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City of Aspen Building IQ **Community Benchmarking Report**

Created by the Community Office for Resource Efficiency on behalf of the City of Aspen to report on the benchmarking data from 2021 through 2023.



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Building IQ Overview

Buildings account for **57%** of Aspen's greenhouse gas emissions. Improving buildings is critical in reaching the City of Aspen's ambitious science-based targets to reduce greenhouse gas emissions by 63.4% by 2030 and 100% by 2050.

On April 12, 2022, the City of Aspen passed Ordinance No. 05, officially establishing the Building IQ program. Building IQ addresses emissions from existing buildings through a phased, two-part program that includes benchmarking and a building performance standard (BPS).

Benchmarking is the process of tracking energy and water use in buildings. Benchmarking helps identify opportunities for emissions reductions in buildings.

The Community Office for Resource Efficiency (CORE), a 501(c)(3) nonprofit, partners with the City of Aspen to offer free personalized benchmarking support to property owners and managers.

CORE and the City of Aspen's partnership resulted in 100% compliance in the last two years. Higher compliance means more property owners and managers understand their buildings' energy and water use. High-quality data and expert support can inform long-term plans to improve a building's efficiency and reduce emissions.

Key Takeaways

36% of the total square footage of buildings in Aspen has been benchmarked through Building IQ



CORE provided technical advising and **more than \$190,000 in funding support** to Building IQ participants in completing ten building retrofit projects.



Many Building IQ participants, including Aspen Meadows, the Aspen Art Museum, and the Yellow Brick, **are already leading the way with year-over-year energy savings.**



In 2023, the average emissions from gas contributed to 76.47% of all benchmarked buildings' emissions. **With Aspen Electric providing 100% renewable energy and Holy Cross Energy providing 100% renewable energy by 2030, electrification of Aspen's buildings will substantially reduce emissions.**



Hotels are the highest greenhouse gas emitters, **accounting for 46% of all benchmarked building emissions.** This shows ample opportunity for targeted improvements.

Steps Forward

More Buildings Benchmarking

The next cycle of benchmarking will include:

- Commercial properties \geq 5,000 square feet.
- Multifamily properties \geq 15,000 square feet.

Building Performance Standard (BPS)

The second phase of Aspen City Council's Building IQ ordinance involves developing a building performance standard (BPS).

To develop a BPS, the City is convening the BPS Stakeholder Committee.

Over 20 building owners, industry experts, local decision-makers, and other relevant stakeholders assemble to provide input on what a BPS could look like in Aspen's local context. These standards will set specific building targets to help the City of Aspen reach its climate goals. **Email BuildingIQ@aspen.gov to provide input on these standards.**



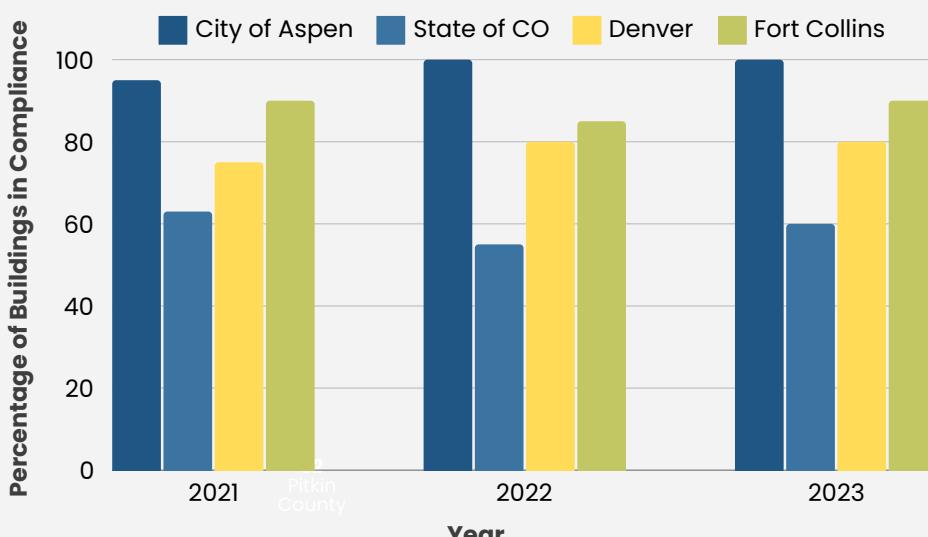
Finding Funding

Identifying funding is a key step in creating change based on benchmarking results. The City of Aspen is conducting a study of the costs and benefits of improving all buildings in Aspen and evaluating funding opportunities.

Supporting Local Building Owners & Occupants

Supporting local building owners in identifying building improvements creates real action from benchmarking results. The City of Aspen and CORE are developing a "Building Performance Hub" to provide centralized support for building owners. **Learn more at AspenCORE.org.**

Year Over Year Compliance Rates:



This graph shows how the City of Aspen's compliance rates **continue to lead the charge across the state.**

**Please note that the State of Colorado has a delayed reporting timeline, and its current compliance rate is subject to change.*

Benchmarking Overview

What is Benchmarking?

Benchmarking is a process where building owners track and compare their building's energy and water use to similar buildings over time. Benchmarking helps owners and occupants understand their building's performance and identify areas for improvement.

In 2023, benchmarked buildings in Aspen emitted an average of 333 MTCO2e, which is equivalent to over 800 thousand miles driven by an average gasoline-powered vehicle.² Research shows that the act of benchmarking alone can lead to a 2-3% decrease in energy consumption, therefore reducing the emissions from benchmarked buildings.³

What is Benchmarked?

119

buildings

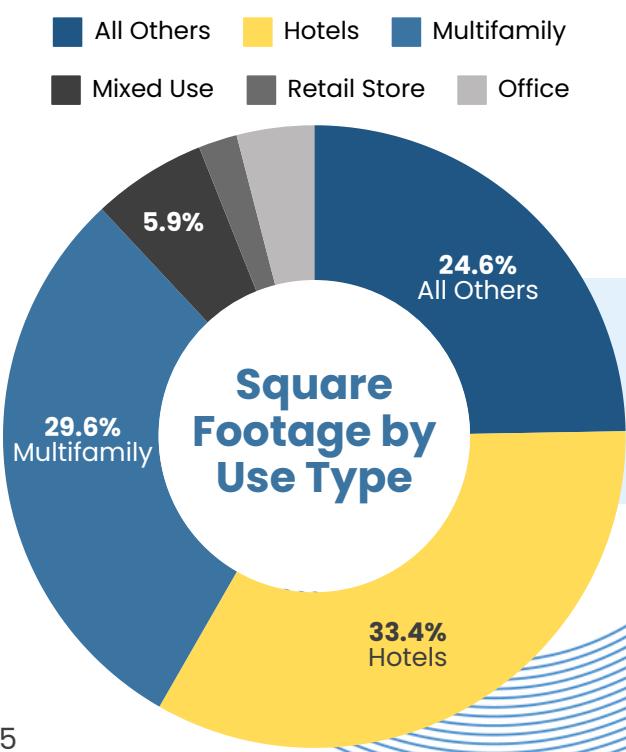
36%

of the total square footage
of buildings in Aspen

4.8

million sq. ft.

The three types of buildings that represent the largest square footage of all buildings benchmarked include hotels, multifamily buildings, and mixed use properties, with a total of about 3.3 million in square footage.



 This graph shows the total gross floor area, in square feet, that was benchmarked in 2023, grouped by building use type.

(Source: [ENERGY STAR Portfolio Manager, 2024](#))

Key Terms

Getting Scientific

To better understand energy usage, it's helpful to understand energy metrics.



kBtu = One thousand (kilo) British thermal units.

A Btu is a measurement of thermal energy, where one Btu is the energy needed to heat or cool one pound of water to one degree Fahrenheit at sea level. So, assuming you're in a room that's set at 60°F and you're at sea level, it would take 1.2 kBtus to bring a gallon of water to a boil.¹



EUI/WUI = Energy Use Intensity/Water Use Intensity

EUI/WUI refers to the amount of energy or water used per square foot annually. EUI/WUI is calculated by dividing the total energy or water consumed by the building in a year (kBtus or gallons) by the total gross floor area (square footage).¹



MTCO2e = Metric Ton Carbon Dioxide Equivalent

Emissions of greenhouse gases can be expressed in a common metric to compare their impacts directly as some have a higher global warming potential than others. Using carbon dioxide equivalents (CO₂e) is the international standard practice for expressing greenhouse gases. So, if a project saves 217 MTCO₂e, that is equivalent to the carbon sequestered by 253 acres of U.S. forests in one year.²



Fire Place, Aspen Fire District

Building Highlights



Multifamily Buildings

In 2024, multifamily buildings in Aspen were benchmarked for the first time. While multifamily buildings present new challenges due to multiple owners, CORE's comprehensive site visits, personalized communication, and new software proved effective in streamlining and completing the process.¹

The Aspen Art Museum

The Aspen Art Museum rapidly reduced emissions with a building automation system upgrade and LED lighting retrofit in 2022. Gas usage went down 26%, and electricity use went down 11% from 2022 to 2023.¹



The Aspen Art Museum

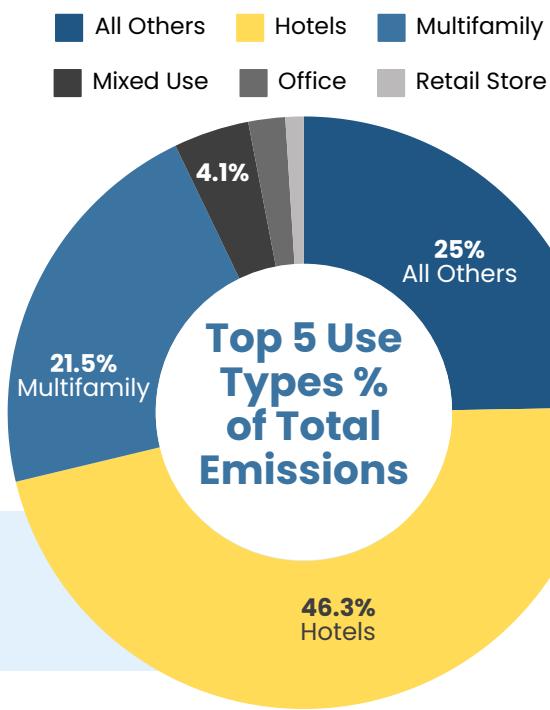


Benchmarking Results

Greenhouse Gas Emissions

Tracking greenhouse gas emissions from Aspen's buildings is critical to reaching the City's climate goals and creating a healthier community. This report references the **"Top Five Use Types"** - building use types with seven or more buildings. Hotels, multifamily housing, mixed use properties, offices, and retail stores comprise **75% of the benchmarked square footage.**

This graph shows how these use types make up about 75% of the total emissions of all of the buildings benchmarked in Aspen in 2023.¹



Building Highlight

Aspen Meadows

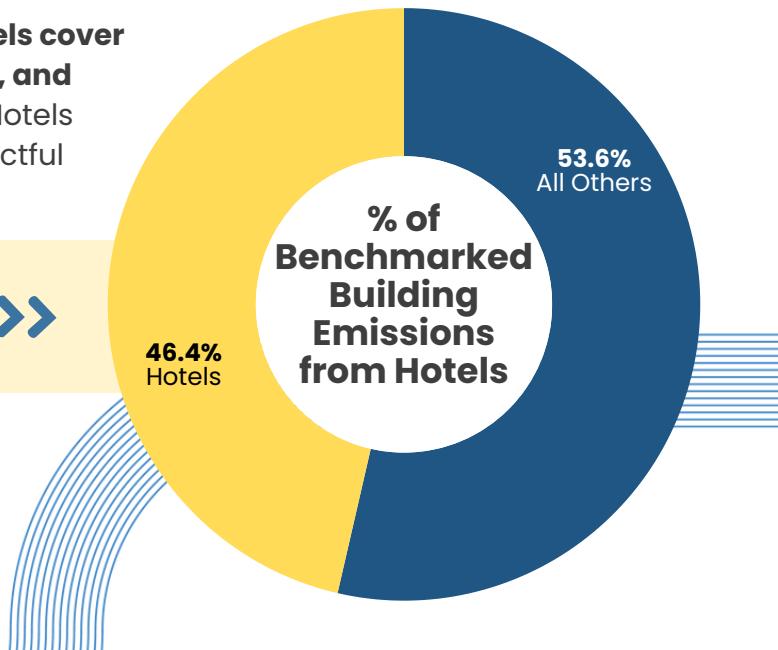
In 2023, Aspen Meadows installed heat pumps with no backup heat in all of their 102 hotel rooms, being the first project of its kind in Aspen. This project contributed to a 217 MTCO₂e decrease in greenhouse gas emissions, equating to the emissions of 28 homes' energy use for one year. The popular assumption in our climate that existing buildings receiving a heat pump retrofit also require backup heating is challenged by the demonstrated reliability and exceptional performance of Aspen Meadows' new heating system.



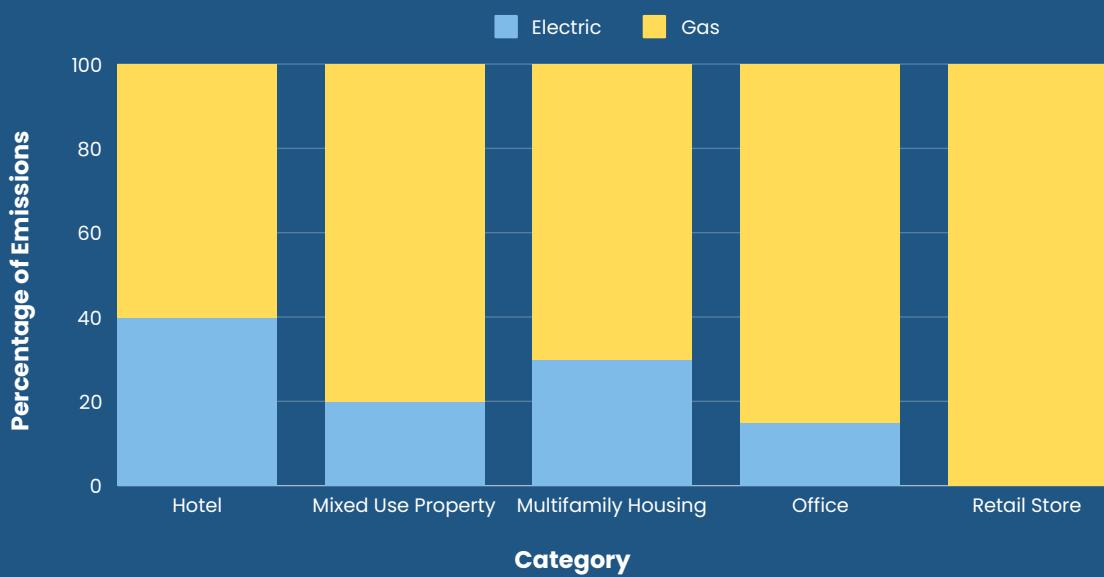
Benchmarking Results Continued...

Of all buildings in the third benchmarking year, **hotels cover 33% of the total square feet, use 38% of the energy, and emit 46% of the total greenhouse gas emissions**. Hotels provide ample opportunities for targeted and impactful improvements.

This graph shows the percentage of benchmarked building emissions from hotels.¹



Percent of Emissions from Gas vs. Electric



This graph shows that gas contributes to the large majority of emissions from hotels, mixed use properties, multifamily housing, offices, and retail stores.

Gas, therefore, is the primary source of all benchmarked building emissions, as these five use types emit 75% of all the emissions from benchmarked buildings.

Electric emissions will continue to fall since Aspen Electric is 100% renewable and as Holy Cross Energy works towards 100% renewable by 2030.

Energy Use Intensity

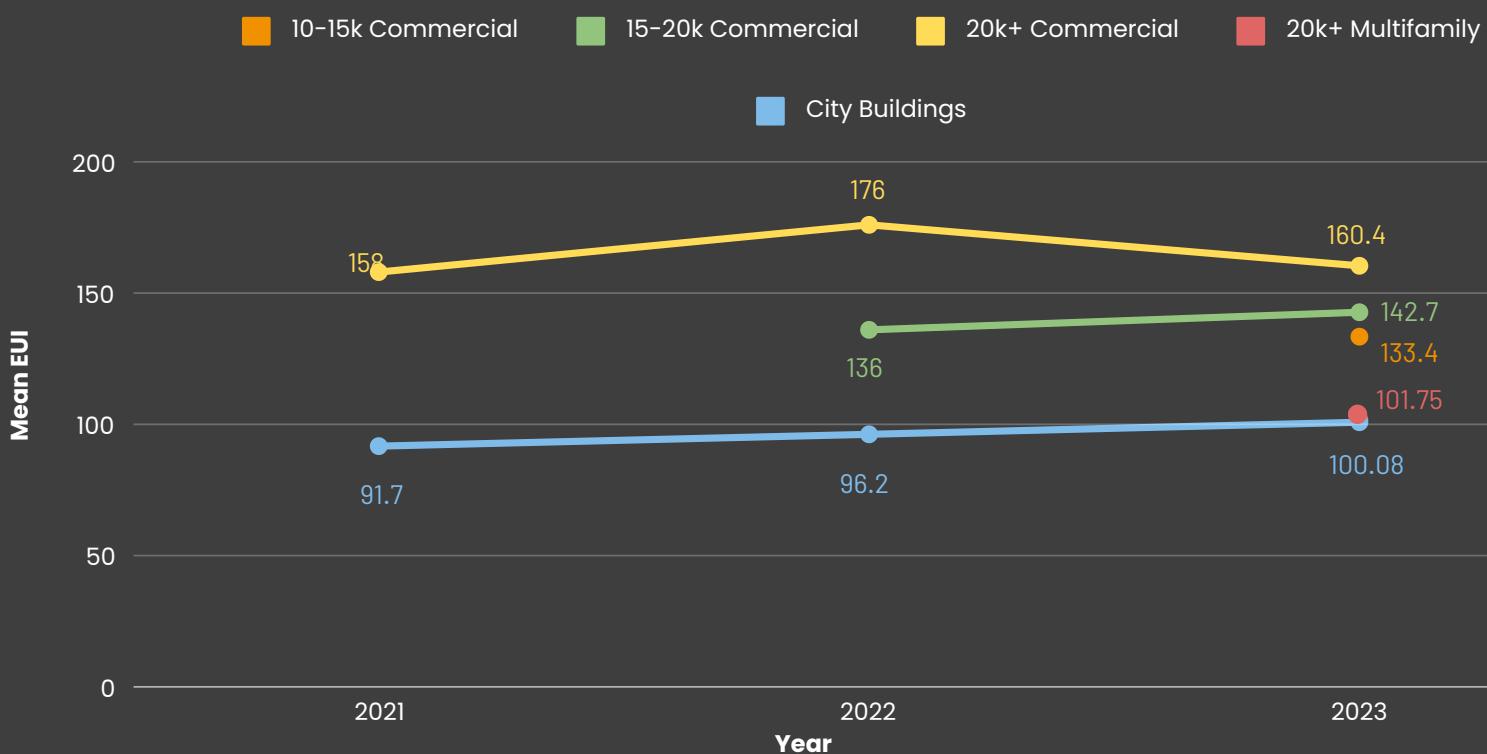
Energy Use Intensity (EUI) tracks a building's energy use and allows for comparison to other buildings of similar size or use type. This helps building owners, managers, and the City of Aspen identify where energy efficiency improvements would have the most significant impact and where more support is needed.

Notes: While a low EUI implies that a property has efficient energy use, some property types will always require more energy because of their amenities or critical services. An elementary school, for example, has a relatively low EUI compared to a hospital.¹

Aspen is in Climate Zone 7, or a "very cold" climate. There is limited data from other Climate Zone 7 areas, so the sample size is small. This can skew results and should be reviewed cautiously.

YOY Mean EUI by Category

This graph shows how Aspen buildings are doing compared to their benchmarks in previous years.¹

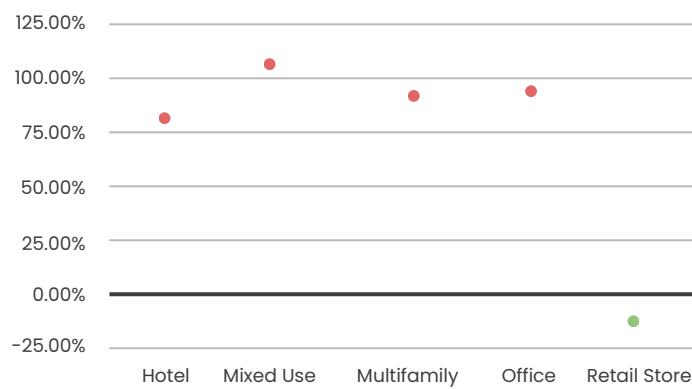


Top Five Use Types % Difference from Climate Zone 7 Median EUI

This graph shows that benchmarked hotels, mixed use, multifamily, and office buildings in Aspen have far higher EUIs than similar buildings in Climate Zone 7. However, the median EUI of benchmarked retail stores is 13% lower than that of retail stores across Climate Zone 7!



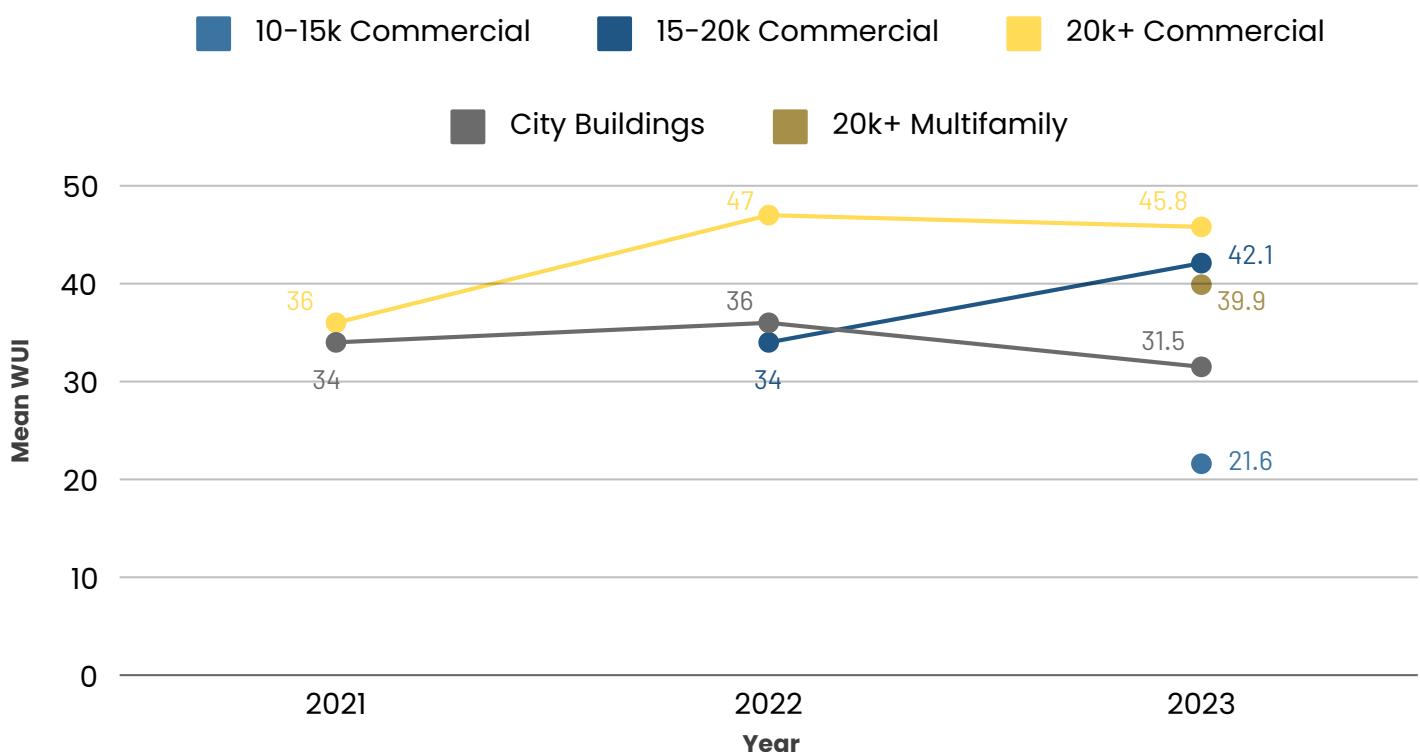
Top 5 Use Types % Difference from CZ7 National Median



Water Use Intensity

Water Use Intensity (WUI) is another important metric of a building's performance. The benchmarking process collects and reports on WUI in the same way it does with energy. As more data becomes available from similar communities, Building IQ will involve working with water experts to understand how Aspen's buildings compare and how they can improve. This will be an opportunity to collaborate with the City of Aspen Utilities in support of their water efficiency plan.

Mean WUI Year Over Year



Building Highlight

The Yellow Brick led the charge by installing the region's first electric heat pump snowmelt system. The **Yellow Brick** is a City of Aspen-owned building and is one of the most efficient buildings in Aspen. Annually, the projects at Yellow Brick save 63.41 MTCO₂e, the equivalent of 12.5 homes' electricity use for one year.²



Benchmarking Outcomes

In August 2024, Building IQ Benchmarking Scorecards were distributed to property owners detailing their building's energy and water consumption and individualized recommendations on how to improve their buildings.

Common Recommendations for Building IQ Buildings

- Electrifying heating systems by fuel switching from gas to electric heat pumps.
- Tuning and improving existing systems. This can include using heat tape timers, lowering boiler temperatures based on outdoor temperatures, upgrading building automation systems, or retro-commissioning.
- Choosing Energy Star kitchen equipment and electric cooking equipment.
- Switching to LED lighting.

From Recommendations to Action

- CORE supported Building IQ buildings by providing \$190,000 in funding for ten building retrofit projects.
- As CORE continues to work with a broader range of buildings through Building IQ and deepens relationships with Building IQ participants, it is expected that the number of projects and the amount of awarded funding will increase year over year.

SOURCES

1. [ENERGY STAR Portfolio Manager, 2024](#)
2. [Environmental Protection Agency, 2024](#)
3. [Benchmarking and Energy Savings, 2012](#)

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