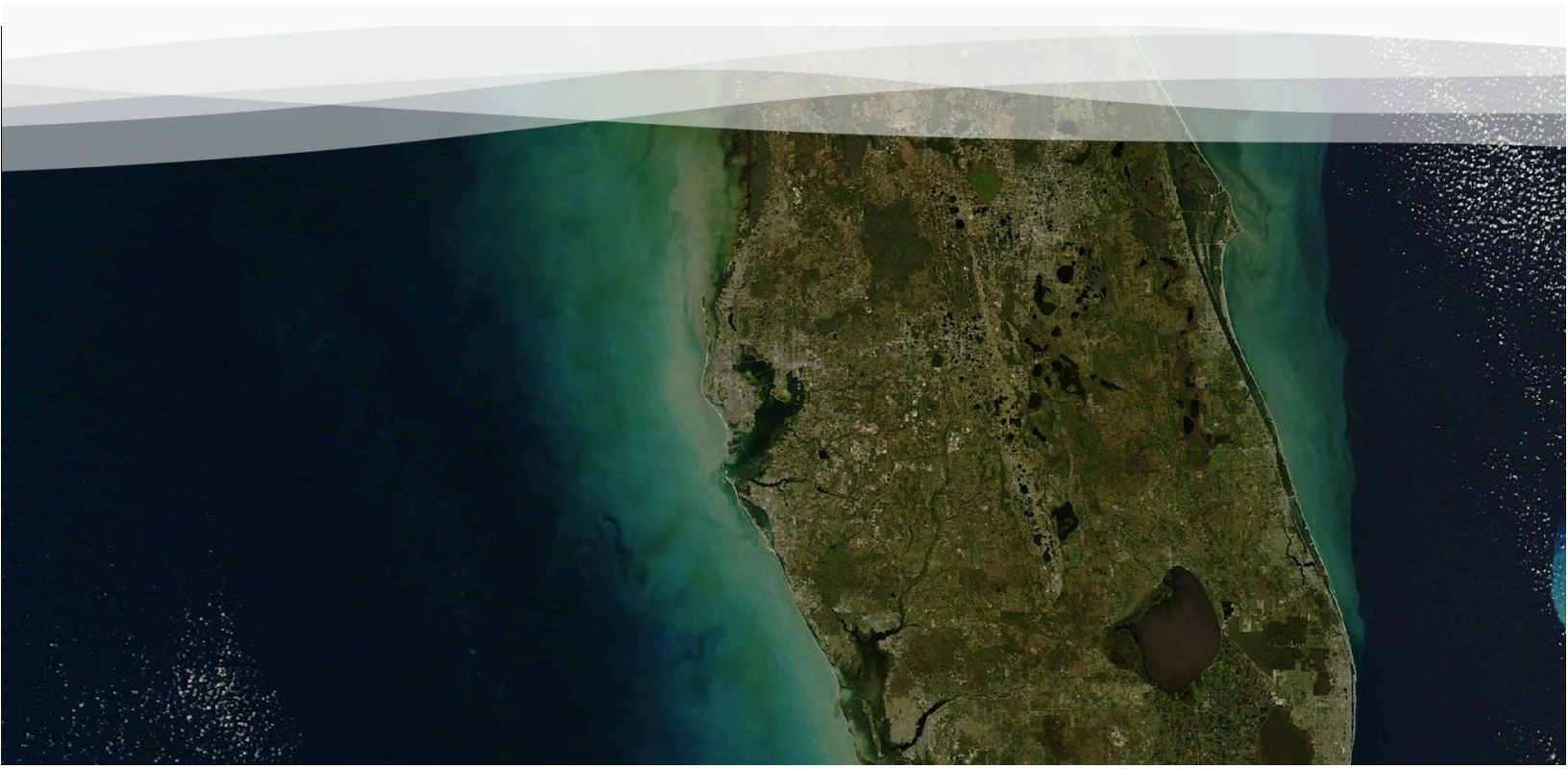
SOUTHEAST
FLORIDA REGIONAL
CLIMATE
CHANGE
COMPACT

Building Energy Benchmarking

Peer Learning Exchange

Workshop Summary Document



February 2025

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About this Document

The Southeast Florida Regional Climate Change Compact (Compact) provides avenues to transfer knowledge and support capacity building among local government practitioners to advance local climate solutions. In the spirit of coordinated efforts to reduce greenhouse gas (GHG) emissions in the region, the Compact hosted a Benchmarking Peer Learning Exchange in November 2024. Municipal and county staff gathered to learn from subject matter experts and one another about designing and implementing a benchmarking program. Designed to facilitate cross-pollination of learnings and best practices from existing benchmarking programs across the region, as well as share external examples, speakers at the workshop included representatives from Institute for Market Transformation (IMT), Miami-Dade County Office of Resilience, City of Miami Building Department, City Boston Environment Department, and Cadmus (a contractor to the U.S. Environmental Protection Agency).

As part of the Compact's ongoing efforts to build the capacity of practitioners and stakeholders in Southeast Florida to advance regional climate action, the Compact has developed this document summarizing and building upon the learnings and tools discussed during the Exchange.

Introduction

Buildings across the U.S. account for 40% of the energy used nationally, with the associated direct and indirect greenhouse gas emissions comprising roughly 40% of national output.[1] Voluntary benchmarking programs and benchmarking ordinances serve as a first step in curbing the 30% of commercial building energy waste estimated by the U.S. Environmental Protection Agency (EPA).[2] Consistent benchmarking can provide significant cost savings and increased property value for building owners. An EPA analysis of 35,000 benchmarked buildings found an average annual savings of 2.4%.[3] Implementation data from other major U.S. cities have shown even more substantial results. The City of Chicago experienced a 4.4% decrease in

[1] Institute for Market Transformation. (2015, December). *The Benefits of Benchmarking Building Performance*. https://imt.org/wp-content/uploads/2018/02/PCC_Benefits_of_Benchmarking.pdf

[2] U.S. Department of Energy. (n.d.) *About the Commercial Buildings* Integration *Program, Energy Savings Potential in Retrofit and New Buildings.* https://www.energy.gov/eere/buildings/about-commercial-buildings-integration-program#:~:text=buildings%20is%20enormous.-,On%20average%2C%2030%25%20of%20the%20energy%20used%20in%20commercial%20buildings,gas%20emissions%2C%20of%20commercial%20buildings.

[3] U.S. Environmental Protection Agency. (2012). *Benchmarking and Energy Savings.* https://www.energystar.gov/sites/default/files/buildings/tools/DataTrends_Savings_20121002.pdf

energy consumption in properties reporting for four consecutive years, resulting in approximately $12.7 million in bill savings per year.[4] The energy reduction potential can translate into considerable cost savings for a building owner. For example, a 500,000-square-foot office building achieving 2.4% energy savings for three consecutive years could realize cumulative cost savings totaling $120,000 and an increased asset value of over $1 million.[5]

Benchmarking is the ongoing review of building energy and water performance compared to itself, as well as other buildings of similar size, to ensure a building is using energy and water as anticipated over time and relative to peers.[6] Benchmarking energy use and publicly disclosing the results can change how people behave in and operate buildings in ways that bring immediate and low-cost reductions in energy consumption. These policies enable building owners and operators to make informed decisions regarding energy use and implement cost-saving measures. It also provides governments data to create efficiency incentives and programs that target underperforming buildings.

Building energy benchmarking and transparency programs typically have several core requirements: certain buildings measure and report energy consumption data; utilities provide access to whole-building energy data; and governments publish the data. These programs can either be voluntary or mandatory via local ordinance, and may also include requirements for audits and periodic retro-commissioning. Retro-commissioning refers to an energy performance assessment for existing buildings that ensures systems are functioning as originally designed in order to optimize energy performance and improve efficiency. Benchmarking allows building owners/operators to better plan for future investments based on identified inefficiencies; qualify for and access funding through energy efficiency rebates, credits, and energy standard certification; and compare energy and water consumption before and after an improvement to measure impact.[7]

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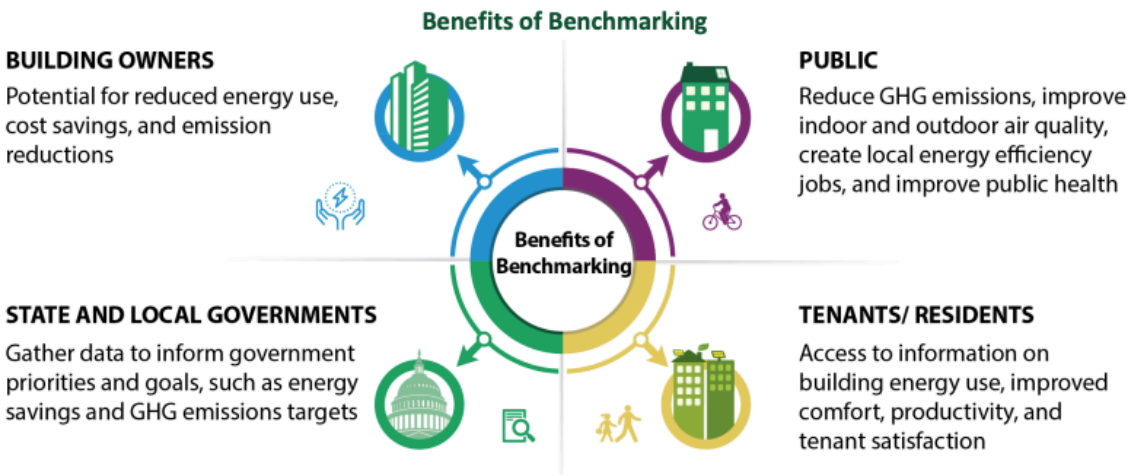
[4] Institute for Market Transformation. (n.d). *A Guide for City Governments to Estimate the Savings from Energy Benchmarking and Energy Efficiency Programs* (https://imt.org/wp-content/uploads/2018/03/PuttingDatatoWork_ImpactAssessment.pdf

[5] U.S. Environmental Protection Agency. (2021, February). *Building Energy Benchmarking and Transparency: Overview for State and Local Decision Makers.* https://www.epa.gov/system/files/documents/2021-12/section-1-building-energy-benchmarking-and-transparency_2-12-2021.pdf

[6] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides, slide 6].

[7] U.S. Department of Housing and Urban Development. (n.d.). *Benchmarking: Promoting Sustainability and Decarbonization.* https://www.hud.gov/sites/dfiles/Main/documents/BFTF-Guide-to-Benchmarking.pdf

Benefits of Energy Benchmarking[8]



Elements of a Benchmarking Policy[9]

[8] U.S. Environmental Protection Agency. (2021, February). *Building Energy Benchmarking and Transparency: Overview for State and Local Decision Makers.* https://www.epa.gov/system/files/documents/2021-12/section-1-building-energy-benchmarking-and-transparency_2-12-2021.pdf

[9] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides, slide 8].

While benchmarking is foundational to effective energy management and is considered an operational best practice of the commercial real estate industry, benchmarking alone will not lead to the necessary market transformation needed to drastically reduce GHG emissions. Several leading local governments and states are building upon benchmarking ordinances with Building Performance Standards (BPS), a policy that requires building owners to meet performance targets by actively improving their buildings over time, often with interim targets that drive energy savings and emission reductions. While discussed during the Learning Exchange this document will not cover BPS in depth.

The Landscape

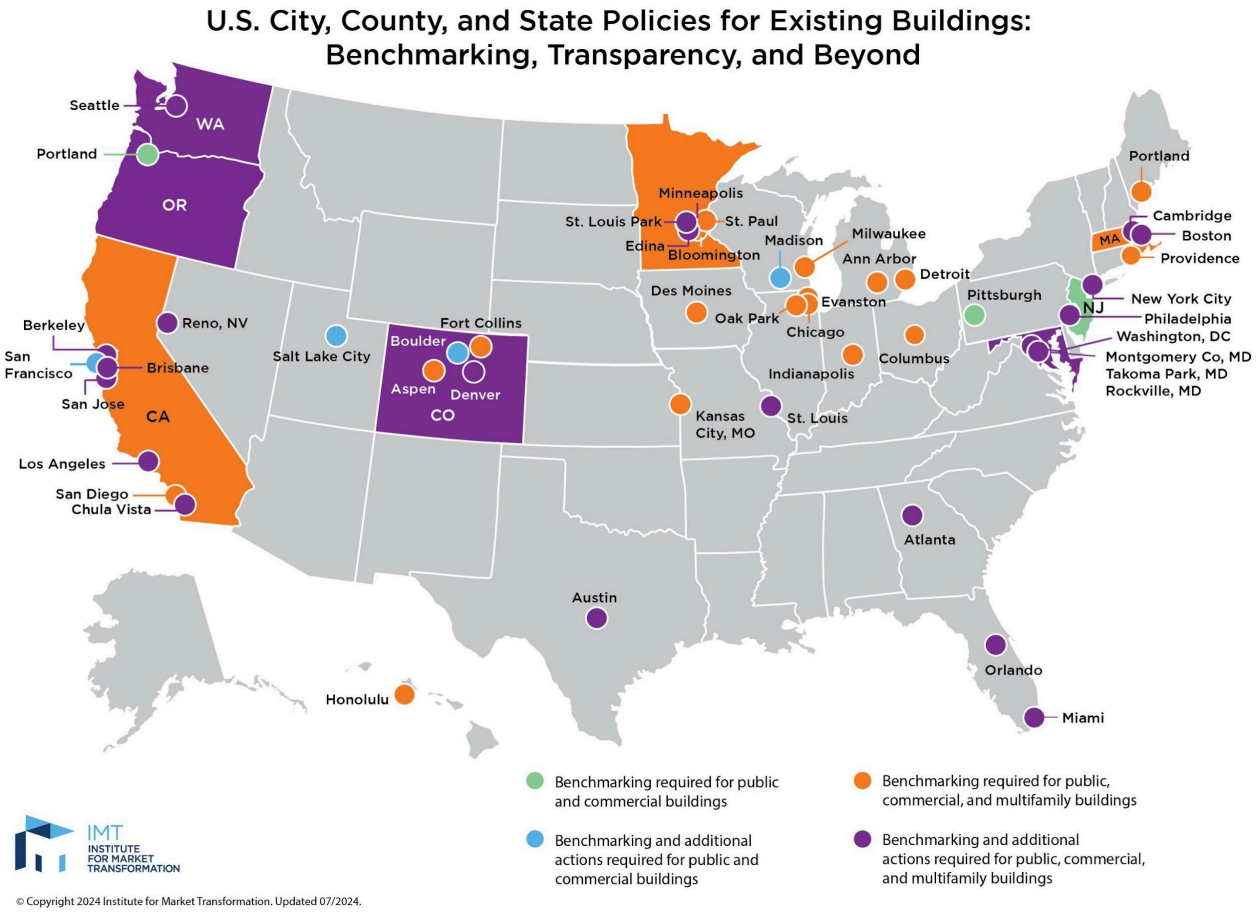
UNITED STATES

Benchmarking throughout the U.S. has shown a strong association with reduced energy consumption and cost savings. IMT reports that New York City, Seattle, and San Francisco demonstrated three-year cumulative reductions in energy consumption of 6%, 3%, and 7.9% respectively. Minneapolis had a two-year cumulative reduction of 3.4% and $21 million in bill savings.[10] Programs are seen in both red and blue states, impacting large and small populations alike. Benchmarking programs can be advanced at the state or local government level.

As shown in the map below, many jurisdictions have programs that include benchmarking requirements for public, commercial buildings, as well as multifamily buildings. Several jurisdictions are also requiring these buildings to take additional actions that go beyond benchmarking, such as requiring properties to meet energy or water performance targets, completing an audit, building retuning, or other cost-effective actions that have a demonstrated ability to reduce energy and water use. Building retuning refers to a systematic process aimed at minimizing building energy consumption by identifying and correcting operational problems that plague buildings at no cost or low cost.

[10] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides, slide 12].

Landscape of Policies[11]



MIAMI-DADE COUNTY[12]

Miami-Dade County began the development of the Building Efficiency 305 (BE305) program in 2017, through the support of the City Energy Project, a joint initiative of the Natural Resources Defense Council and Institute for Market Transformation, that provided human and financial resources to major U.S. cities to improve the energy efficiency of buildings. In 2020, following extensive stakeholder outreach and engagement, and community training, the voluntary BE305 Challenge was officially launched. The challenge currently includes 180 buildings, comprising 47 million square feet across 16 municipalities as well as the unincorporated areas of Miami-Dade

[11] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides, slide 5].

[12] Marello, M. (2024, November). *Building Efficiency 305 Challenge. Miami-Dade County's Building Energy + Water Efficiency Challenge* [powerpoint slides].

County. As part of the BE305 program, 16 ASHRAE Level 2 assessments have been conducted, with a total of $1.035 million saved annually on energy and water bills as a result of low- to no-cost improvements undertaken by participating buildings, which have shown upwards of 30% energy savings annually.

Case Studies of Buildings Participating in Miami-Dade County's BE305 Challenge

Miami Lakes Town Hall
25,000 sq ft
2013
Municipal building

- $24,000 savings annually
- 36% energy savings

City of Miami Police Station
170,000 sq ft
1976

- $217,000 savings annually
- 50% energy savings

Grand Venetian
275,000 sq ft
2001
Large residential building

- $55,000
- 47% energy savings

Creating an impactful voluntary program through an effective challenge program can help lay the groundwork for more robust energy policy, helping to build the brand as well as the capacity among many of the largest real estate owners/operators in the community to reduce energy waste.

Additional resources:

Private Sector Challenges, City Energy Project, 2018

Guide to Energy & Water Efficiency Competitions for Buildings & Plants, U.S. Environmental Protection Agency, 2016

The county has also been working for several years on the development of a proposed mandatory benchmarking ordinance, which has not yet been passed by the Board of County Commissioners, but has been used as the template for the City of Miami's program, and adopted by the City of Miami's commission. The county convened a stakeholder working group to help establish the core components of the proposed benchmarking policy, including representatives from real estate and building industry associations, cities, professional associations/organizations, and community-based organizations, among others.

The proposed policy will include four components: benchmarking of energy and water usage; retuning or retro-commissioning of buildings to improve performance; disclosure of annual energy and water use; and enforcement. The proposed policy will apply to all buildings 20,000 square feet or larger (representing 2% of total buildings in the county, but 27% of floor space). The benchmarking requirements will begin in 2026, with a phased implementation schedule over four years, to ultimately cover a total of 13,500 buildings. The retuning or retro-commissioning components of the policy will only apply to buildings larger than 50,000 square feet and will be required every five years for low-performing buildings (determined by the ENERGY STAR score within Portfolio Manager). Retuning requirements will take effect in 2030 for buildings larger than 200,000 square feet. The county plans to publish the benchmarking data annually to support transparency.

Miami-Dade County's Proposed Implementation Timeline

Building Size (sq. ft.)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Above 200,000	B	B	B	B	B + Retuning	B	B	B	B	B + Retuning
100,000 - 200,000	B	B	B	B	B	B + Retuning	B	B	B	B
50,000 - 100,000		B	B	B	B	B	B + Retuning	B	B	B
30,000 - 50,000			B	B	B	B	B	B	B	B
20,000 - 30,000				B	B	B	B	B	B	B
Total # of Buildings Benchmarking	2,138	4,737	8,605	13,582	13,582	13,582	13,582	13,582	13,582	13,582
Total # of Buildings Retuning					901	1,237	2,599			901

The county estimates that over 10 years, the policy will produce source energy savings of 312,860,720 MMBtu or $190.3 million with both benchmarking and retro-commissioning.

The county plans to procure Touchstone IQ as the energy management solutions provider to be used until December 2026, which is quoted to cost $150,000 without annual help desk support.

CITY OF MIAMI [13]

Miami Building Efficiency 305 (Miami BE305), Ordinance 14005, passed unanimously in 2021, in good part due to the program being well-socialized in advance. The Resilient305 Strategy, published in 2019 by Miami-Dade County, the City of Miami, and the City of Miami Beach, includes Action 17: Develop an energy benchmarking and transparency ordinance for municipal and commercial buildings, with the first-year transparency completed by the end of 2023. Additionally, the city has a goal to achieve net zero GHG emissions by 2050. With 55% of city-wide GHG emissions coming from building energy consumption, benchmarking served as an important step in curbing emissions.

Building Efficiency 305 is a mandatory benchmarking program that requires both multi-family and commercial buildings with 20,000 square feet or greater of floor space and five or more units to report whole-building energy use data annually based on their reporting start date timeline. The ordinance utilizes a tiered system for implementation of the program, beginning with buildings greater than 200,000 square feet (see below chart, *BE305 Applicable Building Counts and Compliance Dates*), which began reporting in June 2023, followed by buildings greater than 100,000 square feet, in October 2023. Compliance dates have a one-year grace period and exemptions for hardships. Non-compliance results in a Chapter 2 code violation, incurring a fine of $150 a day that can reach $250 per day, which is a standard code violation fee, and does not result in stop-work orders.

BE305 Applicable Building Counts and Compliance Dates

BUILDING SIZE	BUILDING COUNT	COMPLIANCE DATE
Above 200,000 sq ft	401	June 30, 2023*
Between 100,000 and 199,999 sq ft	234	October 1, 2023
Between 50,000 and 99,999 sq ft	342	October 1, 2024

[13] Hernandez, D. (2024, November). *BE305: City of Miami Energy and Water Benchmarking & Retuning* [powerpoint slides].

Between 20,000 and 49,999 sq ft	914	October 1, 2025
City of Miami Total	1,891	

**About half of these buildings have submitted but are not necessarily in compliance*

The ordinance also incorporates retuning requirements on a five-year cycle for buildings larger than 50,000 square feet, which is similarly being implemented through a tiered approach, beginning with buildings exceeding 200,000 square feet in December of 2028.

BE305 Retuning Schedule

SIZE	RETUNING
Buildings 200,000 square feet or larger	December 1, 2028, and every five years thereafter
Buildings between 100,000 and 199,000 square feet	December 1, 2029, and every five years thereafter
Buildings between 50,000 and 99,999 square feet	December 1, 2030, and every five years thereafter
Buildings between 20,000 and 49,999 square feet	Optional

The retuning provision of the policy requires the correction of deficiencies identified by the retuning professional that have a simple payback of three years or less. These corrections are made through low-cost adjustments and minor repairs to the property's energy and water systems, which ensure value in cost savings to the building owner. However, a retuning measure is not required if it would necessitate a building permit other than an electrical, plumbing, or mechanical permit. Considering the outcomes of other cities, the City of Miami expects most buildings that retune to see savings in that timeframe. The retuning professional is included in the cost considered for the three-year pay-back period, and expedited permitting is available for green buildings.

The City of Miami has opted for Touchstone for data management. Building managers upload energy data to the U.S. Environmental Protection Agency's ENERGY STAR Portfolio Manager, which enables an Application Program Interface (API) connection with Touchstone. Unique Building Identifiers (UBIDs) are used and emails for buildings were gathered with assistance from the property appraiser. A UBID is a specific code or string used to uniquely identify a building, allowing for accurate tracking and comparison of its energy performance data when

compared against other buildings in a benchmarking exercise, often considered more reliable than simply using a building address due to potential address ambiguities or changes. Touchstone services include 30 live training sessions and daily help desk access. In total, there are four staff and two admins from Touchstone, along with one city staff person working the program with plans to hire an admin next year. BE305 is run by the city's Building Department, given revenue generation, and costs $120,000 annually, which covers the cost of Touchstone.

Program Development

STAFF AND FINANCIAL CAPACITY CONSIDERATIONS

When considering the relative staffing and financial capacity needs, counties and municipalities should be strategic in setting the threshold of the building size so that it is balanced with administrative bandwidth, and relative level of impact. The level of effort to capture smaller buildings may be met with diminishing returns of emission reductions. For example, the City of Boston noted that 93% of building emissions were from buildings with 35,000 square feet of space and above. While staffing levels will vary based on specific program design, among other factors, below is a sample table of staff allocations by jurisdiction across the U.S.

Implementation Resources by Jurisdiction[14]

CITY	FTEs PER 1000 BUILDINGS	BUILDINGS COVERED BY ORDINANCE	TOTAL FTEs
Atlanta	2	1,000	2
Boulder	3.6	450	1.6
Chicago*	0.39	3,850	1.5
City of Miami**	0.52	1,891	1

[14] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides].

CITY	FTEs PER 1000 BUILDINGS	BUILDINGS COVERED BY ORDINANCE	TOTAL FTEs
Miami-Dade County	0.22	13,500	3
Minneapolis	2.5	802	2
Philadelphia	0.7	3,000	2
Portland, OR	1.5	1,000	1.5
San Francisco	0.74	1,700	1.25
Seattle***	.83	3,300	2.75

**Chicago contracts out help center services to Elevate Energy*

*** City of Miami also has a contract with Touchstone that includes four staff and two admins*
**** Seattle's numbers include their benchmarking and tune-up programs*

Additional Resources:

Costs of Benchmarking and Benchmarking-Plus Policies, ACEEE.

PLANNING CONSIDERATIONS

Key Program Design Questions[15]

- How can benchmarking and building performance policies support your equity and climate goals?
- What is your community's building stock makeup?
- Do your utilities provide benchmarking data?

[15] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides].

- Are you benchmarking municipal buildings? Is there a local voluntary program underway?
- Are there current energy efficiency and/or financing programs to support energy efficiency action in your jurisdiction?

Sample Planning and Implementation Timeline[16]

SETTING THE FOUNDATION PRE-ORDINANCE	0-6 MONTHS AFTER ORDINANCE	6-9 MONTHS BEFORE FIRST COMPLIANCE DATE	AFTER FIRST COMPLIANCE DATE
Engage the Community			
Engage Utilities			
Develop an Inventory of Covered Buildings			
	Collect and Manage Building Data		
		Educate to Improve Compliance	
			Communicate Results

Key Program Design Action Items

- Host internal meeting and external meetings to gain buy-in and create policy
- Identify Mayor/Council champion and external champions
- Determine role of utility companies and engage them throughout the program
- Allocate resources for a budget to manage the program and internal owner(s) for compliance and program management

[16] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides].

Decision Points for Designing a Benchmarking Policy

State and local governments have a number of key decision points to make when designing a benchmarking policy[17]:

- Determine the department responsible for administration and funding support.
- Identify the sectors and building types that are covered or exempted.
- Determine a reporting schedule and process.
- Identify an approach to ensure data quality.
- Decide on an approach and timeframe for transparency.
- Determine how to use benchmarking data.

SAMPLE EXTERNAL STAKEHOLDER INVITATION LIST

- Affordable housing representatives
- Architects
- Builders/developers
- Building owners (including associations representing these professionals, such as the Building Owners and Managers Association [BOMA])
- Commercial office tenants (example: major companies headquartered in the city)
- Energy efficiency vendors and contractors
- Energy managers
- Facility managers (including associations representing these professionals, such as the International Facility Management Association [IFMA])
- Green building associations and researchers
- Housing authority representatives
- Labor groups
- Local nongovernmental organizations (NGOs) addressing energy efficiency, sustainability, clean energy, and public health
- Property managers (especially those who are already sustainability leaders)
- Multifamily rental housing representatives such as the Apartment Association
- (Interested) State departments
- Universities, hospitals, and other large institutions
- Utilities (electric, gas, and water if applicable)
- Additional stakeholders such as appraisers, multifamily tenant associations, commercial real estate brokers, and lenders

ENGAGEMENT

Stakeholder Engagement

Robust stakeholder engagement is critical to setting the table for successful building energy efficiency policies and programs. Local governments that proactively create and/or engage with stakeholder groups from the outset are better able to build goodwill, local ownership, and buy-in, directly address concerns, and set a foundation for long-term, broader market transformation.

[17] Institute for Market Transformation. (2019). *City Energy Project: Creating a High-Impact Performance Policy: A Decision Framework for Local Governments.* https://imt.org/resources/city-energy-project-creating-a-high-impact-performance-policy-a-decision-framework-for-local-governments/

While building owners and operators are a critical stakeholder, IMT underscores the importance of including a broad range of stakeholders including community members such as tenants, who will also feel the impact of voluntary programs and ordinances. Benchmarking policies are an important step that often builds toward much more impactful requirements that affect energy use, carbon emissions, health, and jobs.

Additional Resources:

Engaging the Community in Policy Development, City Energy Project, 2018.

Must-Haves for Publicly Launching and Sharing Progress, City Energy Project, 2018.

Utility Engagement

Access to whole-building energy data is critical for building owners to identify the best opportunities for improvements. While many utilities have automated internal processes to satisfy large demands for whole-building data needed for benchmarking, Florida Power and Light (FPL) currently does not. The EPA is launching a campaign to assist building owners in making the case to utilities to help increase the availability of whole-building energy data. Currently, FPL necessitates the address for the service account and uses an internal system to aggregate data. The process is said to be tedious, time-consuming, and not efficient.

The ideal scenario would include the utility providing aggregated whole-building data for multi-owned and multi-tenant buildings, and automatically sending energy and water data for all buildings to Portfolio Manager. Requests have been made for FPL to provide timely machine-readable data as follows:

- ENERGY STAR Portfolio Manager compatibility: Providing energy data in a format that seamlessly integrates with the ENERGY STAR Portfolio Manager web service API would greatly streamline benchmarking efforts for local governments and property owners.
- Interval data availability: Sharing timely interval data in a machine-readable format would enable better analysis of energy usage patterns, promoting more effective energy management strategies.
- Consistency in data provision: Ensuring data is available to local governments and other customers in a consistent and uniform format would facilitate collaboration across organizations and enhance the usability and accessibility of the information.

Access to aggregated whole building data: Providing aggregated energy usage data for entire buildings would allow property owners, including buildings with multiple owners or tenants,

and local governments to benchmark energy performance and identify opportunities for efficiency improvements while safeguarding tenant privacy. The region must leverage its collective bargaining power to move the needle. FPL should be engaged early in the planning process to prepare for the influx of individual requests from building owners or work with the region to develop a holistic solution to meet the demand. Building the case for more streamlined, accessible, and automated data requires ensuring that utilities understand the reduced energy consumption that results from benchmarking and retuning.

Additional Resources:

Engaging with Utilities to Implement Building Performance Standards, City Energy Project, 2018.

Energy Data Accelerator: Stakeholder Engagement Strategy Guide, U.S. Department of Energy, 2016.

DEVELOPING A COVERED BUILDINGS LIST

The following recommendations are taken directly from the U.S. Department of Energy's document, *Considerations for Creating a Covered Buildings List for a Building Performance Standard (BPS) or Benchmarking Program*[18]. Developing a covered buildings list consists of collecting key data related to all buildings covered by the program or policy, for example, all commercial buildings greater than 50,000 square feet. The minimum data collection requirements are:

- **Building physical address:** Different data sources may have different addresses for the same building; reconciling the data to determine the correct address may take time. The minimum information should include the street number, street name, city, and zip code.
- **Contact information for building owners and managers:** This information is needed to make sure the basic building information is correct, as well as to communicate requirements for complying with the BPS or benchmarking program.

You may also wish to include:

- **Building ID:** A unique building identifier to differentiate between individual buildings because buildings may be listed under multiple or changing addresses. This may already exist depending on the data source, but if not, it will be necessary to generate it. One

[18] U.S. Department of Energy. (2022, November). *Considerations for Creating a Covered Buildings List for a Building Performance Standard (BPS) or Benchmarking Program.* https://www.energycodes.gov/sites/default/files/bps/2023-11/DOE_Covered_Buildings_List_Guide.pdf

option is to generate a Unique Building ID (UBID) developed by the U.S. Department of Energy.
- **Building Name:** This information is not essential but may be useful to help with building identification.

The following basic building characteristics are needed::

- **Gross Floor Area:** The total floor area represented by the building, excluding unconditioned spaces.
- **Year Built:** The year the building was originally built, which can be used to generate assumptions about the building's construction.
- **Occupancy Type:** The primary occupancy of the building (e.g. office, retail, etc.), possibly from a defined list of types, such as from the ENERGY STAR Portfolio Manager, the jurisdiction's occupancy codes, or ASHRAE Standard 100. This can be used to generate assumptions about how the building is used if those data are not available from another source. Occupancy type is a key driver of the BPS targets.
- **Number of Buildings:** The number of buildings represented by the "building." In most cases, this value is probably 1, but in situations such as campuses or professional office parks, there may be multiple buildings on one energy utility meter so the combined buildings are considered one building.
- **Last Renovation Year:** The year of the last major renovation of the building, if applicable and available. This might help determine the level of energy-efficient retrofits that may have been applied to the building if more information is not available.

Additional resource:

Considerations for Creating a Covered Buildings List for a Building Performance Standard (BPS) or Benchmarking Program, DOE, 2022.

Program Implementation

DATA MANAGEMENT

ENERGY STAR

ENERGY STAR Portfolio Manager is the leading management tool to assist building managers and jurisdictions in tracking, reporting, and rating key building performance indicators and tracking the impact of energy, water, and waste management strategies. More than 330,000 buildings, comprising more than 33 billion square feet of floor space, currently use Portfolio

Manager to measure and track their energy use, water use, and waste and materials. These buildings account for nearly 25% of all commercial building floor space in the US. Many jurisdictions chose to use ENERGY STAR Portfolio Manager as the required reporting tool as most building operations data can be tracked within the tool, and it is free and relatively easy to use. However, reporters can select from a number of paid platforms and services that meet their specific data management needs.

Energy Star Portfolio Manager Trainings

energystar.gov/buildings/training

- Weekly live webinars
- Recorded webinars
- 3-7 minute training videos on YouTube
- Step-by-step training guides, FAQs, and technical reference documents

Energy Star Help Desk

energystar.gov/BuildingsHelp

Portfolio Manager enables several options to upload data, including data exchange with 450 product providers. In the case of building energy benchmarking, building owners and operators input monthly usage from utility bills along with their building characteristics, such as size and use case. Portfolio Manager then allows users to compare the building to a national sample of similar buildings as well as similar building types within the same portfolio. Decision-makers can then identify underperformers and set priorities for staff time and capital investments. Data transparency is key to investors and potential buyers making decisions that take into account energy consumption. The online platform uses a rating system that factors Energy Use Intensity (EUI), or a measurement of how much energy a building uses relative to its size (energy per square foot per year). EUI is important to determine which building in a portfolio offers the greatest opportunity for improvement.

Features of ENERGY STAR Portfolio Manager

- Assess whole building energy and water consumption, plus waste
- Track changes in energy, water, greenhouse gas emissions, and cost over time
- Track green power purchase
- Share/report data with others
- Create custom reports
- Apply for ENERGY STAR certification
- Data management options: Input data manually
- Upload spreadsheets of data (a simple spreadsheet for one meter, or a complex spreadsheet if you have multiple meters or multiple properties)

- Web services, which is where a third-party provider, such as a utility, will automatically exchange data with Portfolio Manager

OTHER DATA AND CRM TOOLS

Touchstone IQ and BEAM (Building Energy Analysis Manager) are tools that support tracking compliance, verifying data quality, customer relationship management, and connecting with existing enforcement platforms.

Touchstone IQ is software used by governments to manage energy benchmarking and building performance programs. The software streamlines submissions with built-in integration to ENERGY STAR Portfolio Manager. Touchstone also provides services to support with:

- Developing an initial list of covered buildings and owner contacts
- Creating a program website with customized content and resources including digestible ordinance info, how-to guides, training videos, FAQs, and more
- Creating implementation plans for alternative compliance options and technical assistance programs

BEAM aggregates benchmarking data and is capable of performing automatic compliance tracking based on a jurisdiction's specific benchmarking or building performance standard policy, and also facilitates easy communication with various groups of building owners with a built-in CRM.

Data Verification

All ordinances should have data verification codified into law. For example, an ordinance may require third-party verification prior to submission, typically required only every several years. While the benchmarking provider updates and maintains the Portfolio Manager entry for a property and annual benchmarking submissions, a third-party verifier is responsible for reviewing and determining that the information the benchmarking provider is using is correct and complete. Additionally, software tools such as Touchstone also have built-in tools to help verify accurate data, automatically flag buildings with data quality issues, and auto-generate emails to owners with suggested fixes.

Additional Resources:

Managing Benchmarking Data Quality, Institute for Market Transformation & USDN, 2018.

COMPLIANCE AND ENFORCEMENT

As with considering administrative capacity when setting thresholds, the ordinance or pilot program should consider what is reasonably feasible for building owners. Setting a threshold too low may result in capturing buildings with minimal staff capacity, expertise, or financing to comply, creating an undue hardship. Hardship exemptions are a useful tool to build in, but if a large percentage of buildings within a category are applying for the exemption it may point to a weak point in the program, such as the threshold, resources, or communication.

There are four primary buckets of compliance:

1. Reporting on a set cycle, usually annually, using a required reporting tool, such as Portfolio Manager
2. Public disclosure of energy performance, such as a rating in a visible location on a building
3. Third-party data verification
4. Energy audits or compliance with performance standards

The ordinance roll-out should incorporate grace periods, particularly for the first cohort of buildings. Outreach to non-compliant buildings should include tools and resources.

Non-Compliance Fee Examples by Jurisdiction[19]

CITY	FEES
San Jose	For buildings under 50,000 square feet, $25 for each day of non-compliance, up to $2,500 per calendar year For buildings over 50,000 square feet, $50 for each day of non-compliance, up to $5,000 per calendar year
Denver	Buildings who fail to comply with the benchmarking requirement will be subject to a fee of $2,000 per building, for every year they fail to comply.

[19] CIM. (2024, February). *Understanding energy benchmarking ordinances: A state-by-state guide.* https://www.cim.io/blog/understanding-energy-benchmarking-ordinances-local-energy-efficiency-regulations-a-state-by-state-guide

Beyond Benchmarking

Benchmarking is a critical initial step in addressing collective emission reduction goals. Audit, retuning, and retro-commissioning policies and building performance standards are additional tools jurisdictions adopt in conjunction with or following benchmarking programs. There is significant potential for job growth through the development of market conditions that demand better buildings. Nationally, less than 2% of commercial buildings and .5% of residential buildings receive energy-related renovation every year.[20]

AUDITS

An energy audit is a comprehensive assessment of building energy consumption, including systems, insulation, operational characteristics, and other elements. Energy audits help building decision-makers understand energy costs, recommend energy performance improvements, and estimate capital costs and energy savings. Energy audits provide information but don't equate to emission reductions.

RETUNING AND RETRO-COMMISSIONING

Like an audit policy, a tune-up policy requires building owners and operators to conduct a system-wide assessment of their building energy systems and controls, and this assessment provides recommended energy conservation measures. If a retuning policy is created there is no need for an audit policy. The key difference is that retuning requirements focus almost exclusively on identifying opportunities to improve a building's operations and maintenance to achieve energy savings. These opportunities often include measures such as changes to thermostat set points, equipment scheduling, calibrating critical control sensors, optimizing outside air use for economizer cooling, or adjusting lighting or irrigation schedules.

Retro-commissioning (RCx) is a way for qualified professionals to make low- or no-cost improvements to a building's existing operations, through simple repairs and re-calibrating energy systems and controls, which often result in immediate energy savings.
Retro-commissioning policies require periodic assessment of a building's performance relative to its modeled performance, and they often have more robust documentation requirements than a retuning policy. According to a report from the American Council for an Energy Efficiency

[20] Ravulapati, R. Institute for Market Transformation. (2024, November). *Benchmarking and Transparency* [powerpoint slides, Slide 4].

Economy (ACEEE), field results have shown that proper retro-commissioning can yield cost-effective energy savings of 5% to 20% with a typical payback of 2 years or less.[21]

BUILDING PERFORMANCE STANDARDS

Building Performance Standard (BPS) establishes targets for buildings to reduce energy use or greenhouse gas emissions. BPS also:

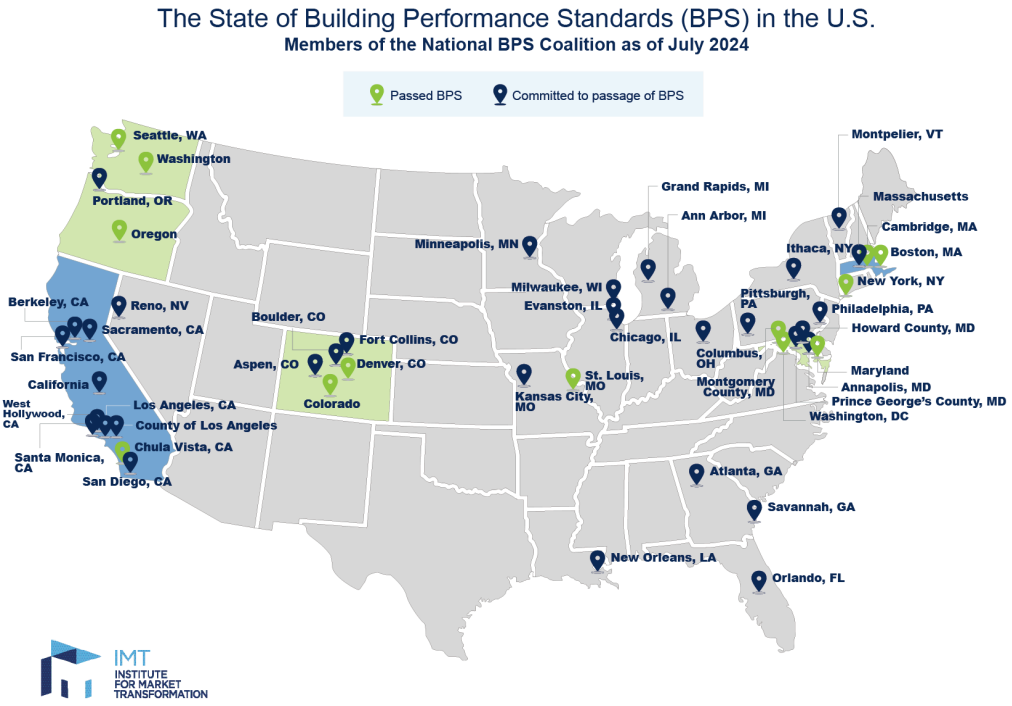
- Allows prioritization of buildings for immediate action, ideally based on a baseline of whole building energy data from a benchmarking policy
- Sends a long-term signal to building owners and operators to anticipate these requirements and sync up the investments with their equipment upgrade schedule in a predictable manner
- An opportunity to truly drive deep energy retrofits of existing buildings at scale and comprehensively across buildings in a single jurisdiction
- Requires mandatory improvements to the performance of buildings over time, that will provide meaningful energy savings, carbon reduction, and other building improvements

City of Boston[22]

The City of Boston has a BPS, "*Building Emissions Reduction and Disclosure Ordinance (BERDO)*", which requires medium and large buildings to reduce emissions over time and achieve net-zero emissions by 2050. The policy covers approximately 6,000 buildings (5% of buildings in Boston) and could collectively reduce city-wide emissions by nearly 40%. Covered buildings include non-residential buildings that are 20,000 square feet or larger excluding parking (e.g., office spaces, churches, universities); residential buildings that have 15 or more units (e.g., apartments and multi-family buildings); and any parcel of land with multiple buildings that sum to 20,000 square feet or 15 units or more. Further information on the specifics of the BERDO program can be found in the PowerPoint slides presented by Aidan Callan, City of Boston, in the appendix.

[21] American Council for an Energy Efficiency Economy (2003, June). *Retrocommissioning: Program Strategies to Capture Energy Savings in Existing Buildings.* https://www.aceee.org/research-report/a035
[22] Callan, A. (2024, November). *Boston's Building Performance Standards - BERDO* [powerpoint slides].

BPS Status Across the U.S.[23]



Regional Context

Florida represents a difficult landscape for BPS. The Florida Building Code is the ceiling, disallowing jurisdictions to enact policies that supersede the code requirement. Florida Statutes, relating to nonresidential buildings (Fla. Stat. §553.904), new residential buildings (Fla. Stat. §553.905), and renovated buildings (Fla. Stat. §553.906) indicate that such buildings "are not required to meet standards more stringent than the provisions of the Florida Building Code-Energy Conservation."

Appendix

[23] Institute for Market Transformation. *Building Performance Standards* https://imt.org/public-policy/building-performance-standards/#:~:text=A%20BPS%20policy%20is%20a,and%20complementing%20building%20energy%20codes.

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Benchmarking and Transparency

Agenda:

- What is benchmarking
- Why implement a benchmarking policy
- Key decision points
- Tools to project manage
- Resources to write, pass, and implement a policy

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About The Institute for Market Transformation (IMT)

Mission

Catalyze widespread and sustained demand for high-performing buildings.

How we work

Advancing policies and business practices that enable people to build and operate healthy, high-performing buildings.

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Why Benchmarking + Building Performance Standards?

- Buildings waste ~30% energy and role in decarbonizing energy supply is not defined by markets

- Current energy-related renovation rates: 2% of commercial buildings and <.5% of residential buildings

Photo: Onion Flats, by Sam Oberter

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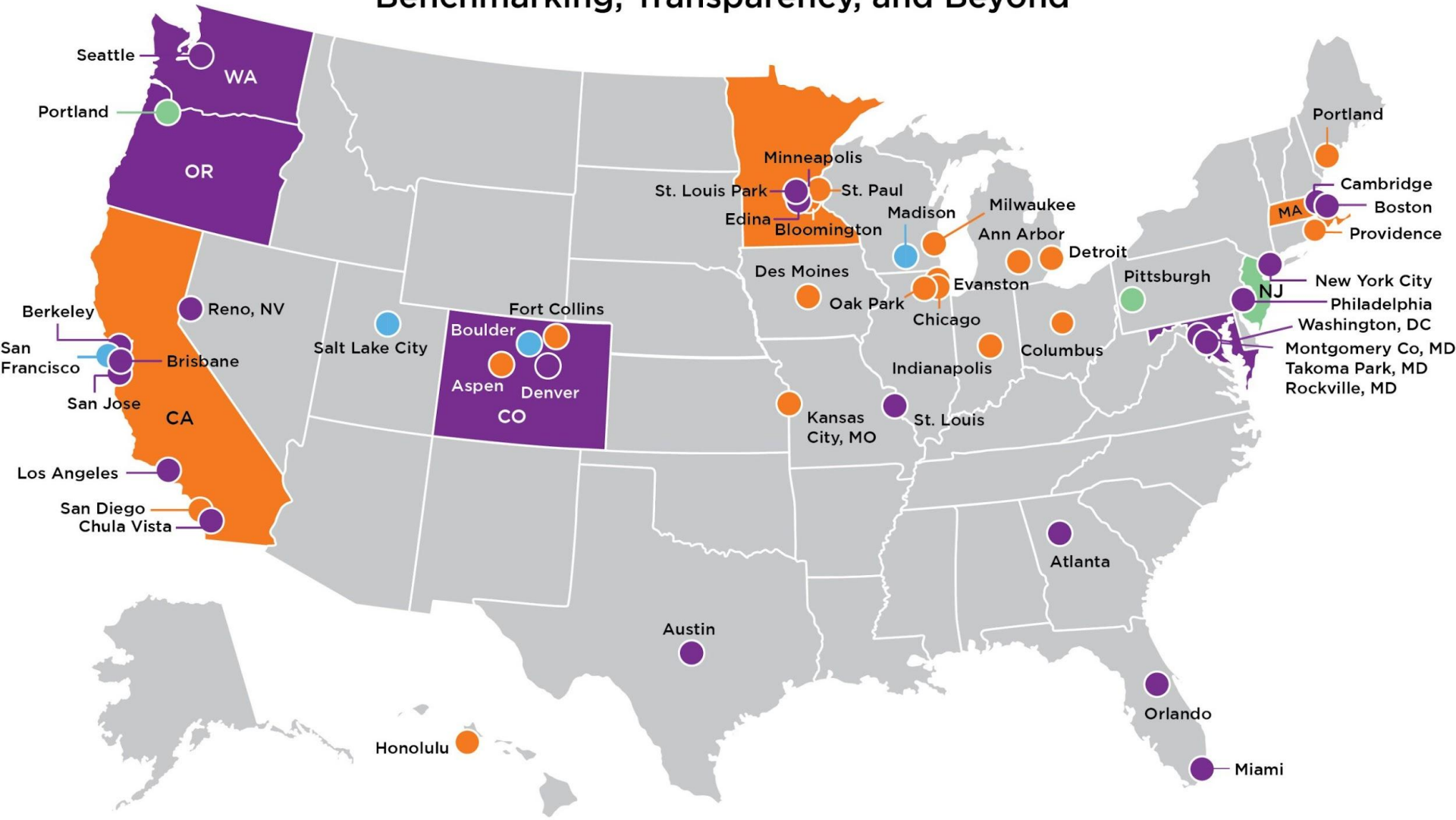
U.S. City, County, and State Policies for Existing Buildings: Benchmarking, Transparency, and Beyond



Benchmarking required for public and commercial buildings

Benchmarking required for public, commercial, and multifamily buildings

Benchmarking and additional actions required for public and commercial buildings

Benchmarking and additional actions required for public, commercial, and multifamily buildings

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What is Benchmarking?

Benchmarking is the on-going review of building energy and water performance compared to itself, as well as other buildings of similar size, to ensure a building is using energy and water as anticipated over time and relative to peers.

ENERGY STAR® Portfolio Manager®

Uses the free, web-based ENERGY STAR Portfolio Manager tool to report data.

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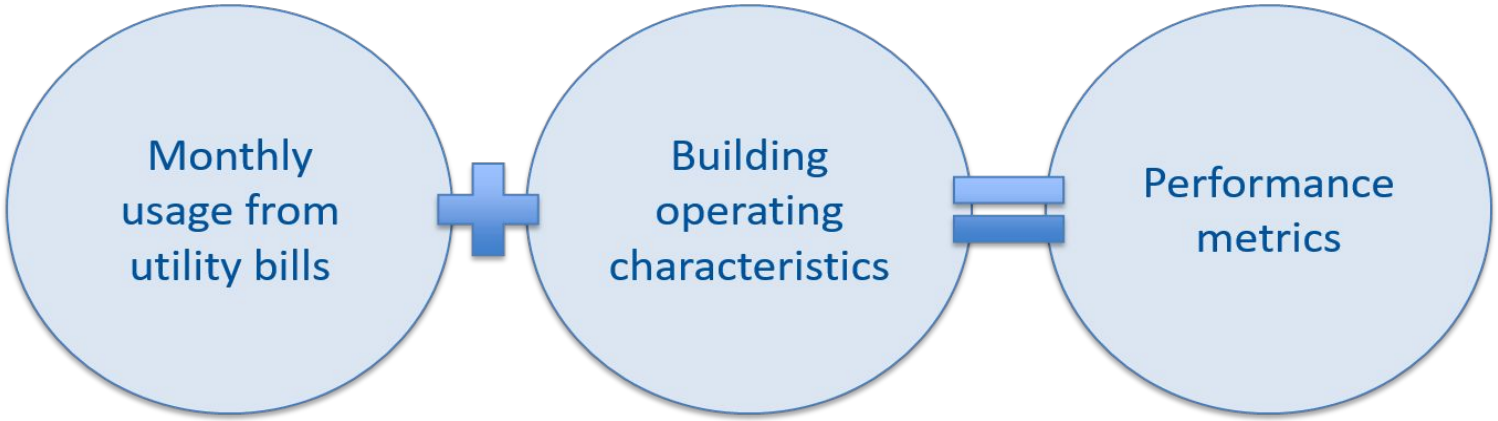
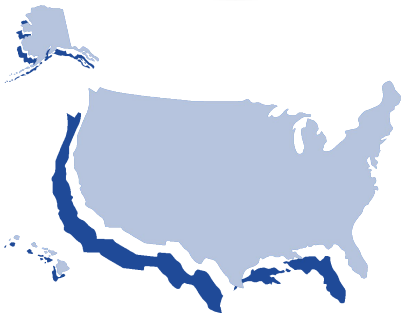
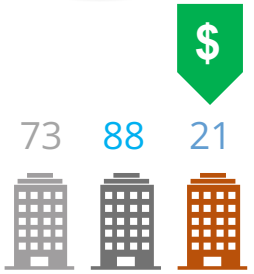
Benchmarking process





Compare your building to a **national sample** of similar buildings

Compare your buildings of a similar type to **each other**



Identify underperformers in your portfolio & set priorities for staff time & investment capital

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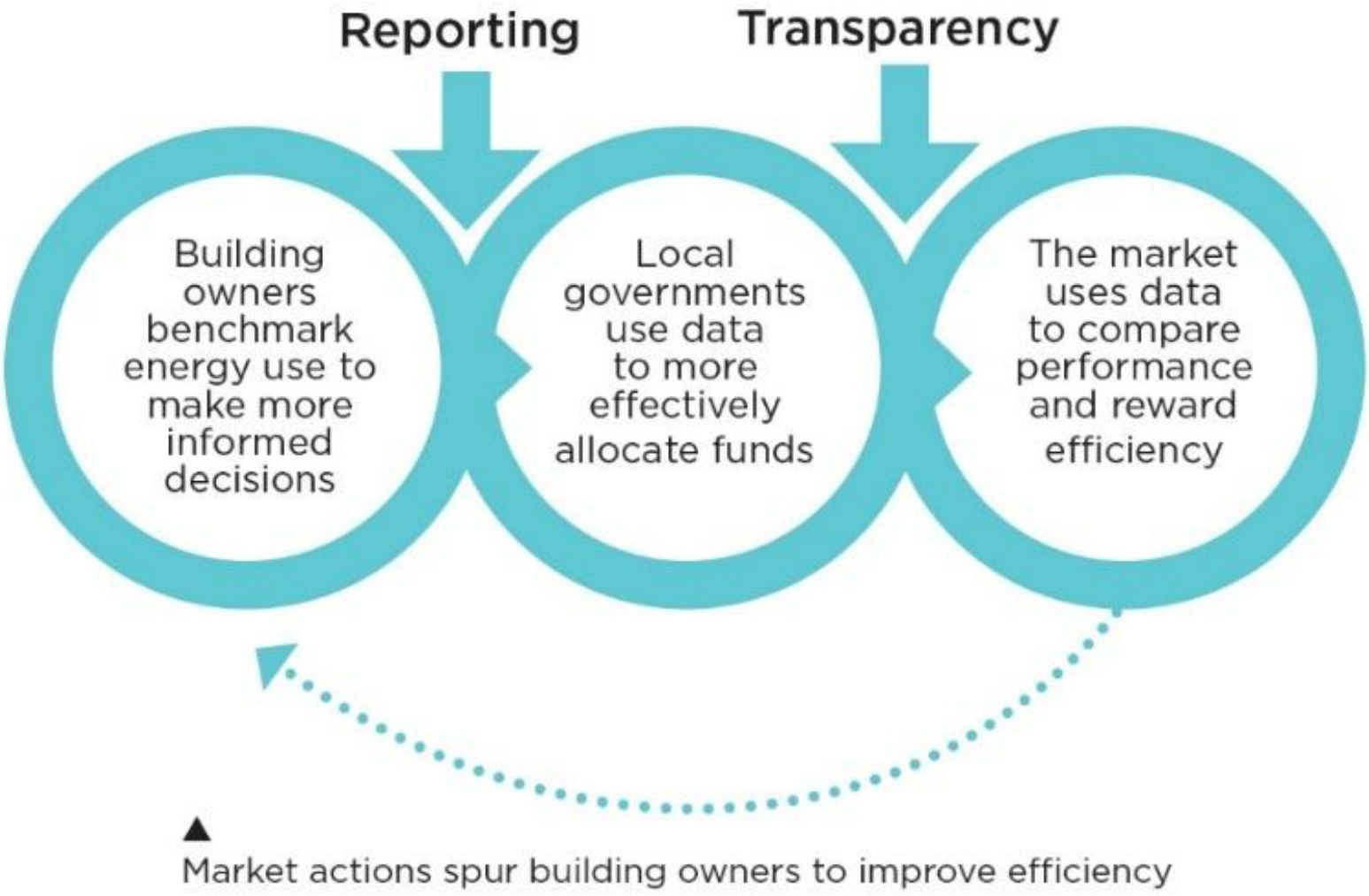
Elements of a Benchmarking Policy



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Benefits of Transparency

- Collecting and sharing the data can help advance equity goals in tandem with economic and climate goals
- Bring to bear the power of the market
- Promote Tenant Engagement
- Job Creation & Economic Growth
- Direct resources to those most in need

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Sharing Data Transparency

2017 Building Energy Benchmarking

Seattle's Building Energy Benchmarking Program (SMC 22.920) requires owners of non-residential

More Vie

OSEBuil...	DataYear	Building...	Primary...	Property...	Address	City	State	ZipCode	TaxParc...
1	2017	NonResidenti...	Hotel						
2	2017	NonResidenti...	Hotel						
3	2017	Campus	Hotel						
5	2017	NonResidenti...	Hotel						
8	2017	NonResidenti...	Hotel						
9	2017	Nonresidenti...	Other						
10	2017	NonResidenti...	Hotel						
11	2017	NonResidenti...	Other						
12	2017	NonResidenti...	Hotel						
13	2017	Multifamily ...	Mid-Rise Mu						
15	2017	NonResidenti...	Hotel						
16	2017	NonResidenti...	Hotel						
17	2017	NonResidenti...	Hotel						
18	2017	NonResidenti...	Hotel						
19	2017	NonResidenti...	Hotel						
21	2017	Nonresidenti...	Other						

Seattle Energy Benchmarking

Office of Sustainability & Environment

Search building name, address, or ID | Neighborhood | Council District

METRIC FILTERS RESET ALL

Select a metric to see filtered results on the map

Show All Buildings

Property Information

Energy Performance Metrics

Building EUI Quartiles MORE INFO

Building EUI Quartiles cannot be calculated across building types. Select a building type above to view this metric.

ENERGY STAR Score MORE INFO

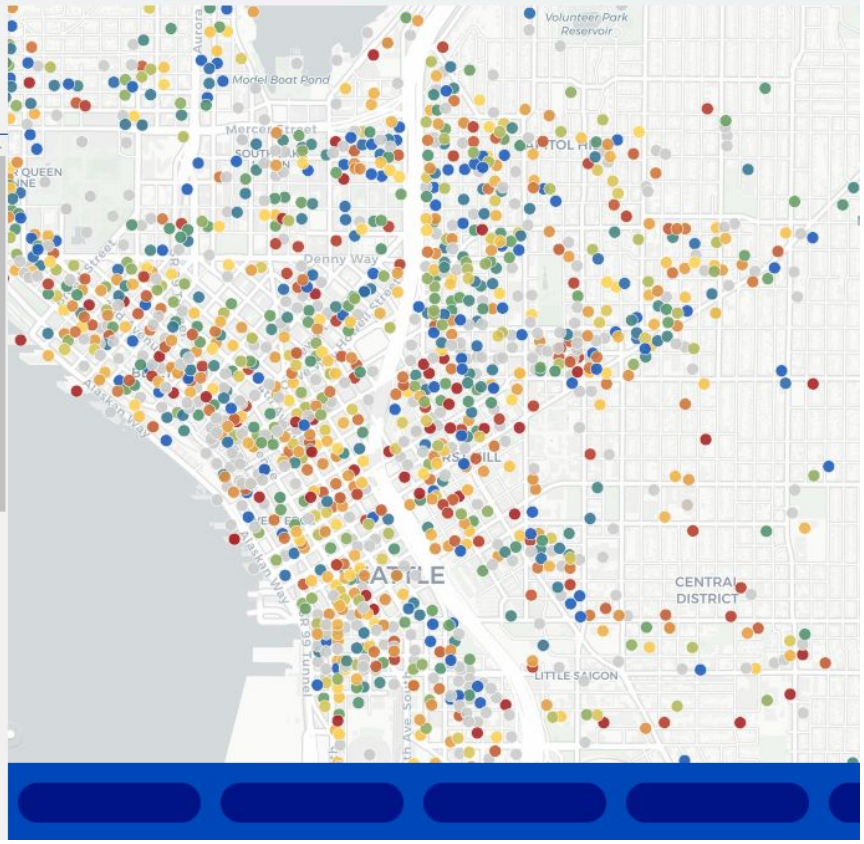
1 — 100

MEDIAN FOR ALL BUILDINGS: **78**

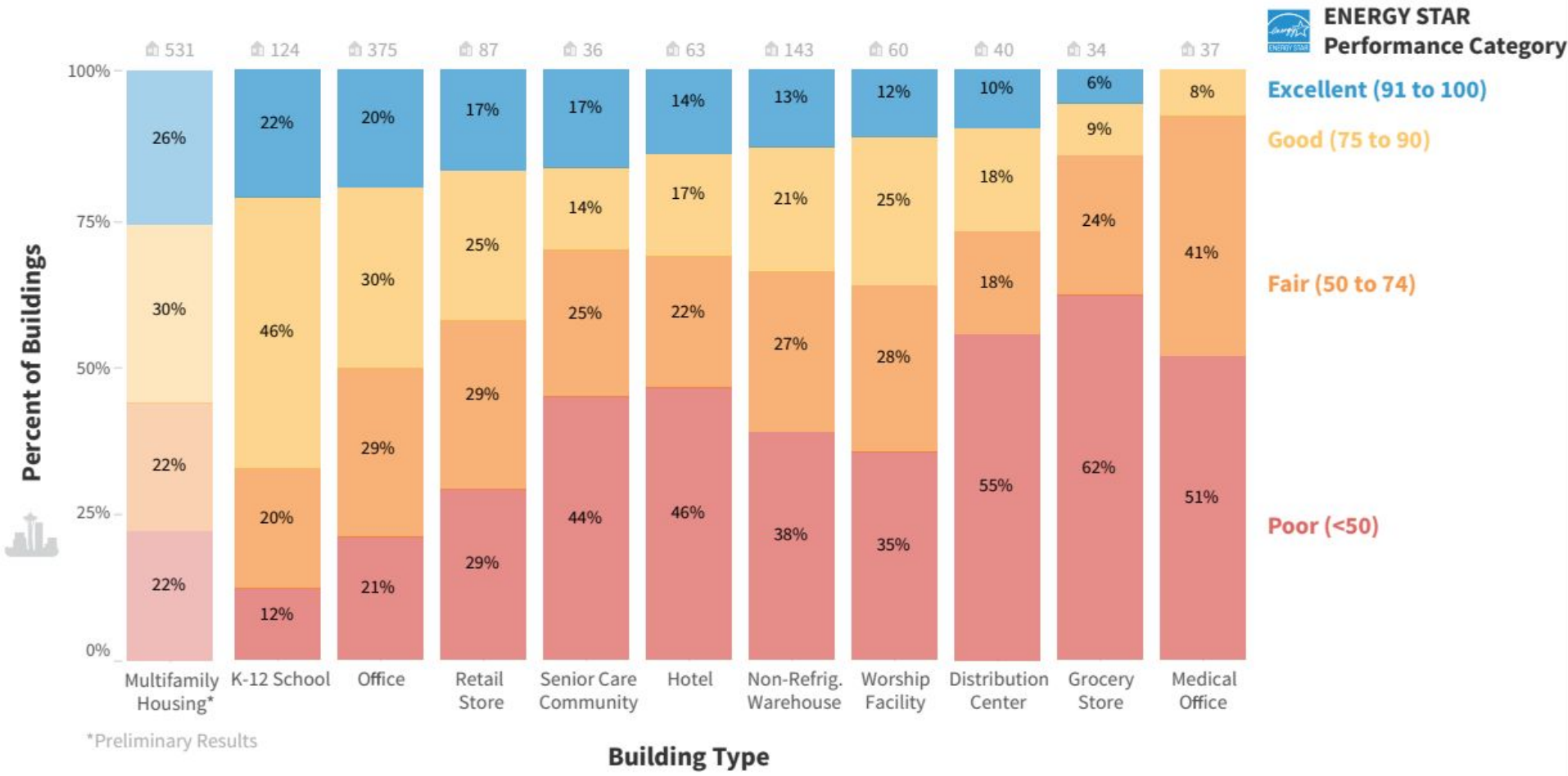
Site Energy Use Intensity MORE INFO

0 — 200+

3,538 OUT OF
3,538 BUILDINGS



Analyze Data for Opportunities



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Benchmarking Associated with Reduced Energy Consumption

Chicago

4.4% Energy consumption in properties reporting for 4 consecutive years

$12.7M Bill savings/ year

Minneapolis

3.4% Energy Consumption from 2014-2016

$ 21 M Cumulative bill savings

New York City

6% Cumulative reduction over three years

Seattle

3% Reduction in properties reporting for three or more years

San Francisco

7.9% Cumulative reduction over three years

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Beyond Benchmarking

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Beyond Benchmarking

Audits

Re-Tuning/RCx

Building Performance Standards

Images created by Maxim Basinski, Hello Many, and EchoEtrernal from Noun Project

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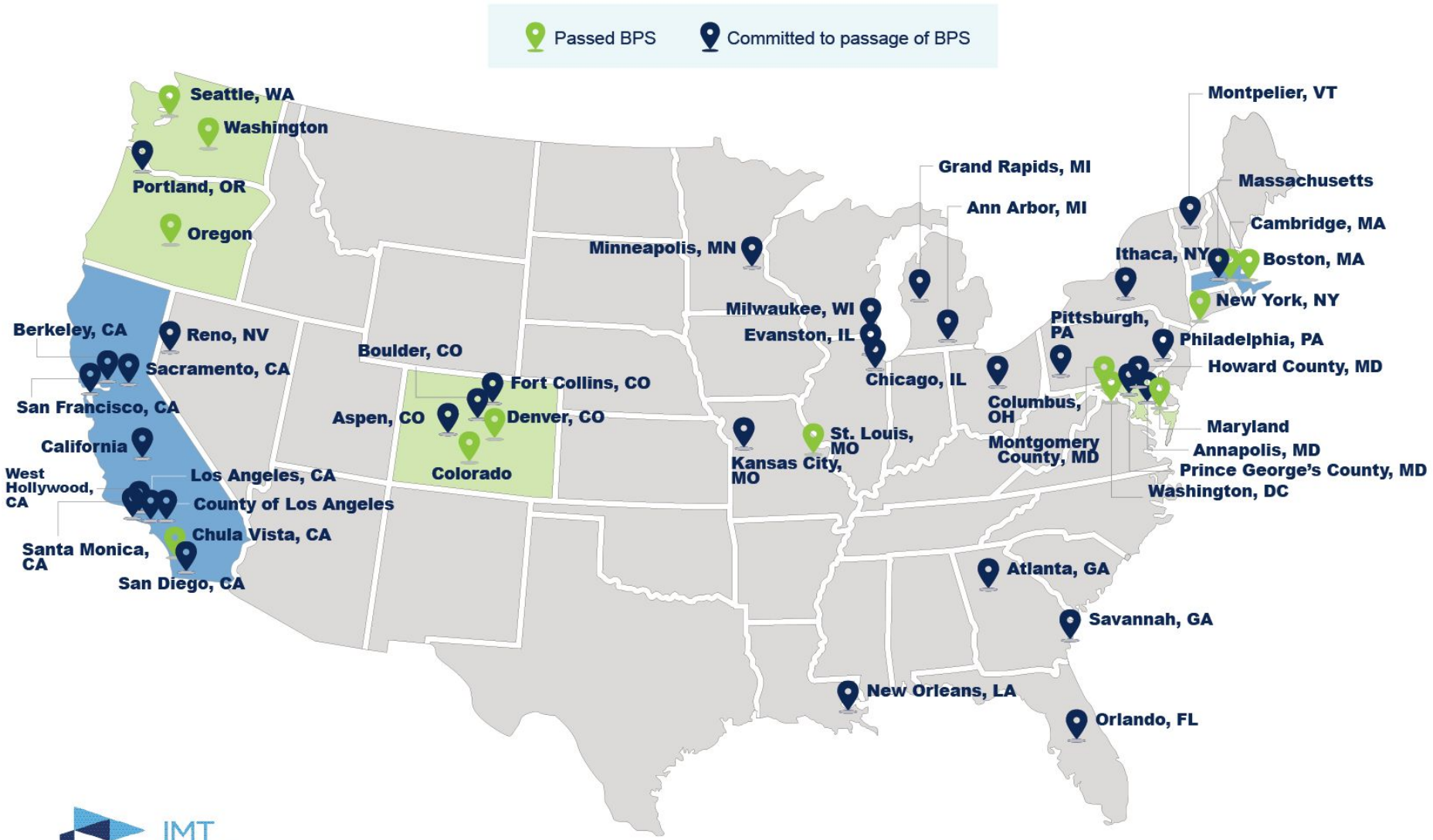
The State of Building Performance Standards (BPS) in the U.S.

Members of the National BPS Coalition as of July 2024



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BPS Around the United States

	WA State	St. Louis, MO	Boston	Denver	Montgomery County
Year Adopted	2019	2020	2020	2020	Pending
First Compliance Deadline	2026	2025	2025	2024	~2026
Minimum Threshold Performance by building type	**Site EUI** targets are 15% less than 2009-2018 averages	Standards set no higher than 35th percentile **site EUI** (so 65+% of buildings must improve)	**GHG emissions** set by building type on an emissions intensity basis,	Interim targets according to the building's "trajectory" from its baseline site EUI performance in 2019 to the **final site EUI** for its property type.	In development to be set in regulation, based on **site EUI**
Covered Buildings	Commercial > 50K sq. ft.	Commercial and multifamily > 50K sq. ft.	Commercial and multifamily > 20K sq. ft.	Commercial and multifamily >25K sq. ft.	Commercial and multifamily > 25K sq. ft.
Compliance Cycle	5 years	4 years (6 years for affordable housing and houses of worship)	5 years until zero carbon is met	Long-term target with 3 year interim check ins	Long-term target with 4 year interim check ins

Pause for Q&A

Key Decision Points

Equity in Benchmarking

Key Questions

- How can benchmarking and building performance policies support your equity and climate goals?
- What is your community's building stock make up?
- Do your utilities provide benchmarking data?
- Are you benchmarking municipal buildings? Is there a local voluntary program underway?
- Are there current energy efficiency and/or financing programs to support energy efficiency action in your jurisdiction?

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Policy Development: City Staff Resources

Key Actions

- Host internal meeting and external meetings to gain buy-in and create policy
- Identify Mayor/Council champion and external champions
- Determine role for Utilities and engage them throughout the program
- Ability to allocate resources for a budget to manage program and internal owner(s) for compliance and program management

Key Roles

- Decision Maker/Sustainability Director attends overview and strategy sessions, approves content and strategy, removes internal roadblocks, and hosts meetings where Director level leadership is needed
- Project manager sets agendas and hosts meetings, create covered buildings list, create project plans, manages facilitators, and develops city specific content and documentation

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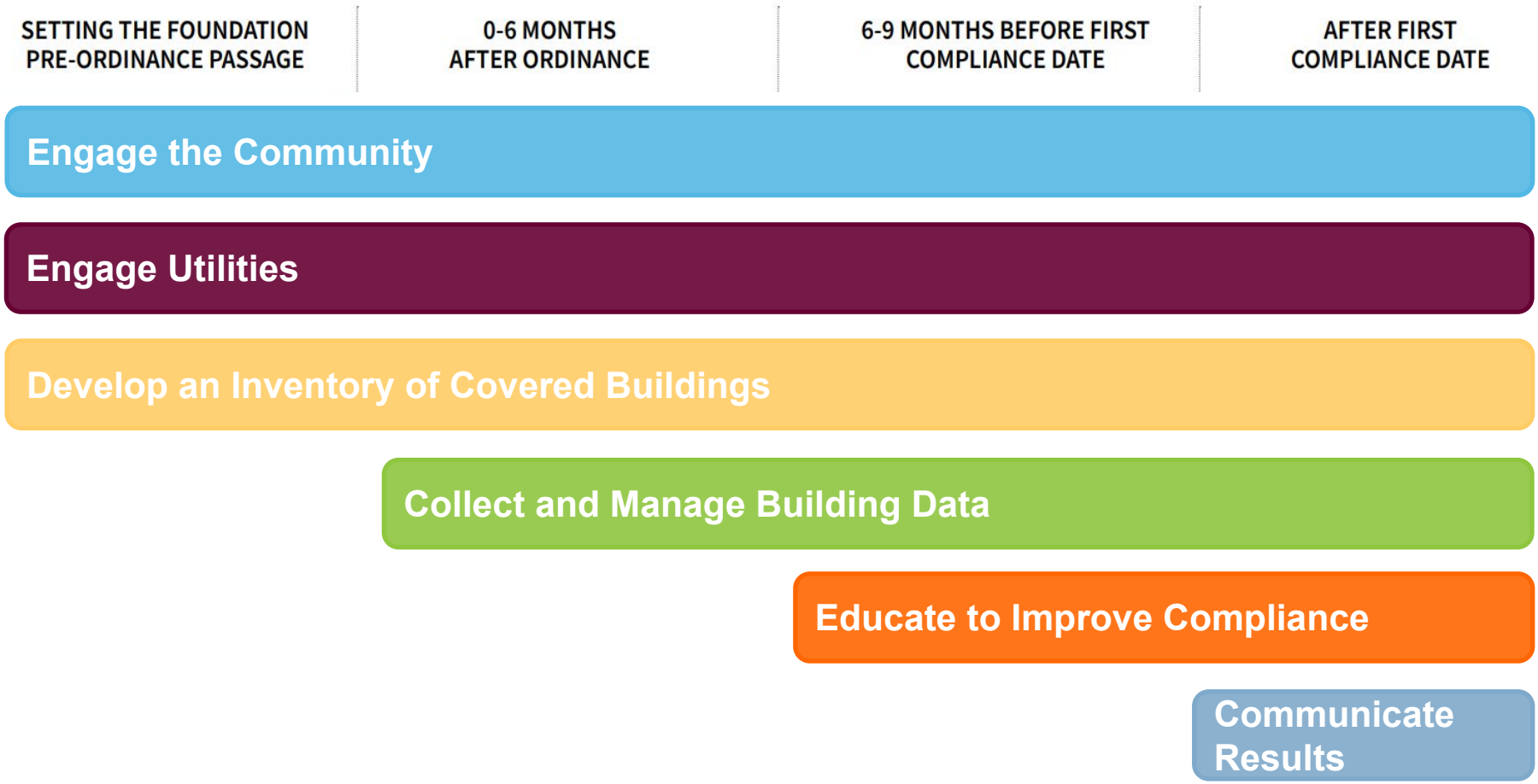
Work Streams and Timelines



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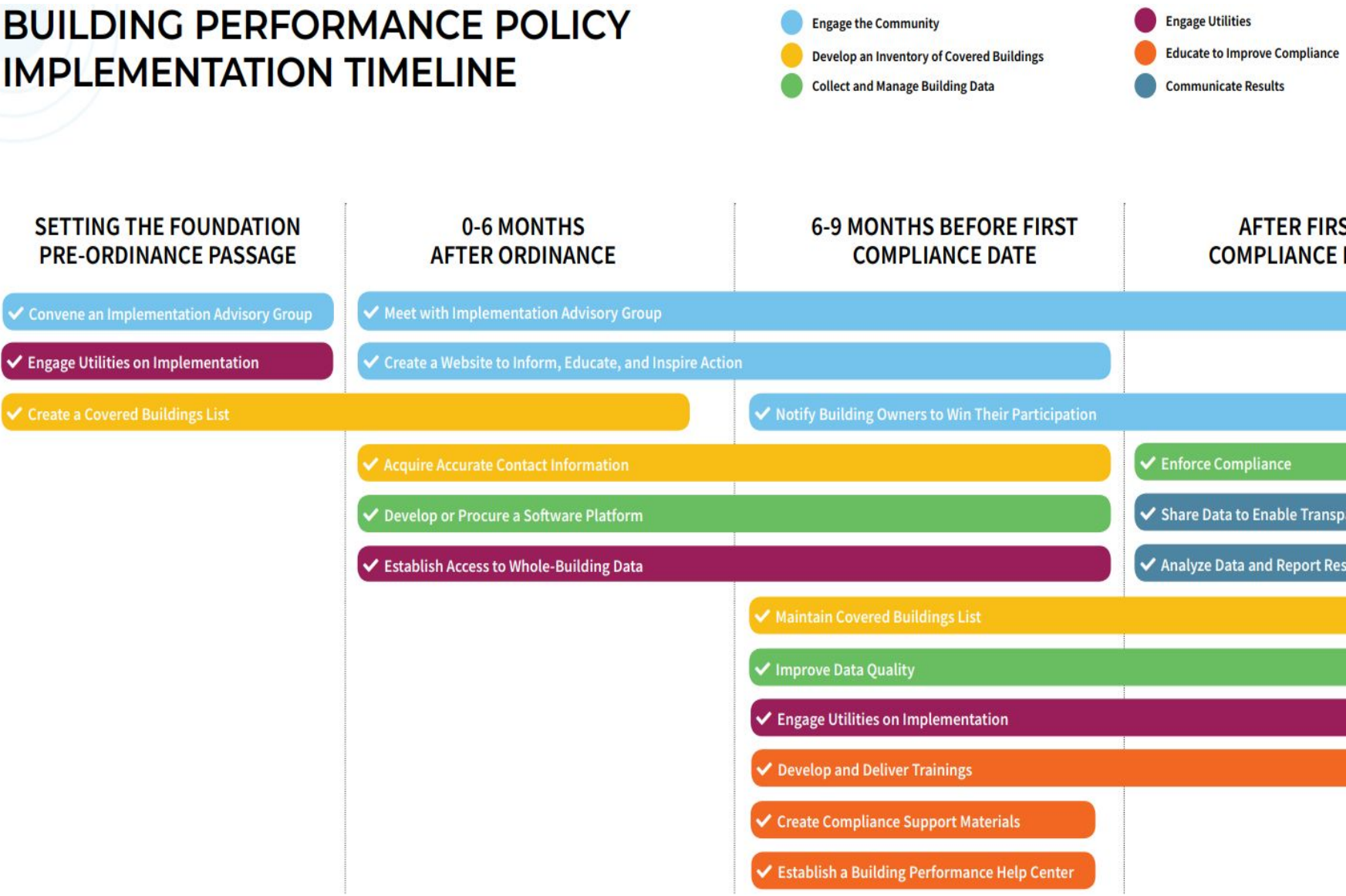
BUILDING PERFORMANCE POLICY IMPLEMENTATION TIMELINE



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Implementation Resources & Costs

City	FTEs per 1000 Bldgs	Bldgs covered by ordinance	Total FTEs
Atlanta	2	1,000	2
Boulder	3.6	450	1.6
Chicago	0.39*	3,850	1.5
Minneapolis	2.5	802	2
Philadelphia	0.7	3,000	2
Portland, OR	1.5	1,000	1.5
San Francisco	0.74	1,700	1.25
Seattle**	.83	3,300	2.75

*Chicago contracts out help center services to Elevate Energy

** Seattle's numbers include their benchmarking and tune-up programs

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Resources

Key Resource: USDN Building Energy Hub

USDN urban sustainability directors network

Building Energy

Overview USDN Programming Offerings Building Energy Resources More

Energy Benchmarking and Transparency

Energy Benchmarking and Transparency Policies require the reporting and disclosure of energy consumption data for privately owned buildings.

Energy benchmarking is the process of measuring a building's energy and water use over time. It allows comparison of buildings' energy use to similar buildings or to their own past performance. Benchmarking is the basis of effective energy management and is considered an operational best practice in the commercial real estate industry.

By collecting this data from building owners and making it available to the public, state and local governments provide the foundation for building decarbonization by raising awareness of buildings' energy consumption, identifying buildings that are ripe for energy efficiency improvements, and spurring investment into better building performance.

You will find resources below that will help you implement an energy benchmarking policy. These resources will be updated as new information becomes available.

- General Background
- Planning
- Policies/Ordinances
- Utility Data Access
- Implementation
- Case Studies
- Other Resources

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Collective Action Group Recordings

- Introduction to Benchmarking and Collective Action Group
- Stakeholder Engagement
- Data and Stakeholder Engagement Discussion
- Utility Engagement
- Utility Engagement Discussion
- Implementation Preparation
- Software and Implementation Discussion

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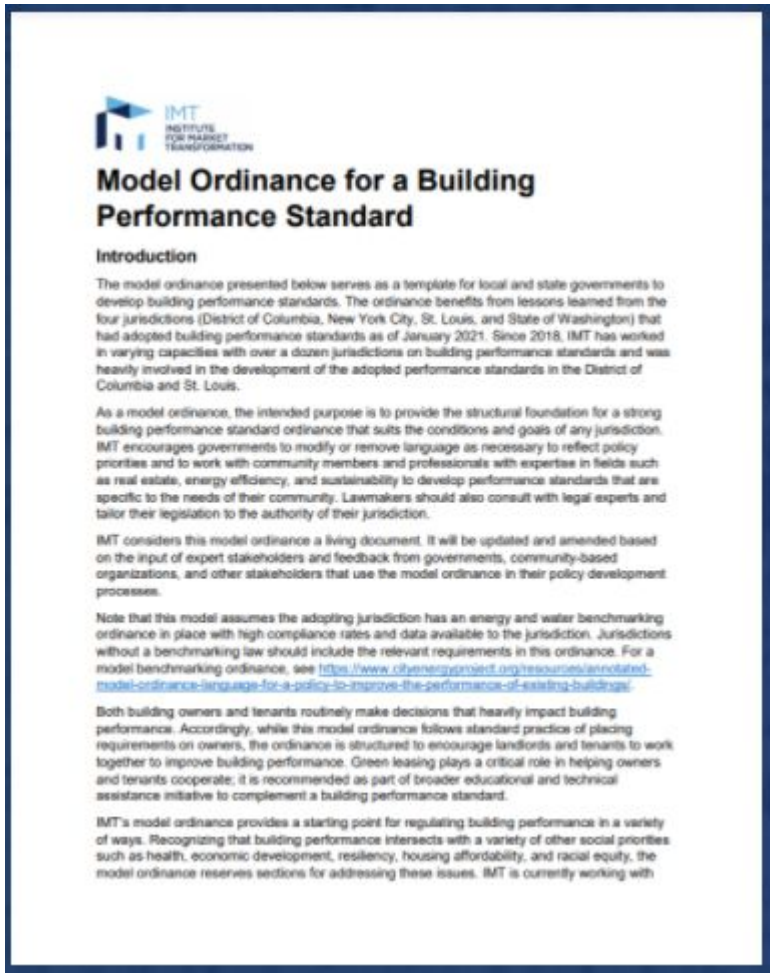
Equity Guidance and Framework

IMT's Model Ordinances

- Benchmarking Model Ordinance
- BPS Model Ordinance
- Summary of BPS Ordinance
- Model Utility Data Access Law



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Model Ordinance for a Building Performance Standard

Introduction

The model ordinance presented below serves as a template for local and state governments to develop building performance standards. The ordinance benefits from lessons learned from the four jurisdictions (District of Columbia, New York City, St. Louis, and State of Washington) that had adopted building performance standards as of January 2021. Since 2018, IMT has worked in varying capacities with over a dozen jurisdictions on building performance standards and was heavily involved in the development of the adopted performance standards in the District of Columbia and St. Louis.

As a model ordinance, the intended purpose is to provide the structural foundation for a strong building performance standard ordinance that suits the conditions and goals of any jurisdiction. IMT encourages governments to modify or remove language as necessary to reflect policy priorities and to work with community members and professionals with expertise in fields such as real estate, energy efficiency, and sustainability to develop performance standards that are specific to the needs of their community. Lawmakers should also consult with legal experts and tailor their legislation to the authority of their jurisdiction.

IMT considers this model ordinance a living document. It will be updated and amended based on the input of expert stakeholders and feedback from governments, community-based organizations, and other stakeholders that use the model ordinance in their policy development processes.

Note that this model assumes the adopting jurisdiction has an energy and water benchmarking ordinance in place with high compliance rates and data available to the jurisdiction. Jurisdictions without a benchmarking law should include the relevant requirements in this ordinance. For a model benchmarking ordinance, see https://www.cityenergyproject.org/resources/annotated-model-ordinance-language-for-a-policy-to-improve-the-performance-of-existing-buildings/.

Both building owners and tenants routinely make decisions that heavily impact building performance. Accordingly, while this model ordinance follows standard practice of placing requirements on owners, the ordinance is structured to encourage landlords and tenants to work together to improve building performance. Green leasing plays a critical role in helping owners and tenants cooperate; it is recommended as part of broader educational and technical assistance initiative to complement a building performance standard.

IMT's model ordinance provides a starting point for regulating building performance in a variety of ways. Recognizing that building performance intersects with a variety of other social priorities such as health, economic development, resiliency, housing affordability, and racial equity, the model ordinance reserves sections for addressing these issues. IMT is currently working with

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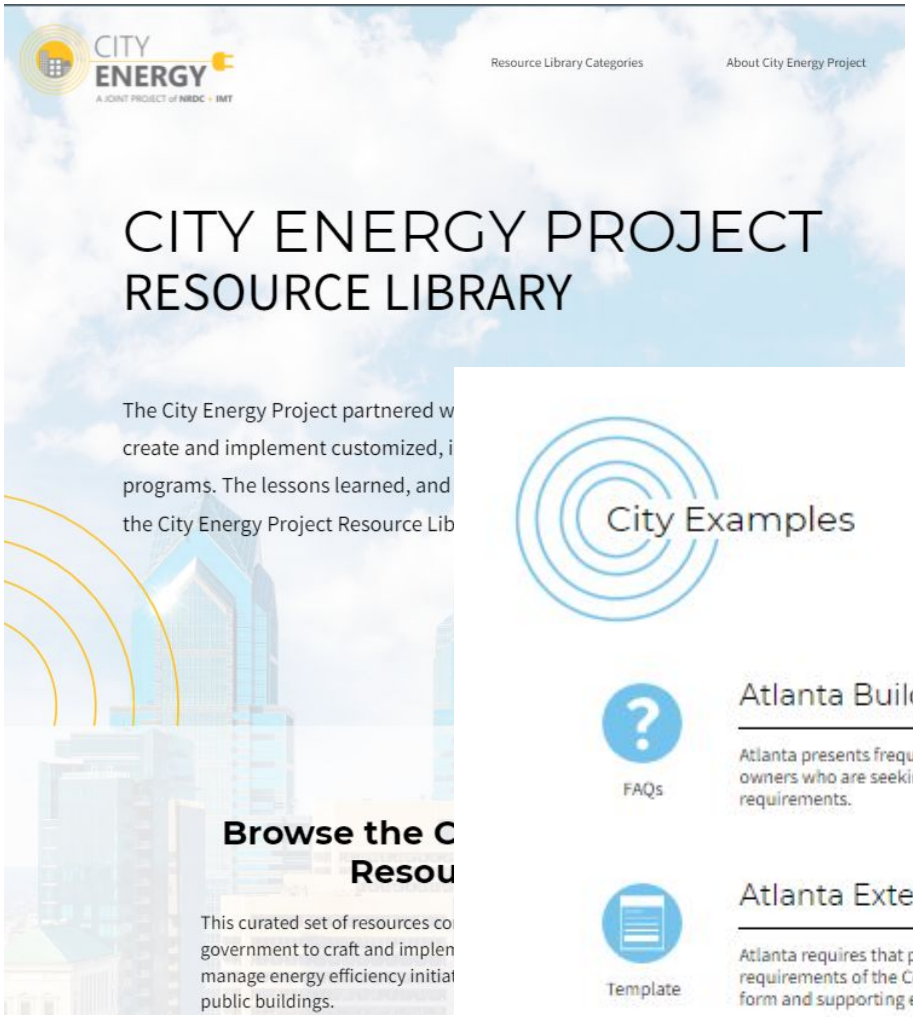
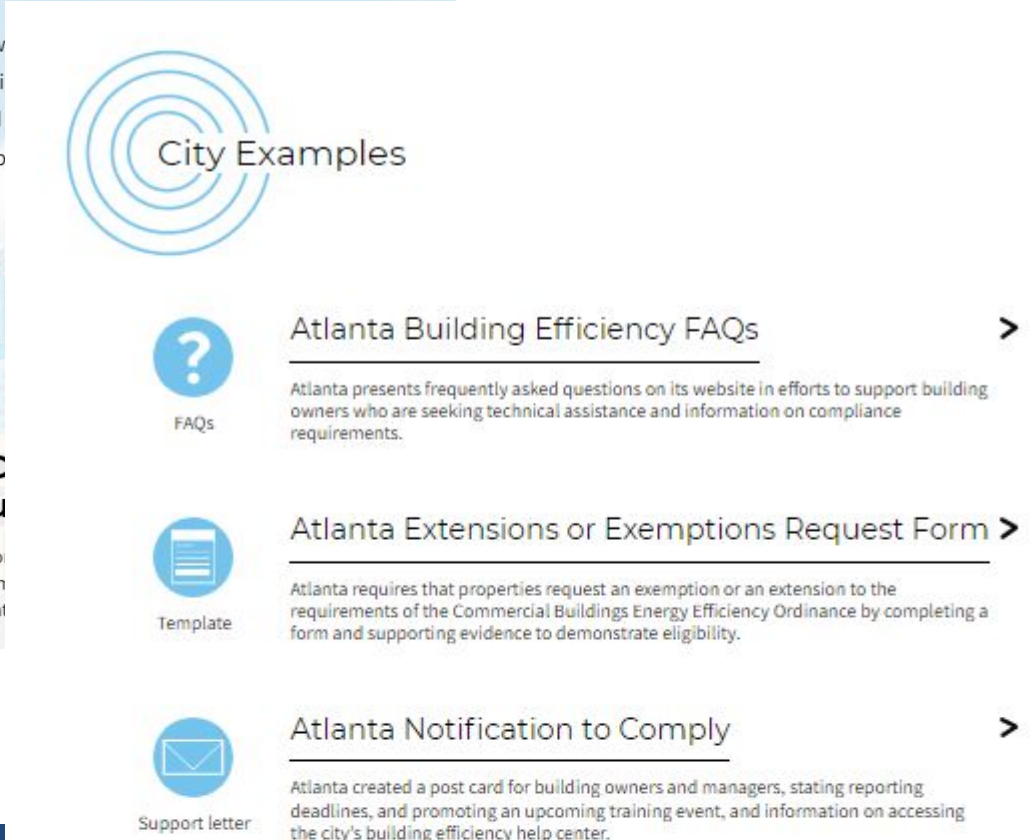
Additional City Examples and Templates





[City Examples] - Public website that can be accessed by partners

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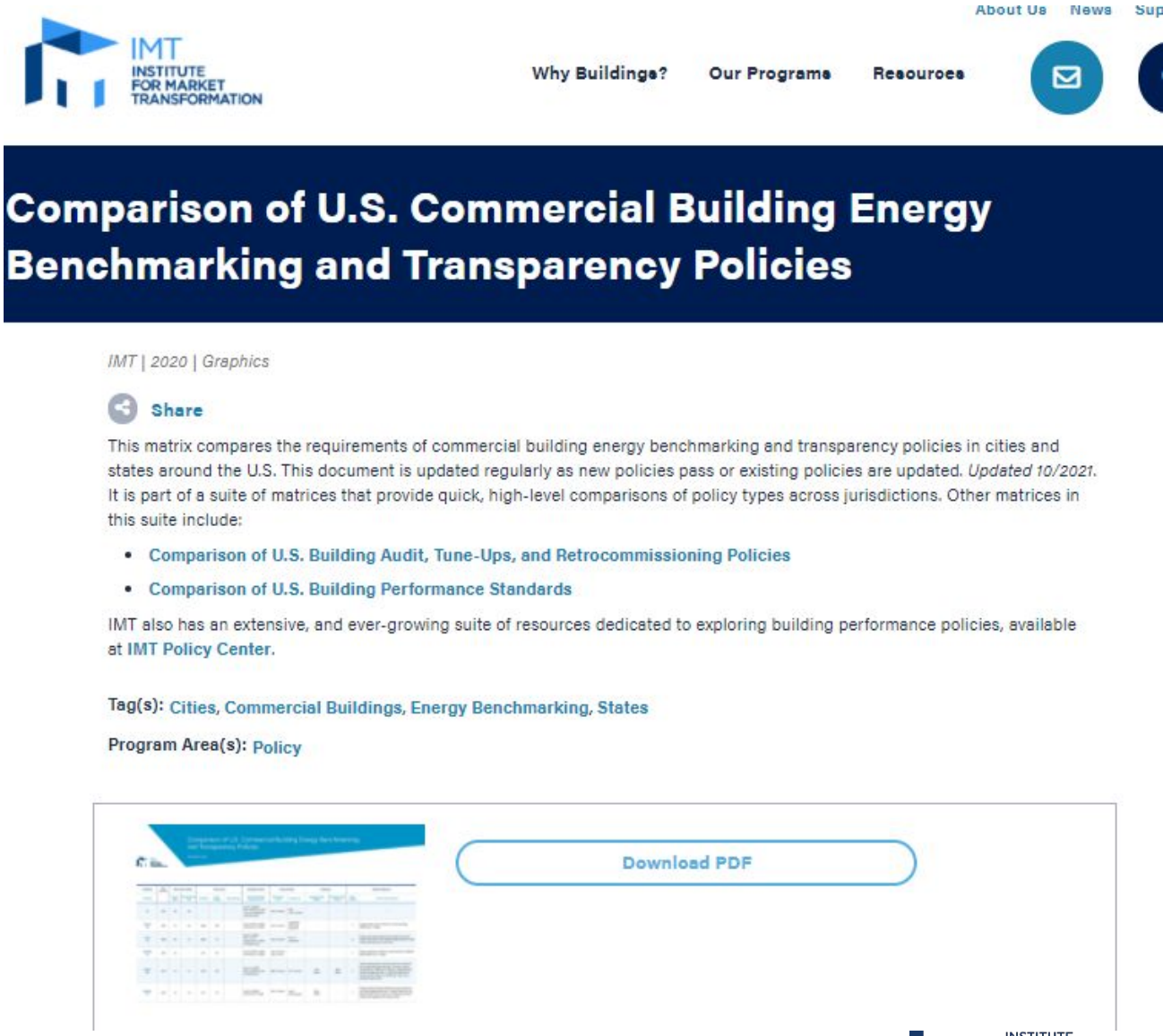
City Policy Comparison Tools

- City policy comparison
- Maps
- Blog posts
- Reports



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EPA ENERGY STAR Tools, Resources, & Support

- ENERGY STAR is a U.S. EPA voluntary program that helps businesses and individuals achieve superior energy efficiency through partnership and leadership commitment, tools and resources, and recognition for top performance
- Two staff on the Buildings program at ENERGY STAR support U.S. jurisdictions implementing initiatives that focus on existing commercial and/or multifamily buildings to save energy, reduce greenhouse gas emissions, and stimulate economic growth
- To get rolling, please review the **Benchmarking and Buildings Performance Standards Policy Toolkit** or just reach out: Hall.Brendan@epa.gov (Brendan) and Hatcher.Caterina@epa.gov (Katy)

ENERGY STAR® Portfolio Manager®

Support Examples

- **Reviewing draft requirements** to ensure they align with goals and can be implemented in ENERGY STAR Portfolio Manager, the program's free, industry-standard benchmarking tool;
- Creating connections to the **ENERGY STAR team that supports utilities trying to develop data access solutions**;
- Developing a **summary of Portfolio Manager activity and aggregate performance** in a jurisdiction;
- Walking through **tools and resources to run a competition or voluntary campaign**;
- **Helping train up jurisdictions on Portfolio Manager** and collecting data through it, and sharing a list of recommended metrics;
- Creating awareness of **ENERGY STAR training and help desk resources**;
- Detailing common approaches taken by jurisdictions to **promote data quality**;
- **Strategizing on how best to train building owners and managers** on benchmarking;
- **Making introductions and highlighting best practices across the network**; and
- **Educating on 1-100 ENERGY STAR Scores and ENERGY STAR Certification**.

Development & Implementation Partners

cee
Center for Energy and Environment

ELEVATE ENERGY
Smarter energy use for all

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Southface

**Not an exhaustive list of all organizations supporting building policy work*

Q&A

Rajiv Ravulapati

Associate Director, Government Engagement

rajiv@imt.org

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BUILDING EFFICIENCY 305 CHALLENGE

MIAMI-DADE COUNTY'S BUILDING ENERGY + WATER EFFICIENCY CHALLENGE

BE 305 BUILDING EFFICIENCY CHALLENGE

305 RESILIENT

MIAMI-DADE COUNTY

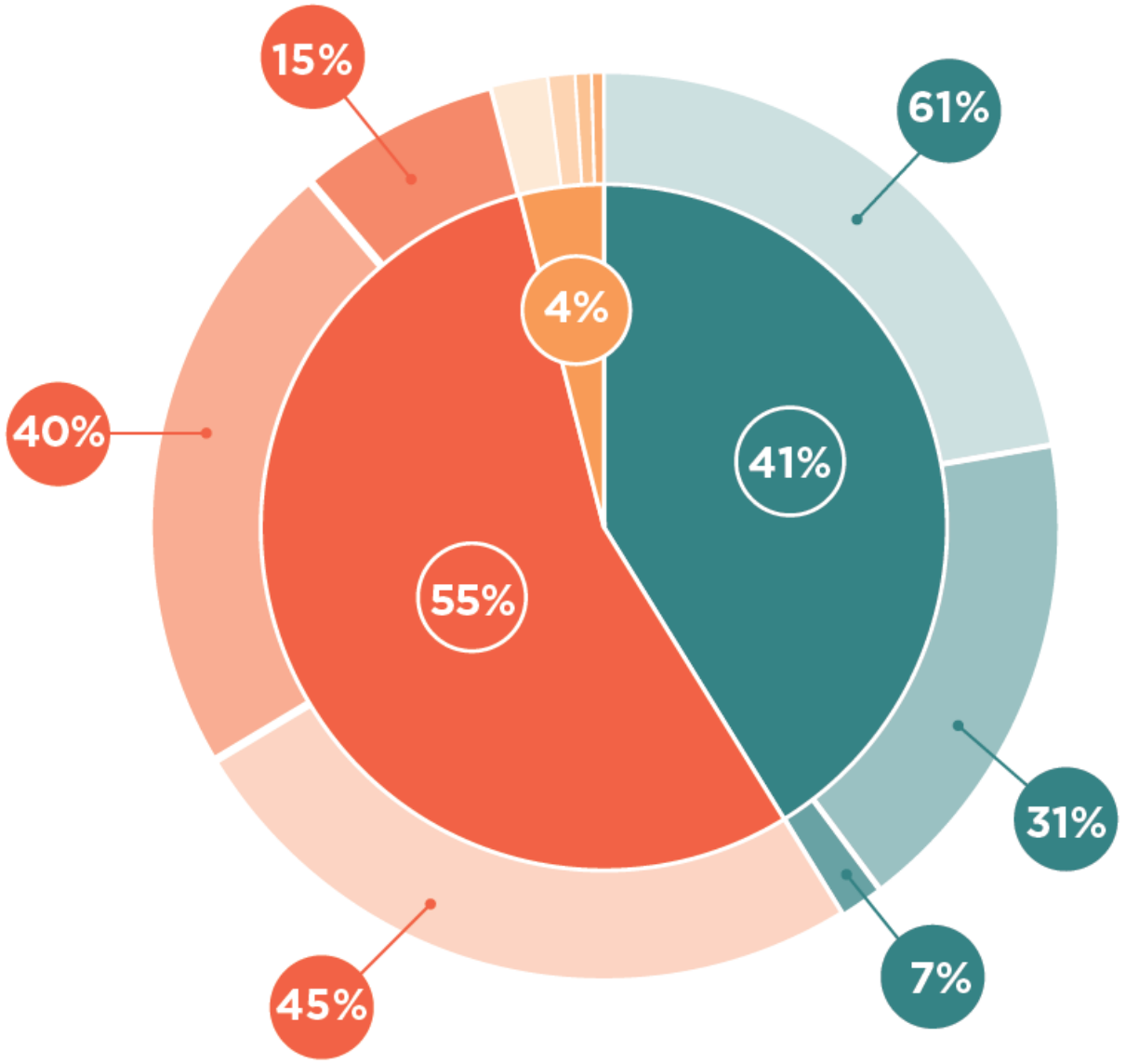
Roadmap

- Why benchmarking
- History
- Key policy components
- Supporting Tools
- Implementation timeline and resources needed
- Integration with City of Miami's existing ordinance
- Lessons learned from voluntary Building Efficiency 305 Challenge Program

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Communitywide Emission Sources 2019



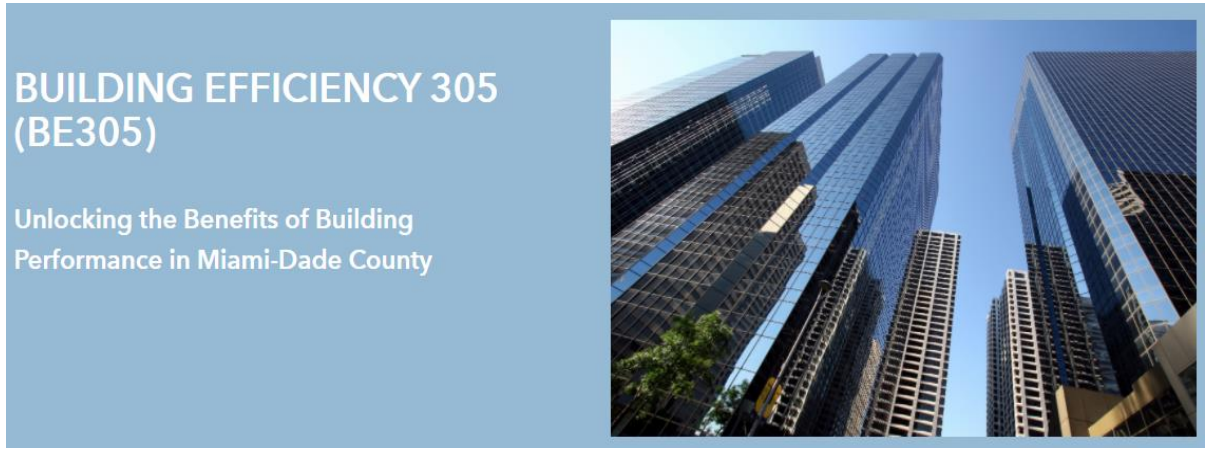
Communitywide Sources of Emissions

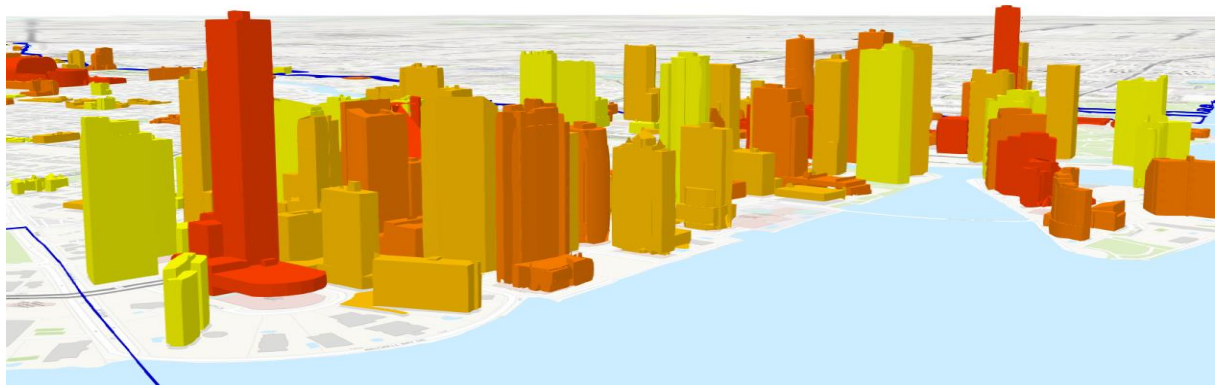
- **Buildings and Energy 41%**
  - Electricity **61%**
  - Other Fuels **31%**
  - Natural Gas **7%**
- **Transportation and Land Use 55%**
  - Air Travel **45%**
  - Ground - Gasoline **40%**
  - Ground - Diesel **15%**
- **Water and Waste 4%**
  - Landfilled Waste **53%**
  - Wastewater Energy **25%**
  - Incinerated Waste **12%**
  - Other **10%**

TARGET AUDIENCE

- Large buildings (20,000 sq ft or larger) represent 2% of total number of buildings but > 27% of floor space in the County

- Up to 30% of energy is wasted due to inefficient equipment and operations





BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Estimated energy savings

- Over 10 years source energy savings of 312,860,720 MMBtu or $190.3 million with both benchmarking and retrocommissioning providing roughly equal levels of savings
- IMT estimates that buildings who consistently benchmark save 5-10% on energy
- Greenlink and Autocase report show great savings over the long-term

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Roadmap

- Why benchmarking
- History
- Key policy components
- Supporting Tools
- Implementation timeline and resources needed
- Integration with City of Miami's existing ordinance
- Lessons learned from voluntary Building Efficiency 305 Challenge Program

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Timeline

2017
- BE305 umbrella program launch

2018
- Working Group meetings held
- Community trainings

2019
- Ordinance in legal review

2020
- BE305 Challenge launch

2021-2023
- BE 305 Challenge continues
- Supporting tools: UBIDs, FPL WBD, dashboard procurement

2024
- Significant progress on legal review of ordinance
- Gearing up for implementation, finalizing supporting tools

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

BE305 Program Components

- Community Trainings
- County Leadership
- Facilitating Access to Financing
- Building Code Education
- Mandatory Building Performance Ordinance
- Voluntary BE305 Challenge

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

BE305 Working Group

Colliers INTERNATIONAL
JLL
BOMA International
Dream in Green
RA Royal American Management
MENIN | HOSPITALITY
FPL
MIAMI-DADE COUNTY PUBLIC SCHOOLS giving our students the world
THE CITY OF MIAMI FLORIDA
TECELA REAL ESTATE INNOVATION
ATLANTIC PACIFIC COMMUNITIES
Johnson Controls
SIEMENS
ULI Urban Land Institute
Ygrene ENERGY FUND
Baptist Health South Florida
MIAMI
Shulman + Associates
FirstService RESIDENTIAL
U.S. GREEN BUILDING COUNCIL
fs energy
GREATER MIAMI & THE BEACHES HOTEL ASSOCIATION
PARTNERS IN HOSPITALITY
THE AMERICAN INSTITUTE OF ARCHITECTS
CATALYST MIAMI
MIAMIBEACH RISING ABOVE

BE305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

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BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Key Policy Components

1. Benchmarking

Building owners report energy and water usage and building characteristics

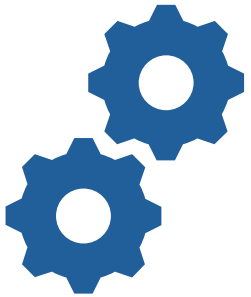
2. Retuning

Retuning or retrocommissioning (RCx) of building to improve performance

3. Disclosure

Disclosure of annual energy and water use publicly to create market transformation

4. Enforcement



Ensuring compliance through penalties

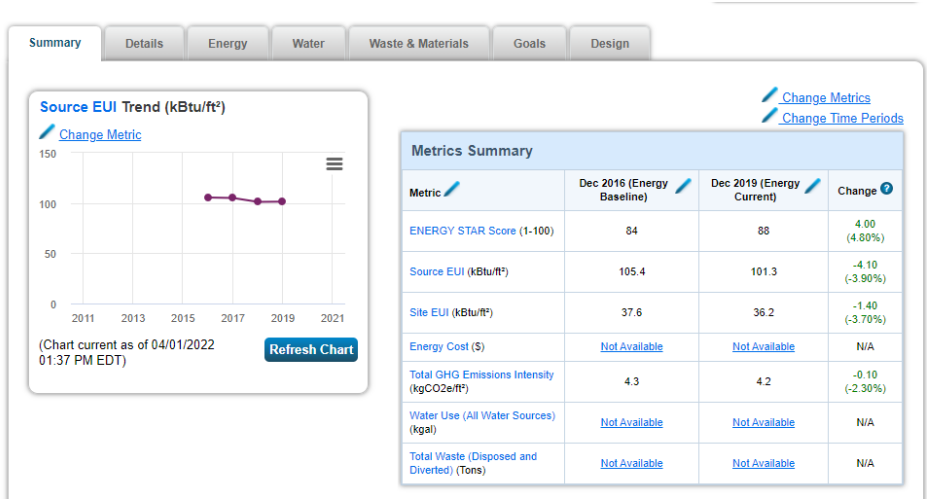
BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Benchmarking

- Merging of building characteristics with consumption data
  - Equivalent to MPG for cars
- Use Energy Star Portfolio Manager, free managed by EPA
- For all buildings >20,000 sq ft
- Phase-in implementation, with a few thousand buildings coming online over 4 years for a total of ~13,500 (no City)

ENERGY STAR® Portfolio Manager®



BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Retuning

- Retuning or retrocommissioning (RCx)
- Every 5 years for low-performers
- Only for buildings >50,000 sq ft
- 4,700 buildings (no City) to retune, divided over 3 years

Figure 1 depicts the cooling load of floor 22 over a week, and we can see that AC units operate between 6 a.m. and 6 p. To 6:00 pm. To compute non-cooling load during non-operational hours, we focus on floor 22 because we logged cooling on this level, and it is easier to discover non-cooling (including light) during these hours. Based on this estimate, we may calculate additional floors.

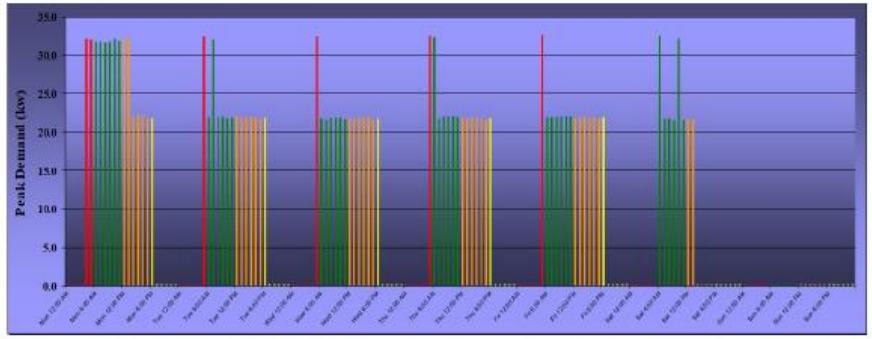


Figure 1: Cooling load of floor 22 during period 06/28/24 – 07/05/24

Figure 2 demonstrates that the company is seeing consistent demand this week.

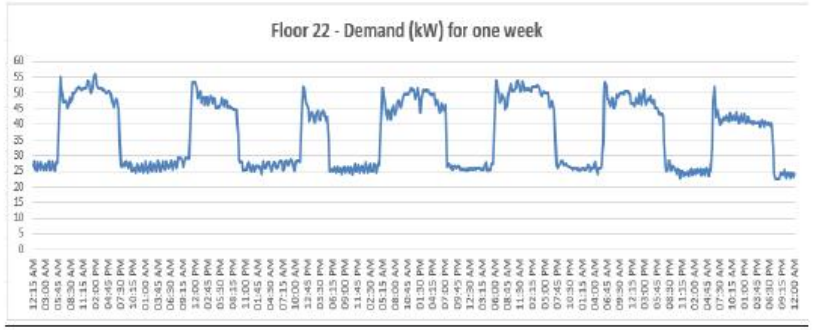


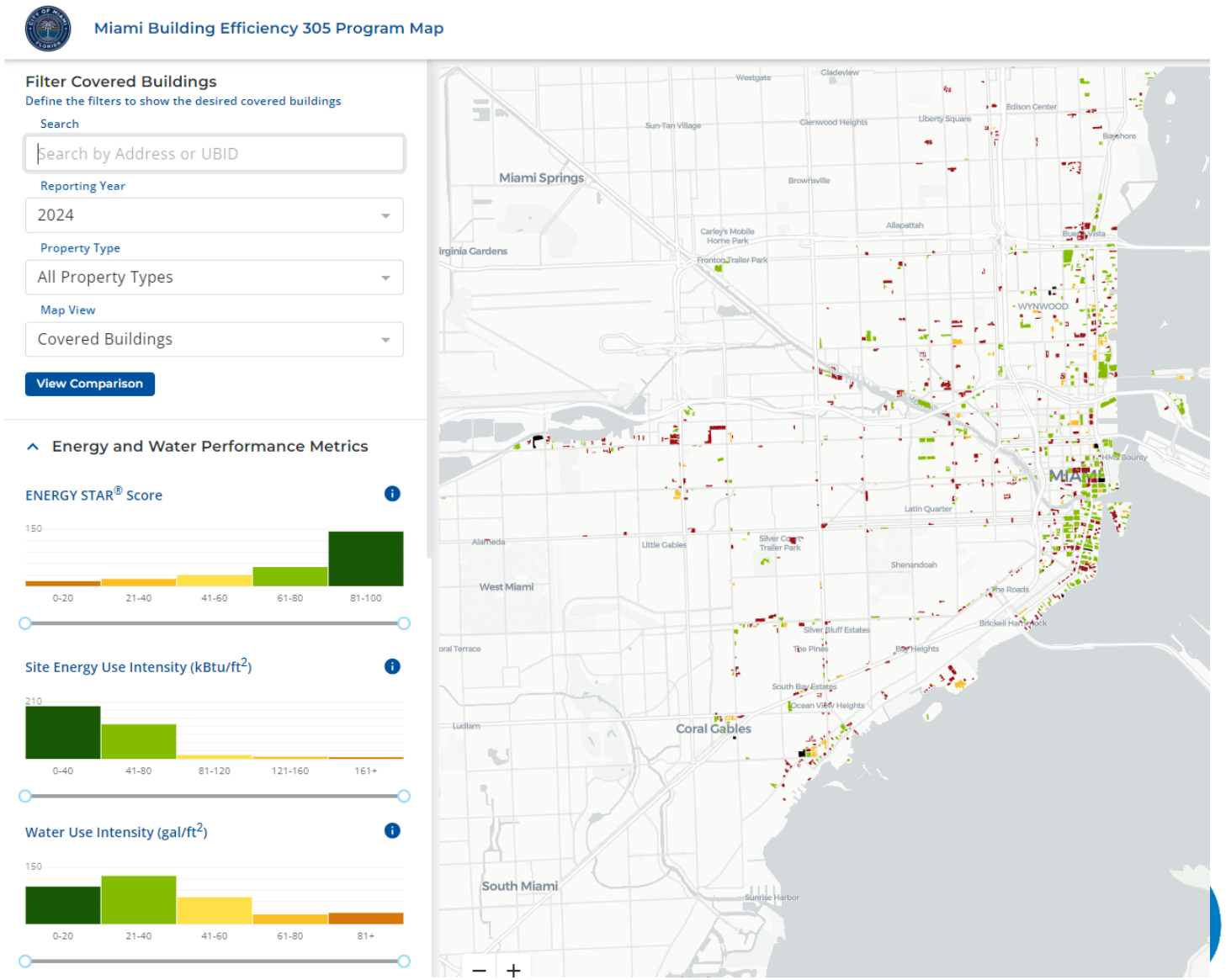
Figure 2: Demand of floor 22 during period 06/28/24 – 07/05/24

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Disclosure

- County to publish benchmarking data annually



BE 305 BUILDING EFFICIENCY CHALLENGE

Roadmap

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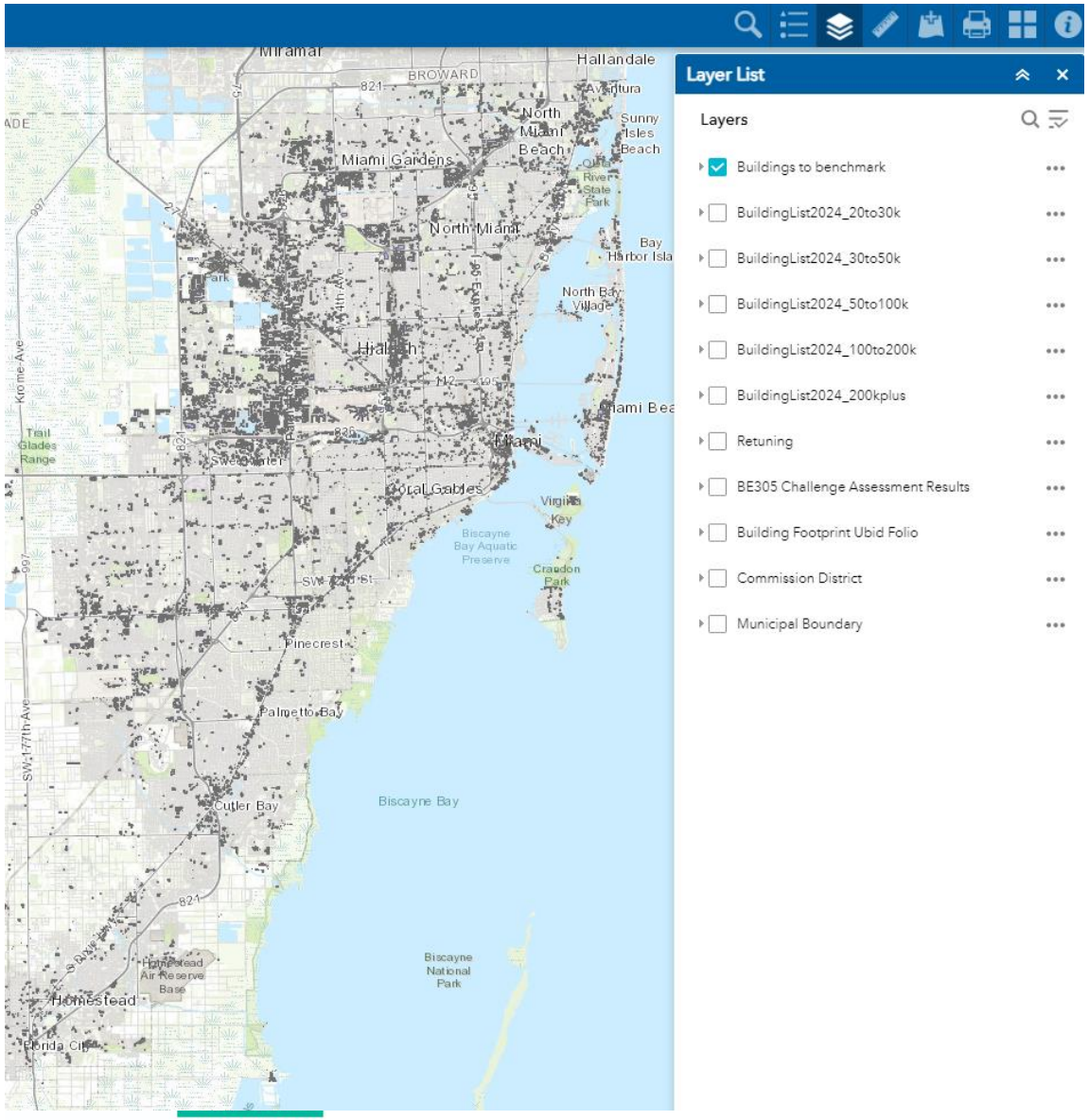
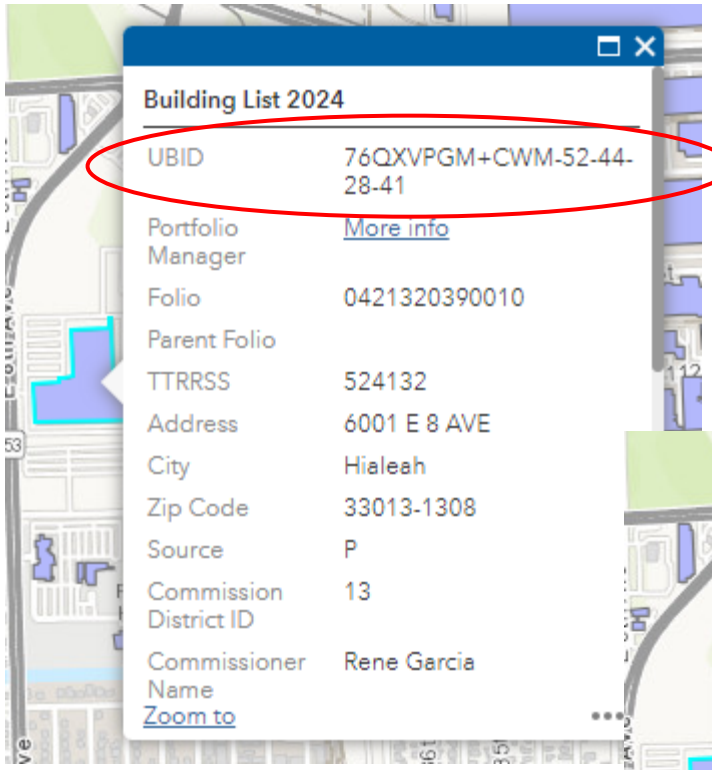
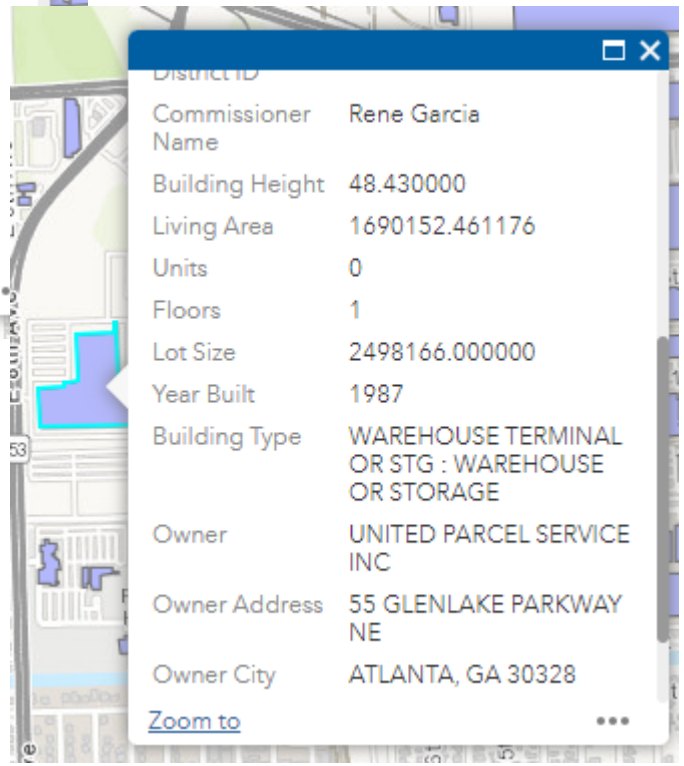
BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Building List and UBIDs







Benchmarking Tool

- Dashboard to:
  - keep track of compliance
  - verify data quality
  - be CRM tool
  - connect with existing enforcement platform
- Includes or excludes help desk

- County procuring Touchstone to be used until December 2026

TOUCHSTONE IQ

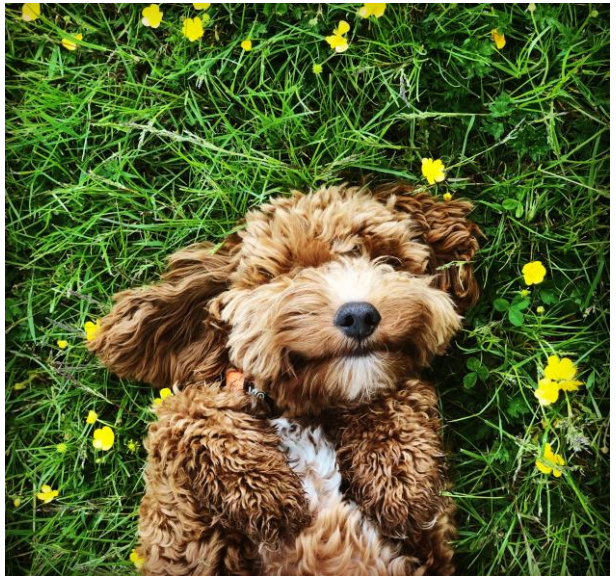
BEAM

Building Energy Analysis Manager

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Working with utilities



Ideal scenario

1. Provide aggregated whole-building data for multi-owned and multi-tenant buildings (FPL)
2. Streamline benchmarking process by automatically sending energy and water data for all buildings to Portfolio Manager (FPL and WASD)

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Whole-Building Data (WBD)

For **multi-tenant** or **multi-owned buildings** that have only access to energy for common areas:

Multi-tenant or multi-owner building with multiple unique accounts

Building owner submits request to FPL for aggregated whole-building energy data

FPL provides owner with the sum of energy use for all accounts aka aggregated whole-building data

Owner enters number into Portfolio Manager

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Reality - FPL

- Master-metered buildings use paper or digital bills to obtain data
- Multi-owned/multi-tenant buildings request aggregated data using a form and receiving an excel file

FPL

LETTER OF AUTHORIZATION

By executing this Letter of Authorization ("LOA"), the FPL customer of record or authorized representative of the FPL customer of record signing below ("FPL Customer") hereby authorizes FPL to release to FPL Customer's Designated Agent or Consultant ("Agent") FPL Customer records specifically identified on this form, which may include FPL Customer account information and consumption data. By executing this LOA, FPL Customer further authorizes FPL to make the specified modifications to the designated account(s) of FPL Customer identified on this LOA at the request of Agent.

Agent: _____

Phone Number of Agent: _____

Email Address of Agent: _____

Signature of Agent: _____

Information and/or records to be disclosed to Agent (Check as applicable):

☐ Billing/Payment Options ☐ Billing Detail
☐ Billing/Payment History ☐ Deposit Information
☐ Rate Analysis ☐ Other: _____

Modifications to the account(s) Agent is authorized to request (Check as applicable):

☐ Address Change ☐ EDI
☐ Rate Change ☐ Other: _____

Length of the term of the LOA _____ to _____.

[Note: This LOA will remain in effect for the duration of the period of time indicated above, not to exceed two (2) years, unless revoked in writing sooner. Any revocation of this LOA must be sent by e-mail to LOA@FPL.com.]

1

Address	10 VENETIAN WAY		
Sum of TOTAL_kWh		Year	
Month	Month (MMM)	2022	2023
1	Jan	177,518	164,221
2	Feb	137,789	161,783
3	Mar	165,607	163,001
4	Apr	167,602	163,413
5	May	159,068	165,349
6	Jun	183,913	182,812
7	Jul	180,851	188,878
8	Aug	177,637	194,966
9	Sep	202,251	192,333
10	Oct	174,538	170,050
11	Nov	153,651	172,827
12	Dec	187,981	158,114
Grand Total		2068406	2077747

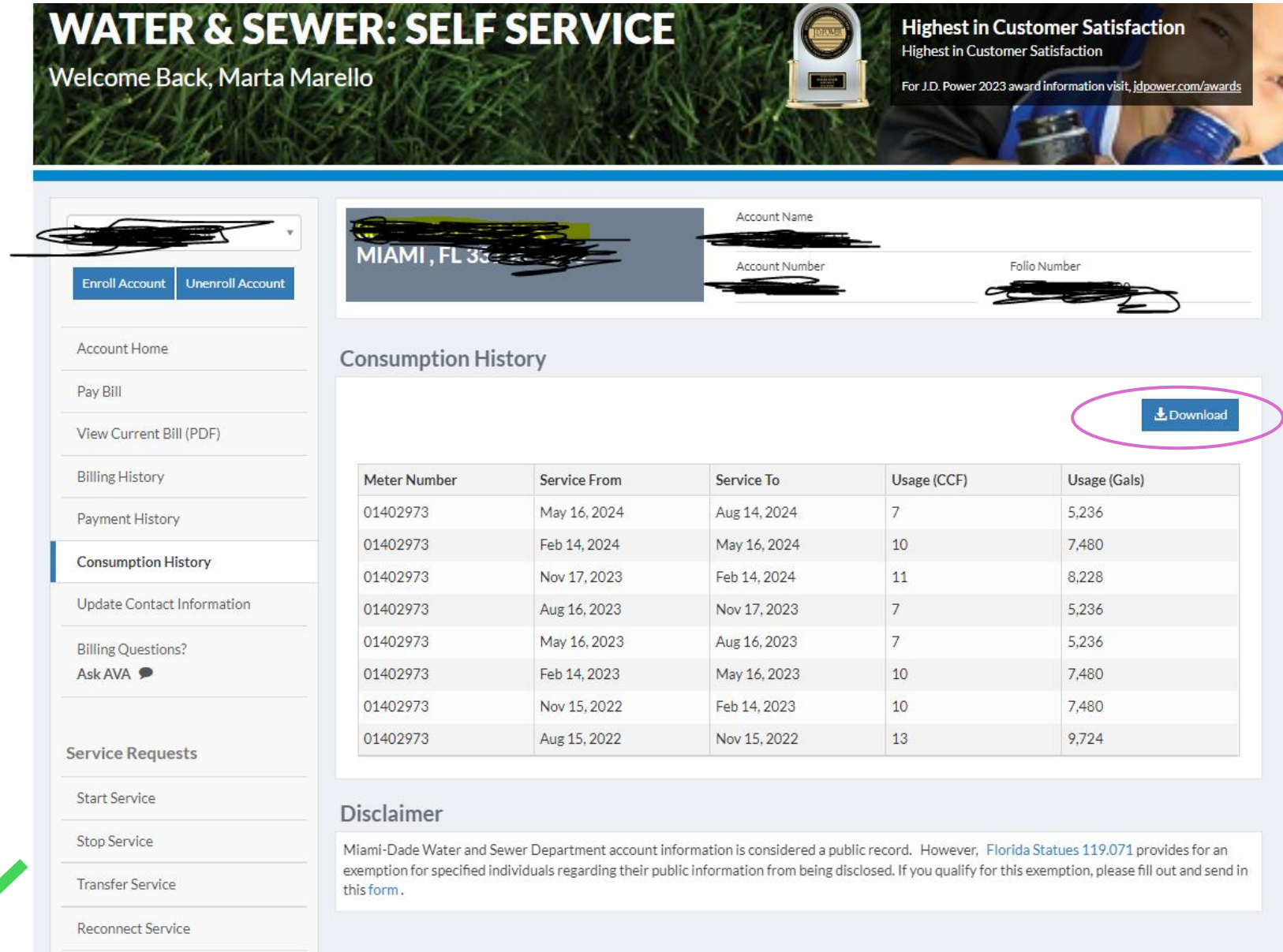
Disclaimer

Based on the information provided, FPL reports a total number of 125 accounts at this building address. The data below is an aggregate of electric usage for the accounts associated to this building. If the number of accounts is not consistent with your expectations, the best option is to provide the meter numbers to all services within a certain building, and the aggregate of the meters provided can then be delivered.

Reality - WASD

- All buildings are master-metered and can download 24 months of water data in excel format from WASD customer portal

B	C	D	E	F	G
n Start Date	End Date	Usage (CC	Cost	Estimatio	Usage (Gal
5/16/2024	8/14/2024	7		No	5236
2/14/2024	5/16/2024	10		No	7480
11/17/2023	2/14/2024	11		No	8228
8/16/2023	11/17/2023	7		No	5236
5/16/2023	8/16/2023	7		No	5236
2/14/2023	5/16/2023	10		No	7480
11/15/2022	2/14/2023	10		No	7480
8/15/2022	11/15/2022	13		No	9724



Working with utilities - future

- FPL
  - Automate internal process to satisfy large demands for WBD
  - Considering automatic integration with Portfolio Manager in the future
- WASD
  - Working to approve automation process and start working on it in mid-2025 to be implementation ready by mid-2026
  - AMIs/Smart meters?

Roadmap

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BE 305 BUILDING EFFICIENCY CHALLENGE

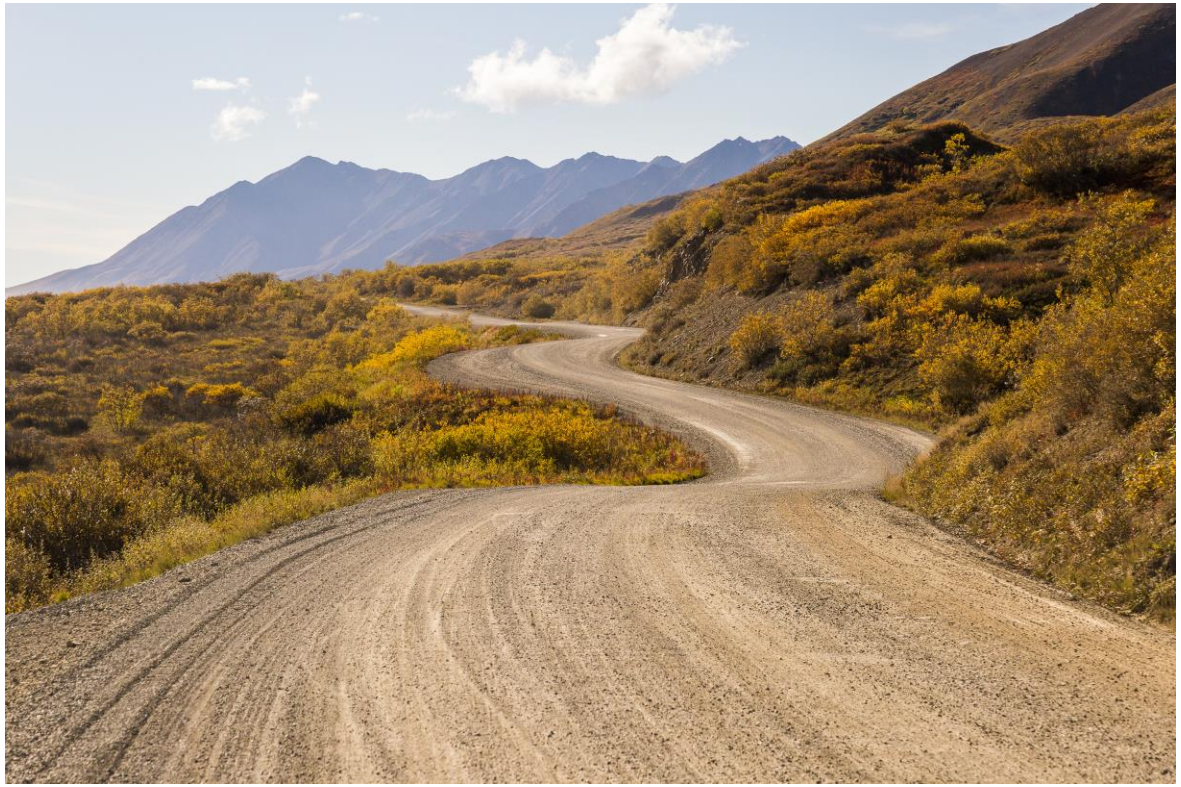
MIAMI-DADE COUNTY

Implementation timeline

Building size (sq ft)	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Above 200,000	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking + Retuning	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking + Retuning
100,000 - 200,000	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking + Retuning	Benchmarking	Benchmarking	Benchmarking	Benchmarking
50,000 - 100,000		Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking + Retuning	Benchmarking	Benchmarking	Benchmarking
30,000 - 50,000			Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking
20,000 - 30,000				Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking	Benchmarking
Total # buildings benchmarking	2138	4737	8605	13582	13582	13582	13582	13582	13582	13582
Total # of buildings retuning					901	1237	2599			901

Implementation tasks

- Maintain building list and UBIDs
- Outreach to increase compliance rate
- Assist with help desk
  - Answer questions
  - Provide trainings
  - Review exemptions
- Revise contract for benchmarking tool



BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Labor and cost

- Labor for ~13,500 buildings
  - In-house: 3 FTEs + Additional assistance (University class, interns, AIA members,..) for a few months around compliance date
  - Delegate to third party such as NGO

- Cost
  - Touchstone quote for 15,711 buildings
    - ~$150,000 w/out help desk annually
    - ~$550,000 with help desk annually
  - Building list and UBIDs inhouse

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

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BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Integration with City of Miami

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

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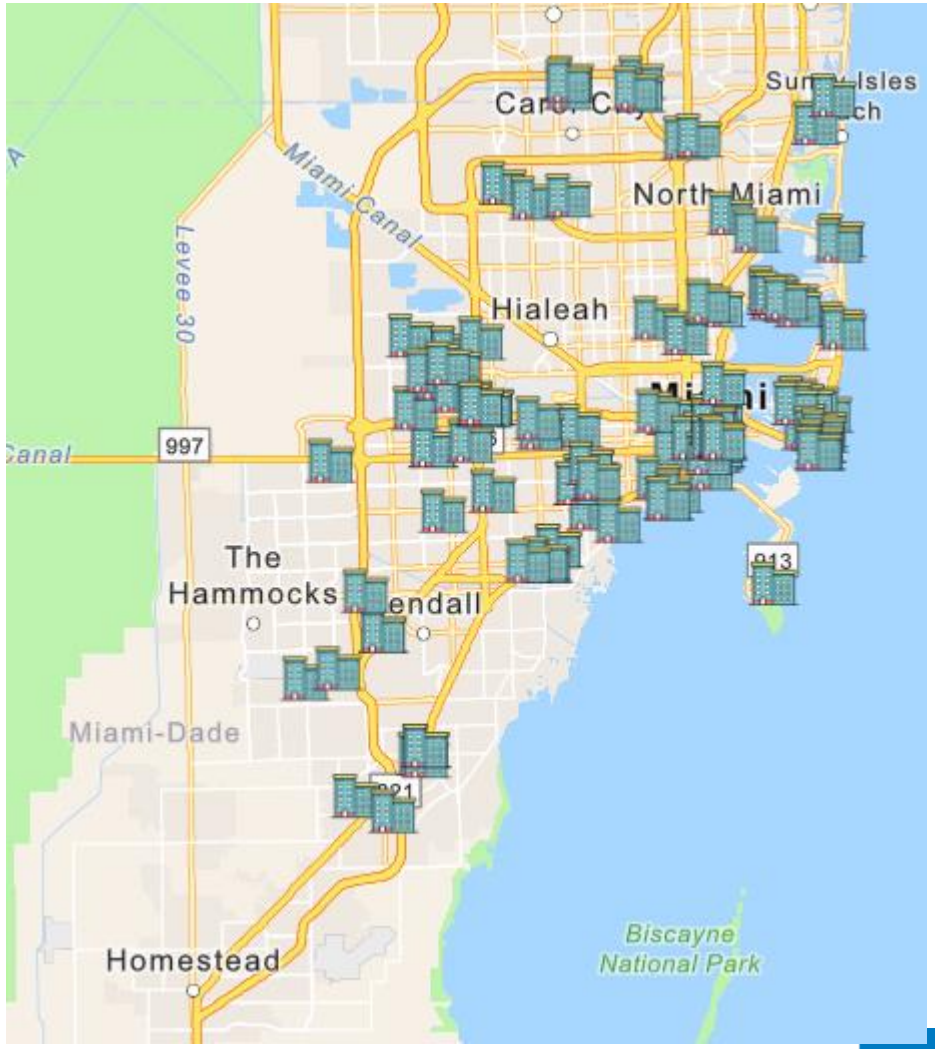
BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

PARTICIPATING BUILDINGS

- 180 buildings
- 47 million sq ft
- 16 municipalities + UMSA
- Office buildings, condos, hospitals, car dealership, nonprofit, high school, hotels
- Some interest in climate work, saving money is sill the chief driver



BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

GAME TIME!

Miami Lakes Town Hall

25,000 sq ft
2013
Municipal building

City of Miami Police Station

170,000 sq ft
1976

Grand Venetian

275,000 sq ft
2001
Large residential building

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

ASSESSMENTS & CASE STUDIES

Miami Lakes Town Hall

25,000 sq ft
2013
Municipal building

- $24,000 savings annually
- 36% energy savings

City of Miami Police Station

170,000 sq ft
1976

- $217,000 savings annually
- 50% energy savings

Grand Venetian

275,000 sq ft
2001
Large residential building

- $55,000
- 47% energy savings

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

IRRIGATION EVALUATION

A condominium in North Bay Village saved ?% on their water bill!

IRRIGATION EVALUATION

A condominium in North Bay Village saved 50% on their water bill!

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

ASSESSMENTS & CASE STUDIES

ESTIMATION SUMMARY OF ASSESSMENT RECOMMENDATIONS

Assessment Recommendations		Annual Resource Savings (kWh/yr)	Total Annual Savings	Capital Costs	Simple Payback (years)
1)	Turn Off Unused Equipment on Weekends	38,964	$2,205	$0	0.00
2)	Review the Rate Structure	0	$44,524	$0	0.00
3)	Increase Thermostat Settings on Weekends	166,027	$22,606	$580	0.03
4)	Increase Thermostat Settings during Operating Hours	210,677	$16,925	$580	0.03
5)	Install Motion Sensor Where Needed	29,679	$1,721	$1,680	0.98
6)	Replace Fluorescent Lights With LED	160,928	$12,928	$12,962	1.00
7)	Replace Chiller with New Efficient Ones	1,198,003	$96,243	$163,000	1.69
8)	Install the Solar Water Heater on the Roof	353,995	$20,532	$87,956	4.28
9)	Fix the Leak from Cooling Tower	Additional Consideration			
10)	Remove Personal Heaters	Additional Consideration			
Total		**2,158,273**	**$217,684**	**$266,758**	**1.0 yrs**

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

ASSESSMENTS & CASE STUDIES

ESTIMATION SUMMARY OF ASSESSMENT RECOMMENDATIONS

Assessment Recommendations		Annual Resource Savings (kWh/yr)	Total Annual Savings	Capital Costs	Simple Payback (years)
1)	Eliminate Water Leaks	1,068	$16,760	$1,600	0.10
2)	Increase Thermostat Settings in the Lobby and Common Areas	119,540	$9,859	$580	0.06
3)	Reduce Unused Energy Consumption on Devices After Hours	147,600	$9,742	$3,360	0.34
4)	Replace Inefficient Lights with LED in Selected Areas	80,558	$6,649	$2,870	0.43
5)	Change the Rate Structure from GSDT to GSD	0	$6,413	$0	0.00
6)	Install Motion Sensors in Common Areas	39,312	$2,595	$1,200	0.46
7)	Control Air Conditioning by Installing Smart Thermostat in Hallways and Lobby	21,068	$1,738	$4,120	2.37
8)	Enroll in FPL Autopay	0	$712	$0	0.00
9)	Reduce Temperature Setpoint for Pool Water Heaters	9,953	$702	$40	0.06
Total		**419,099**	**$55,170**	**$13,770**	**0.42 yrs**

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

ASSESSMENTS IMPACT

16 ASHRAE Level 2 assessments conducted so far

Annual energy saved in kWh: 8,872,158

One time-cost for upgrades: $367,987

Total annual dollar savings on bills: $1.035 million

Median savings of $ $48,572

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

Takeaways

- Voluntary programs are a great way for County staff to learn
- Many buildings are A students who understand the value of operating costs
- Some buildings have a layered structure with lots of stakeholders (Board, property management, consulting company handling the bills)
- Many more buildings don’t even do benchmarking
- Lots of opportunities for improvement
- Building assessments show that up to 30% of energy can be saved, confirming the theory
- No complaints but no waiting list for assessments
- A LOT of hand-holding, need to streamline and simplify as much as possible
- A lot of interest in WBD, especially for reporting purposes

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

THANK YOU!

Don’t hesitate to reach out:

Marta.Marello@miamidade.gov

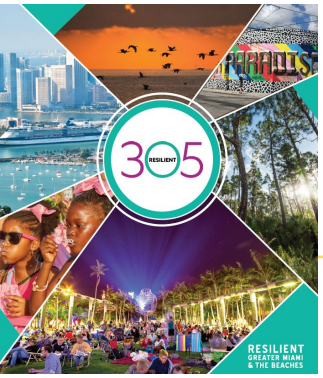
Patricia.Gomez@miamidade.gov

BE 305 BUILDING EFFICIENCY CHALLENGE

MIAMI-DADE COUNTY

BE305:
City of Miami

Energy and Water Benchmarking & Retuning



Planning for Sustainability

Relevant City Goals

2050 Goal	Achieve net zero GHG emissions by 2050
Built Environment Resilient305: Action 17	Develop an energy benchmarking and transparency ordinance for municipal and commercial buildings, with the first-year transparency completed by the end of 2023.
GHG Emissions	55% of city-wide GHG emissions comes from building energy consumption

BE305 Adopted!

Miami
FL

Ordinance
14005

ADOPTED WITH MODIFICATION(S)
Jun 10, 2021 9:00 AM

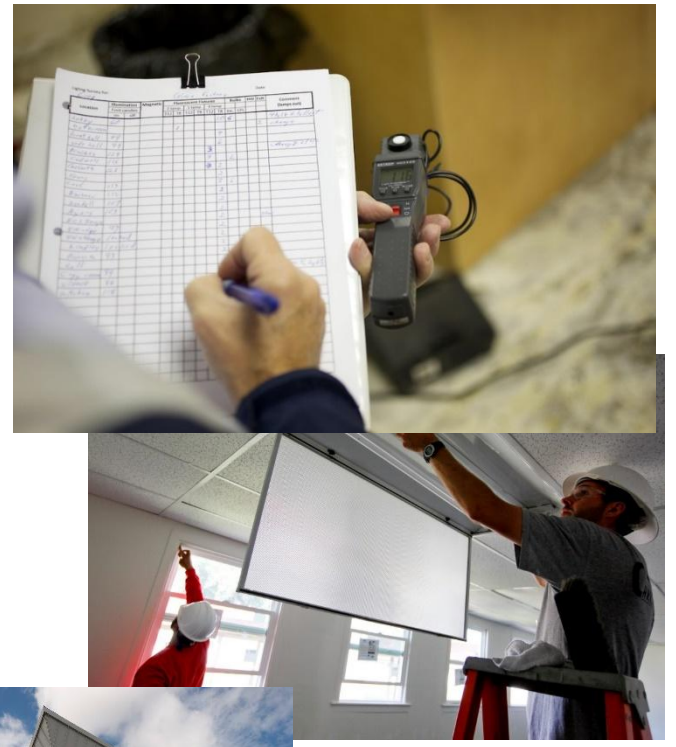
AN ORDINANCE OF THE MIAMI CITY COMMISSION AMENDING CHAPTER 10 OF THE CODE OF THE CITY OF MIAMI, FLORIDA, AS AMENDED, TITLED "BUILDINGS," TO ADD A NEW ARTICLE XII, TITLED "BUILDING ENERGY AND WATER CONSUMPTION BENCHMARKING", REQUIRING BUILDINGS OVER 20,000 SQUARE FEET OF GROSS FLOOR AREA TO PERFORM AND REPORT ANNUAL ENERGY AND WATER BENCHMARKING TO THE CITY OF MIAMI; PROVIDING FOR EXEMPTION OF CERTAIN BUILDING TYPES; CONTAINING A SEVERABILITY CLAUSE; AND PROVIDING FOR AN IMMEDIATE EFFECTIVE DATE.

Applicable Buildings

Building size	Building count
Above 200,000 sq ft	401
Between 100,000 and 199,999 sq ft	234
Between 50,000 and 99,999 sq ft	342
Between 20,000 and 49,999 sq ft	914
City of Miami Total	**1891**

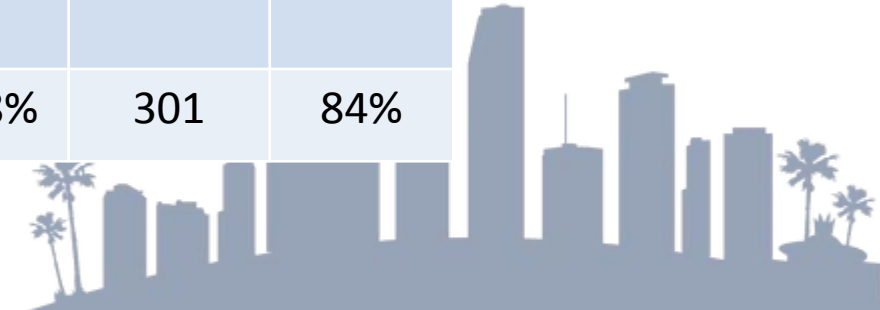
Compliance Dates: Benchmarking

Property size	Benchmarking (annual)
200,000 sq. ft. and larger	June 30, 2023
100,000 sq. ft. - 199,999 sq. ft	October 1, 2023
50,000 sq. ft. - 99,999 sq. ft	October 1, 2024
20,000 sq. ft. - 49,999 sq. ft	October 1, 2025



How It's Going

	All BIDs	%	200K SF+	%	100k – 200k SF	%	50K-100 K SF	%
Number of BIDs	976		395		232		340	
Submitted	357	37%	221	56%	97	42%	39	11%
In Compliance	306	31%	193	49%	82	35%	31	9%
Exempt	9	1%	6	1.5%	3	1.3%	0	0%
Pending Revisions	42	4%	22	6%	12	5%	8	2%
Not Submitted	619	63%	174	44%	135	58%	301	84%



ENERGY STAR Portfolio Manager Overview

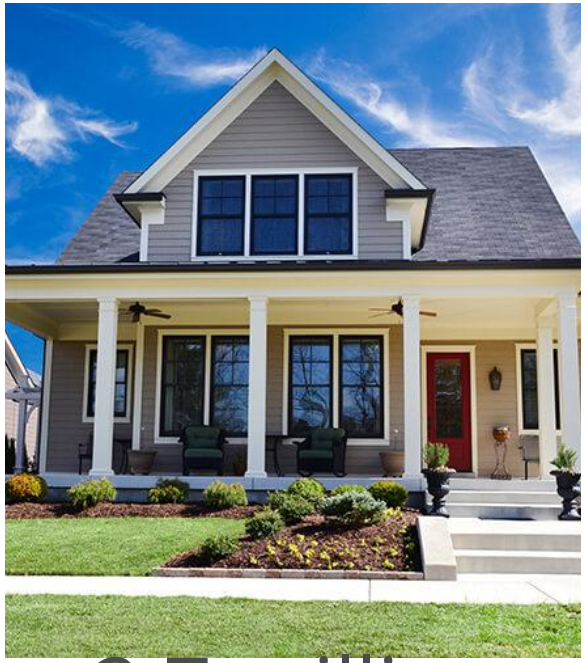
Southeast Florida Regional Climate Change Compact

November 18, 2024

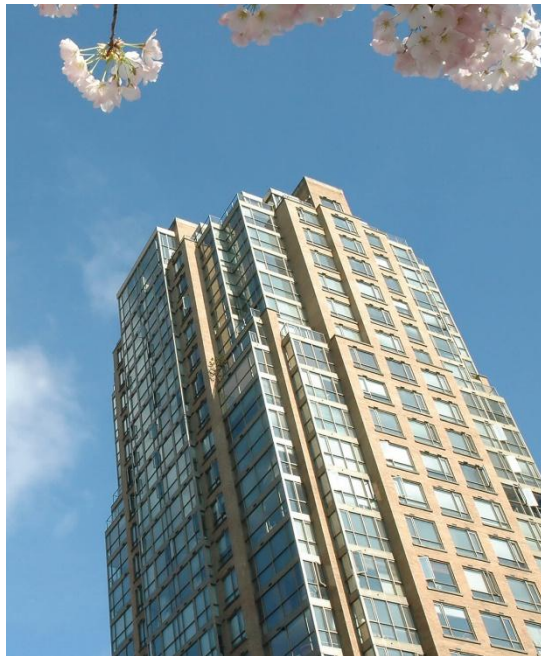
What is ENERGY STAR?

The biggest little label in energy efficiency

7 billion products

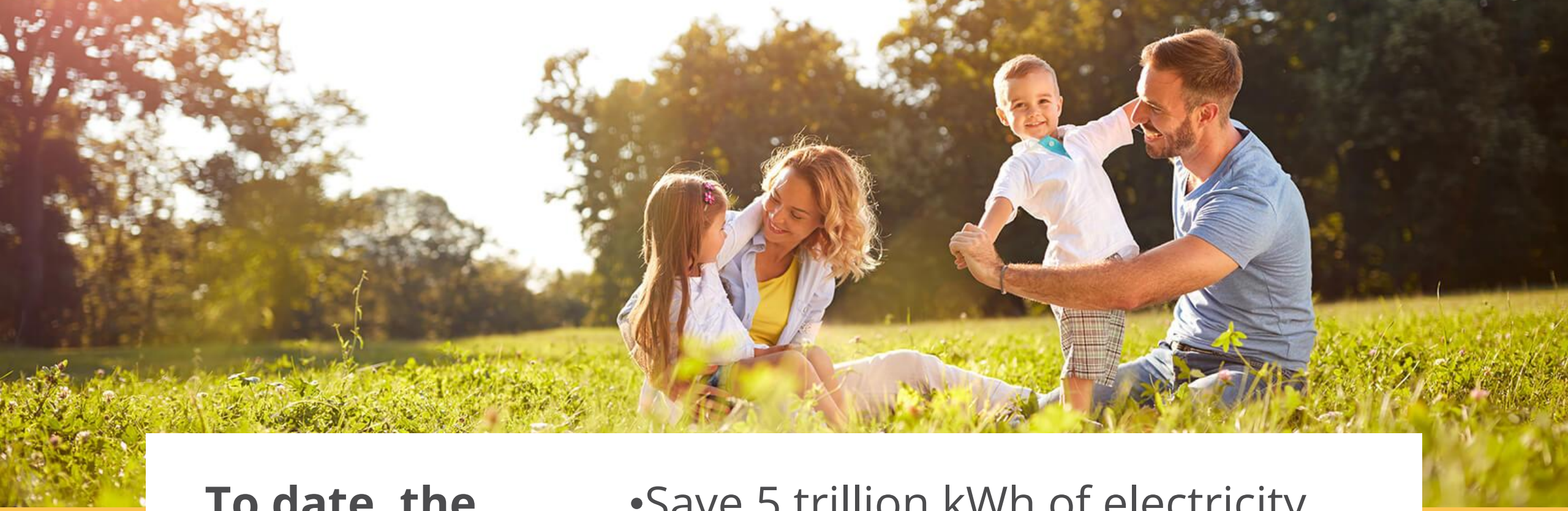


2.7 million new homes



43,000 buildings

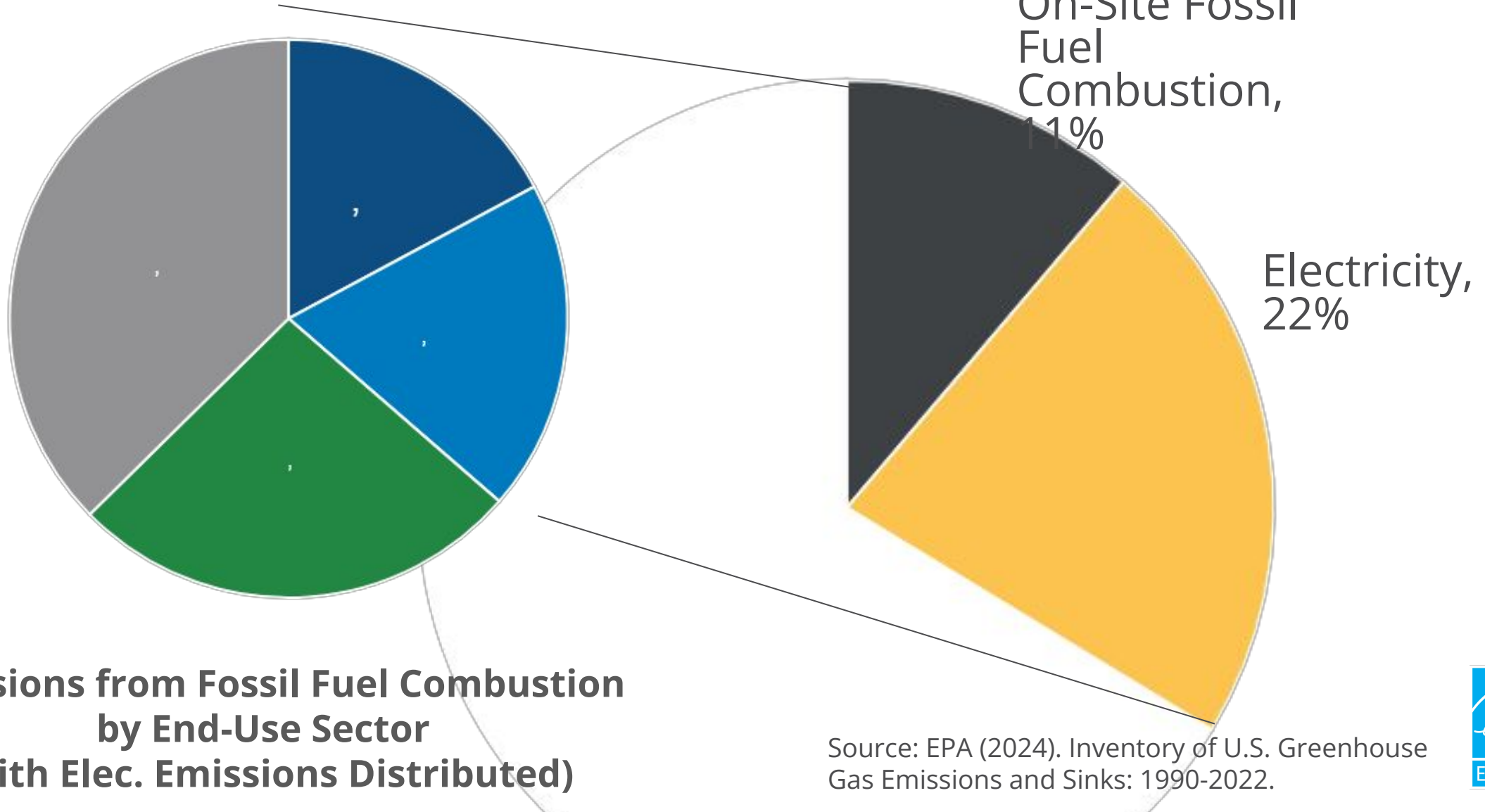
270 industrial plants



To date, the ENERGY STAR program has helped Americans:

- Save 5 trillion kWh of electricity
- Save $500 billion in energy costs
- Avoid 4 billion metric tons of GHG emissions

Where Do U.S. Emissions Come From?



Emissions from Fossil Fuel Combustion by End-Use Sector (with Elec. Emissions Distributed)

Source: EPA (2024). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2022.

What is Portfolio Manager?

Benchmarking allows you to:

- Evaluate portfolio-wide performance
- Understand individual building performance
- Compare energy performance to national median
- Identify and address potential problems by looking at monthly trends
- Track the impact of energy, water, waste management strategies

Free. Online. Secure.
energystar.gov/benchmark

ENERGY STAR®
PortfolioManager®

- 330,000+ buildings last year
- Nearly 25% of all floorspace
- Dozens of state/local benchmarking policies
- One foreign government (Canada)

ENERGY STAR® Portfolio Manager®

Management Tool

- Assess whole building energy and water consumption, plus waste
- Track green power purchase
- Share/report data with others
- Track changes in energy, water, greenhouse gas emissions, and cost over time
- Create custom reports
- Apply for ENERGY STAR certification

ENERGY STAR® Portfolio Manager®

Hundreds of metrics, including:

Energy use
Source, site, weather normalized, demand

Water use
Water use intensity, Water Score (for Multifamily)

Waste & Materials
Waste intensity, diversion rate

1-100 ENERGY STAR score

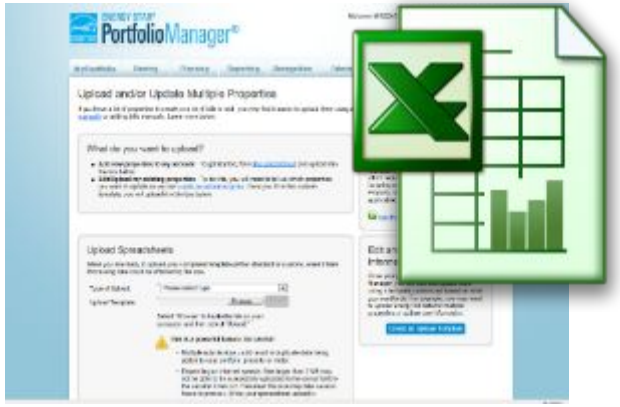
GHG emissions
Indirect, direct, total, avoided

ENERGY STAR

Choose the best data management method

Manual Entry

Spreadsheet Upload



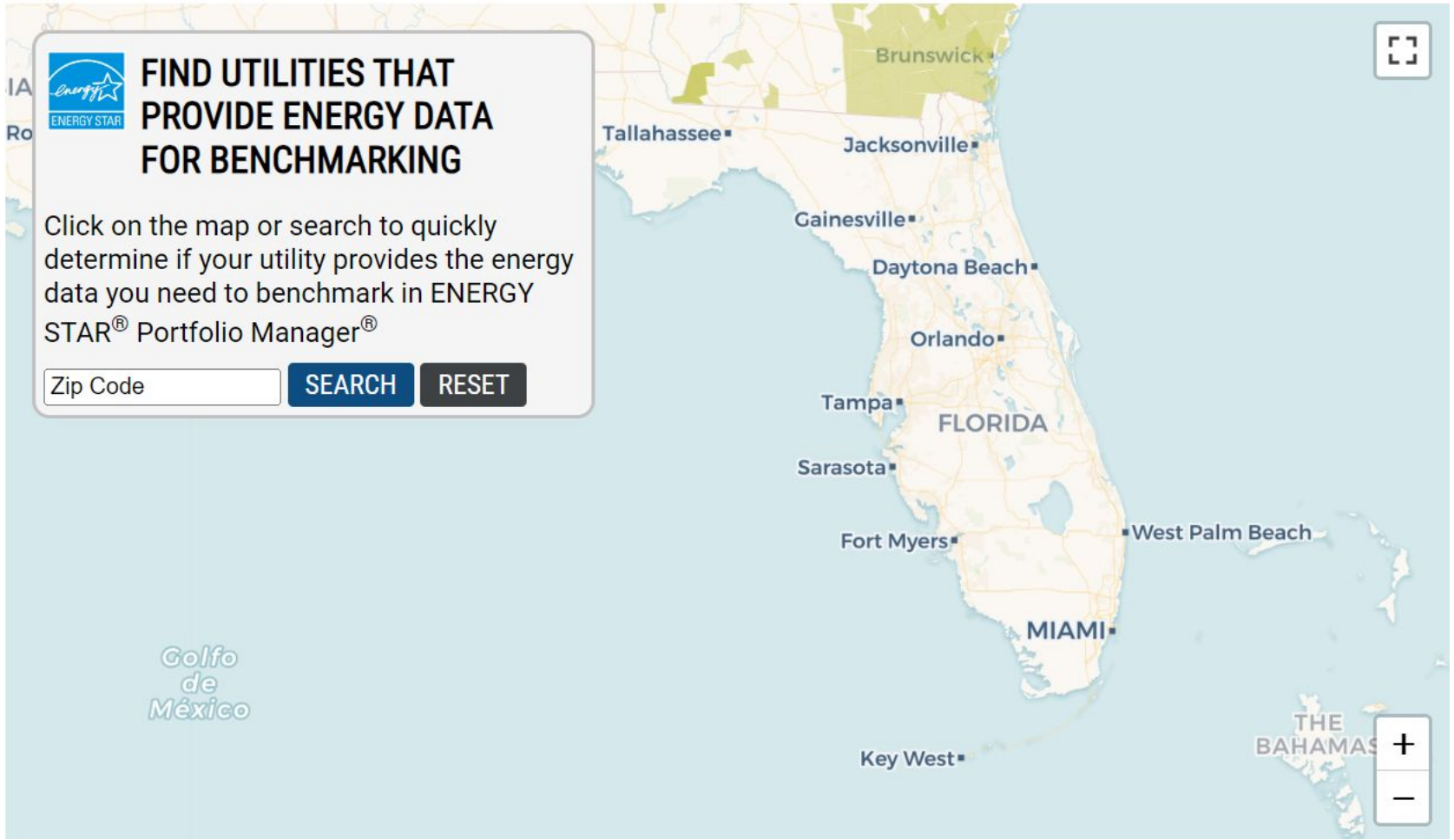
Web Services

Utility Data Access Campaign

- Access to whole-building energy data is critical for building owners to identify the best opportunities for improvements.
- Many utilities already provide the energy and/or water data needed for benchmarking, but the vast majority across the country don't.
- The EPA is launching a new campaign to assist building owners in making the case to utilities about why they need the data.
  - The EPA is working with Florida Power & Light to help increase the availability of whole-building energy data.

Expanding Access to Whole-Building Energy Data | ENERGY STAR

Find Utilities that Provide Benchmarking Data

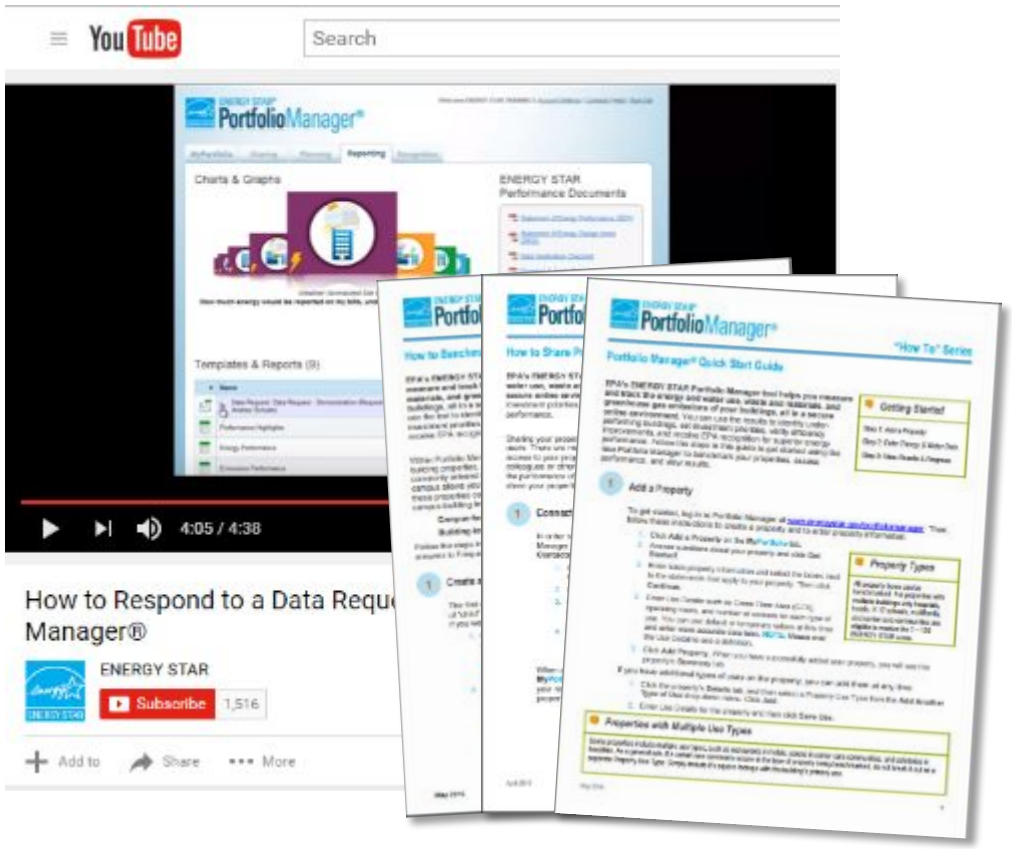


energystar.gov/UtilityData

450 Providers Exchange Data with Portfolio Manager

energystar.gov/buildings/save-energy-commercial-buildings/expert-help/service-providers-exchange-data

Portfolio Manager Training



- Weekly live webinars
- Recorded webinars
- 3-7 minute training videos on YouTube
- Step-by-step training guides, FAQs, and technical reference documents

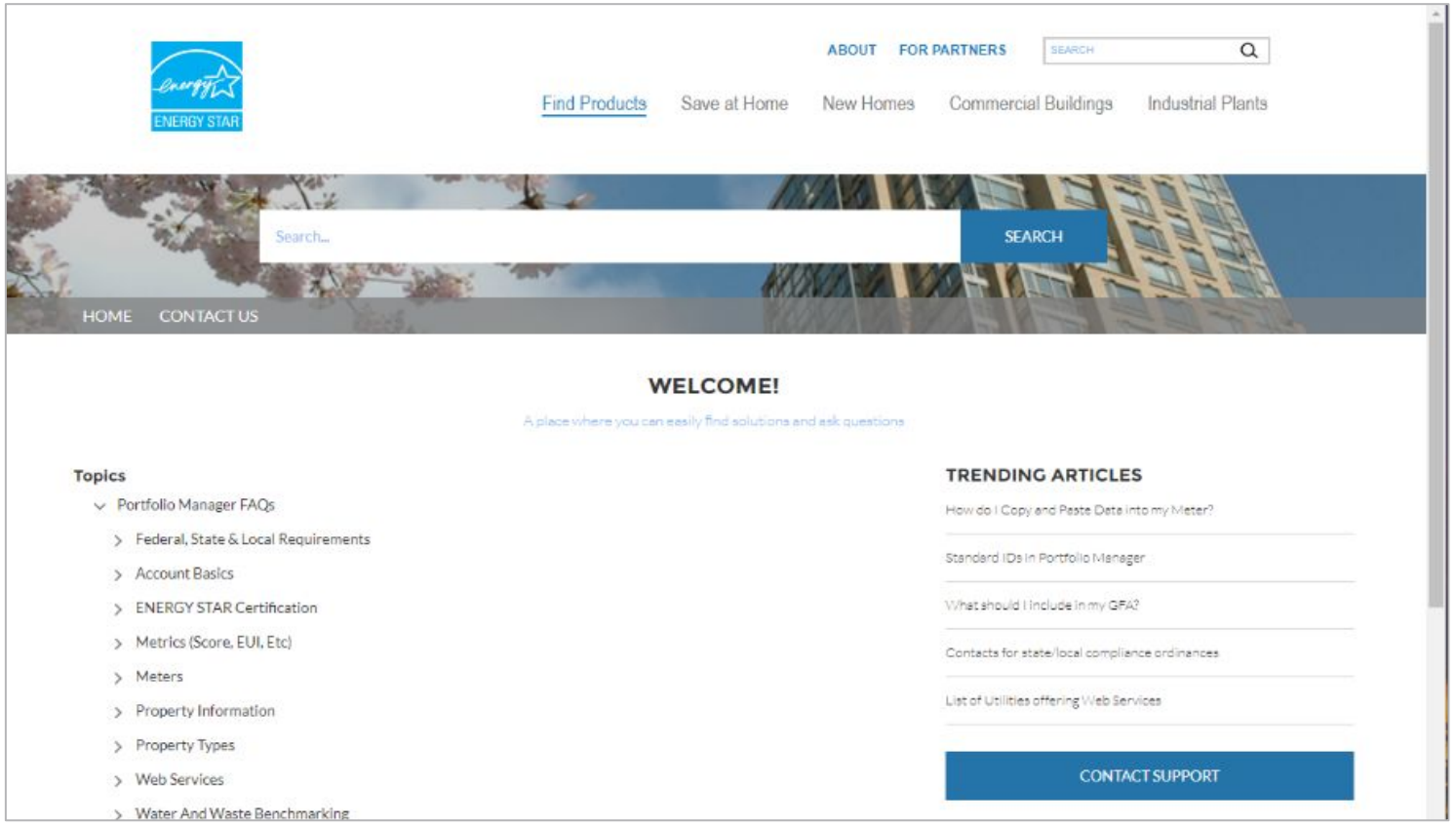
energystar.gov/buildings/training

Training Series: Complying with Ordinances

- This 3-part webinar series serves as a beginner's guide to Portfolio Manager and provide you with all the essential "how-to" information you need to start benchmarking and reporting your building data to your local or state government.
  - **Part 1:** A Beginner's Guide to Using Portfolio Manager for Benchmarking Law Compliance
  - **Part 2:** Using Benchmarking Results to Understand Your Building's Performance
  - **Part 3:** To Efficiency & Beyond! How to Benefit from Benchmarking Compliance with Strategies for Improving Energy Performance

energystar.gov/buildings/training/complying-ordinances

ENERGY STAR Help Desk



- Hundreds of FAQs
- Send in a ticket for a response within two business days
- EPA is creating a new FAQ that pulls together compliance-relevant FAQs in one place

energystar.gov/BuildingsHelp

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Two Rebate Finders for Commercial Buildings

Find Rebates on Efficient Commercial Building Equipment

Start your search in the ENERGY STAR rebate finder. If you can't find what you're looking for, the Utility Genius rebate finder contains additional types of commercial equipment in categories where ENERGY STAR certification is not available.

ENERGY STAR Rebate Finder

Search for rebates on products in all 85 ENERGY STAR product categories including:

- Appliances
- Consumer electronics
- Commercial food service
- Data center equipment
- Lighting (mostly residential)
- Pool pumps
- Residential and light commercial HVAC
- Smart thermostats
- Water heating

ENERGY STAR Rebate Finder

Utility Genius Rebate Finder

Search for rebates on commercial building equipment within product categories where ENERGY STAR certification is not available, including:

- Commercial HVAC equipment
- Commercial lighting
- Commercial building automation

Utility Genius Rebate Finder

energystar.gov/CommercialRebat

Thank you!

Please be in touch!

- hatcher.caterina@epa.gov, statelocal@energystar.gov

ENERGY STAR Policymakers Page

Sign up for newsletters

- ENERGY STAR: Commercial Buildings Program Updates, Portfolio Manager Updates, Training, Building Performance Policy Updates, Updates for Web Service Providers (for anyone using the web services API – also join quarterly web service webinars!)
- State and Local Climate and Energy News: Newsletter from our sister program at EPA; includes training and funding opportunities

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Boston's Building Performance Standards - BERDO

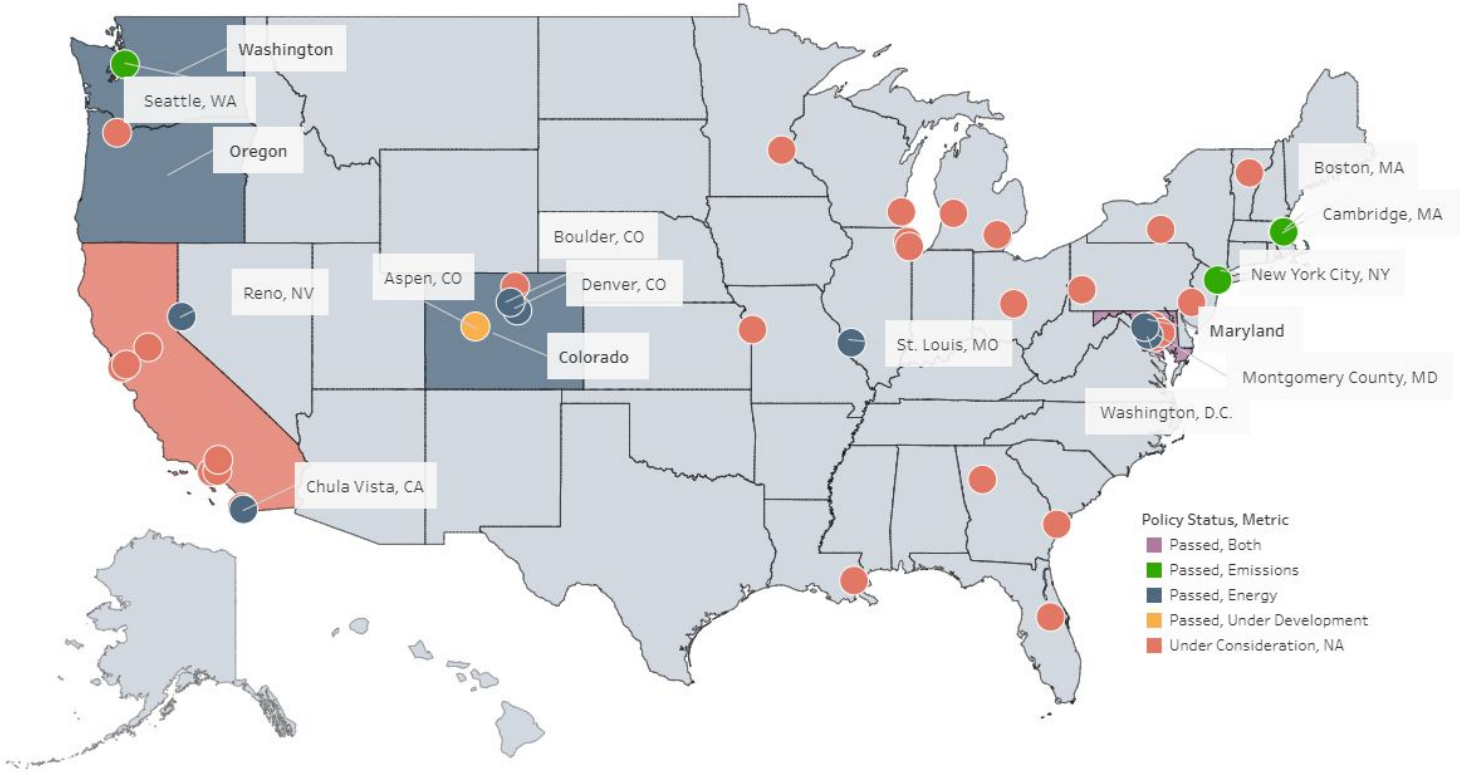
November 18, 2024

WHAT IS BERDO?

The Building Emissions Reduction and Disclosure Ordinance (BERDO) addresses Boston's largest source of emissions.

- BERDO requires medium and large buildings in Boston to reduce emissions over time and achieve **net-zero emissions by 2050**.
- By complying with BERDO, the approximately 6,000 covered buildings (5% of buildings in Boston) could collectively **reduce city-wide emissions by nearly 40%**.
- There are several ways a building can directly or indirectly reduce its emissions and come into compliance with its BERDO emissions standard.

STATE AND LOCAL BUILDING PERFORMANCE STANDARDS



WHAT IS REQUIRED UNDER BERDO?

REPORTING

Annual reporting of total energy and water use from the previous calendar year.

THIRD-PARTY VERIFICATION

Third-party verify reported data on their first year of reporting and every "Verification Year" thereafter.

EMISSIONS REDUCTIONS

Reduce annual emissions below an emissions standard (emissions limit).

WHAT BUILDINGS ARE COVERED BY BERDO?

- **Non-residential buildings** that are **20,000 ft^2** or larger excluding parking (e.g., office spaces, churches, universities)
- **Residential buildings** that have **15 or more units** (e.g., apartments and multi-family buildings)
- Any parcel of land with multiple buildings that sum to **20,000 ft^2** or **15 units** or more.

WHEN DO EMISSIONS STANDARDS START?

First year with an emissions standard	Non-Residential buildings	Residential buildings
2025	35,000 ft^2 or larger	35 or more units
2030	20,000 - 34,999 ft^2	15 - 34 units

WHAT ARE THE EMISSIONS STANDARDS (LIMITS)?

Emissions standards set annual emissions limits based on different types of building uses.

Emissions Standards by Building Use Type:

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

- Based on emissions intensity and reported in kilograms of carbon dioxide equivalent per square foot per year.
- Based on the building use type and reduced every five years.
- All buildings covered by BERDO are expected to achieve net-zero emissions by 2050.

COMPLIANCE MECHANISMS

HOW WILL BUILDINGS REDUCE THEIR EMISSIONS?

Options to keep a building's emissions under its limit include:

Direct reduction of emissions produced by a building:

- *Energy efficient appliance upgrades, electrification, improved building insulation and controls, etc.*

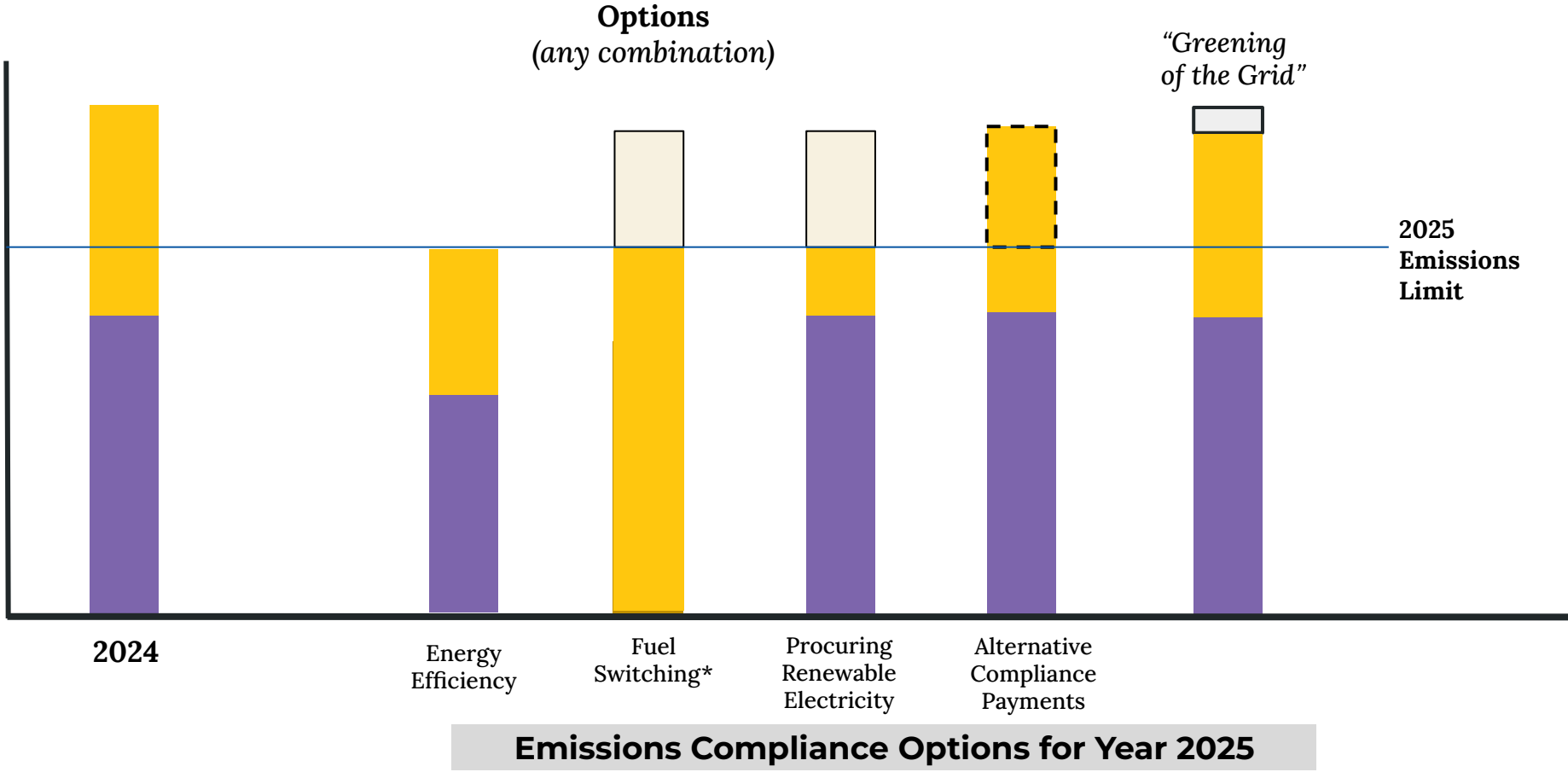
Purchasing of eligible renewable energy

- *Boston Community Choice Electricity, local solar generation, Renewable Energy Certificates, Power Purchase Agreements*
- *Renewable energy may be used to reduce emissions only from electricity usage.*

Alternative Compliance Payments (ACP)

- *$234 per metric ton of CO_2e*
- *ACPs go into the Equitable Emissions Investment Fund*

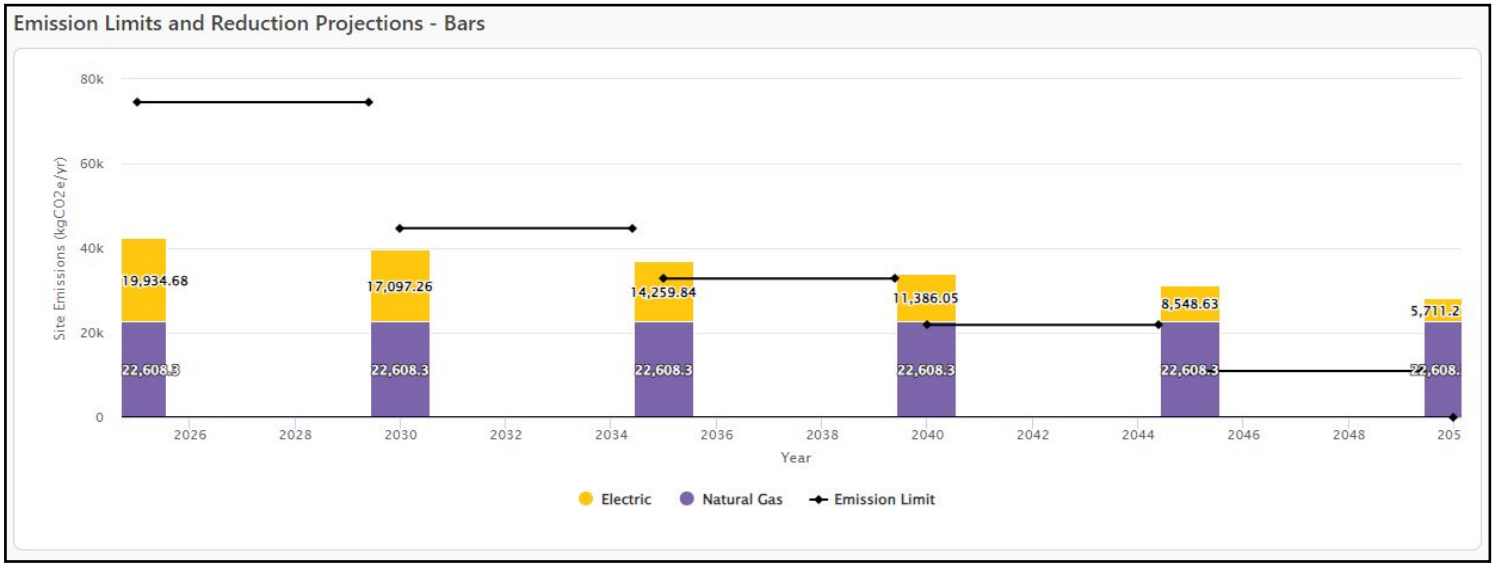
EXAMPLE: SINGLE BUILDING COMPLIANCE



** Fuel switching often best when combined with efficiency **For illustrative purposes only*

BERDO EMISSIONS CALCULATOR

BERDO Emissions Calculator - Designed to assist building owners in evaluating and understanding their projected emissions and compliance. Paired with its **guidance document**.



berdocalculator.touchstoneiq.com

FLEXIBILITY MEASURES

	BLENDED EMISSIONS STANDARD	BUILDING PORTFOLIO	INDIVIDUAL COMPLIANCE SCHEDULE	HARDSHIP COMPLIANCE PLAN
DESCRIPTION	Allows Owners of a building or building portfolio with more than one primary use to calculate a blended emissions standard based on the mix of primary uses in the building(s).	Allows Owners of multiple Buildings to comply with a single portfolio-level emissions standard according to the mix of Building Uses in the portfolio.	Allows Owners to comply with an alternative emissions reduction schedule based on a baseline year.	Allows Owners to comply with alternative emissions reduction limits and/or schedules.
EMISSIONS REDUCTION REQUIREMENT	Requires calculating and complying with a blended emissions standard.	Requires use of a blended emissions standard in most cases.	Requires a 50% emissions reduction from the baseline year by 2030 and a 100% reduction by 2050.	May allow alternative emissions reduction timeline or less stringent emissions reduction limits.
ELIGIBILITY	**More than one** Primary Use in a building.	Any Owner with **multiple buildings**, that demonstrates eligible shared ownership or a shared Institutional Master Plans for all Buildings in the Building Portfolio.	**Third-party verified data** for the baseline year and Gross Floor Area must not have reduced by more than 10% and the Primary Use type must be the same from the baseline year.	Owner must **demonstrate** one of the **eligible hardships**.
REQUIRES REVIEW BOARD APPROVAL	⊘	✓	✓	✓
CAN BE COMBINED WITH	Building Portfolios	Blended Emissions Standard; Individual Compliance Schedules; Hardship Compliance Plans	Building Portfolios	Building Portfolios

A Building Owner **cannot combine an Individual Compliance Schedule with a Hardship Compliance Plan.*

WHY YOU MAY CONSIDER APPLYING FOR A FLEXIBILITY MEASURE

BUILDING PORTFOLIOS

- *If you own multiple BERDO buildings.*
- *If you want to align your capital planning to target deeper retrofits and other improvements in certain buildings first.*

INDIVIDUAL COMPLIANCE SCHEDULE

- *If you have good quality historical data that can be third-party verified.*
- *If you have implemented significant building retrofits or other emissions reduction efforts prior to 2021.*
- *If your current emissions are significantly higher than the average building in your Building Use category.*
- *If you would prefer to plan emissions reduction efforts by benchmarking against your historical emissions, rather than based on your Building Use category.*

HARDSHIP COMPLIANCE PLAN

- *If you face an unforeseen "hardship" that will not allow you to comply with emissions standards in the short-term (1 - 3 years)*
- *If you face a long-term "hardship" (4+ years) in complying with emissions standards.*

REMINDERS & RESOURCES

ONGOING CHALLENGES

- Ongoing Data Quality Concerns
- Data Access from the Utility Companies
- Outreach to Non-Compliant Building Owners
- Administrative Bandwidth

FINES & ENFORCEMENT

The Ordinance establishes three types of fines:

Failure to comply with reporting and verification requirements	• *Non-Residential Buildings ≥ 35,000 sq. ft.* • *Two or more Buildings on the same parcel ≥ 100,000 sq. ft.* • *Residential Buildings ≥ 35 units or ≥ 35,000 sq. ft.*	$300 per Day
	• *Non-Residential Buildings ≥ 20,000 SF but < 35,000 sq. ft.* • *Residential Buildings ≥ 15 units but < 35 units; or ≥ 20,000 sq. ft. but <35,000 sq. ft.*	$150 per Day
Failure to comply with Emissions standards	• *Non-Residential Buildings ≥ 35,000 sq. ft.* • *Two or more Buildings on the same parcel ≥ 100,000 sq. ft.* • *Residential Buildings ≥ 35 units or ≥ 35,000 sq. ft.*	$1,000 per Day
	• *Non-Residential Buildings ≥ 20,000 SF but < 35,000 sq. ft.* • *Residential Buildings ≥ 15 units but < 35 units; or ≥ 20,000 sq. ft. but <35,000 sq. ft.*	$300 per Day
Failure to accurately report information	• *All Buildings*	$1,000 - $5,000, at Review Board's discretion

HOW WE ARE HELPING BUILDING OWNERS

- **Help desk phone and email**
- **BERDO Emissions Calculator tool (Guide)**
- **BERDO webinar series (recordings available at boston.gov/berdo)**
  - *Recordings on flexibility measures and emissions compliance*
- **Free assistance for BERDO reporting and third-party verification**
  - *Targeting self-managed residential buildings, small non-profit owners, or commercial buildings with small business tenants. Staff will prioritize owners with limited English proficiency, digital literacy, financial resources, located in EJ communities, and/or facing unusual challenges.*
- **Weekly office hours for emissions compliance**
- **One-on-one building emissions consultations**
- **How to Report Guide**
- **Renewable Energy Guide**
- **Hardship Compliance Plan Guide & FAQs**
- **BERDO Handbook for Condo Associations**

RESOURCES

[BERDO Homepage]
[BERDO Regulations]
[Retrofit Resource Hub]
[BERDO Emissions Calculator]

CONTACT US:

Emissions Compliance: retrofit@boston.gov

Energy Reporting: energyreporting@boston.gov

THANK YOU