Energy Performance Standards Policies for Existing Buildings in U.S. Cities and States

Renewable Energy Institute

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What are Building Performance Standards?

Building performance standards are regulations or policies that require building owners to meet some performance benchmark or target, generally an energy performance rating, or energy or carbon intensity, often giving building owners multiple years to bring buildings into compliance, sometimes with staged requirements increasing in stringency over time.

Performance standards can require action from all building owners covered by the standard.

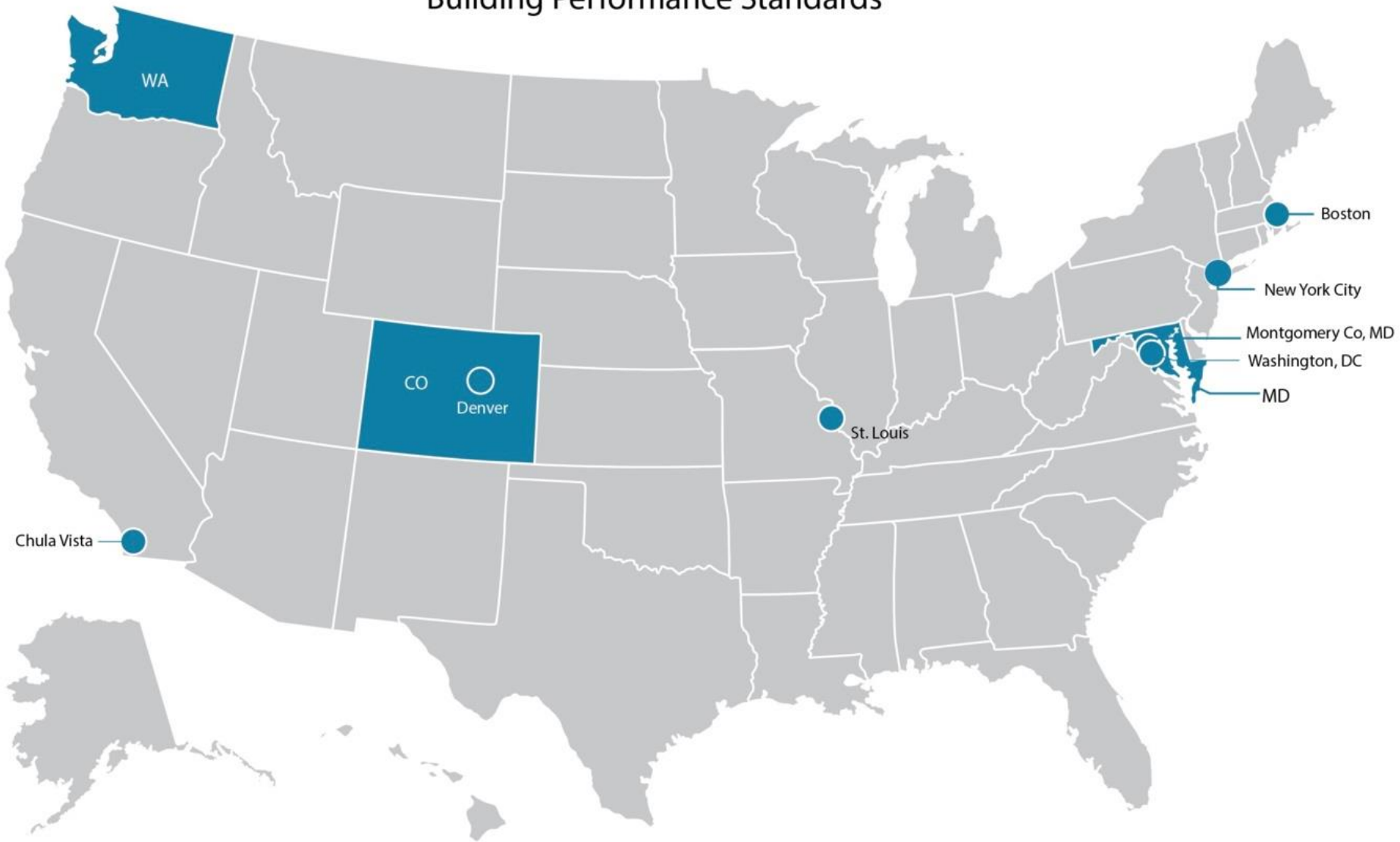
How do BPS differ from Energy Codes?

	Energy Codes	Performance Standards
Basis of requirements	Codes are generally developed for new construction, though some new construction requirements are applied to substantial renovation or alteration projects	Based on some threshold of building energy or carbon performance, generally measured energy or carbon intensity, or linked to a performance rating
Basic trigger for requirement	A “one-time” requirement to meet prescribed energy efficiency levels or performance when renovating, refurbishing or remodeling an existing building, generally when the level of renovation exceeds a stated portion of the building floor area or value, or some specified construction value	Meet a prescribed energy (or emissions) performance level by a given date, often with the performance level ratcheted up over time sending longer term signal for more stringent requirements in the future

Benefits & Challenges: BPS relative to Energy Codes

	Energy Codes	Performance Standards
Benefits	Development and implementation process already in place for new construction and some renovation in most jurisdictions Construction stakeholders largely familiar with energy codes Most jurisdictions have some building control department in place, dealing with variety of building codes	Can trigger major energy improvement activity without other construction (renovation/ remodelling) being a trigger Should drive much more significant volume of building energy improvement in existing building stock than solely buildings being otherwise renovated Potential longer-term glide to more stringent standards, with regular ratcheting up of requirements; a clear signal about requirements several years ahead allows consideration in normal building capital planning
Challenges	Most code processes are focused on a construction process trigger, which means large portion of existing building stock not addressed Code implementation/ enforcement is focused on health and life safety issues; energy performance lower priority	Relatively new policy lever – not many mature policies in place which creates some uncertainty and potential risk regarding policy effectiveness Relative lack of familiarity by many industry stakeholders, and potential lack of technical knowledge of ways to meet the standards

U.S. City and State Policies for Existing Buildings: Building Performance Standards



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Over 30 Jurisdictions Join National Building Performance Standards Coalition launched by White House in 2022

Administration Priorities COVID Plan

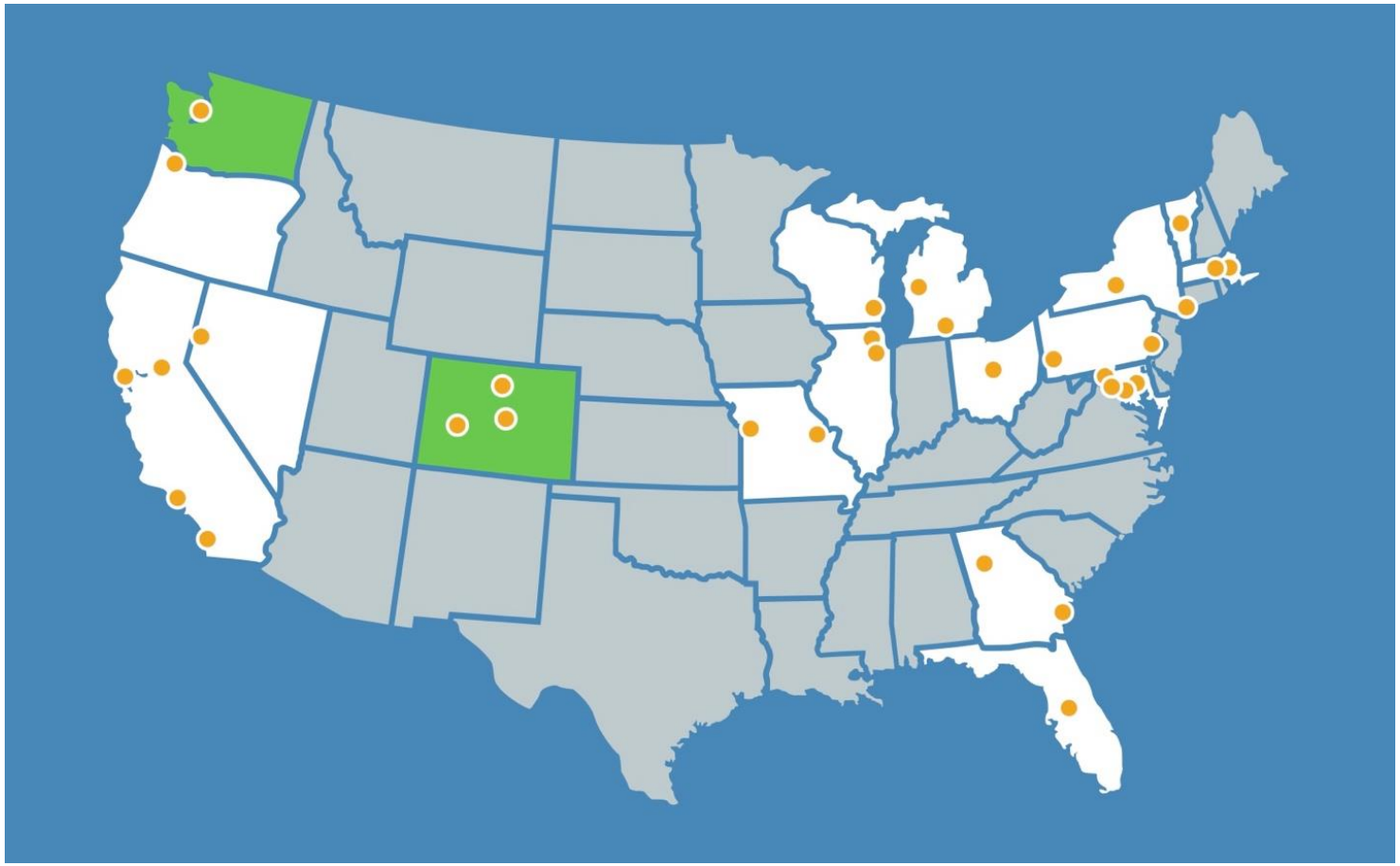
BRIEFING ROOM

FACT SHEET: Biden-Harris Administration Launches Coalition of States and Local Governments to Strengthen Building Performance Standards

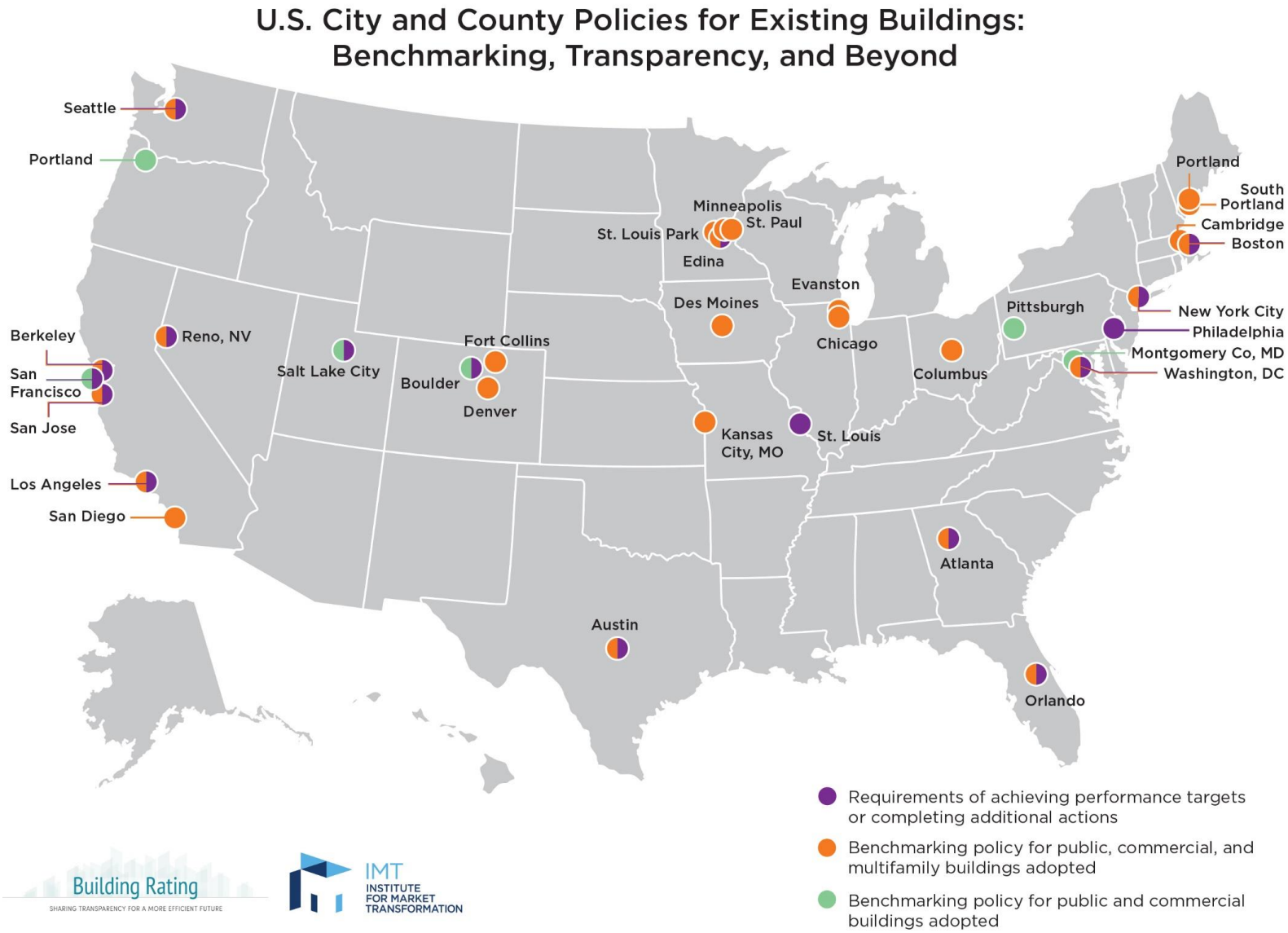
JANUARY 21, 2022 • STATEMENTS AND RELEASES

New Federal, State, and Local Action to Support Energy Efficient Buildings, Create Jobs, and Lower Costs

Today, President Biden announced during his remarks at the U.S. Conference of Mayors that his Administration is teaming up with states, cities, labor, and industry to launch the Building Performance Standards Coalition, a first-of-its-kind partnership between 33 state and local governments dedicated to delivering cleaner, healthier, and more affordable buildings. With nearly 20%



BPS Build on other energy reporting policies



Building Rating
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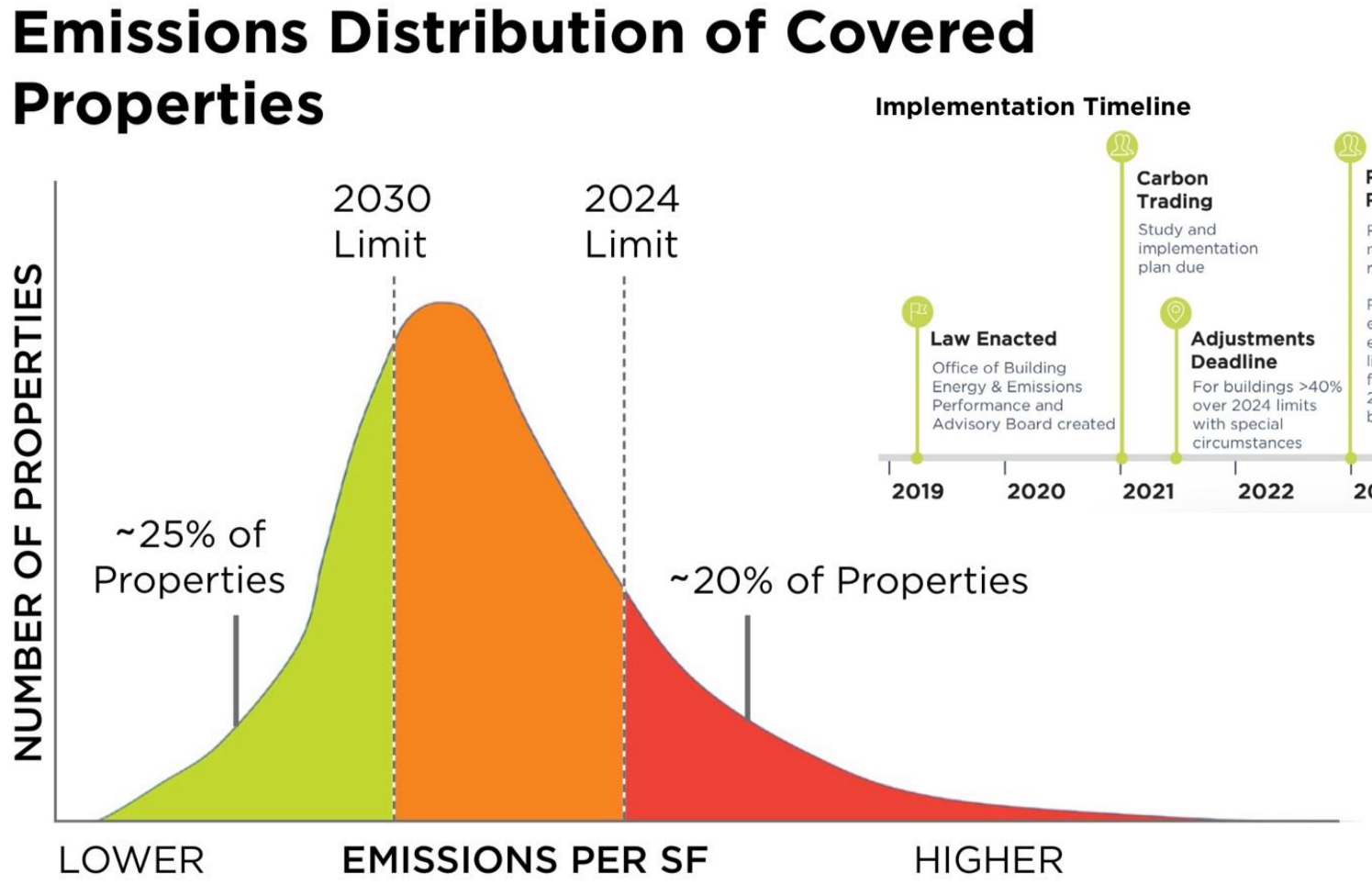
Key Criteria for U.S. BPS

Jurisdiction	Year enacted	Building types included	Minimum building size covered (sq. ft.)	Metric	Initial year of performance requirements
Washington, DC	2019	C, MF	10,000	ENERGY STAR 1-100 Benchmark Score	2026
New York City	2019	C, many MF	25,000	Carbon intensity (tons CO_2 equivalent per floor area)	2024
Washington State	2019	C	50,000	Energy intensity[1]	2026
St. Louis	2020	C, MF	50,000	Energy intensity	2025
Colorado	2021	C, MF	50,000	To be determined in regulations	2026
Boston	2021	C, MF	20,000	Annual GHG emissions	2025
Maryland	2022	C, MF	25,000	Onsite GHG emissions	2030

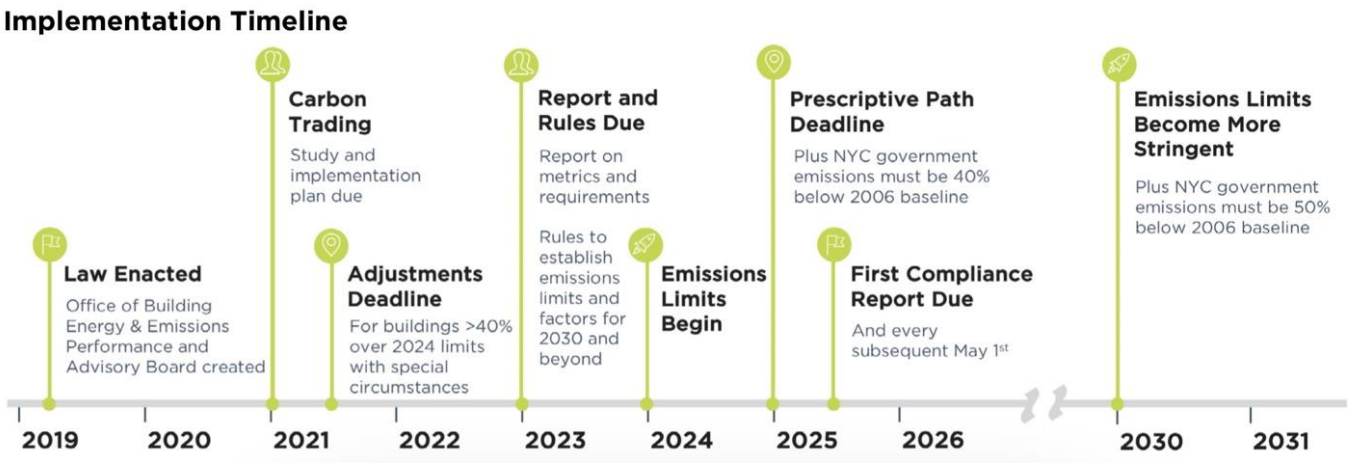
Building types: C = commercial; MF = multifamily. "Initial year" refers to the first year that requirements apply to at least some buildings. Many jurisdictions phase this over time, and the date listed may apply to only some covered buildings.

[1]Energy intensity can be measured as primary or secondary energy consumption (secondary known as "site," and primary as "source" energy in the US. Bot the Washington State and St Louis BPS use "site"/secondary energy as the metric, while other jurisdictions have considered "source"/primary

New York City's Local Law 97 (of 2019)



This graph is meant as a conceptual aid and does not represent actual properties or emissions limits.



Source: Urban Green Council Local Law 97 Summary, https://www.urbangreencouncil.org/sites/default/files/2020.07.09_urban_green_building_emissions_law_summary_revised_11.17.2020.pdf

Boston BPS Emissions Limits

Boston's "Building Emissions Reduction and Disclosure Ordinance" (BERDO) set emissions intensity limits for different building types out to Zero Emission by 2050

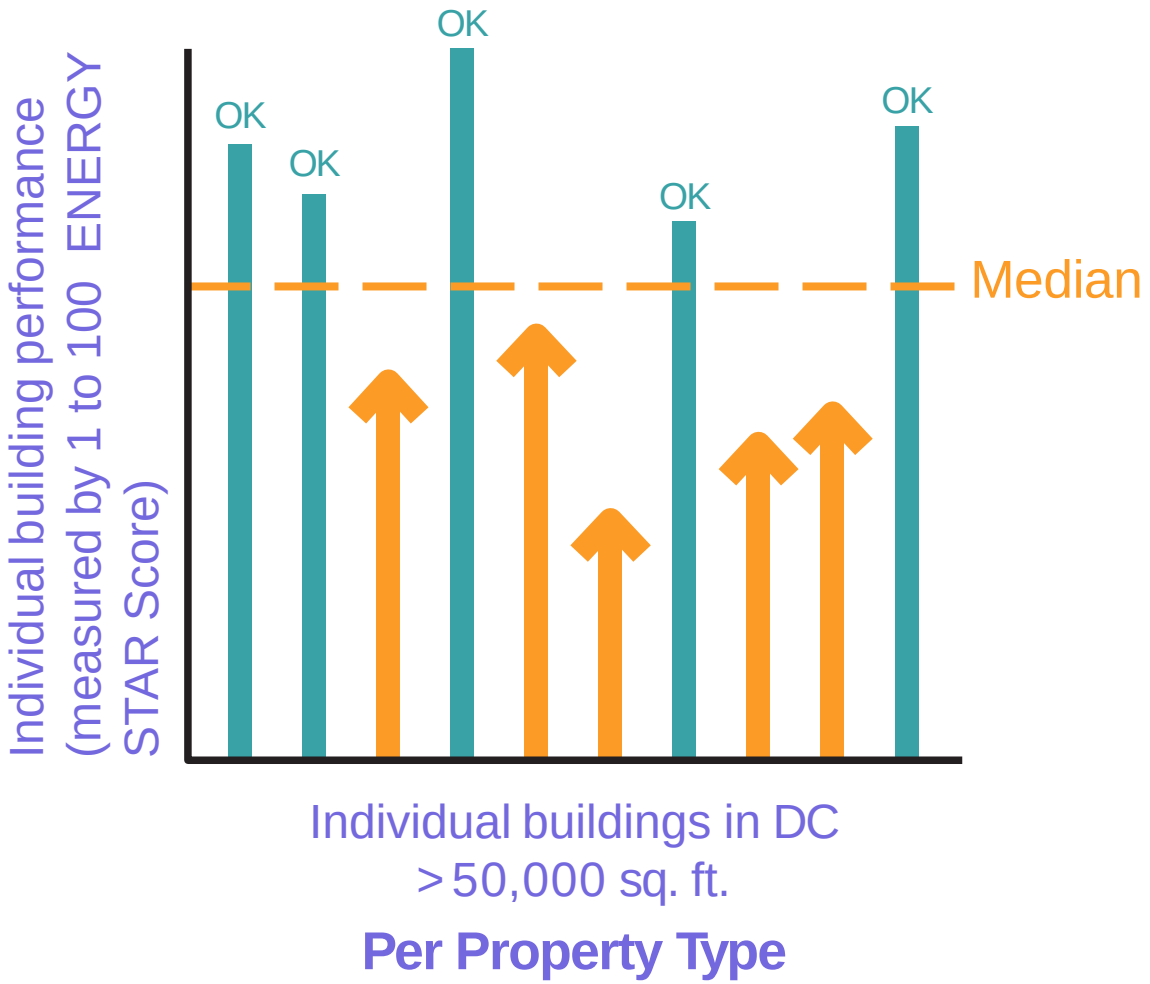
Table 1: CO_2e Emissions Standards by Building Use

Building use	Emissions standard ($kgCO_2e$/SF/yr.)					
	2025 - 2029	2030-2034	2035-2039	2040-2044	2045-2049	2050-
Assembly	7.8	4.6	3.3	2.1	1.1	0
College/ University	10.2	5.3	3.8	2.5	1.2	0
Education	3.9	2.4	1.8	1.2	0.6	0
Food Sales & Service	17.4	10.9	8.0	5.4	2.7	0
Healthcare	15.4	10.0	7.4	4.9	2.4	0
Lodging	5.8	3.7	2.7	1.8	0.9	0
Manufacturing/ Industrial	23.9	15.3	10.9	6.7	3.2	0
Multifamily housing	4.1	2.4	1.8	1.1	0.6	0
Office	5.3	3.2	2.4	1.6	0.8	0
Retail	7.1	3.4	2.4	1.5	0.7	0
Services	7.5	4.5	3.3	2.2	1.1	0
Storage	5.4	2.8	1.8	1.0	0.4	0
Technology/Science	19.2	11.1	7.8	5.1	2.5	0

Washington, DC Building Energy Performance Standard ("BEPS")

The DC BEPS sets a minimum threshold for energy performance for existing buildings.

These standards are based on and measured against a building's demonstrated energy performance, measured by the 1 to 100 ENERGY STAR score.

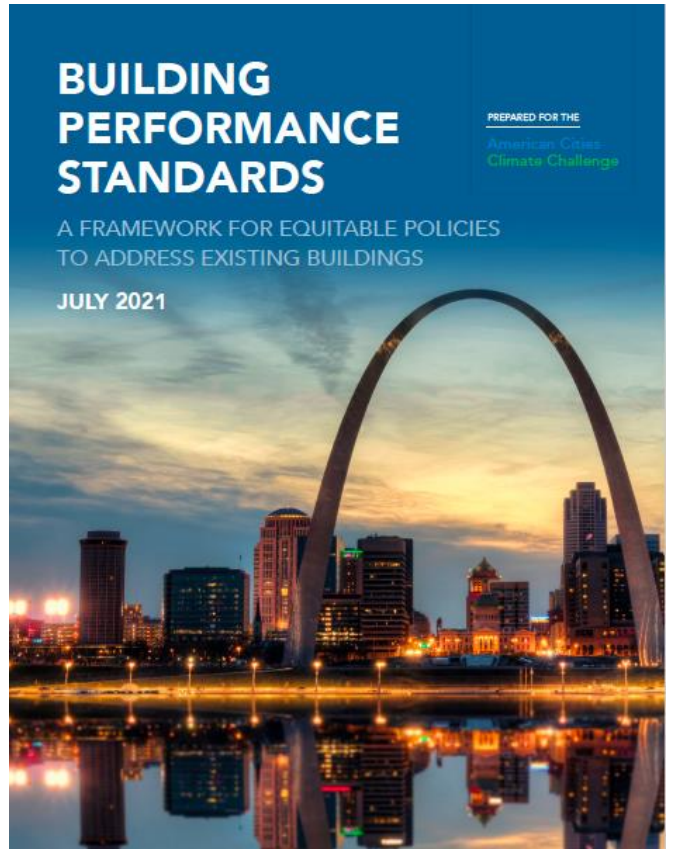


Issues with different BPS metrics

Metric	Pros	Cons
Energy Use Intensity	Can use established programs such as ENERGY STAR to address important normalizations; many users are familiar with these metrics and tools Emphasizes energy efficiency	Largely ignores what happens on the grid, even though the source of power is very important for emissions Since only addresses energy use, harder to develop long-term targets that get to emissions reductions of 80% or more
GHG emissions	Gets at the ultimate goal for most jurisdictions—reducing GHG emissions Provides additional flexibility for building owners if offsets and trading are allowed Easier to set long-term goals, e.g., out to 2050	Emissions from the grid included but are beyond the control of building owners; these emissions factors will change over time Could deemphasize energy efficiency if credits/offsets widely available; with less efficiency, supplying power on peak and calm/cloudy days could be more challenging

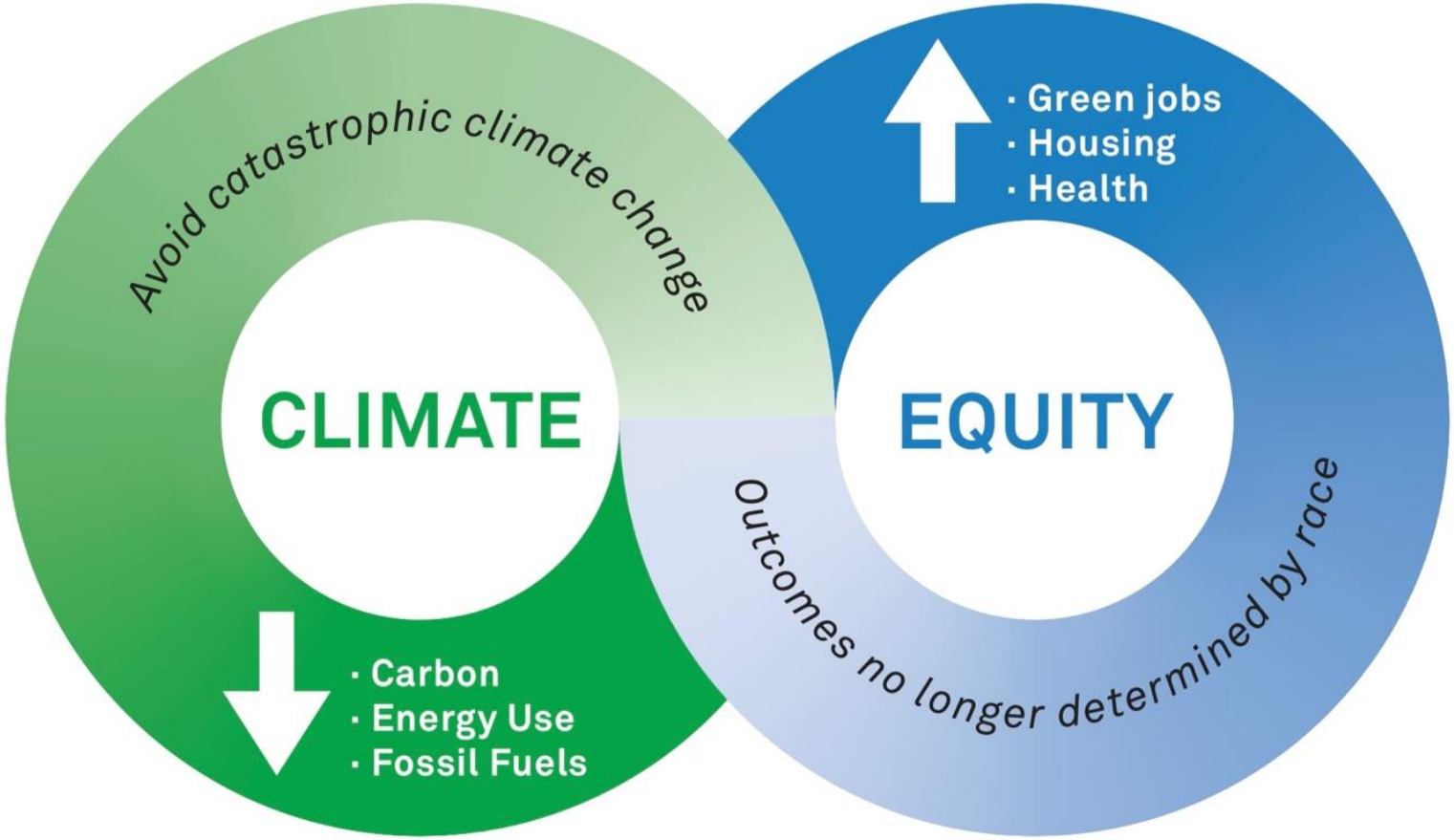
Growing Number of Resources for Cities

BPS Components	Ordinance Essentials	Major Considerations
1) Define scope of covered buildings	• Building type (e.g., commercial, multi-family, industrial) • Building size threshold (e.g., >25,000 sqft)	• Specific exclusions
2) Choose a building performance metric	• Primary metric (e.g., site EUI, GHG intensity, ENERGY STAR score)	• How metric selection influences types of actions in buildings • Combination of metrics to meet different BPS goals
3) Set targets for covered buildings	• How targets are set • How targets may change over time	• Long-term and interim target(s) • Is the metric based on a percentile or absolute target
4) Establish a timeline	• When compliance begins • Length of compliance periods	• Approach for resource-constrained buildings • Phased approach for different building types or sizes
5) Determine compliance pathways	• Establish process and/or body that defines compliance pathways and penalties	• Prescriptive options • Pathways for resource-constrained buildings
6) Determine compliance penalties	• Clear framework for determining penalty amount over time (specific values in the ordinance may not provide enough flexibility)	• Monetary and non-monetary • Determine if penalties relate to estimated cost of compliance • Find out what penalties fund • Determine how financial hardship is addressed[6]
7) Identify supportive programs	• Designate staff to develop appropriate programs	• How to incorporate economic inclusion in program efforts • Specific support for building owners without adequate financial resources



www.usdn.org/uploads/cms/documents/bps-framework_july-2021_final.pdf

Increased Focus: Equity issues along with Climate



More BPS Policy Details Available from Institute for Market Transformation

(Example: Boston)

	POLICY INFORMATION	DESCRIPTION OF REQUIREMENTS	COMPLIANCE	AFFORDABLE HOUSING PROVISIONS	EXEMPTIONS
Boston MA	**Name** Building Emissions Reduction and Disclosure Ordinance **Year Enacted** 2021 **Covered Buildings** All municipal. All commercial and multifamily buildings above 20,000 sq. ft. in size, 15 residential units, or multiple buildings on the same parcels totaling 20,000 sq. ft. or 15 or more units in size.	**Performance Metrics** Annual greenhouse gas (GHG) emissions (tCO_2e/sq. ft.) **Performance Targets/Standards** Building targets are set by building type on an emissions intensity basis, each building's target being multiplied by its gross floor area (blended average for multi-use buildings). Buildings must meet their targets annually starting in 2025 and these targets are ratcheted down every 5 years. Buildings can also opt into a "glide path" target achieving 50% emissions reduction by 2030 and 100% by 2050 using a 2005 or later baseline.	**Compliance Cycle** Annually starting in 2025 for buildings ≥ 35,000 sq. ft. and 2030 for those between 20,000 - 34,999 sq. ft., with emissions targets ratcheting down every 5 years thereafter until zero carbon in 2050. **Compliance Pathways** Buildings must meet emissions targets based on their use type or the glide path aligned with a 50% reduction by 2030 and 100% reduction by 2050 targets. Any combination of energy efficiency, electrification, onsite renewables is allowed. Buildings may use Renewable Energy Credits to offset greenhouse gas emissions from electrical demand. RECs must, 1) be Massachusetts Class 1 RECs or be from a long-term Power Purchasing Agreement that meets approval by the city; 2) are solely owned and retired by owner; and 3) are from the same year as the reporting year.	The Equitable Emissions Investment Fund made up of monies acquired through enforcement is set aside for investment into local carbon abatement projects specifically targeting Boston's environmental justice populations and affordable housing buildings. The Fund is under the authority of the Review Board made up of 2/3 environmental justice community organization-nominated members.	Does not cover state, county, or federal buildings. Exemptions for newly constructed buildings, those with permits for demolition, and those facing specific financial distress.

Source: https://www.imt.org/resources/comparison-of-u-s-building-performance-standards/

US BPS Policy Resources

- Institute for Market Transformation (IMT) BPS Resources (Comparison of different US BPS, Model BPS Ordinance)
  - www.imt.org/bps
- National BPS Coalition
  - nationalbpscoalition.org
- **Building Performance Standards – A framework for existing buildings**, for the American Cities Climate Challenge
  - www.usdn.org/uploads/cms/documents/bps-framework_july-2021_final.pdf
- Relationship of BPS with Building Energy Codes: International Energy Agency/Building Energy Codes Working Group report **Building Energy Codes and Other Mandatory Policies Applied to Existing Buildings**
  - https://www.iea-ebc.org/Data/Sites/1/media/docs/working-groups/building-energy-codes/ebc_wg_becs_codesothermandatorypolicies-existingbuildings_june_2021.pdf