



DEAR FELLOW CHICAGOANS,



A word I like to use when I talk about the work ahead for our city's environmental initiatives is "alignment." The incredible alignment of Mayor Brandon Johnson, all City departments, and the people of Chicago with regard to climate policies puts us in a strong position to advance transformational climate action.

More importantly, there is alignment between climate solutions and solutions to other challenges Chicagoans face in their daily lives. For example, providing resources to our city's building operators, businesses, and residents to reduce their energy consumption helps them save money on their utility bills, boosts the local economy, and supports clean energy jobs. And it also helps reduce our city's carbon footprint.

That alignment is no mere coincidence – because while climate change is an environmental issue, it is also a matter of social and economic justice. Everyone is experiencing the negative impacts of climate change, but low-income communities and communities of color feel the impacts much more acutely. Thus, equity-focused climate solutions are paramount to addressing the economic issues and climate crises that Chicagoans face.

Energy use in buildings represents approximately 70% of the city's current greenhouse gas emissions, so reducing buildings' energy consumption and increasing their energy efficiency are critical steps for a greener future. To that end, the Energy Benchmarking program and the Energy Rating System are helping ensure continued movement towards the City's climate goals, including a 26-28% reduction in greenhouse gas emissions by 2025. Building owners citywide have collectively achieved a 16% reduction as of 2023

Since the first building owners began reporting annual energy consumption in 2014, we have seen a cumulative decrease in carbon emissions of 39%, even as the number of buildings required to report increased. That said, there remain key opportunities to maximize energy savings

potential with longtime participants while assuring compliance support for newly identified building owners. In addition to a suite of technical tools and resources on the benchmarking web page, the City is excited about offerings from external partners and agencies, including improved energy efficiency and electrification incentives from both utilities serving Chicago, and state and federal incentives and programs that promote renewable energy and emerging clean energy technologies. The City is steadfast in its commitment to equipping building owners with the tools and knowledge to make the best-informed decisions about energy consumption that are good for the environment and good for their bottom line, while improving the health and comfort of Chicagoans everywhere.

Now, with a newly reconstituted Department of Environment, the City is better positioned than ever to accomplish this. Together with our partners and community, we can build upon the progress Chicago has already made as the first U.S. city to implement a mandatory energy performance rating for buildings and require the rating to be displayed. We are grateful for the efforts and support of many dedicated stakeholders, from building owners to property managers to operating engineers, who believe in the importance of making Chicago cleaner, healthier, and more livable for all. Thank you for your persistent attention and work to ensure that Chicago continues to serve as a global leader in reducing energy waste and promoting sustainable action at both the community and building levels.

Sincerely,

Angela Tovar

Chief Sustainability Officer

Commissioner, Department of Environment

City of Chicago

* 2022Chicago Energy Benchmarking Report



- Reducing energy,
- Saving on utility costs, &
- Supporting clean energy jobs.

😌 REACH Under Chicago Energy Benchmarking, 83% of large buildings reported their energy use in 2022.

2022

83%



IMPACT AND OPPORTUNITY

The median carbon emissions per square foot (greenhouse gas (GHG) intensity) from reporting properties are down by 39% since 2016. Energy use per sq. ft. (also known as energy use intensity or EUI) for buildings reporting in the last three consecutive years (2020-2022) has dropped by 4%.





BUILDING ON SUCCESS

The Chicago Energy Rating System was implemented in 2019 to increase visibility of energy use. Building owners are required to display a placard illustrating their building's energy performance on an annual basis to the general public. Approximately 36% of buildings received a four out of four-star rating in 2022. Chicago is proud to have been the first city in the nation to require this kind of transparency.

2023 Chicago Energy Benchmarking Report * * * *

ENERGY

benchmarking

is the foundation for



- Reducing energy,
- Saving on utility costs, &
- Supporting clean energy jobs.



Under Chicago Energy Benchmarking,

82% of large buildings reported their energy use in 2023.





• IMPACT AND OPPORTUNITY

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Energy use per sq. ft. (also known as energy use intensity or EUI) for buildings reporting in the last three consecutive years (2021-2023) has increased by **3%.**





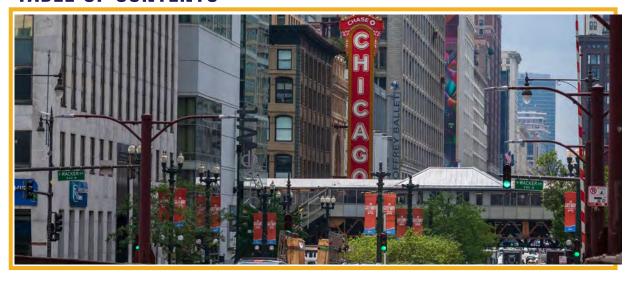
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I. EXECUTIVE SUMMARY

Tracking and sharing a building's energy use is an essential first step in identifying opportunities to reduce that usage and save on utility bills. In 2013, the City of Chicago adopted its benchmarking ordinance requiring buildings over 50,000 square feet (sq. ft.) to report their energy use once per year and perform data verification every three years. The City used a tiered approach for phasing in compliance requirements by building sector and size that started with the largest buildings. The impetus for the benchmarking ordinance is to raise awareness of energy performance through information and transparency, with the goal of unlocking energy and cost savings opportunities for businesses and residents.

To further support this goal, the City began implementing the Chicago Energy Rating System in 2019, which makes energy use information for large buildings easily accessible to residents and encourages energy savings. The Chicago Energy Rating System uses a zero-to-four-star scale that is based on existing publicly available energy data and requires buildings covered under the ordinance to post their rating in a prominent location on the property. Complying buildings are also required to share this information at the time of sale or lease listing. Chicago was the first city in the U.S. to assign buildings an energy performance rating and require properties to disclose their rating.

Building owners are not currently required to gather and report their water usage data, as the City collects this data from its Department of Water Management and Department of Finance. The City plans to begin sharing information on water usage in buildings in the future. Like energy data, water consumption information will provide valuable insight to assist building owners in finding opportunities for efficiency and savings.

REACH

Compliance with the Chicago Energy Benchmarking Ordinance has continued to remain high. In 2022, 2,581 properties spanning over 701 million sq. ft. reported energy use. The 2022 reporting rate by number of properties was 83% (89% by total sq. ft.), which is 3% lower than the 2021 reporting rate of 87%. In 2023, the City received reports from 2,724 properties with a total size of close to 750 million sq. ft. Though the number of properties in compliance increased from 2022, the reporting rate dropped slightly in 2023 to 82% (78% by total sq. ft.).

In this report, energy benchmarking results from two reporting years – 2022 and 2023 – are presented. All subsequent reports will focus on single-year reporting results.

Energy benchmarking has continued to prove effective in fostering energy and cost savings since its implementation. From 2016 to 2023, the median carbon emissions per sq. ft. (also known as GHG Intensity) for reporting buildings has fallen by 39%, while median energy use per sq. ft. (also known as Energy Use Intensity) has fallen by 13% (after adjusting for weather differences from year to year). These improvements have been driven by property owners as the City encourages, but does not require, owners to make improvements through this ordinance. The City supplements regular compliance-related notifications to building owners with additional resources on how to reduce their energy use.

KEY TAKEAWAYS: •

Energy benchmarking continues to provide the foundation for increasing awareness of energy use and opportunities for savings, reducing utility costs, and supporting clean energy jobs throughout Chicago.



2 IMPACT

Many Chicago properties required to benchmark continue to perform above national averages, based on a median ENERGY STAR score of 63 out of 100. Energy use per sq. ft. (also known as Energy Use Intensity) for buildings reporting between 2020-2022 dropped by 4% but increased slightly by 3% between the reporting years 2021-2023.



I. EXECUTIVE SUMMARY

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OPPORTUNITY

ComEd and Peoples Gas both offer several incentive programs to support building owners and managers in making energy efficiency improvements to their facilities. These programs also offer technical support such as facility assessments for a variety of building types including small businesses, schools, industrial, nonprofit organizations, and affordable housing providers.

The passing of the Inflation Reduction Act (IRA) in 2022 also ushered in new federal investment in climate and clean energy programs. This has led to new federally funded incentives and tax credits available at the local level for commercial and residential properties. Local funding opportunities and technical support programs exist as well, including Illinois Solar for All and the Building Energy Resource Hub.



BUILDING ON SUCCESS



Enacted in 2019, the Chicago Energy Rating System was the first of its kind in the U.S. and greatly expanded awareness of and transparency about energy use in large buildings throughout the city. This update to the 2013 Chicago Energy Benchmarking ordinance requires property owners or their representatives to post their rating placard and share it at the time of listing the property for sale or for lease. Property owners will continue to receive updated rating placards on an annual basis and be required to post and share.

Approximately 36% of buildings received a four out of four-star rating in 2022, down from 39% in 2021. In 2023, 33% of buildings received a four out of four-star rating. A breakdown for all buildings that received a one- to four-star rating is shown in Table 1 below.

Table 1. 2022-2023 Energy Rating Scores Breakdown

Number of Stars Received	2022 Number of Buildings	2022 Percentage	2023 Number of Buildings	2023 Percentage
1 or 1.5	540	21%	567	23%
2 or 2.5	461	18%	532	21%
3 or 3.5	619	24%	595	24%
4	928	36%	819	33%
TOTAL:	2,548	100%	2,513	100%



II. REACH: CHICAGO ENERGY BENCHMARKING BACKGROUND AND COMPLIANCE

OVERVIEW

The goal of the Chicago Energy Benchmarking Ordinance (2013) and Energy Rating System updates (2019) is to increase awareness of energy performance through the measurement, tracking, analysis, and publication of covered properties' energy use information. Approximately 3,600 buildings that are 50,000 sq. ft. or greater are required to measure and report energy use annually, post updated placard ratings, and complete additional data verification every three years.

COMPLIANCE SUMMARY

Compliance with the Chicago Energy Benchmarking Ordinance continues to be relatively high every year. The 2022 reporting rate by number of properties was 83% and 82% in 2023, down only slightly from 87% in 2021 (See Figure 1). The City of Chicago and its partners are committed to supporting building teams through outreach and assistance to continue to reach similar or higher compliance levels into the future.

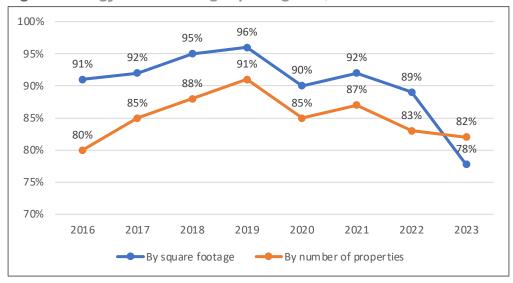
2022 Reporting, by the Numbers:

- 2,965 total reporting properties out of 3,568 on the Covered Buildings List¹
 - 2,711 covered properties
 - 254 covered properties received temporary exemptions
- 83% reporting rate, when measured by number of properties
 - 89% reporting rate, when measured by total sq. ft.
- 40 properties submitted reports on a voluntary basis²

2023 Reporting, by the Numbers:

- 2,915 total reporting properties out of 3.576 on the Covered Buildings List
 - 2,689 covered properties
 - 226 covered properties received temporary exemptions
- 82% reporting rate, when measured by number of properties
 - 78% reporting rate, when measured by total sq. ft.
- 38 properties submitted reports on a voluntary basis







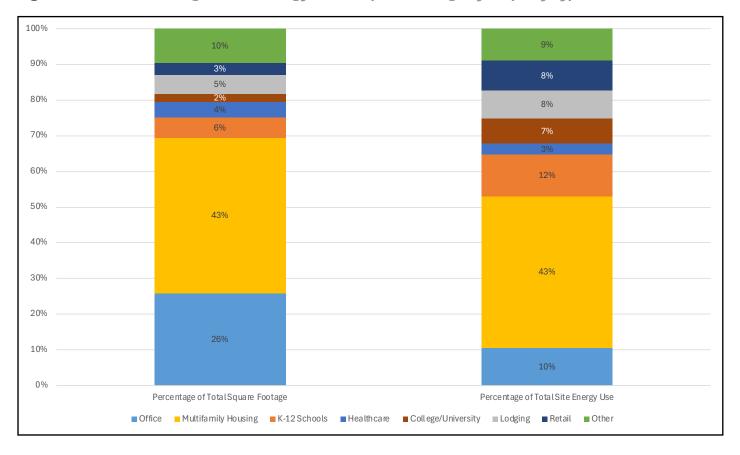
III. IMPACT: 2022-2023 BENCHMARKING RESULTS

PROPERTIES ANALYZED IN 2022

Energy benchmarking reports from 2,539 properties are included in analysis for the reporting year 2022. These buildings are referred to as "analyzed properties." Each property is assigned to one of eight property groups.

The total square footage of all 2022 analyzed properties is approximately 700 million sq. ft. (including both buildings and parking). A breakdown of the square footage versus breakdown of energy use by type of building for 2022 is shown in Figure 2a. Multifamily housing continues to be the largest by both sq. ft. and percentage of energy use, representing 43% of the total sq. ft., and 43% of total site energy use of all analyzed properties, followed by offices, and then K-12 schools.

Figure 2a: 2022 Percentage of Site Energy Use v. Square Footage by Property Type



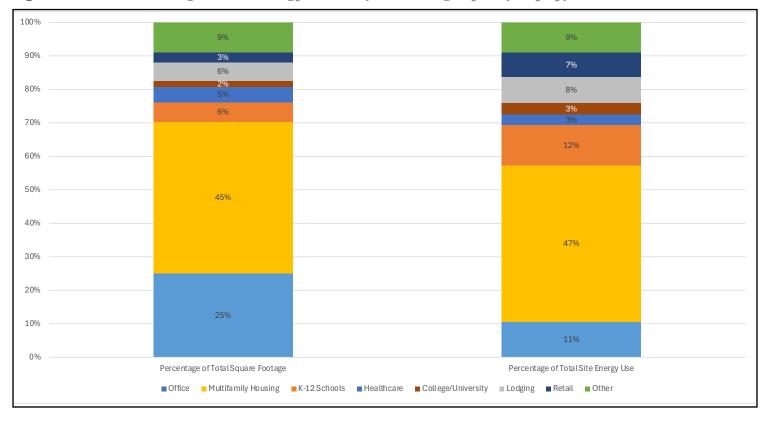


■ PROPERTIES ANALYZED IN 2023

For results related to the reporting year 2023, reports from 2,516 properties were analyzed.

The total square footage of all 2023 analyzed properties is approximately 702 million sq. ft. (including both buildings and parking). A breakdown of the square footage versus breakdown of energy use by type of building for 2023 is shown in Figure 2b. As with 2022, multifamily housing continues to be the largest by both sq. ft. and percentage of energy use, representing 45% of the total sq. ft., and 47% of total site energy use of all analyzed properties, followed by offices, and then K-12 schools.

Figure 2b: 2023 Percentage of Site Energy Use v. Square Footage by Property Type





OVERALL ENERGY PERFORMANCE

The 1-100 ENERGY STAR score represents a property's overall energy performance relative to similar property use types across the nation, while normalizing for different climates. A score of 50 indicates energy performance at the national median, while a score of 100 represents extremely high energy performance. Scores below 50 indicate significant opportunities for improvement. (For more details on ENERGY STAR score calculations, please see the Appendix.)

In 2022, the median ENERGY STAR score for all analyzed properties in Chicago was 64 out of 100. In 2023, the median ENERGY STAR score for all analyzed properties in Chicago was 63 out of 100. Figure 3 shows the median reported ENERGY STAR score from Chicago Energy Benchmarking reports over the past three years.

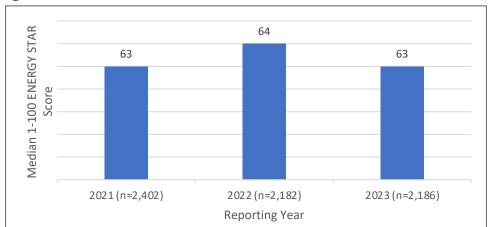


Figure 3: Median ENERGY STAR Scores, 2021 to 2023

Since 2021, the median ENERGY STAR score has increased in Retail and Multifamily Housing, while dropping across the other sectors (Figure 4). A median score of 63 is well above the national median of 50, indicating that Chicago properties over 50,000 sq. ft. are performing slightly better than most comparable buildings in the U.S.

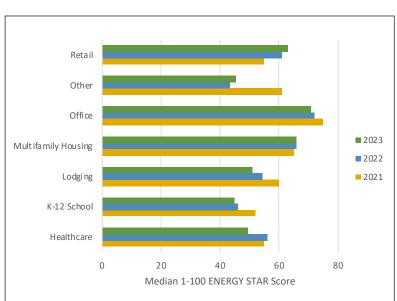


Figure 4: ENERGY STAR Scores by Building Sector Reported from 2021–2023

^{*}Median reported ENERGY STAR scores from 2016-2018 not included due to updates implemented to the ENERGY STAR Portfolio Manager system in 2018.⁵



TREND ANALYSIS

As building owners benchmark their buildings year after year, it is the goal of the City to use insights to identify opportunities for improvements. On a broader scale, analyzing trends can help City officials identify sectors that may be lagging, work to better understand technical assistance needs, and direct opportunities to building owners that need them the most. Understanding how buildings are performing over time is an important metric to gauge this need.

1,635 properties that benchmarked and reported in 2021, and again benchmarked and reported in 2023 (three consecutive reporting years), saw a decrease in total net energy costs of approximately \$24.9 million. This is in large part due to substantial electricity cost savings seen for both commercial and residential properties included in the analysis, totaling approximately \$13.6 million. These properties saw an increase in energy use per sq. ft. of 3%, based on the median weather-normalized source energy use per sq. ft. from 2021 compared to 2023 (which considers changes in weather from year to year, as well as changes in property size).

Overall, the carbon emissions per sq. ft. of space have continued to decline steadily, in total by 39% since 2016. All building sectors have seen overall decreases in GHG intensity since 2016, with only a few sectors experiencing slight upticks in recent years (Figure 5).

Finally, comparison over the past six years of benchmarking information shows that the median weather-normalized source energy use per sq. ft. for all reporting buildings has dropped by 13% from the 2016 to 2023 reporting years (Figure 6). All sectors saw decreases since the 2016 reporting year. The largest drops were in the Office (31%), Lodging (24%), Healthcare (20%), and Retail (20%) sectors.

Figure 5: Median GHG Intensity from 2016-2023

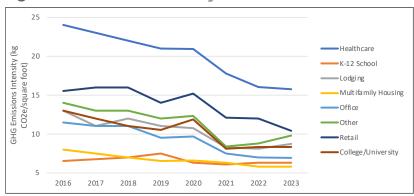
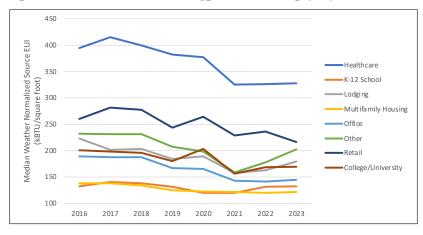


Figure 6: Median Source Energy Use Intensity (EUI) from 2016-2023





■ ENERGY STAR Certification

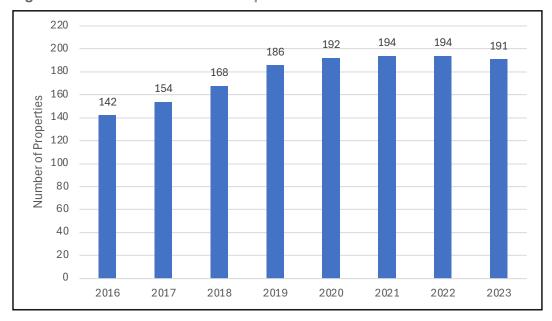
Properties that receive a score of 75 or higher and meet other criteria have the potential to earn ENERGY STAR certification. In Chicago, the number of ENERGY STAR certifications continues to increase since the implementation of the ordinance (Figure 7).

ENERGY STAR certification is a nationally recognized standard for energy performance. ENERGY STAR certified buildings meet strict energy performance standards set by the U.S. EPA – using less energy, costing less to operate, and causing fewer GHG emissions than comparable structures.

If your property has a score of 75 or higher, consider getting it certified in recognition of your building's high performance. Learn more about the certification process on ENERGY STAR's website: https://www.energystar.gov/about/how-energy-star-works/energy-star-certification



Figure 7: ENERGY STAR Certified Properties from 2016-2023





IV. OPPORTUNITY: Ways to Save Energy

UTILITY INCENTIVE AND REBATE PROGRAMS

Many incentive and rebate programs are available from ComEd and Peoples Gas that support building owners and managers in making energy improvements to their facilities. Incentive programs can change each year, so building owners are advised to contact the utilities directly to understand the current offerings.

Energy assessments are a great first step to reducing usage and costs, as they provide an analysis of energy-consuming equipment and operations to help you gain a better understanding of areas for improvement. It is advisable to get an energy assessment every two to three years, and most properties are eligible for a free assessment. This process will help identify low-cost and no-cost opportunities for reducing consumption, including which products can be replaced with updated energy-saving models. ComEd's Marketplace provides several discounted products for all building types. To find out more, contact the utilities today:

· ComEd:

Phone: 855.433.2700

Website: https://www.comed.com/WaysToSave/ ForYourBusiness/Pages/FacilityAssessments.aspx

https://www.comedmarketplace.com/

· Peoples Gas:

Phone: 855.849.8928

Website: http://www.peoplesgasdelivery.com/

business/rebates.aspx

If you have already conducted an assessment or audit, or you have already identified specific projects to retrofit your property, be sure to consider using one of the utility rebates and incentive programs to help finance your project:

Commercial, Institutional, and Public Buildings:

- ComEd's Energy Efficiency program can help reduce building energy use. Incentives and support programs help businesses, schools, and other public buildings drive energy savings and an improved bottom line.
 For more information, please visit: https://www.comed.com/WaysToSave/ ForYourBusiness/Pages/Default.aspx
- Peoples Gas Natural Gas Savings Program offers incentives to encourage business customers to make energy-efficient improvements to reduce energy use and enhance workplace comfort. For more information, please visit: https://www.peoplesgasdelivery.com/savings/business/rebates

Multifamily Residential Buildings:

 ComEd and Peoples Gas offer building managers and owners the Multi-Family Energy Savings program: https://www.multifamilyportal.com/

All Property Types:

 Several discounted products are also available via ComEd's Marketplace. Current listings of product offerings and discounts can be found here: https://www.comedmarketplace.com/



OTHER FUNDING OPPORTUNITIES AND SUPPORT RESOURCES

Building owners and managers should continue to stay informed through local media outlets and green building networks as federal investment in climate and energy has ramped up through the Inflation Reduction Act (IRA). New federal funding sources such as incentives and tax credits will be available at the local level for commercial and residential properties to make improvements that lower their carbon footprints.

Additionally, there are local funding opportunities to support energy reduction and savings. Illinois Solar for All provides reduced cost solar installation for qualifying nonprofits, public facilities, and multifamily housing. More information can be found on the program website: https://www.illinoissfa.com/

Another funding mechanism is Chicago PACE, a voluntary financing program that makes it possible for owners and developers of commercial and multifamily properties to obtain low-cost, long-term financing for energy efficiency, sustainability, and renewable energy infrastructure in new or existing buildings. PACE is available to the following types of properties: commercial and industrial properties, multifamily residential apartment buildings or cooperative housing properties with five or more units, and nonprofit properties.

In February 2021, Cook County launched a similar program that is accessible to qualified building owners in Chicago. For more information on the City of Chicago PACE program, please visit: www.ChicagoPACE.org
For more information on the Cook County PACE program, please visit: https://iecapace.org/cook-county-c-pace-program

The Building Energy Resource Hub Offers Financial and Technical Support!

Launched in 2023, the Building Energy Resource Hub is a comprehensive resource offering trainings and funding tools for building professionals at all levels of familiarity with energy efficiency concepts. Building developers, owners, operators/managers, and contractors have access to services to support the City's climate change goals while bolstering the green economy. This includes resources to assist with Energy Benchmarking requirements and a directory of local and regional funding mechanisms. Learn more about the available tools and resources at the Hub website: https://www.buildinghub.energy.





V. BUILDING ON SUCCESS: Energy Rating System Implementation

The original Chicago Energy Benchmarking Ordinance (2013) allows the City to share buildings' ENERGY STAR scores and other metrics publicly, via the City's online data portal. However, many tenants, condominium owners, building operating engineers, and even some property managers lacked awareness of the portal and how to access and utilize it for their benefit. To address this, the City issued ordinance updates in 2019 that introduced the Energy Rating System, with the aim of improving the visibility and transparency of information that is already publicly available. There were no new reporting requirements or costs associated with these updates.

Disclosing a building's rating at the time of listing for sale or lease enables prospective buyers and tenants to make more-informed decisions about operating costs related to energy use. The rating system also offers every property that has one, two, or three stars the opportunity to earn an extra star by making one 10-point improvement, thus incentivizing properties to improve their ENERGY STAR scores.



Increased visibility and transparency of ratings can help performance. For example, restaurants in New York City are required to publicly post grades of A, B, or C, based on their health inspections. After implementing this requirement, the number of restaurants receiving an A grade on initial inspection increased by 14% in the first 18 months. As Chicago continues to prioritize the growth of the Energy Benchmarking program and Energy Rating System, the City anticipates seeing the increased visibility translating to improvements in buildings' energy use performance.

In 2017, the City of Chicago committed to the goals of the Paris Climate Agreement, including a 26-28% reduction in greenhouse gas emissions by 2025. Energy use in buildings represents approximately 70% of the City's current greenhouse gas emissions. Therefore, it is crucial that the City prioritizes energy efficiency in buildings to meet its long-term climate goals.⁷

WATER DATA / ANALYSIS OPPORTUNITIES

The City will continue to explore opportunities to automatically share water data and include this data in benchmarking on a voluntary or required basis. Like benchmarking energy usage, benchmarking water usage is the first step to identifying opportunities to reduce water use and save on utility bills.

Some building owners also use ENERGY STAR Portfolio Manager to track their water use. While this is not required, it is encouraged by the City for building owners to begin addressing their building's water use and look for efficiency opportunities.



VI. ACKNOWLEDGEMENTS

The City of Chicago is grateful for the assistance and input of several partnering organizations that have supported the implementation of the Chicago Energy Benchmarking Ordinance and the Chicago Energy Rating System.

The 2022-2023 Chicago Energy Benchmarking Report and the initiatives / programs described herein were created with input, analysis, and other support from the following organizations and individuals:

DEPARTMENT OF ENVIRONMENT, CITY OF CHICAGO

Angela Tovar, Commissioner and Chief Sustainability Officer

Jared Policicchio, Deputy Commissioner and Deputy Chief Sustainability Officer

Lindy Wordlaw, Director of Climate and

Environmental Justice Initiatives

Joe Arcus, Project Manager, Building Decarbonization **Kathleen O'Shea**, Director of Public Affairs

ELEVATE AND THE HELP CENTER TEAM

Devon Snyder, Project Manager **Dara Reiff**, Associate Director

And a special thanks to ComEd and Peoples Gas for ongoing support in providing energy use data for the benchmarking requirements, as well as information regarding appropriate energy-saving opportunities.

Document design by: City of Chicago

CHICAGO ENERGY BENCHMARKING / CHICAGO ENERGY RATING SYSTEM PARTNERS

- ABOMA
- · ASHRAE Illinois
- · American Cities Climate Challenge
- American Institute of Architects Chicago Chapter
- BOMA Chicago
- C40 Cities Climate Leadership Group
- · Chicagoland Apartment Association
- Chicago Association of REALTORS
- ComEd
- Elevate
- Enterprise Community Partners
- · Illinois Environmental Council
- · Illinois Green Alliance
- Institute for Market Transformation
- Midwest Energy Efficiency Alliance
- · Natural Resources Defense Council
- · Peoples Gas
- Slipstream
- · Sierra Club
- U.S. Environmental Protection Agency



■ USEFUL BENCHMARKING METRICS AND HOW TO USE THEM

- **ENERGY STAR Score:** A 1-100 ENERGY STAR score shows the property's overall energy performance relative to similar buildings. A score of 50 indicates energy performance at the national median, while a score of 100 represents extremely high energy performance. Scores below 50 indicate significant opportunities for improvement.⁸
 - •The 1-100 ENERGY STAR rating allows comparisons across property types and across different geographies because it normalizes for differences in energy use (such as climate or annual weather patterns, building space uses, operating characteristics, and other variables).
 - A score of 75 or above represents a top performer, and properties with scores of 75 or above may be eligible for the national ENERGY STAR recognition.

Learn more at: www.EnergyStar.gov/Buildings

- **Energy Use Intensity:** Energy use intensity (EUI) is the energy use per square foot of gross floor area in the property. There are two types of EUI metrics:
 - Site EUI refers to the total energy per sq. ft. that is actually consumed in the building, including all electricity, natural gas, and other fuels in all building spaces (including common areas and tenant spaces).
 - Source EUI includes the energy per sq. ft. that is actually consumed in the building (i.e., site EUI), plus additional energy that is generated and consumed upstream' of the building at power plants as well as energy lost through transmission and distribution.

The ENERGY STAR Portfolio Manager tool can also be used to track energy costs, as well as water consumption and water costs, solid waste generation, and many other metrics.





ADDITIONAL TERMS

- **ENERGY STAR Portfolio Manager**: Free, online software developed by the U.S. EPA to help buildings benchmark, verify, and report energy use and property information (www.EnergyStar.gov/PortfolioManager).
- Greenhouse Gas (GHG) Emissions: Carbon dioxide (CO₂) and other gases released as a result of energy generation, transmission, and consumption. GHG emissions contribute to climate change and are expressed in metric tons of carbon dioxide equivalent (CO₂e). GHG emissions are also released due to other activities in buildings, such as refrigeration and cooling, but those emissions are not calculated from energy benchmarking. Greenhouse gas intensity is a measurement of the total carbon emissions of a property divided by the square footage of a property.
- Gross Floor Area (Building Size): Total interior floor space between the outside surfaces of a building's enclosing walls, expressed in square feet. This includes tenant space, common areas, stairwells, basements, storage, and interior parking.
- **Site Energy Use:** Energy consumed on-site at a building, as measured by utility bills, and expressed in thousands of British Thermal Units (kBTU).
- **Source Energy Use:** Energy required to operate a property, including on-site consumption, as well as energy used for energy generation, transmission, and distribution; expressed in kBTU.

MULTI-YEAR BUILDING COMPARISONS

For buildings that have two or more years of benchmarking results, weather-normalized metrics can be used to determine the property's performance over time. Weather-normalized metrics account for changes in weather from year to year (such as an extremely hot summer or a very cold winter) and allow comparisons of the same building to itself across different years.⁹

DATA VERIFICATION

Under the Chicago Energy Benchmarking Ordinance, all covered properties are required to complete data verification once every three years, starting with the first year that the property is required to comply with the ordinance. Data verification is required to ensure that reported information is being tracked and reported correctly.

Data verification may be completed by in-house staff, and the use of a third party is not required. However, data verification must be completed by an individual holding a City-recognized license or training credential. City of Chicago-recognized credential programs must include training that covers benchmarking and the use of ENERGY STAR Portfolio Manager, as well as energy-efficient operations, measures, and technology.

Data verification takes the form of a signed Data Verification Checklist, a standard report generated automatically by the ENERGY STAR Portfolio Manager tool. It is important to note that verifiers are not required to complete the Indoor Environmental Standards section of the Data Verification Checklist but are required to complete all other sections. Covered properties are not required to submit the signed Checklist, but they are required to add verification information in the Verification section under their building(s) profile in the ENERGY STAR Portfolio Manager tool. The ordinance requires covered properties to maintain benchmarking and data verification records for three years and to produce a copy of the signed Data Verification Checklist upon request by the City.

In 2023, any building team that had verified data in 2020, as well as any building team that had not ever verified data in the past, was required to conduct official verification. The City has followed up with all teams that were required to complete verification and did not do so and will also continue to conduct outreach to building teams about the data verification requirement.



DATA QUALITY

Energy benchmarking continues to rely on a self-reporting process (although data verification is required once every three years). Certain indicators continue to point to a high level of data quality for the information reported in Chicago.

As in previous years, the City and its partners complete automated reviews of all benchmarking submissions to identify missing information, errors, or possible data issues. If any issues are found, the Chicago Energy Benchmarking Help Center then sends a customized email to property representatives containing a list of issues, and links to documentation on how to address each issue. Property teams typically review their data, update any information that was entered in error, and then resubmit their report to the City. Once a submission is found to be complete and free of any potential data quality issues, the property representatives receive a final confirmation email.

Some of the indicators used to track data quality include the number of properties that use default, estimated, and temporary values. While using these values is allowed under the energy benchmarking ordinance, these values indicate a slightly lower level of data quality and accuracy. The use of each of these indicators has continued to remain low, indicating strong data quality (See Table 2).

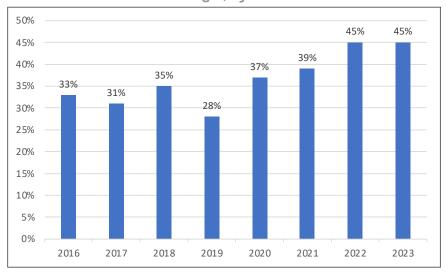
Table 2: Percentage of Analyzed Properties Using Estimated, Default, or Temporary Values

Number of Stars Received	2022 Number of Buildings	2022 Percentage	2023 Number of Buildings	2023 Percentage
1 or 1.5	540	21%	567	23%
2 or 2.5	461	18%	532	21%
3 or 3.5	619	24%	595	24%
4	928	36%	819	33%
TOTAL:	2,548	100%	2,513	100%

In addition, more properties are using the Data Quality Checker, a feature provided within the ENERGY STAR Portfolio Manager benchmarking tool. Chicago Energy Benchmarking participants are strongly encouraged to use the Data Quality Checker to review their submissions before reporting to the City of Chicago each year (Figure 8).



Figure 8: Percentage of Analyzed Properties Using the Data Quality Checker in ENERGY STAR Portfolio Manager, by Year



ANALYSIS METHODOLOGIES

Data Analysis Methodology

This report covered reports submitted in 2022 and 2023. Efforts were made to ensure transparency in sharing results for both reporting years. Most data analysis methodologies were unchanged from what was used in the 2016, 2017, 2018, 2019, 2020, and 2021 data analyses.

Data Cleansing and Summary of Analyzed Properties

For the analysis of both 2022 and 2023 reports, data cleansing was completed using the same process as previous years. First, properties located outside of the City of Chicago were removed. Next, any duplicates were removed; duplicate submissions can occur when multiple facility managers or owners submit reports for the same property. After these two initial steps, the dataset included 2,762 reporting properties for 2022 and 2,749 reporting properties for 2023 (as of the annual analysis cutoff dates, which are January 1, 2023, and February 23, 2024, respectively).

Of these reporting properties, 42 properties reported voluntarily (i.e., were not required to comply) in 2022 and 38 in 2023. These voluntary submissions were removed from the dataset used in analysis, leaving 2,720 reports for "covered properties" (required to comply) in 2022 and 2,711 in 2023. From these remaining covered properties, 181 reports in 2022 and 195 in 2023 were removed from the data analysis due to being outliers or due to missing information.

The outlier records removed from the analysis either reported extreme values for key energy metrics or had other data issues as follows:



2022:

- 13 properties: Site EUI less than three kBTU/sq. ft., more than 2,000 kBTU/sq. ft., or more than three standard deviations above or below the median site EUI for the property's building sector.¹¹
- 142 properties: ENERGY STAR score of 1, 2, 99, or 100.
 Properties with scores of 99 or 100 were removed if they had not been ENERGY STAR certified in 2021. All properties with scores of 1 or 2 were removed.
- 16 properties: Missing electricity use.
- 10 properties: Missing Site EUI metrics.

2023:

- 27 properties: Site EUI less than three kBTU/sq. ft., more than 2,000 kBTU/sq. ft., or more than three standard deviations above or below the median site EUI for the property's building sector.
- **141** properties: ENERGY STAR score of 1, 2, 99, or 100. Properties with scores of 99 or 100 were removed if they had not been ENERGY STAR certified in 2022. All properties with scores of 1 or 2 were removed.
- 7 properties: Missing electricity use.
- 20 properties: Missing Site EUI metrics.

This data cleansing process resulted in 2,539 covered building data submissions for 2022 and 2,516 covered building data submissions for 2023 that provide the basis for the analysis presented in this report.

VII. APPENDIX

BUILDING SECTORS

Tables 3a and 3b show the eight building sectors included in this report's analysis and the ENERGY STAR Portfolio Manager property types included in each sector. The number of properties analyzed, total floor area, median ENERGY STAR scores, and median site and source EUI values are also provided for each Portfolio Manager property type or property type grouping.

Properties with multiple uses are typically assigned to the space use that comprises 50% or more of the total floor area. If no single space use makes up 50% or more of the property's floor area, then the property is considered Mixed Use, which is included in the "Other" property type category.



 Table 3a: Detailed Building Sector Description and Energy Performance Metrics by Sector for Analyzed Properties for 2022

Building Sector	Primary ENERGY STAR Portfolio Manager Property Type(s)	Number of Properties Included in Analy- sis	Total Floor Area (Gross ft2) – Build- ings and Parking	Median Site EUI (kBTU/ square foot)	Median Source EUI (kBTU/ square foot)	Median ENERGY STAR Score (1-100 rating)
	Bank Branch and Financial Office	6	5,455,312	79.4	22.12	71.5
	Office, 50,000 ft2 - 99,999 ft2	83	6,002,692	69.3	143.4	65
Office	Office, 100,000 ft2 - 249,999 ft2	87	13,780,204	70.5	145.4	64.5
	Office, ≥ 250,000 ft2	169	161,632,384	59	134.6	75
	All Offices	339	181,415,280	63.6	136.8	72
	Multifamily Housing, 50,000 ft2 – 99,999 ft2	458	32,308,584	70.1	110.25	73
Multifamily Housing	Multifamily Housing, 100,000 ft2 - 249,999 ft2	411	66,551,854	69.3	115.1	68
3	Multifamily Housing, ≥ 250,000 ft2	410	204,458,244	72.45	122.75	59.5
	All Multifamily Housing	1,279	303,318,682	70.7	114.9	66
	K-12 School, 50,000 ft2 - 99,999 ft2	170	12,697,853	79.45	127.95	41
K-12	K-12 School, 100,000 ft2 - 249,999 ft2	137	19,625,253	71.2	119	48
Schools	K-12 School, ≥ 250,000 ft2	26	8,781,734	69.45	112.95	62
	All K-12 Schools	333	41,104,840	75.8	124.1	46
	Ambulatory Surgical Center; Outpatient Rehabilitation/Physical Therapy; and Urgent Care/Clinic/Other Outpatient	4	432,069	91.5	186.55	
 Healthcare	Hospital (General Medical & Surgical)	18	26,055,893	221.2	387.15	60.5
riculticule	Medical Office	15	3,216,436	102.4	237.7	52
	Other - Specialty Hospital	5	636,230	226.8	361.4	
	All Healthcare	42	30,340,628	178.05	319.4	56
	College/University, 50,000 ft2 – 99,999 ft2	38	2,694,285	93.7	164.1	
College/	College/University, 100,000 ft2 - 249,999 ft2	47	7,205,868	88.5	157.1	
University	College/University, ≥ 250,000 ft2	12	5,916,984	95.95	181.5	
	All College/University	97	15,817,137	90.7	162.2	
	Hotel	69	24,719,430	89.9	163.3	65
	Other - Lodging/Residential and Residence Hall/Dormitory	27	5,305,627	79.1	131.6	72
Lodging	Residential Care Facility	12	1,361,182	110.5	174.5	-
	Senior Care Community	61	5,445,498	98.9	164.2	43
	All Lodging	169	36,831,737	92.9	158.9	54.5



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Building Sector	Primary ENERGY STAR Portfolio Manager Property Type(s)	Number of Properties Included in Analysis	Total Floor Area (Gross ft2) – Build- ings and Parking	Median Site EUI (kBTU/ square foot)	Median Source EUI (kBTU/ square foot)	Median ENERGY STAR Score (1-100 rating)
	Automobile Dealership	2	331,358	120.15	216.5	
	Enclosed Mall and Other - Mall	12	4,992,459	97.9	212.5	
	Lifestyle Center and Strip Mall	22	4,116,568	78.65	170.95	
	Retail Store	42	9,581,640	80.8	162.15	63
Retail	Supermarket/Grocery Store	50	4,491,848	224.05	476.95	61
	Wholesale Club/Supercenter; Other – Services; and Repair Services (Vehicle, Shoe, Locksmith, etc.)	5	622,675	115.2	260.6	26
	All Retail	133	24,136,548	112.5	232.5	61
	Adult Education; Other – Education; and Preschool/Daycare	6	698,005	83	185.1	
	Convention Center and Other- Entertainment/Public Assembly	5	9,731,275	81.5	158.4	
	Courthouse; Other - Public Services; and Prison/Incarceration	7	7,640,066	79.2	155.9	66
	Fitness Center/Health Club/Gym	12	1,664,844	148.35	269.35	
	Ice/Curling Rink and Other - Recreation	3	286,473	63.9	122.9	
Other	Laboratory	16	3,094,891	310.25	565.2	
Otner	Library	8	2,066,559	118.75	217.75	
	Mixed Use	34	30,495,842	71.7	162.15	44
	Movie Theater; Performing Arts; and Social/Meeting Hall	16	1,953,708	102	172.15	
	Museum	5	1,858,242	58.3	103.1	
	Other	14	2,403,886	80.5	141.75	
	Parking	7	2,793,791	120.6	30.9	
	Self-Storage Facility	1	220,307	31.3	76.3	
	Worship Facility	7	795,196	60.2	113.3	33
	All Other Properties	147	66,524,795	87.8	173.9	43.5
Grand Total		2,539	699,489,647			

NOTE: Does not include data center or manufacturing/industrial properties for confidentiality reasons.



Table 3b: Detailed Building Sector Description and Energy Performance Metrics by Sector for Analyzed Properties for 2023

Building Sector	Primary ENERGY STAR Portfolio Manager Property Type(s)	Number of Properties Included in Analy- sis	Total Floor Area (Gross ft2) – Build- ings and Parking	Median Site EUI (kBTU/ square foot)	Median Source EUI (kBTU/ square foot)	Median ENERGY STAR Score (1-100 rating)
	Financial Office	3	2,272,828	64.40	127.30	74
	Office, 50,000 ft2 - 99,999 ft2	75	5,489,431	73.4	156.9	60.5
Office	Office, 100,000 ft2 - 249,999 ft2	88	13,947,054	72.25	149.8	60.5
	Office, ≥ 250,000 ft2	171	157,181,880	61.9	139.1	75
	All Offices	334	176,618,365	65.25	142.8	71
	Multifamily Housing, 50,000 ft2 – 99,999 ft2	458	32,572,213	75.6	115.75	71
Multifamily Housing	Multifamily Housing, 100,000 ft2 - 249,999 ft2	447	70,704,398	74.6	121	68
J	Multifamily Housing, ≥ 250,000 ft2	423	214,422,786	75.1	123.1	63
	All Multifamily Housing	1,329	317,730,800	75.70	75.4	119.9
	K-12 School, 50,000 ft2 - 99,999 ft2	159	11,920,799	84.6	132.7	40
K-12	K-12 School, 100,000 ft2 - 249,999 ft2	139	19,995,076	76.5	124.5	47
Schools	K-12 School, ≥ 250,000 ft2	26	8,958,116	73.9	121.8	54.5
	All K-12 Schools	324	40,873,991	80.90	130.3	45
	Outpatient Rehabilitation/Physical Therapy; and Urgent Care/Clinic/Other Outpatient	5	1,692,280	120.8	212.5	
 Healthcare	Hospital (General Medical & Surgical)	18	26,570,446	228.25	384.95	59.5
ricaltificate	Medical Office	14	3,277,206	111.15	259.7	37
	Other - Specialty Hospital	3	327,143	194.20	340.7	-
	All Healthcare	40	31,867,075	183.7	325.7	56
	College/University, 50,000 ft2 - 99,999 ft2	29	2,035,068	99.9	189.4	
College/	College/University, 100,000 ft2 - 249,999 ft2	35	5,582,340	79.6	158.7	
University	College/University, ≥ 250,000 ft2	10	5,217,530	97.9	165.75	
	All College/University	74	12,834,938	92.85	168.25	
	Hotel	76	28,375,894	106.25	194.1	53
	Other - Lodging/Residential and Residence Hall/Dormitory	14	3,783,572	85	140.85	69
Lodging	Residential Care Facility	10	1,208,105	113.40	179.3	
	Senior Care Community	59	5,609,712	100.8	158.4	44
	All Lodging	159	38,977,283	103.3	177.4	51



(Continued from previous page.)

Building Sector	Primary ENERGY STAR Portfolio Manager Property Type(s)	Number of Properties Included in Analysis	Total Floor Area (Gross ft2) – Build- ings and Parking	Median Site EUI (kBTU/ square foot)	Median Source EUI (kBTU/ square foot)	Median ENERGY STAR Score (1-100 rating)
	Automobile Dealership	2	331,358	119.70	210.15	
	Enclosed Mall and Other - Mall	10	2,351,233	99.50	203.55	
	Lifestyle Center and Strip Mall	22	4,199,836	94.25	204.85	
	Retail Store	40	9,372,601	85.00	166.7	61
Retail	Supermarket/Grocery Store	39	3,488,277	227.00	460.8	63
	Wholesale Club/Supercenter; Other – Services; and Repair Services (Vehicle, Shoe, Locksmith, etc.)	5	1,081,721	63.70	124.6	83.5
	All Retail	118	20,825,026	104.90	215.1	63
	Adult Education; Other – Education; and Preschool/Daycare	5	558,451	83	164.5	-
	Convention Center and Other- Entertainment/Public Assembly	5	9,731,275	93	182.4	
	Courthouse; Other - Public Services; and Prison/Incarceration	6	6,046,352	93.45	180.5	48.5
	Fitness Center/Health Club/Gym	11	1,572,844	161.00	305.8	
	Ice/Curling Rink and Other - Recreation	3	286,473	88.1	166.8	
Oth	Laboratory	16	3,094,891	291.75	458.65	
Other	Library	6	21,742,274	121.95	245.3	
	Mixed Use	30	27,445,811	74.70	167.4	53
	Movie Theater; Performing Arts; and Social/Meeting Hall	16	2,384,335	125.2	234	-
	Museum	6	2,866,658	58.3	103.1	
	Other	14	2,403,886	88.85	159.5	
	Parking	7	2,951,927	120.6	30.9	
	Self-Storage Facility	1	220,307	29.10	77.4	
	Worship Facility	5	662,355	66.30	111.6	36
	All Other Properties	138	62,771,548	102.35	203.8	45.5
Grand Total		2,516	702,499,027			

NOTE: Does not include data center or manufacturing/industrial properties for confidentiality reasons.



TREND ANALYSIS METHODOLOGY

The trend analysis presented in this report applies to individual properties that reported in 2021, 2022, and 2023. The properties included in the trend analysis were only those that were analyzed in 2022 and 2023. Weather-normalized source energy use per sq. ft. was used for the trend analysis to control for weather variations between the calendar years of the comparison, as well as any changes in the properties' square footage.¹²

CALCULATION METHODOLOGIES

The median weather-normalized source energy use intensity (in kBTU/sq. ft.) for the sample properties was calculated for 2021 and 2023. The difference between these median values was then calculated, showing a slight increase in total weather-normalized source energy use for the group of properties analyzed.

The total GHG emissions (in Carbon dioxide equivalent or CO2e per year) for the sample properties was calculated for 2021 and 2023. The difference between these median values was then calculated, showing a decrease in total GHG emissions for the group of properties analyzed. Table 4 shows the median weather-normalized source energy use intensity (in kBTU) and the total GHG emission values for 2021-2023 for this group of buildings, and the total percentage reductions achieved.

Table 4: Three-Year, Same Building Trend Analysis¹³

Year	Median Weather-Normalized Source Energy Use Intensity (kBTU/sq. ft./year) (n=1,623) ¹³	Total Greenhouse Gas Emissions (CO2e/year) (n=1,620)
2021	133.10	3,617,667.10
2022	133.00	3,395,365.90
2023	136.60	3,324,783.00
Change from 2021 to		
2023	3.5	-292,884.10
Percentage Change	3%	-8%



- ¹ Properties Listed on the Covered Building List are required by the Chicago Energy Benchmarking Ordinance to report annually.
- ²These properties are not required by the ordinance to report due to size or property use type but see the value in energy use tracking and sharing.
- ³ For more details on the analysis methodology please see the Appendix, pages 21-22.
- ⁴ For more details on property types, please see the Appendix, Tables 3a and 3b.
- ⁵ In August 2018, EPA updated performance metrics for some U.S. buildings in ENERGY STAR Portfolio Manager® based on the most recent market data available. This update is part of EPA's standard process to keep ENERGY STAR metrics as current as possible, and reflective of current market perfor mance. At this time, the 1–100 ENERGY STAR scores and other source energy metrics were updated for certain U.S. building types benchmarking in Portfolio Manager across all time periods to reflect the latest performance metrics.
- This update was followed by a score review period for U.S. K-12 schools, worship facilities, warehouse properties, hotels, offices, retail stores, and supermarkets, during which EPA engaged industry to get feedback, conduct additional analysis, and ensure the score models deliver metrics that sup port organizations' energy efficiency goals. See additional information on this update here: https://www.energystar.gov/buildings/facility-owners-man agers/existing-buildings/use-portfolio-manager/update-energy-star-scores-cbecs
- ⁶ N=1,623, as properties without a median weather normalized source EUI at any point during the three-year period were excluded from this calculation. More details on page 27 of the Appendix.
- ⁷ City of Chicago Greenhouse Gas Inventory Report https://www.chicago.gov/content/dam/city/progs/env/GHG_Inventory/Chicago-2017-GHG-Report_ Final.pdf
- ⁸ For more details about how to interpret your property's ENERGY STAR score, please visit:https://www.energystar.gov/buildings/benchmark/analyze-benchmarking-results
- ⁹Two key weather normalized metrics include weather normalized site energy use and weather normalized source energy use, both expressed in kBTU. These include the site and/or source energy (kBTU) that a property would have consumed under 30-year average weather conditions, based on actual energy use for a given time-period. For more information on weather normalization, see the ENERGY STAR Portfolio Manager Technical Reference on Climate and Weather: https://portfoliomanager.energystar.gov/pdf/reference/Climate%20and%20Weather.pdf
- ¹⁰ See www.CityofChicago.org/EnergyBenchmarking for additional information.
- ¹¹See Tables 3a and 3b for a breakdown of the eight building sectors included in this analysis.
- ¹² For more information, see the ENERGY STAR Portfolio Manager Technical Reference on Weather and Climate: https://portfoliomanager.energystar.gov/pdf/reference/Climate%20and%20Weather.pdf
- ¹³ Properties without values in these fields for any year of the three-year period were excluded from analysis.





2022-2023 CHICAGO ENERGY BENCHMARKING ** REPORT **