

April 24, 2024

To: Mayor and Members of City Council
From: Sheryl M.M. Long, City Manager
Subject: Energy Benchmarking & Building Performance Standards

202401247

Reference Document #202400225

The Climate, Environment, & Infrastructure Committee at its session on January 10, 2024, referred the following item for review and report.

MOTION, WE MOVE that the Administration compile a report back to Council within sixty (60) days on the use of “energy benchmarking” practices and building performance standards in other cities and their effectiveness on reducing energy consumption and carbon emissions from residential, commercial, and industrial buildings.

WE MOVE, that the Administration share as a part of this report any learning as a result of the energy benchmarking involving companies in the 2030 District.

WE FURTHER MOVE, that the report contains a list of existing incentives, programs, and/or financing tools at the Federal, State and Municipal level that can be utilized to improve the energy efficiency of residential, commercial, and industrial buildings.

The purpose of this report is to provide City Council with the requested information on energy benchmarking and building performance standards to determine the potential implementation of benchmarking practices in Cincinnati.

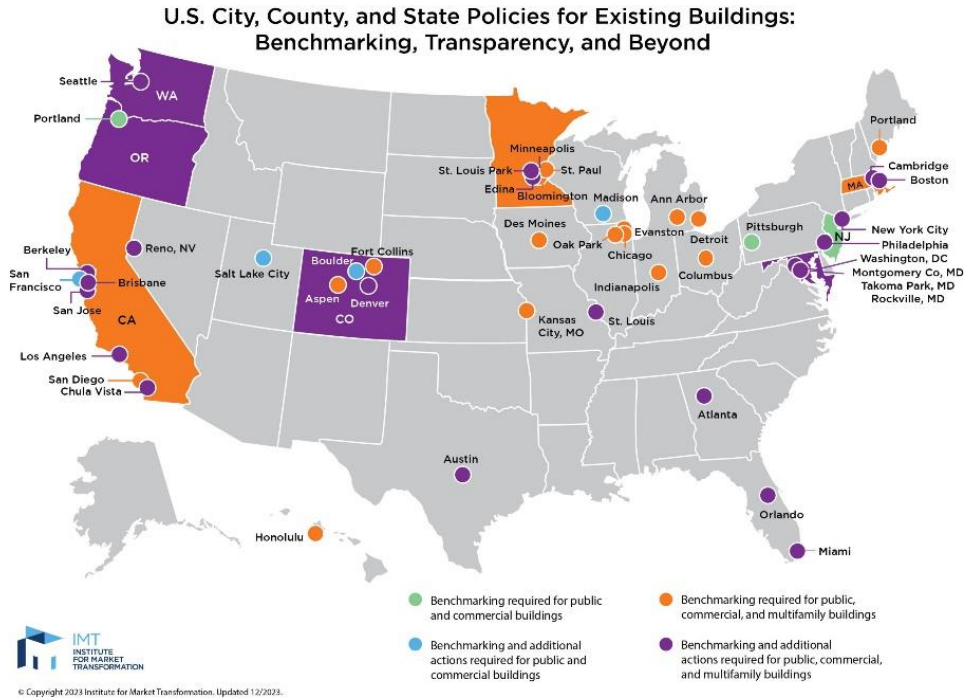
BACKGROUND

Commercial buildings currently account for more than 30% of greenhouse gas emissions in Cincinnati¹. Two strategies cities and states often employ to reduce emissions from commercial buildings include “energy benchmarking” and “building performance standards.”

Energy benchmarking refers to the practice of measuring the energy performance of a building over time. This provides owners and occupants the ability to understand their building’s energy performance relative to similar buildings and provides an easy way to understand energy use and evaluate smarter, more cost-effective operational and capital investment decisions. Performance is measured using energy usage intensity (EUI), which is the amount of energy the building uses per square foot on an annual basis (kBtu/sq.ft./year). Currently, 44 cities, 6 states, and the District of Columbia have passed benchmarking policies requiring certain types of buildings to report energy usage annually. The policies are designed to make building energy performance information available to the market, to help owners and occupants value energy performance in decision-making.

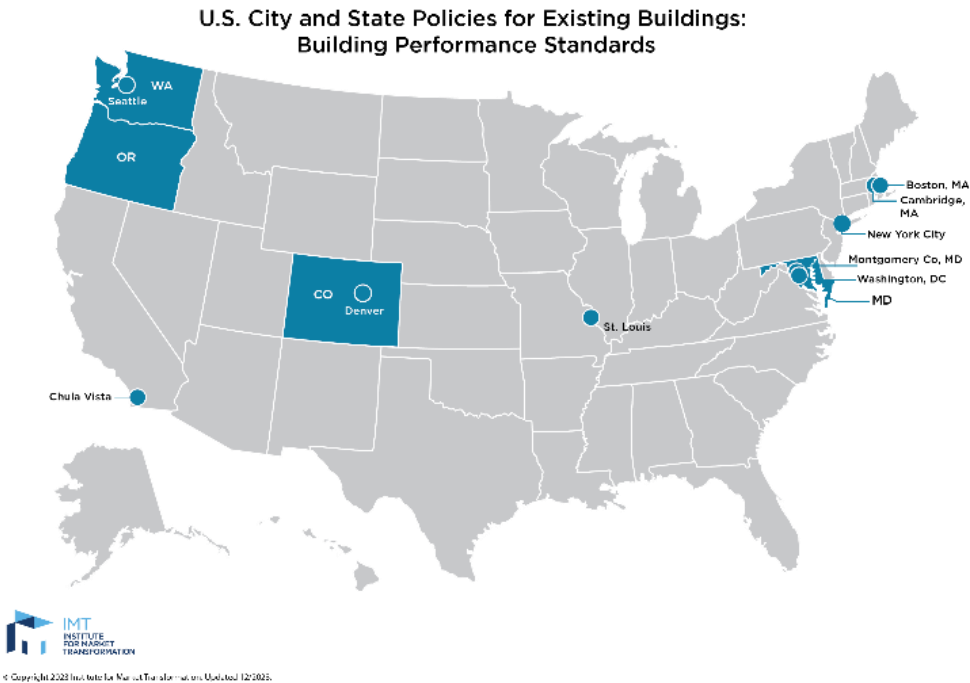
¹ 2023 Green Cincinnati Plan

Figure 1: Energy Benchmarking Policies in the United States²



Building performance standards (BPS) are an additional policy tool beyond energy benchmarking that establishes performance targets that buildings are required to achieve. BPS use reported benchmarking data to track compliance with targets such as energy use intensity (EUI) or greenhouse gas emissions (GHG). BPS often get stricter over time which ensures continuous improvement of a city’s building stock.

Figure 2: Building Performance Standards Policies in the United States³



² Institute for Market Transformation, 2023

³ Institute for Market Transformation, 2023

Most benchmarking and BPS programs utilize the Environmental Protection Agency's (EPA) free ENERGY STAR® *Portfolio Manager*® tool to track and score building energy usage. Building owners enter information for each building such as size, type of building, and occupancy information. Utility usage must be entered monthly and can be obtained from utility bills, data collected from tenants, or from master meters. Once data is entered in *Portfolio Manager*®, it will calculate the building's EUI and assign an ENERGY STAR score. Program managers can review the data for compliance with local policies. In many cities, this information is displayed on transparency maps so that the data can be viewed by the public and other interested parties.

Benchmarking policies can help reduce building energy usage. *Portfolio Manager*® conducted a study of 35,000 buildings that consistently benchmarked their energy usage for three years. The study found that, on average, benchmarking produces energy savings of 2.4% annually, and 7% over a three-year period.⁴ The savings are due to increased awareness of energy usage by building owners and increased market competition as tenants are better equipped to value energy costs in the site selection process.

EXAMPLES OF BENCHMARKING POLICIES IN THE MIDWEST

Several Midwestern cities have passed benchmarking policies, including Columbus, Chicago, Indianapolis, and St. Louis. Columbus, Indianapolis, and Chicago have adopted benchmarking ordinances while St. Louis has adopted benchmarking as well as building performance standards. All four cities require benchmarking on commercial buildings measuring 50,000 square feet and larger.

Columbus

The City of Columbus measures energy use intensity (EUI) through *Portfolio Manager*®. Under Columbus City Code Title 41 - Building Code Chapter 4117, public, commercial, and multifamily buildings over 50,000 square feet must report their energy usage.⁵ Based on 2023 reporting, 39.94% of applicable buildings were in compliance with the ordinance.⁶ The average EUI for buildings required to benchmark their data was 84.6 kBtu/sq.ft./year during the 2023 reporting year.⁷ Over three years, Columbus saw an 11.04% decrease in average energy usage.⁸ Under Section 4117.15 of the benchmarking ordinance, failure to comply results in a notice of the violation after 60 days and potential fines or late fees.⁹

Chicago

Chicago requires residential, commercial, and multifamily buildings to report energy data to benchmark EUI and GHG emissions. The city's benchmarking policy is outlined under Municipal Code Chapter 18-14.¹⁰ Based on 2020 reporting, 85% of required buildings were in compliance.¹¹ Chicago's benchmarking ordinance charges a fee of up to \$100.00 for an initial violation, with an additional penalty of \$25.00 for each day that a building fails to report.¹² The city reports that GHG intensity decreased 25% from 2016 to 2020 while EUI decreased by 9% over the same time period.¹³ In 2019, the city implemented the Chicago Energy Rating System, which requires buildings to place a placard indicating their energy performance in public view.

⁴ https://www.energystar.gov/sites/default/files/buildings/tools/DataTrends_Savings_20121002.pdf

⁵ <https://www.columbus.gov/sustainable/benchmarking/>

⁶ <https://maps.touchstoneiq.com/columbus/>

⁷ Data cited from Sustainable Columbus Initiative's Columbus Compliance Report

⁸ Data cited from Sustainable Columbus Initiative's Columbus Compliance Report

⁹ <https://www.columbus.gov/sustainable/benchmarking/>

¹⁰ https://codelibrary.amlegal.com/codes/chicago/latest/chicago_il/0-0-0-2685180

¹¹ https://www.chicago.gov/content/dam/city/progs/env/EnergyBenchmark/2020_Chicago_Energy_Benchmarking_Report.pdf

¹² https://codelibrary.amlegal.com/codes/chicago/latest/chicago_il/0-0-0-2685180

¹³ https://www.chicago.gov/content/dam/city/progs/env/EnergyBenchmark/2020_Chicago_Energy_Benchmarking_Report.pdf

St. Louis

St. Louis passed building performance standards in addition to its benchmarking policies. The original ordinance, #70474, was passed in 2017, mandating the reporting of energy usage.¹⁴ In 2021, the city reported an average EUI of 81.2 kBtu/sq.ft./year, a decrease of 14.9 kBtu/sq.ft. from 2017.¹⁵ In the same year, 76.1% of buildings were in compliance, an increase of over 20% from 2017.¹⁶ In 2020, the city became the first in the Midwest to enact building performance standards.¹⁷ The St. Louis BPS include EUI requirements for different types of buildings. For example, education buildings must achieve an EUI of 80.1 kBtu/sq.ft./year, while hospitals must achieve an EUI of 259.9 kBtu/sq.ft./year. [08]

Indianapolis

Indianapolis passed its Benchmarking and Transparency Ordinance in July of 2021. The policy requires commercial buildings larger than 50,000 sq. ft. and public buildings 25,000 sq. ft. and larger to report their energy usage.¹⁸ As of 2022, 83 total buildings had reported their energy usage through *Portfolio Manager*®, 66 of which were privately-owned.¹⁹ Under Section 710-109 of Chapter 710 of the Revised Code of the Consolidated City and County, buildings that do not report their energy usage will be subject to fines after 30 days past the initial notice of violation.²⁰ There is currently no published data for energy savings under the ordinance.

Table 1: Summary of Benchmarking Requirements in Midwest Cities

	Building Size	Measurement	Participation	Enforcement	Energy Savings	BPS in Place
Columbus, OH	≥ 50,000 sq ft	EUI, Energy Star Score	39.94% (2023)	60 days past notice, fee of up to \$1000	11.04% average energy usage decrease from 2021 to 2023	No
Chicago, IL	≥ 50,000 sq ft	GHG, EUI, Energy Star Score	85% (2020)	First violation results in fine ≥ \$100, + \$25 for each additional day	GHG: decrease of 25% since 2016; EUI: 9% decrease since 2016	No
St. Louis, MO	≥ 50,000 sq ft	EUI, Energy Star Score	76.1% (2021)	60 days past notice, fine ≤ \$50 - \$200 ≥, cumulative fine not exceeding \$1000 annually	15.50% average EUI decrease over 4 years (2021)	Yes
Indianapolis, IN	≥ 50,000 sq ft ≥ 25,000 sq ft (city buildings)	EUI, Energy Star Score	66 privately-owned buildings, 17 city buildings (2022)	30 days past notice results in issuance of fine, not in effect until January 1, 2026	Pending	No

BENCHMARKING IN THE CINCINNATI 2030 DISTRICT

The 2030 District Network includes 24 cities across the United States and Canada, encompassing 1,650 organizational members and 618 million square feet of commercial building space.²¹ As a registered 501(c)(3) nonprofit, the 2030 District aims to “establish a global network of thriving high-performance

¹⁴ <https://www.stlouis-mo.gov/government/city-laws/upload/legislative//Ordinances/BOAPdf/BB205CSAA-wd7--Ord.%2070474.pdf>

¹⁵ <https://www.stlbenchmarking.com/Resources#Training104>

¹⁶ <https://www.stlbenchmarking.com/Resources#Training104>

¹⁷ <https://www.imt.org/news/st-louis-passes-first-building-performance-standard-in-the-midwest/>

¹⁸ <https://www.indy.gov/activity/benchmarking-and-transparency>

¹⁹ https://static1.squarespace.com/static/5fd7a2f03c3ad531f41de6bb/t/644173908021bb51b8c3df6d/1682011040412/ThriveAnnualReport2022_FINAL.pdf

²⁰ https://library.municode.com/in/indianapolis_-_marion_county/codes/code_of_ordinances?nodeId=TITHIPUHEWE_CH710ENBETR_S710-109EN

²¹ <https://2030districts.org/>

building districts and cities, uniting communities to catalyze transformation in the built environment and its role in mitigating and adapting to climate change.”²²

The Cincinnati 2030 District was established in 2018 as a program run by Green Umbrella. It includes 321 buildings that have committed to reducing their energy, water, and transportation emissions 50-60% by 2030.²³ There are 50 building owners participating in the Cincinnati 2030 District representing over 28 million sq. ft.²⁴

Cincinnati’s 2030 District collects building data from its members to track progress towards its goals. The 2030 District uses ENERGY STAR® *Portfolio Manager*® to track energy usage data, which it compares against baseline data from the 2003 Commercial Building Energy Consumption Survey (CBECS). At the conclusion of 2021, the 2030 District reported a 31.5% decrease in energy usage.²⁵ They have also reported a 31.3% reduction in water usage and a 20.8% decline in transportation emissions.²⁶ It is important to note that benchmarking data for members of the 2030 District is confidential so the only data available to the public is aggregate data for the district as a whole.

The Cincinnati 2030 District has identified several challenges related to benchmarking since its creation. Small building owners often do not have a dedicated energy team to assist with reporting data. Large building owners can have difficulty obtaining energy data if portions of the property are leased and tenants do not share data in a timely manner.

INCENTIVES, PROGRAMS, AND FINANCING TOOLS

While benchmarking ordinances can help identify how much energy buildings are using, many building owners lack access to funding that can be used to implement energy saving improvements. There are several local, state, and federal programs available to help buildings reduce their energy consumption.

Property Assessed Clean Energy (PACE): Through PACE, the costs of implementing energy improvement projects are paid for by a lender. The property owner repays the loan through a special assessment on the building’s property tax bill.²⁷ PACE features 15- to 30-year terms, no down payment, no personal guarantees, fixed rates, and set payment schedules.²⁸ PACE financing is active in Cincinnati and can be used to fund energy saving improvements.

Green and Resilient Retrofit Program (GRRP): The U.S. Department of Housing and Urban Development (HUD) offers GRRP which provides funding for direct loans and grants to projects that improve energy or water efficiency, enhance indoor air quality or sustainability, install renewable energy, or utilize low-emission building materials, energy storage, or electrification strategies in eligible HUD-assisted multifamily properties.²⁹ GRRP also provides funding to support benchmarking at assisted properties.

Federal tax credits: The Inflation Reduction Act offers tax credits for the installation of qualifying energy saving technologies. These credits are also available to nonprofits as a direct pay benefit from the Internal Revenue Service (IRS). The most common technologies supported through this program are solar energy and battery storage. However, there are also benefits available for other sources of clean energy production.

²² <https://2030districts.org/about/>

²³ <https://2030districts.org/>

²⁴ <https://www.dropbox.com/s/uk3zgyalxvxz95/Cincinnati%202030%20District%202021%20Progress%20Report.pdf?e=1&dl=0>

²⁵ <https://www.dropbox.com/s/uk3zgyalxvxz95/Cincinnati%202030%20District%202021%20Progress%20Report.pdf?e=1&dl=0>

²⁶ <https://www.dropbox.com/s/uk3zgyalxvxz95/Cincinnati%202030%20District%202021%20Progress%20Report.pdf?e=1&dl=0>

²⁷ https://www.brickergreydon.com/assets/htmldocuments/Documents/Resources/OH_PACE-Financing_WhitePaper.pdf

²⁸ <https://www.cincinnati-oh.gov/oes/energy/pace-financing1/>

²⁹ <https://www.hud.gov/GRRP/Benchmarking>

Section 179D commercial buildings energy efficiency tax deduction: This tax deduction enables building owners to claim a tax deduction for installing qualifying energy saving systems in buildings. A deduction of up to \$1.88 per square foot is available for interior lighting, building envelope, or heating, cooling, ventilation, or hot water systems that reduce the energy consumption by 50% or more in comparison to a building meeting minimum requirements set by ASHRAE (American Society of Heating, Refrigerating and Air Conditioning Engineers) Standard 90.1.³⁰

U.S. Department of Energy Rebate Programs: The Inflation Reduction Act created the HOMES and HEERA Rebate programs which provide grants to State Energy Offices for rebate programs to reduce the costs of energy efficiency retrofits that are modeled to achieve or have achieved verifiable minimum energy use reductions. These rebates are available to owners of multifamily buildings that house low- to moderate-income residents and qualifying homeowners.

Greenhouse Gas Reduction Fund: The U.S. EPA offers several programs under the Greenhouse Gas Reduction Fund (GGRF) – a program created by the Inflation Reduction Act. The first of these is the National Clean Investment Fund (NCIF) which recently awarded \$14 billion in competitive grants to three national nonprofit financing institutions with a focus on clean energy.³¹ These financing institutions will partner with the private sector to fund and secure clean energy projects.³² Eligible projects must meet a six-part definition that requires each project to reduce greenhouse gas emissions; reduce other air pollutants; deliver benefits to communities; meet the requirement that it may not have otherwise been financed; mobilize private capital; and support only commercial technologies. The Clean Communities Investment Accelerator (CCIA) is a similar program offering \$6 billion to five national nonprofits to provide funding and technical assistance to community lenders in low-income neighborhoods to support clean energy projects and activities.³³ These nonprofits can lend to many public, quasi-public, not-for-profit, and non-profit community lenders in community development financial institutions, credit unions, green banks, housing finance agencies, minority depository institutions, and more.

Ohio Air Quality Development Authority (OAQDA): The OAQDA is an independent state agency that funds projects that improve air quality, offer significant public health savings, and foster a strong economy. Through its Clean Air Improvement Program, it provides businesses with access to financing through OAQDA issued bonds. Eligible projects may also be able to leverage Green Bonds which can provide access to additional capital from the investment community. The program supports energy conservation measures on new and existing buildings, renewable energy, clean transportation infrastructure, and other projects that improve air quality.

Ohio Department of Development (ODOD): Through its various energy programs, the ODOD helps building owners identify and implement energy efficiency improvements. The Energy Efficiency Program connects commercial buildings and manufacturing facilities to certified energy auditors who will review energy usage and identify energy saving measures. Once building owners have completed an energy audit, the Energy Loan Fund provides eligible projects with access to low interest financing to install efficiency measures that reduce energy by at least 15%.³⁴

³⁰ <https://www.irs.gov/credits-deductions/energy-efficient-commercial-buildings-deduction>

³¹ <https://www.epa.gov/greenhouse-gas-reduction-fund/national-clean-investment-fund>

³² <https://www.epa.gov/greenhouse-gas-reduction-fund/national-clean-investment-fund>

³³ <https://www.epa.gov/greenhouse-gas-reduction-fund/clean-communities-investment-accelerator>

³⁴ <https://development.ohio.gov/community/redevelopment/energy-efficiency-program>

Conclusion

Energy Benchmarking and Building Performance Standards are established policies currently used by cities and states across the United States. Both policies have been proven to effectively reduce building energy usage and carbon emissions. These policies are most effective when local context is carefully considered, and stakeholders are engaged in program development.

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