LOCAL GOVERNMENT
**SUSTAINABLE
ENERGY COALITION**

Our Network of Leaders

LGSEC.org





LOCAL GOVERNMENT
SUSTAINABLE
ENERGY COALITION

Our Speakers

LGSEC.org



Moderator

Paul Mathew

Energy/Environmental Policy
Staff Scientist/Engineer
Lawrence Berkeley National
Laboratory



Barbara Locci

Conservation Specialist
City of Chula Vista



Cory Downs

Sustainability Specialist
City of Chula Vista



Eric Engelman

Climate Policy Consultant
Energy Policy Consultants
(EPC)

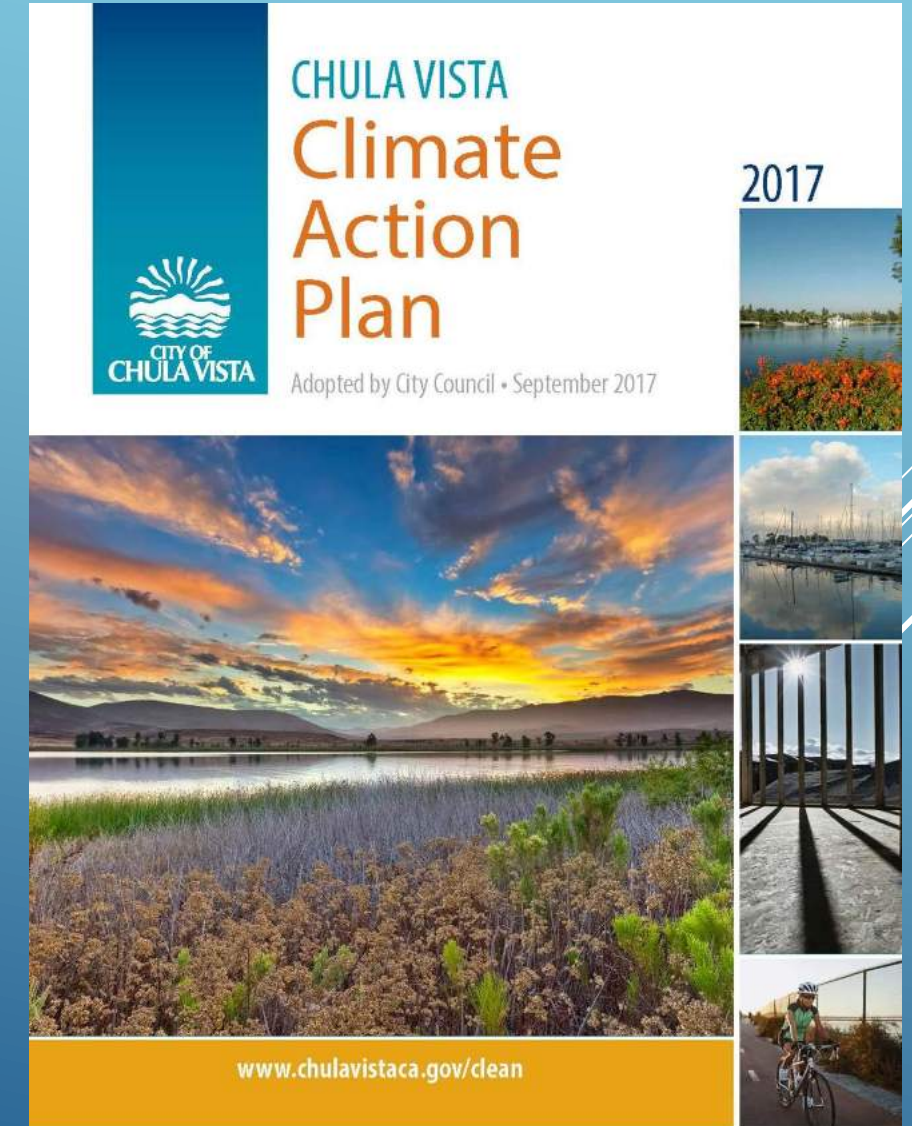
MULTIFAMILY AND COMMERCIAL ENERGY BENCHMARKING AND CONSERVATION ORDINANCE



Barbara Locci
City of Chula Vista

2017 CHULA VISTA CLIMATE ACTION PLAN

- Approved by Sustainability Commission
- Adopted by City Council
- Calls for “building performance reporting and public disclosure” policies
- Directed city staff to “develop a Residential and Commercial Energy Conservation Ordinance for City Council consideration.”
- Set a target of retrofitting 20% of multifamily and commercial space to achieve 50% savings by 2035



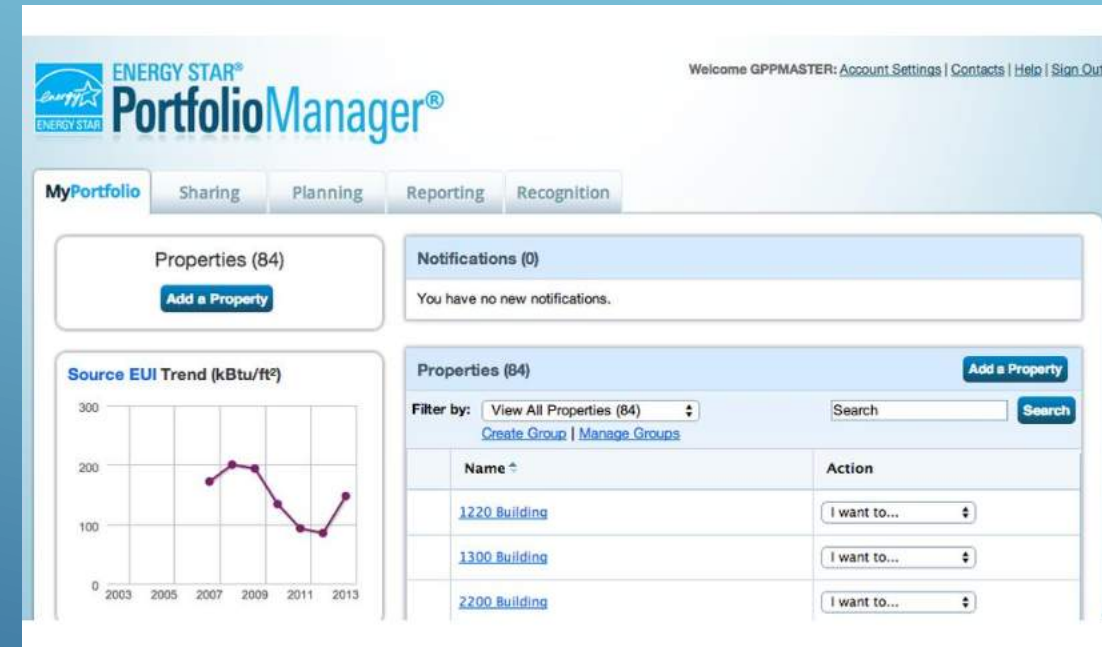
BENCHMARKING AND DISCLOSURE

- ▶ Process of measuring a building's energy consumption
- ▶ Rating the building's performance
- ▶ Comparing performance with similar buildings
- ▶ Tracking progress over time
- ▶ Disclose energy performance rating to public
- ▶ Average building sees 2-3% improvement

Philosophy: Measurement + Transparency =
Energy Efficiency

HOW TO BENCHMARK

- Register buildings in ENERGY STAR Portfolio Manager
- Import energy bills electronically from SDG&E
- Portfolio Manager calculates an ENERGY STAR Score between 1 and 100
- Click Chula Vista's reporting link to electronically submit building data each year starting 2021

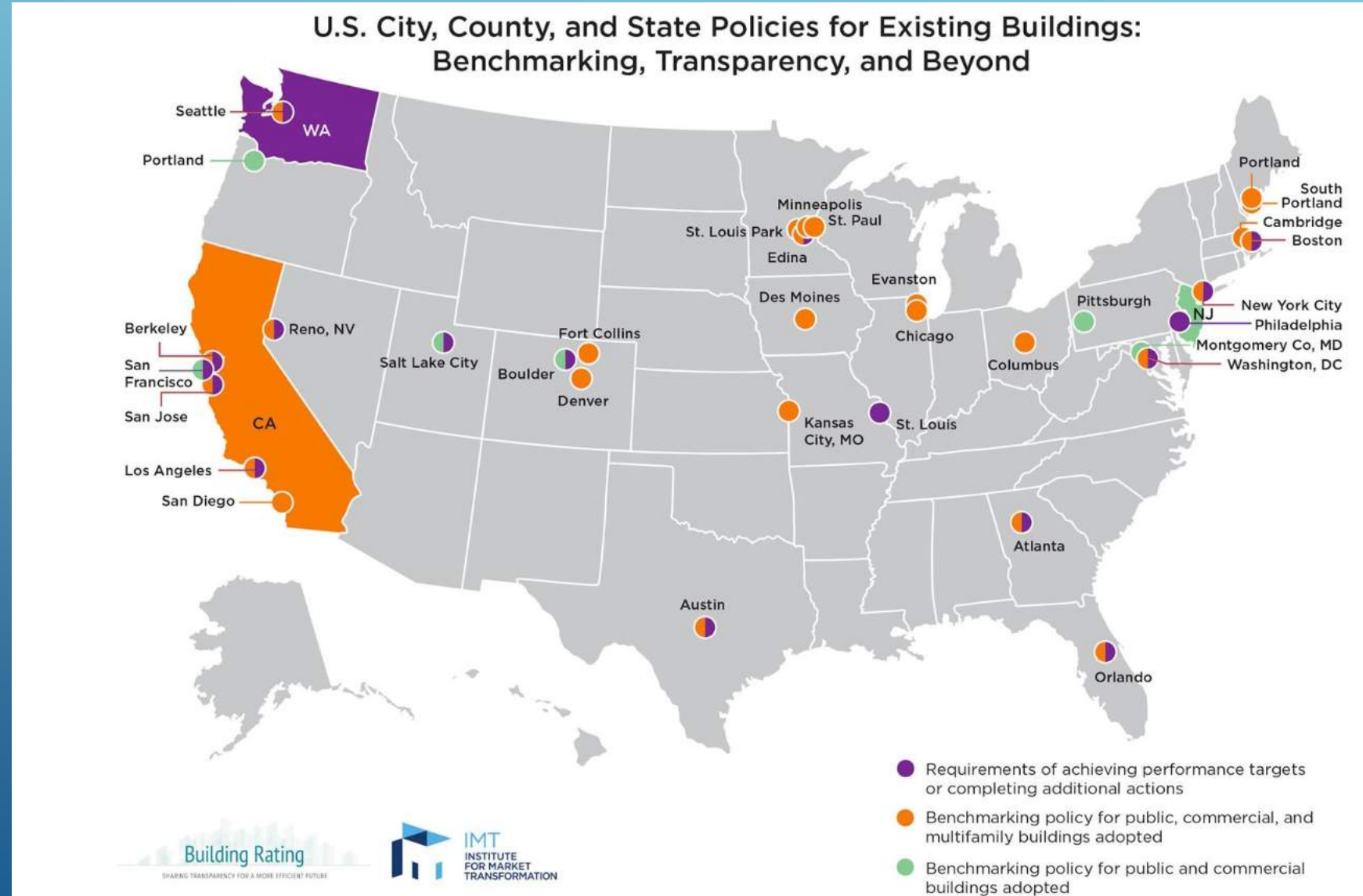


ENERGY CONSERVATION / BUILDING PERFORMANCE ORDINANCES

- Improves on Benchmarking-only policies
- Additional requirements if sufficient progress is not made
- Audits – Prioritize the energy efficiency investments with the best ROI
- Retro-commissioning – Low cost, immediate results
- Performance standards – Assure follow-up on audits

BUILDING PERFORMANCE ORDINANCES

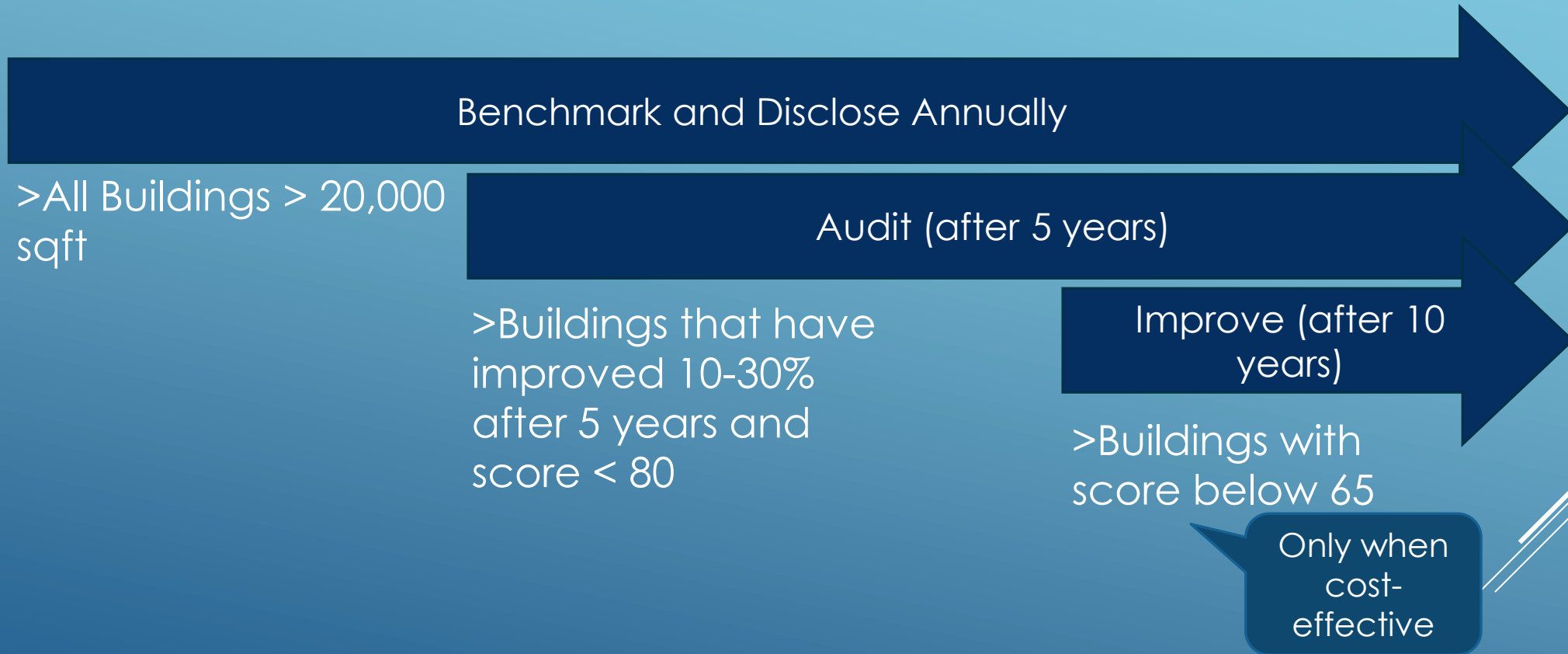
- Have been adopted by more than 30 major US cities
- California AB802 already requires Benchmarking



ORDINANCE COMPARISON

City/State	Adopted	Covers Multifamily	Min. Building Size (sqft)	Bench-marking	Public Disclosure	Audit Req.	Minimum Performance Standard
New York City	2009; 2019	✓	25,000	✓	✓	✓	✓
San Francisco	2011		10,000	✓	✓	✓	
Washington DC	2012; 2018	✓	10,000	✓	✓	✓	✓
State of California	2015	✓	50,000	✓	✓		
Los Angeles	2015	✓	20,000	✓	✓	✓	
St. Louis	2017; 2020	✓	50,000	✓		✓	✓
San Jose	2018	✓	20,000	✓	✓	✓	
Chula Vista	2021	✓	20,000	✓	✓	✓	✓

CHULA VISTA PROGRAM DESIGN



MULTIFAMILY BUILDINGS

Benchmark and Disclose Annually

>All Buildings > 20,000 sqft

Tenant Spaces (built pre-2006)

- Install cost-effective one-time prescriptive upgrades where applicable
 - LED Lighting
 - Low-Flow Water Fixtures
 - Duct Sealing
 - Attic Insulation

Common Areas (if building has with significant common load)

Audit (after 5 years)

>Buildings that have improved 10-30% after 5 years and score < 80

Improve (after 10 years)

>Buildings with score below 65

Only when cost-effective

FEES AND FINES

City	Annual Benchmarking Fee	Audit/Performance Req. Fee (5 year)	Penalties and Fines
Los Angeles	\$64.66	\$183	\$202-\$505 plus interest. Potential financing and transaction complications.
San Francisco	none	none	Up to \$1,250-\$2,500
Berkeley	none	\$240	Up to \$1,000
San Jose	none	none	Subject to general penalties for city code violation
San Diego	none	none	Possible misdemeanor citation
Chula Vista	none*	none*	Waived first two years. Up to \$750-\$2,250. Potential financing and transaction complications.

CHULA VISTA'S REQUIREMENTS

>Commercial Building Requirements

	Who	What	When
Benchmark	All	Submit energy data	Annually from 2022
Disclose	All	Provide benchmarking report to current and prospective owners and tenants	Starting 2022
Audit	Buildings with ENERGY STAR score below 80 that do not meet performance targets after 5 years of benchmarking (10-30% energy use reduction)	Conduct an ASHRAE Level I Audit (including retro-commissioning where appropriate)	Every 5 years, beginning 2023 through 2028
Improve	Building with ENERGY STAR score below 65 that do not meet minimum improvement requirements after 10 years of benchmarking (10-15% energy use reduction)	Implement cost-effective measures identified in the audit in order to reduce energy consumption at least 10-15%	Every 10 years, beginning 2028-2032

Questions?

Barbara Locci

Conservation Specialist

blocci@chulavistaca.gov



Bringing Energy Efficiency to Existing Residential Buildings

Cory Downs
7/1/21



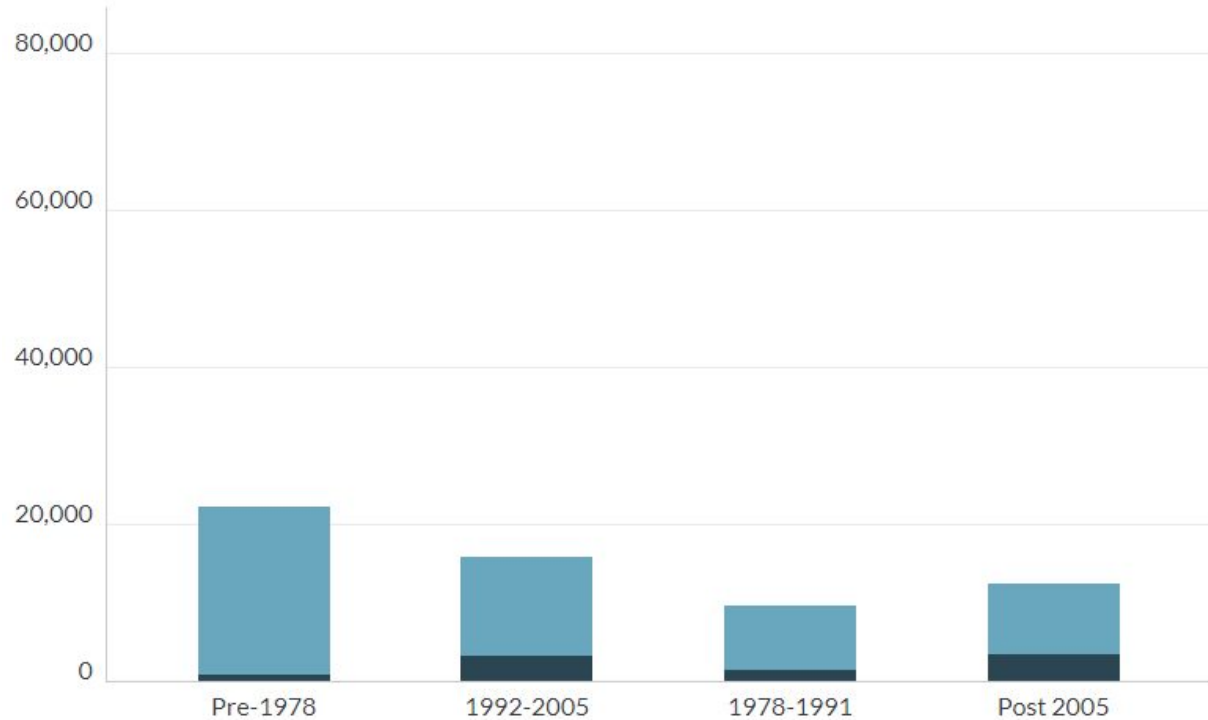
Background
Voluntary Actions
Existing Home Sustainability Ordinance
Next Steps

Background



- Growing community
- Previous cycle reach codes

Single Family Dwelling Units 60,266



Voluntary Actions

- Home Energy & Water Check-Ups
- Sustainable Home Toolkit at Library
- Chula Vista Climate Action Challenge

Compliment but do not replace mandatory action



Existing Home Sustainability Ordinance

Require homes built **before 2006** that are performing additions or major remodels to also perform energy efficiency upgrades in existing portion of the home



Existing Home Sustainability Ordinance

<i>Location</i>	<i>Year Home Was Built</i>	<i>Energy Efficiency Requirements</i>
All Chula Vista zip codes	2006 or later	0
All zip codes except 91914	2005 to 1979	2
All zip codes except 91914	1978 or older	3
91914	2005 or older	4

Changes were made during ordinance development based on stakeholder feedback

Projects that trigger this requirement:



- Adding square footage
- Moving interior walls or other structural elements
- Adding or moving windows and doors

Projects that do NOT trigger this requirement:



- Adding new tile or flooring
- Bathroom fixtures
- Lighting fixtures
- Appliances
- Adding or moving a kitchen island
- Adding or changing counters
- Patio or landscaping
- Adding an Accessory Dwelling Unit (ADU/JADU)
- Projects that are medically necessary
- Repairing, without moving, structural elements

Prescriptive Measures

- LED Lighting
- Water Heating Package
- Attic Insulation
- Duct Sealing
- Air Sealing
- Cool Roof
- High Efficiency Windows*
- High Efficiency Water Heaters*
- High Efficiency Air Conditioning*

*Not found to be cost effective



Exemptions

- Similar measures have already been completed
- Similar measures will be incorporated
- High performing home (Home Energy Score)
- Fully solar powered
- Low income
- Project value cutoff
- Technical infeasibility
- Homeowner association
- Medically necessary or repair
- Can pre-certify a home



Development Services staff was not able to review exemptions so Conservation staff will do that

Promotion

- Website - www.chulavistaca.gov/departments/clean/retrofit
- Flyer
- Press release - dual focus with Benchmarking
- Presentation - staff and public
- Email to known contractors



Next Steps

- Adopted but not currently enforced
- Promote EHSO & energy efficiency broadly
- Track implementation
- Support inspection staff
- Re-evaluate ADU exemption
- Re-evaluate number of measure required
- How to support equity in home retrofits?
- Evaluate if water saving measures be added?



Thank you!!



Cory Downs

Sustainability Specialist

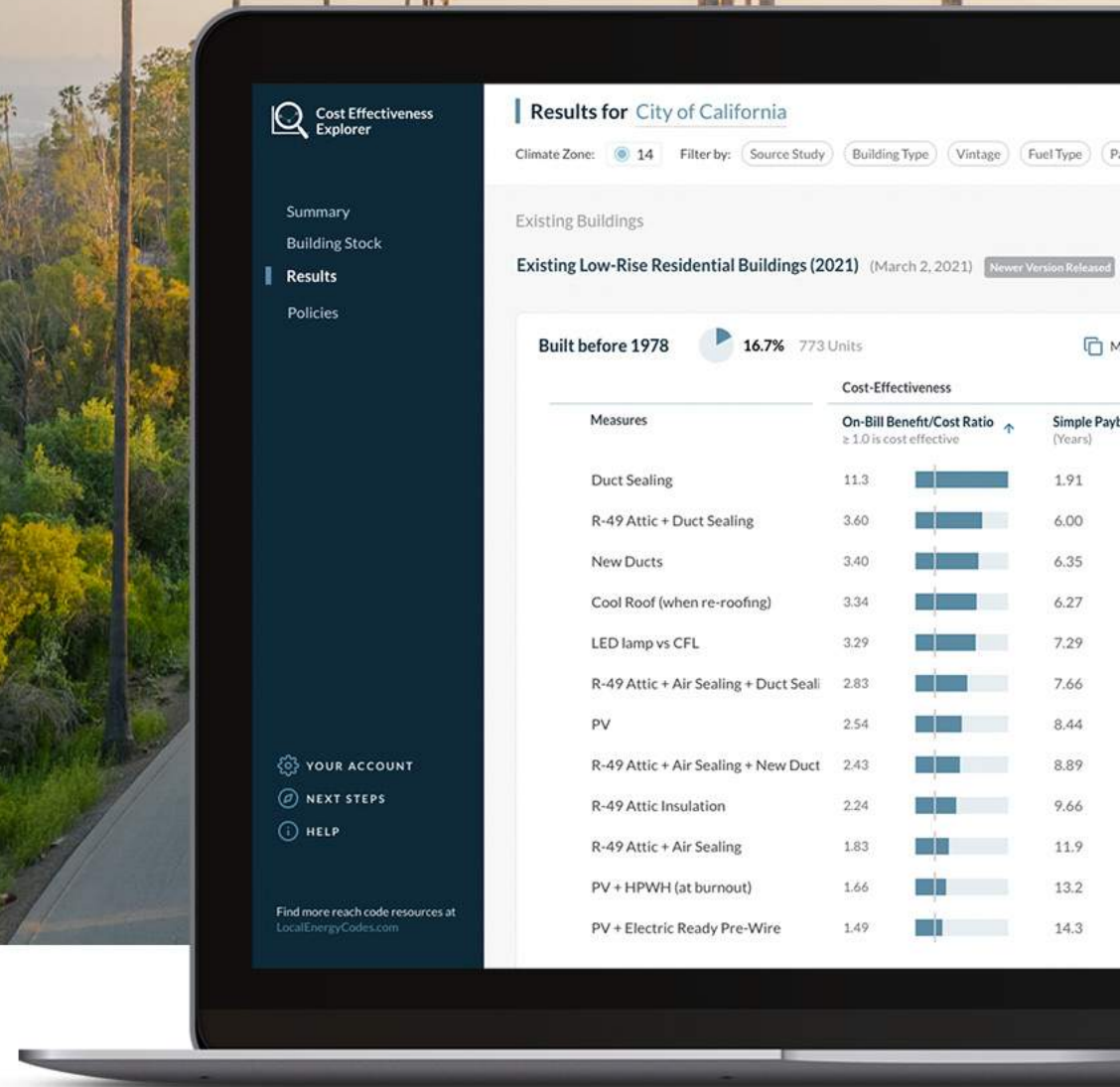
Cdowns@chulavistaca.gov



www.chulavistaca.gov/clean

Cost-Effectiveness Explorer

explorer.localenergycodes.com





Reach Code Basics

Process Overview

- Local amendment to the California Building Energy Efficiency Standards (Title 24 parts 6 and 11)
- Primary legal mechanism among growing suite
- Must reduce building energy consumption
- Local government must make a finding that requirements are cost-effective
- California Energy Codes and Standards Program provides resources including cost-effectiveness studies to support local govs
- After local adoption apply for CEC approval & file with BSC

My last decade in local energy policy

2 years

**Local government
policy making**



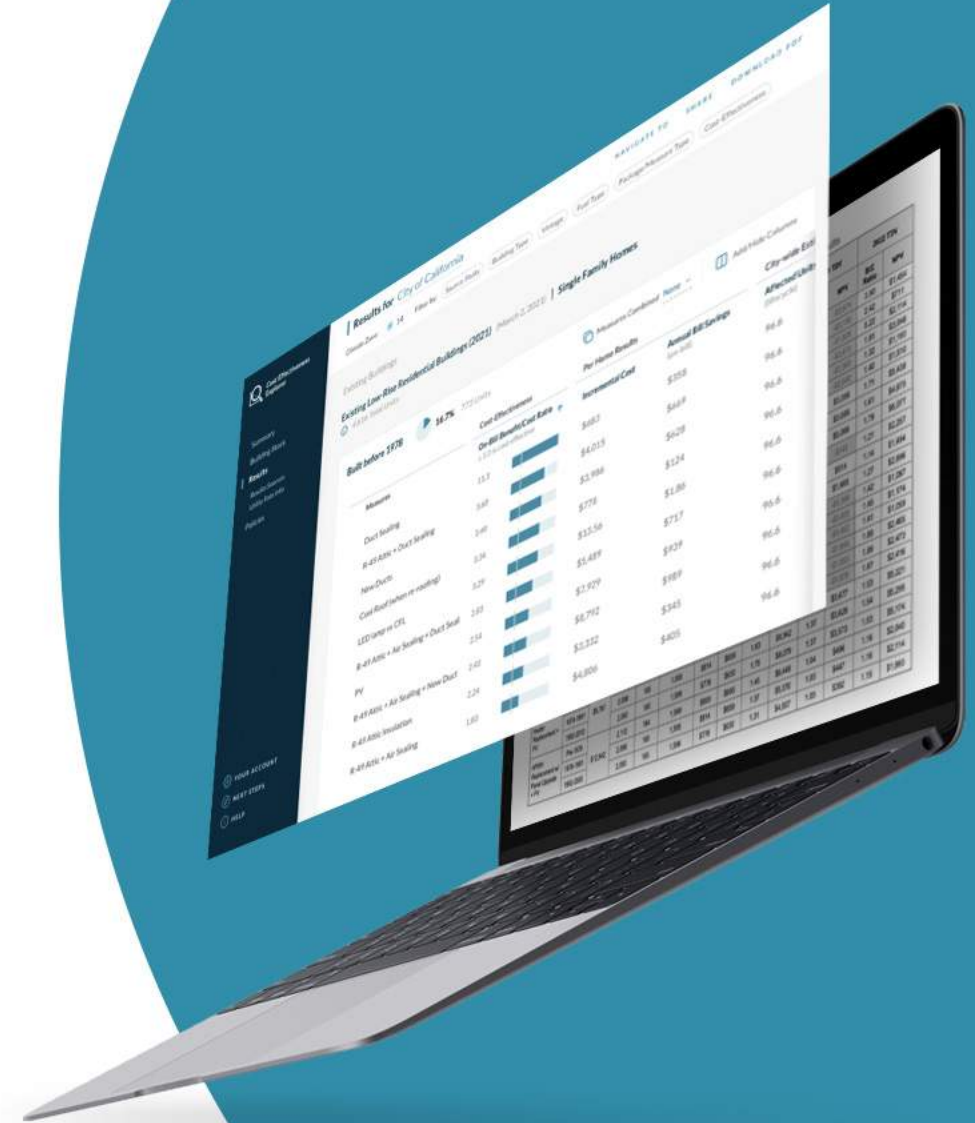
My last decade in local energy policy



Cost-Effectiveness Explorer

explorer.localenergycodes.com

- ✓ Web-based software for California local government energy policy makers
- ✓ Designed to help accelerate reach code adoption and support data-driven decision making
- ✓ Launched in late 2020
- ✓ Aggregates findings from 4 state-wide cost-effectiveness studies
- ✓ Estimates residential building stock for each of 500+ California cities and counties
- ✓ Helps users evaluate and develop cost-effective policy options



Results for City of California

Climate Zone: 14 Filter by: Source Study Building Type Vintage Fuel Type

Existing Buildings

Existing Low-Rise Residential Buildings (2021) (March 2, 2021) [Newer Version](#)

Built before 1978 16.7% 773 Units

Measures	Cost-Effectiveness		Simple Payback (Years)		
	On-Bill Benefit/Cost Ratio	≥ 1.0 is cost effective			
Duct Sealing	11.3	<div></div>	1.91		
R-49 Attic + Duct Sealing	3.60	<div></div>	6.00		
New Ducts	3.40	<div></div>	6.35		
Cool Roof (when re-roofing)	3.34	<div></div>	6.27		
LED lamp vs CFL	3.29	<div></div>	7.29	\$13.56	\$1.86
R-49 Attic + Air Sealing + Duct Seal	2.83	<div></div>	7.66	\$5,489	\$717
PV	2.54	<div></div>	8.44	\$7,929	\$939
R-49 Attic + Air Sealing + New Duct	2.43	<div></div>	8.89	\$8,792	\$989
R-49 Attic Insulation	2.24	<div></div>	9.66	\$3,332	\$345
R-49 Attic + Air Sealing	1.83	<div></div>	11.9	\$4,806	\$405
PV + HPWH (at burnout)	1.66	<div></div>	13.2	\$11,907	\$900
PV + Electric Ready Pre-Wire	1.49	<div></div>	14.3	\$13,404	\$939

Existing Low-Rise Residential Buildings (2021)

Built before 1978 16.7% 773 Units

Measures	Cost-Effectiveness	
	On-Bill Benefit/Cost Ratio	≥ 1.0 is cost effective
Duct Sealing	11.3	<div></div>
R-49 Attic + Duct Sealing	3.60	<div></div>
New Ducts	3.40	<div></div>
Cool Roof (when re-roofing)	3.34	<div></div>

Cost-Effectiveness Explorer

Demonstration

Study Results

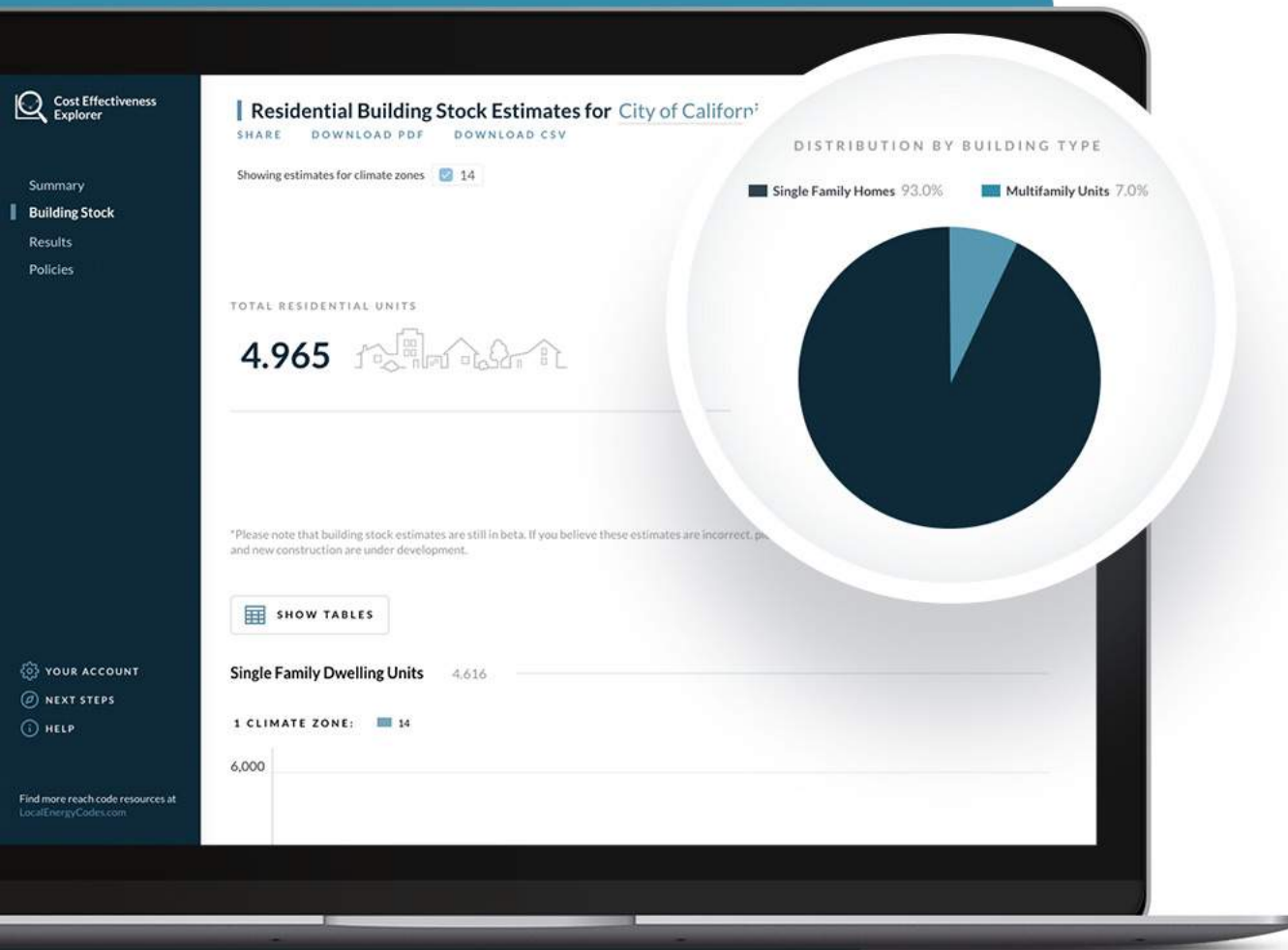
Building Stock Data

Building a Policy

Sharing a Policy

Managing Policies

Comparing Policies



Cost-Effectiveness Explorer

Demonstration

Study Results

Building Stock Data

Building a Policy

Sharing a Policy

Managing Policies

Comparing Policies

Cost-Effectiveness Explorer

Demonstration

Study Results

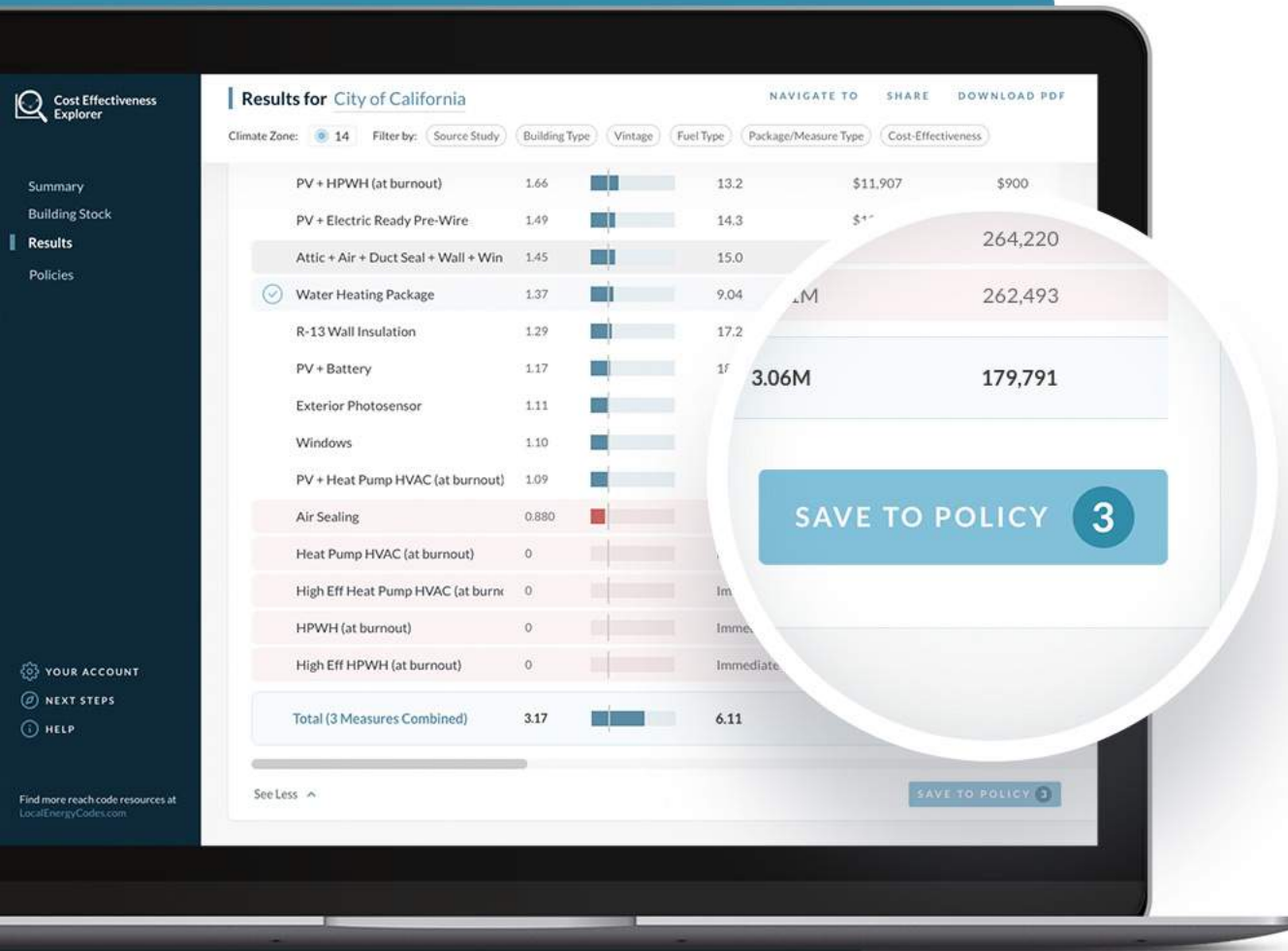
Building Stock Data

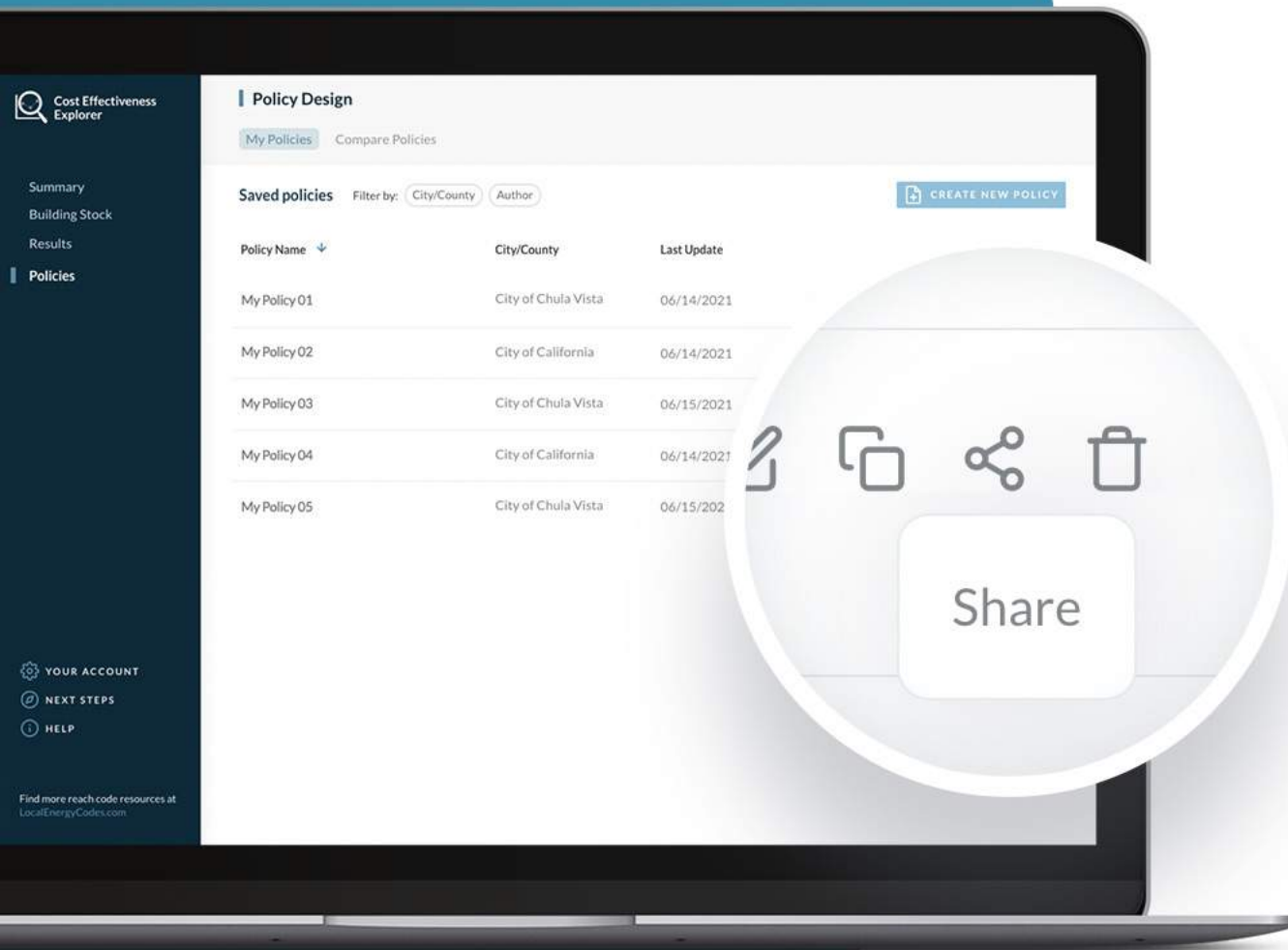
Building a Policy

Sharing a Policy

Managing Policies

Comparing Policies





Cost-Effectiveness Explorer

Demonstration

Study Results

Building Stock Data

Building a Policy

Sharing a Policy

Managing Policies

Comparing Policies

Cost-Effectiveness Explorer

Demonstration

Study Results

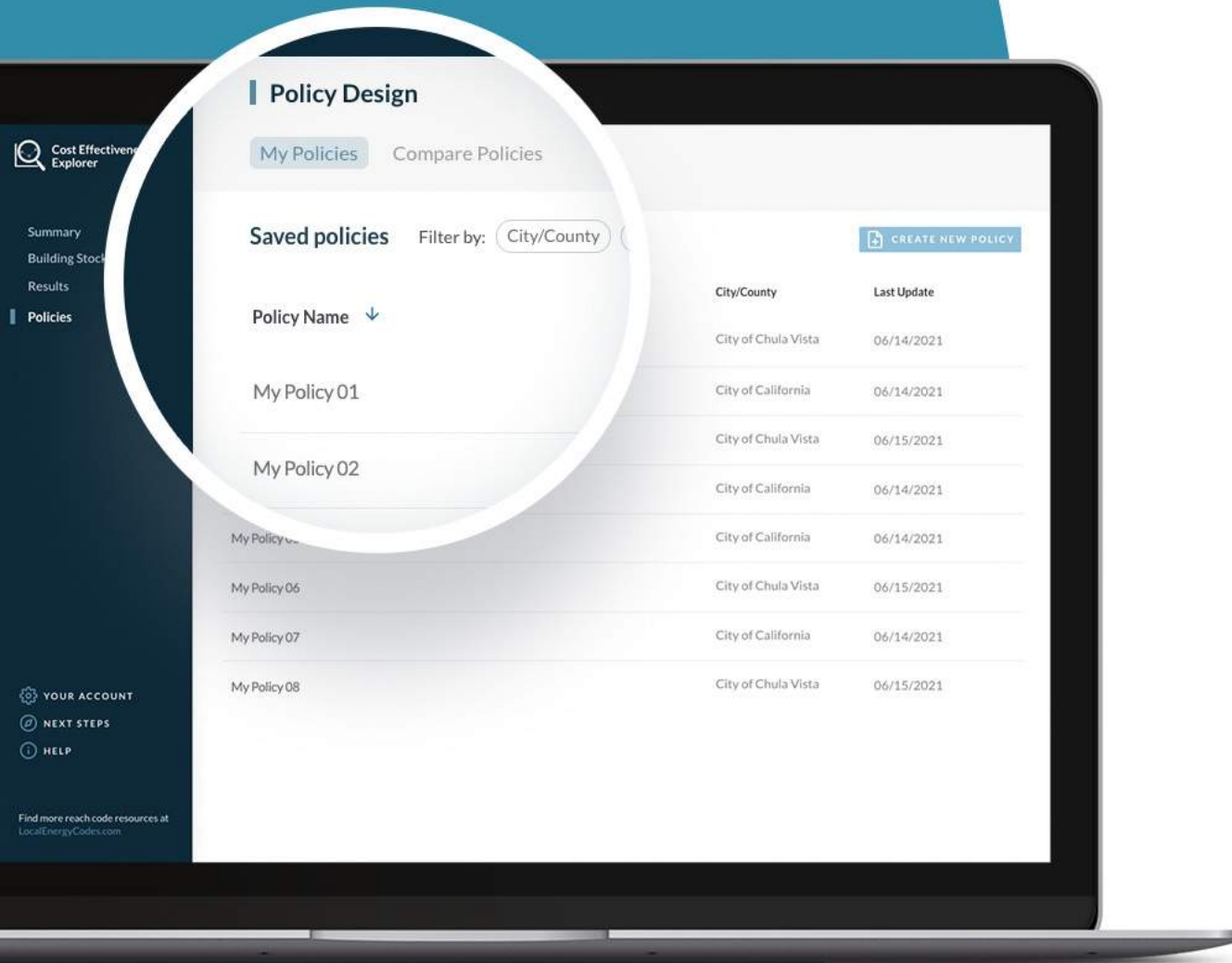
Building Stock Data

Building a Policy

Sharing a Policy

Managing Policies

Comparing Policies



Cost-Effectiveness Explorer

Demonstration

Study Results

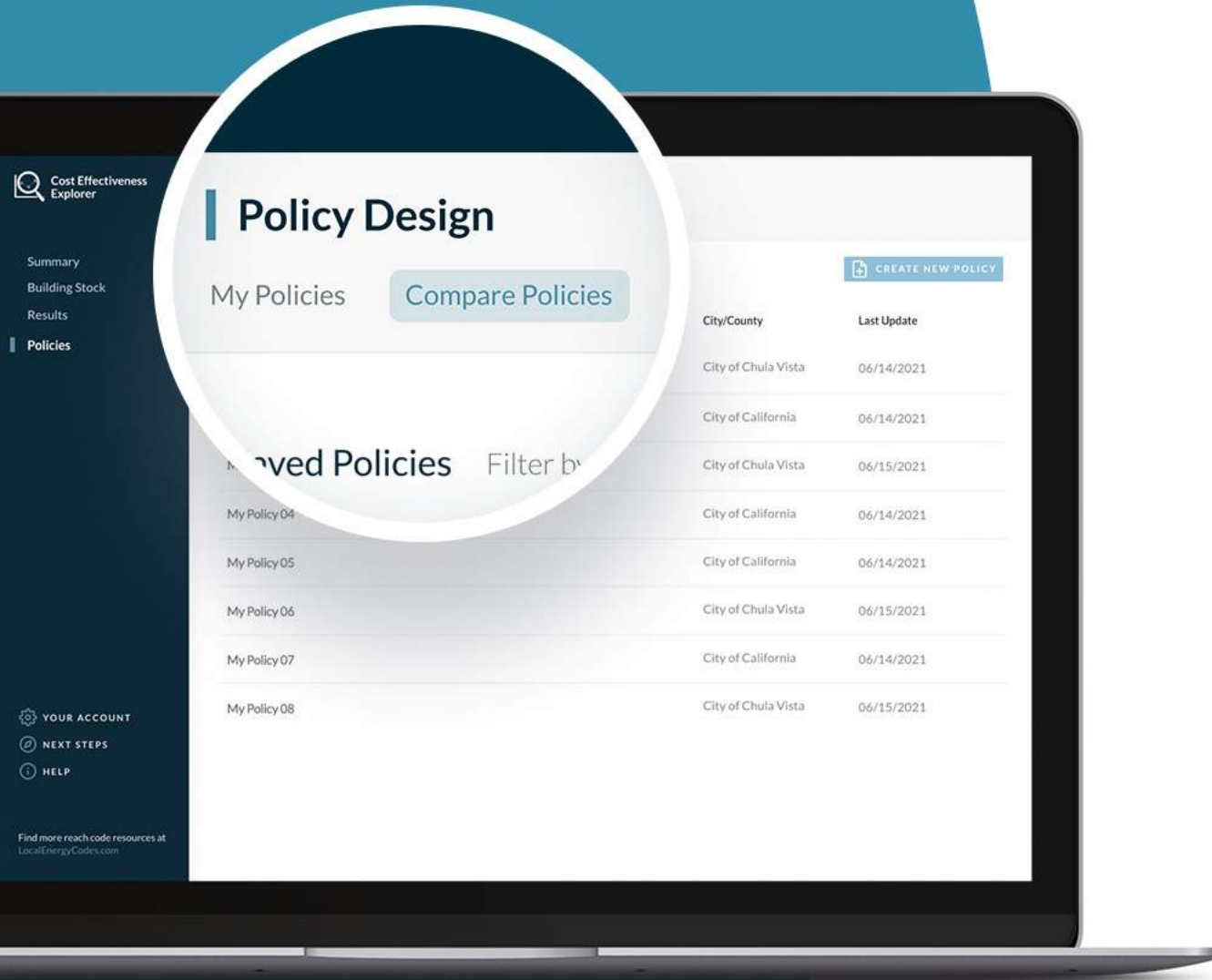
Building Stock Data

Building a Policy

Sharing a Policy

Managing Policies

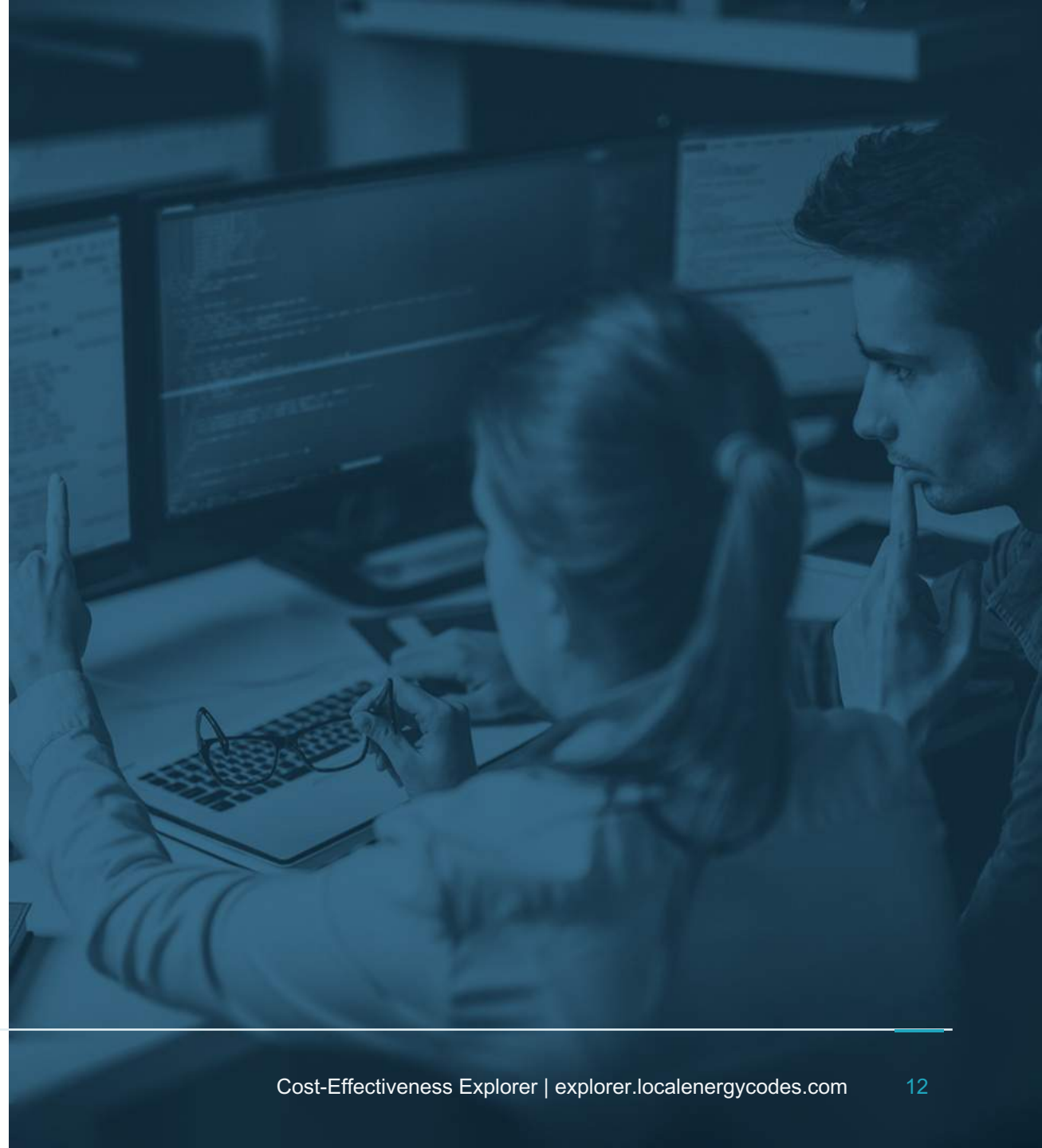
Comparing Policies



Cost-Effectiveness Explorer

Upcoming Features

- Nonresidential building stock data
- Future construction forecasts
- Flexible policy options
- Ordinance drafting
- Additional Studies



Thank you.



Try the Cost-effectiveness Explorer
as explorer.LocalEnergyCodes.com
and share your feedback



Get in touch touch with me at
eric.engelman@gmail.com with
feedback, questions, ideas



Contact info@localenergycodes.com
for no-charge assistance from expert
Reach Code advisors



BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY



U.S. DEPARTMENT OF
ENERGY

Technical Support for Building Performance Standards

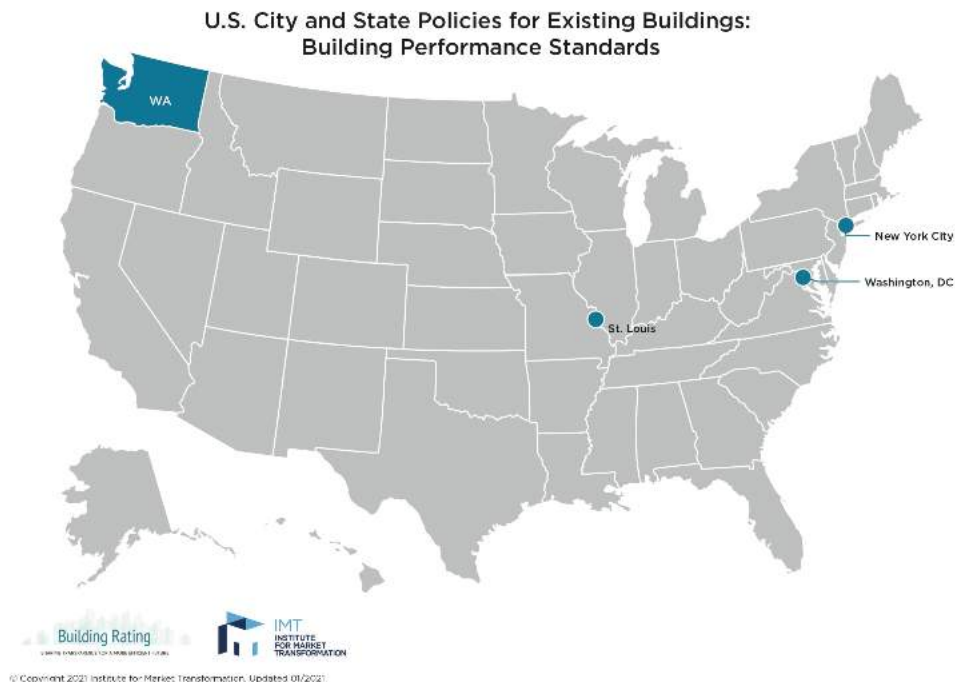
Paul Mathew

Building Performance Standards (BPS) are expanding

Cities and states setting efficiency requirements for existing buildings.

Grappling with policy design questions:

- What metrics? Site EUI? GHG?
- What targets?
- How should electrification be addressed?
- What are the impacts of timing?
- Should smaller buildings be exempt?
- Should some building types be exempt?

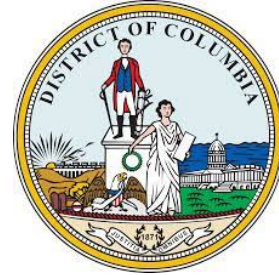


and several other considering....

Technical support to inform policy-making

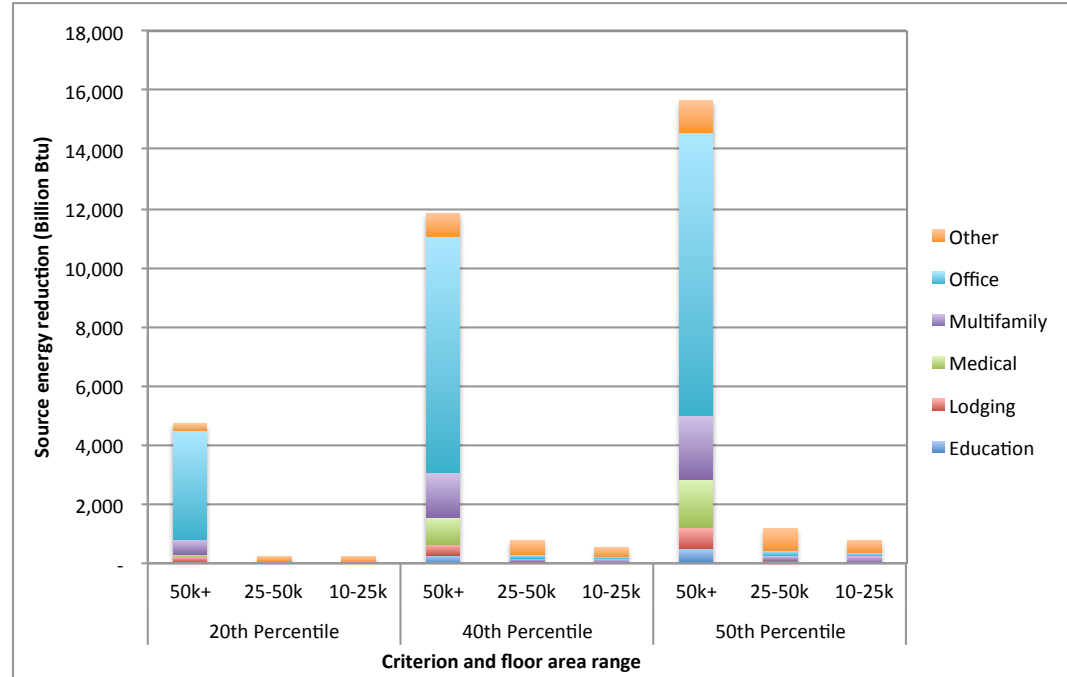
- Driven by policy-analysis questions
- Focus on analysis to support decision-making
- Working with the data we have vs. the data we'd like to have

Strong Federal interest in supporting cities/states to be successful



Washington DC

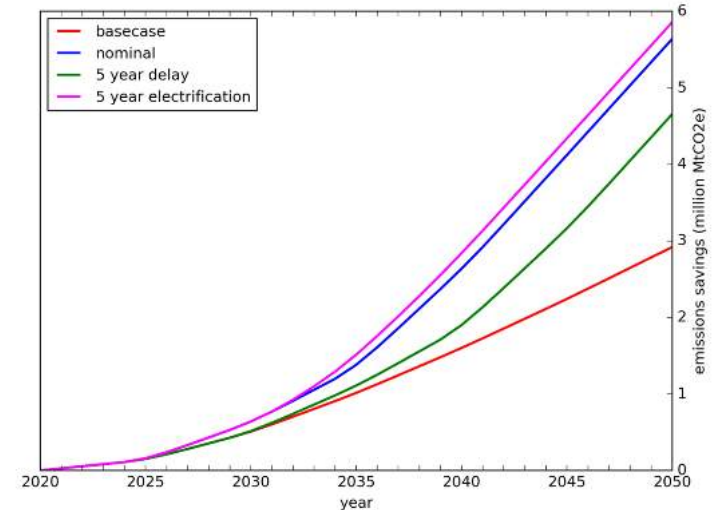
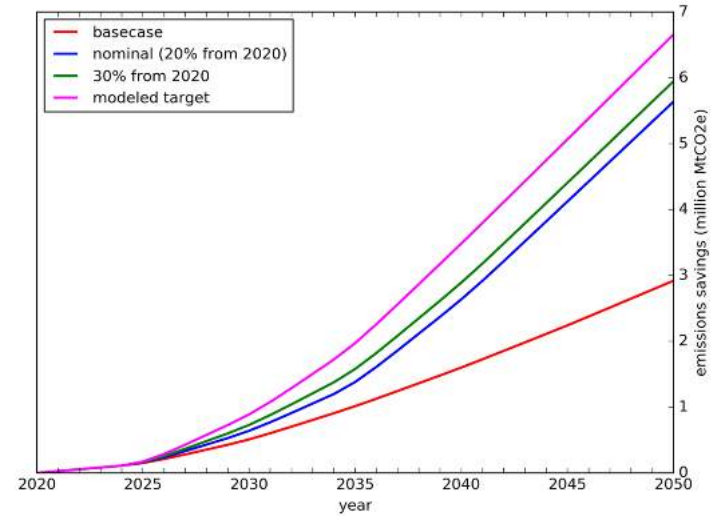
- Quantify impact of requiring buildings to meet certain %ile of ENERGY STAR score
- Data sources: Tax data, Benchmarking data, BPD, DCSEU projects
- Vast majority of reductions from buildings > 50ksf
- Large variation in costs. But median payback ~3yrs



Bergfeld, K., Mathew, P., Duer-Balkind, M., Perakis, J., Khah, P.N., Walter, T. Held, A. Making Data-Driven Policy Decisions for the Nation's First Building Energy Performance Standards. ACEEE Summer Study on Energy Efficiency in Buildings. August 2020. American Council for an Energy Efficient Economy. <https://doi.org/10.20357/B7831V>

Seattle

- Scenario-based analysis of GHG reduction requirement.
 - Includes WA state site EUI requirement
 - Includes electrification scenarios
- Analyzed 2020-2050 cumulative emissions.
- Including smaller buildings has significant impact.
- Timing matters. 5 year delay has more impact than setting higher target



Walter, T., Mathew, P. (2021). GHG policy impacts for Seattle's buildings: targets, timing, and scope. *Buildings and Cities*, 2(1), 283–301. DOI: <http://doi.org/10.5334/bc.81>

ENERGY CODES | 2021

2021 NATIONAL ENERGY CODES CONFERENCE
HOSTED BY THE U.S. DEPARTMENT OF ENERGY

July 20-22 | Virtual

U.S. DEPARTMENT OF
ENERGY

Office of ENERGY EFFICIENCY
& RENEWABLE ENERGY



Building Energy Codes
U.S. DEPARTMENT OF ENERGY

BPS Session Topics

- BPS 101
- Analysis and goal setting
- Model policy and core components
- Compliance and Implementation
- Engaging stakeholders for equitable outcomes



Thank you

Paul Mathew
pamathew@lbl.gov



BERKELEY LAB
LAWRENCE BERKELEY NATIONAL LABORATORY



U.S. DEPARTMENT OF
ENERGY



LOCAL GOVERNMENT
**SUSTAINABLE
ENERGY COALITION**

Thank you for attending!

LGSEC.org

