

MONTGOMERY COUNTY, MD

2020 Energy Benchmarking Report



[Montgomery County's Benchmarking Law](#) requires building owners to capture and report whole-building energy use of certain non-residential buildings 50,000 square feet and greater annually using [ENERGY STAR Portfolio Manager](#).

Published each year, benchmarking results help to:

- Provide new insights and deepen our understanding of energy consumption patterns,
- Identify energy saving opportunities within a building types and portfolios,
- Manage business bottom lines through consistent data collection and tracking, and
- Prepare for proposed [Building Energy Performance Standards](#) requirements.

In addition to this report highlighting 2020 results and trends, an interactive [map](#) and raw [dataset](#) are available online for further exploration.

Questions: energy@montgomerycountymd.gov

BENCHMARKING LAW OVERVIEW

In May 2014, Montgomery County was the first county in the country to adopt a building energy benchmarking and transparency law. The [Building Energy Benchmarking Law](#) requires property owners to capture and report high-level, whole-building energy use annually using EPA's ENERGY STAR Portfolio Manager.

Three groups are required to benchmark annually under the Benchmarking Law in Montgomery County. In July 2016, the City of Rockville opted into the Law. In March 2018, the City of Gaithersburg also opted in. DEP publicly discloses benchmarking data following the first year of reporting. This report reflects benchmarking submissions received by the County through October 1, 2021.

Group	Total Building(s) Square Footage	First Data Year	First Deadline	First Data Disclosure
County	50k sq. ft. +	2014	June 1, 2015	CY 2015 data, Oct 1, 2016
Group 1	250k sq. ft. +	2015	June 1, 2016	CY 2016 data, Oct 1, 2017
Group 2	50k sq. ft. - 250k sq. ft.	2016	June 1, 2017	CY 2017 data, Oct 1, 2018

The current Benchmarking Law covers roughly 100 million square feet of building area, representing about 40% of all commercial building area in Montgomery County.

The Benchmarking Law also requires [data verification](#) the first year of reporting and every 3 years thereafter. In 2020, most County properties were due for data verification.

For more information and resources on complying with the Benchmarking Law, please visit [DEP's benchmarking webpage](#).

BENCHMARKING AMENDMENTS & PERFORMANCE STANDARDS

In April 2021, [Bill 16-21](#), Building Energy Use Benchmarking and Performance Standards – Amendments were transmitted to County Council to modify the County’s current Building Energy Benchmarking Law. The legislation will:

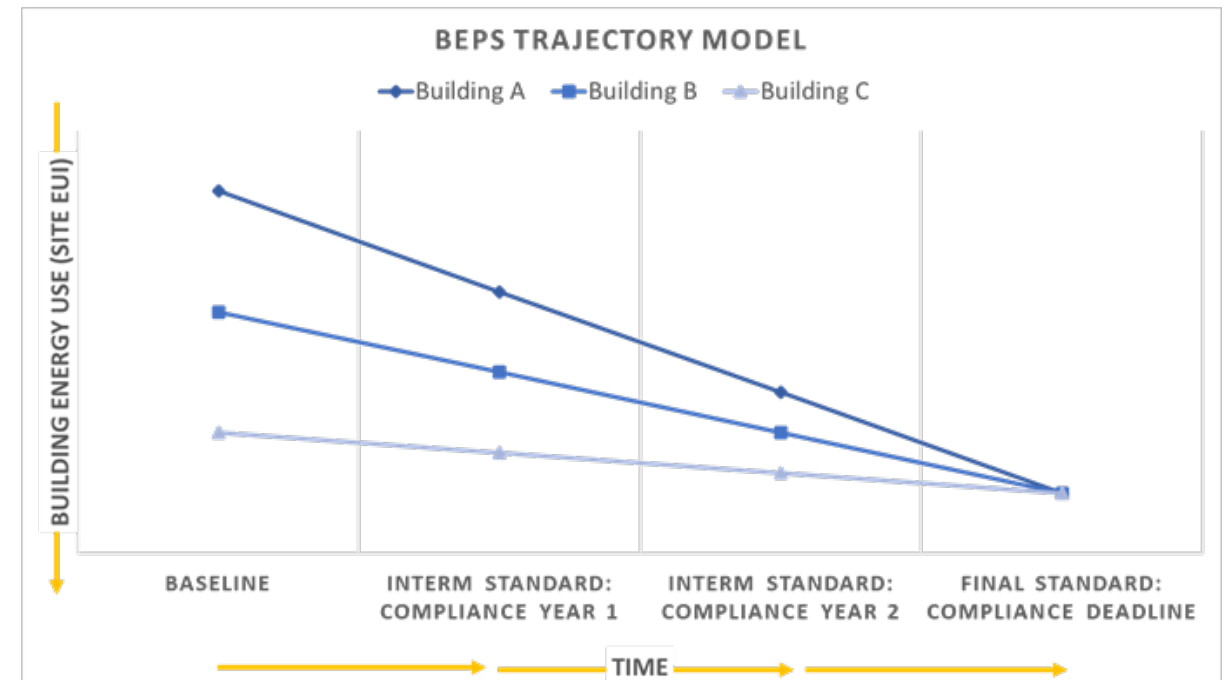
- Expand the number of buildings covered by benchmarking requirements,
- Establish energy performance standards for existing buildings, and
- Create a Building Performance Improvement Board.

Proposed amendments would expand benchmarking to smaller commercial buildings by reducing the square footage threshold from 50,000 to 25,000 square feet, add multifamily residential buildings, and include some previously exempted building types. Over time, all buildings covered by the Building Energy Benchmarking Law would become subject to **Building Energy Performance Standards (BEPS)**.

BEPS set a minimum energy performance threshold for buildings and are one of the most powerful policy tools available to drive energy improvements in existing buildings, which account for 50% of community-wide greenhouse gas emissions.

Buildings are grouped by property type, and each property type is assigned a long-term performance standard. All buildings within a property type must meet the same final performance standard by the designated compliance deadline.

For more information and updates on this proposed legislation, please visit [DEP’s BEPS webpage](#).



SCORECARDS FOR BENCHMARKERS

DEP began sending scorecards to benchmarkers following the CY 2019 reporting cycle. In 2020, DEP transitioned to a new software and scorecard format.

Scorecards highlight performance relative to other similar property types, display changes in year-over-year energy use, and provide links to incentive and financing programs to support energy efficiency projects.

If you did not receive a scorecard for your building and would like to receive a copy, please [email DEP](#) with your Montgomery County Building ID and address.



BUILDING ENERGY BENCHMARKING 2020 SCORECARD

MONTGOMERY COUNTY BUILDING ENERGY BENCHMARKING PROGRAM

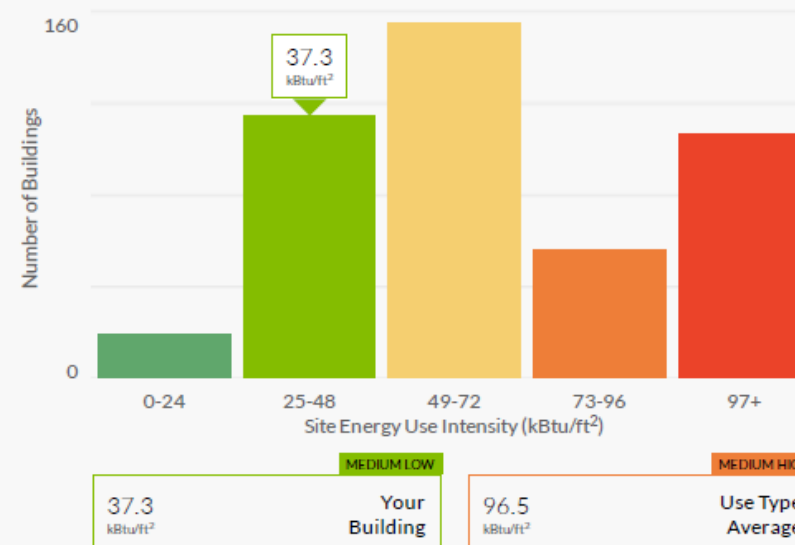
123 Demo Street

Timeframe Jan. - Dec. 2020 Building ID 01234567 Square Footage 90,000 Year Built 1972

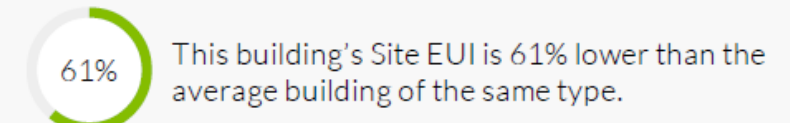
Thank you for benchmarking your building's energy as required by Montgomery County's Building Energy Benchmarking Law. Your property's 2020 energy performance - in site energy use intensity (EUI), a measure of energy use per square foot for the year - is outlined below. Please share this scorecard with your property team and tenants.

2020 Energy Use Metrics

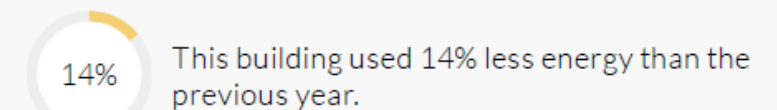
How Your Building Compares to Other Strip Mall Buildings



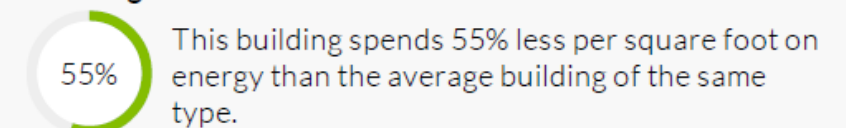
Building EUI Compared to the Average Strip Mall Building



Energy Use Compared to Last Year



\$ per Square Foot Compared to the Average Strip Mall Building



Despite the ongoing COVID-19 health emergency, many building owners opted to report energy benchmarking data by the June 1st reporting deadline. Many commercial buildings experienced historically low average occupancy, rendering 2020 energy use out of the norm of typical operations. This change makes year-over-year trends difficult to compare.

High Compliance Rate Maintained ([page 6](#))

Outreach and education has been ongoing with compliance rates improving over time. DEP took enforcement actions following the 2019 reporting cycle which also led to higher compliance rates. DEP received roughly twice the amount of waiver requests in 2020 as 2019, mostly for average occupancy less than 50% during the calendar year. As of October 1, 2021, **89% of covered properties submitted reports**, marking the highest ever compliance rate by the time of the annual report.

Libraries, Worship Facilities, Hotels See Greatest Decrease in Site EUI During Pandemic ([page 11](#))

Libraries experienced the greatest decrease in weather normalized site EUI between 2019 and 2020 with a 35% reduction. Other – mall, mixed use properties, movie theaters, college/university, hotels, and strip malls all reduced site EUI by over 20% compared to 2019. While this reduction in energy use is likely primarily attributable to lower occupancy in 2020, these properties also managed energy wisely to take advantage of reduced operations.

64 buildings Received ENERGY STAR Certifications in 2020 ([page 6](#))

Sixty-four buildings spanning over 16 million gross square feet received ENERGY STAR certifications in 2020. The [ENERGY STAR certification](#) recognizes buildings with an ENERGY STAR score of 75 or higher on EPA's 1 – 100 scale, indicating that it performs better than at least 75 percent of similar buildings nationwide.

REPORTING RATE

89% compliance⁺

County = 100%
Group 1 = 96%
Group 2 = 87%

AREA REPORTED

87.3 million

Gross square footage
reported in 2020.

PROPERTIES

614⁺

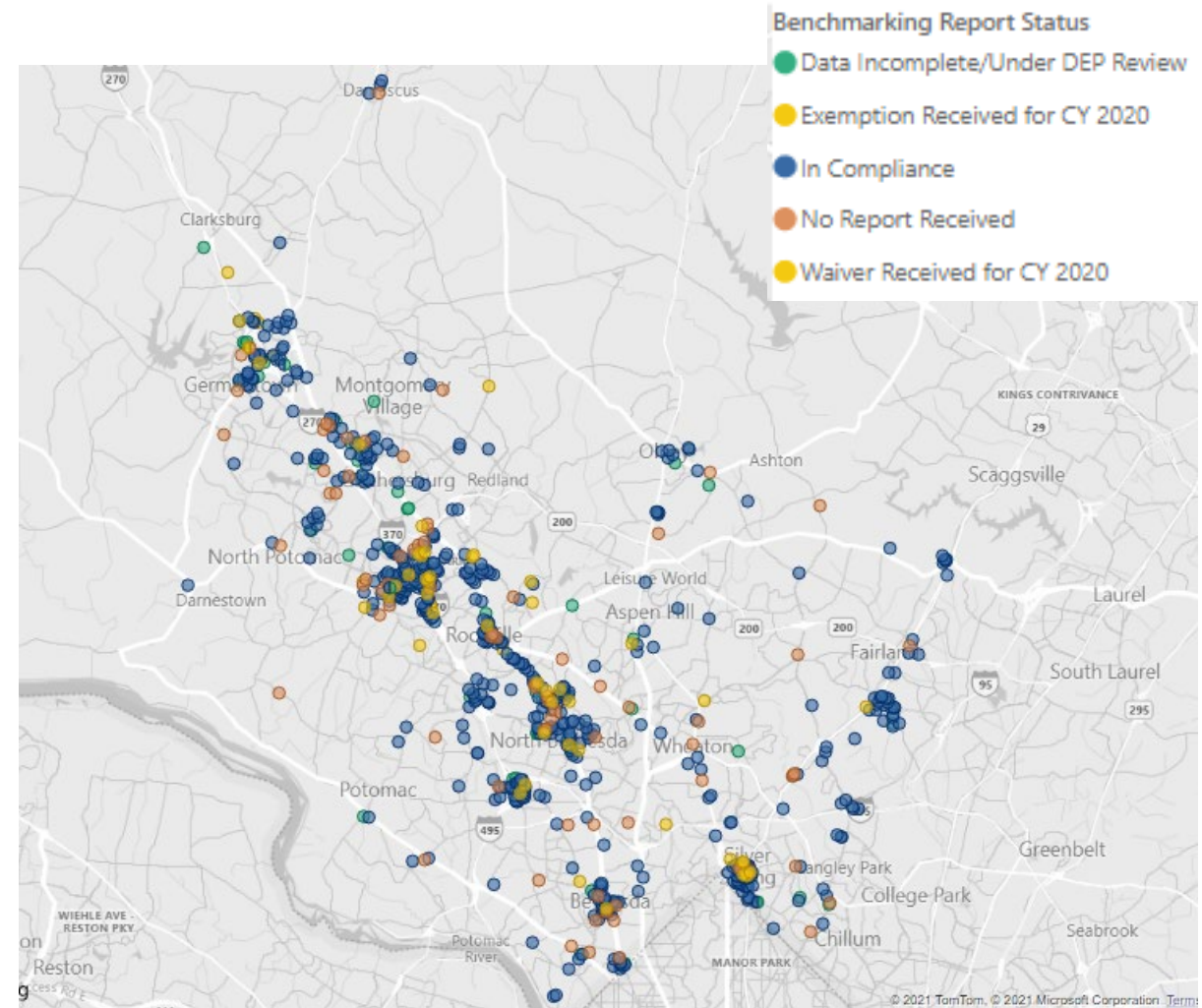
Properties, containing 1,114
buildings submitted
benchmarking data.

ENERGY STAR CERTIFICATIONS

**64 buildings,
16+ million gsf**

Received ENERGY STAR
certifications in 2020*

BENCHMARKED BUILDINGS



⁺ Accounts for only covered properties under the Law. All other stats and graphics include all covered and “special not-covered” reporting properties, received as of Oct 1, 2021.

* Montgomery County buildings earning the [ENERGY STAR label](#) in 2020.

2020 PERFORMANCE SNAPSHOT

ENERGY STAR

69

Median ENERGY STAR score for all reported properties. 50 is the national median.

SITE EUI

62.2

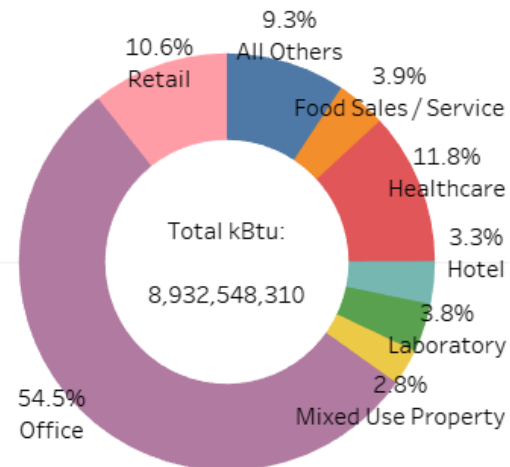
Median weather-normalized site energy use intensity (kBtu per sq ft per year).

TOTAL ENERGY

8.9 BILLION KBTU
1.5 BILLION KWH
37.8 MILLION THERMS

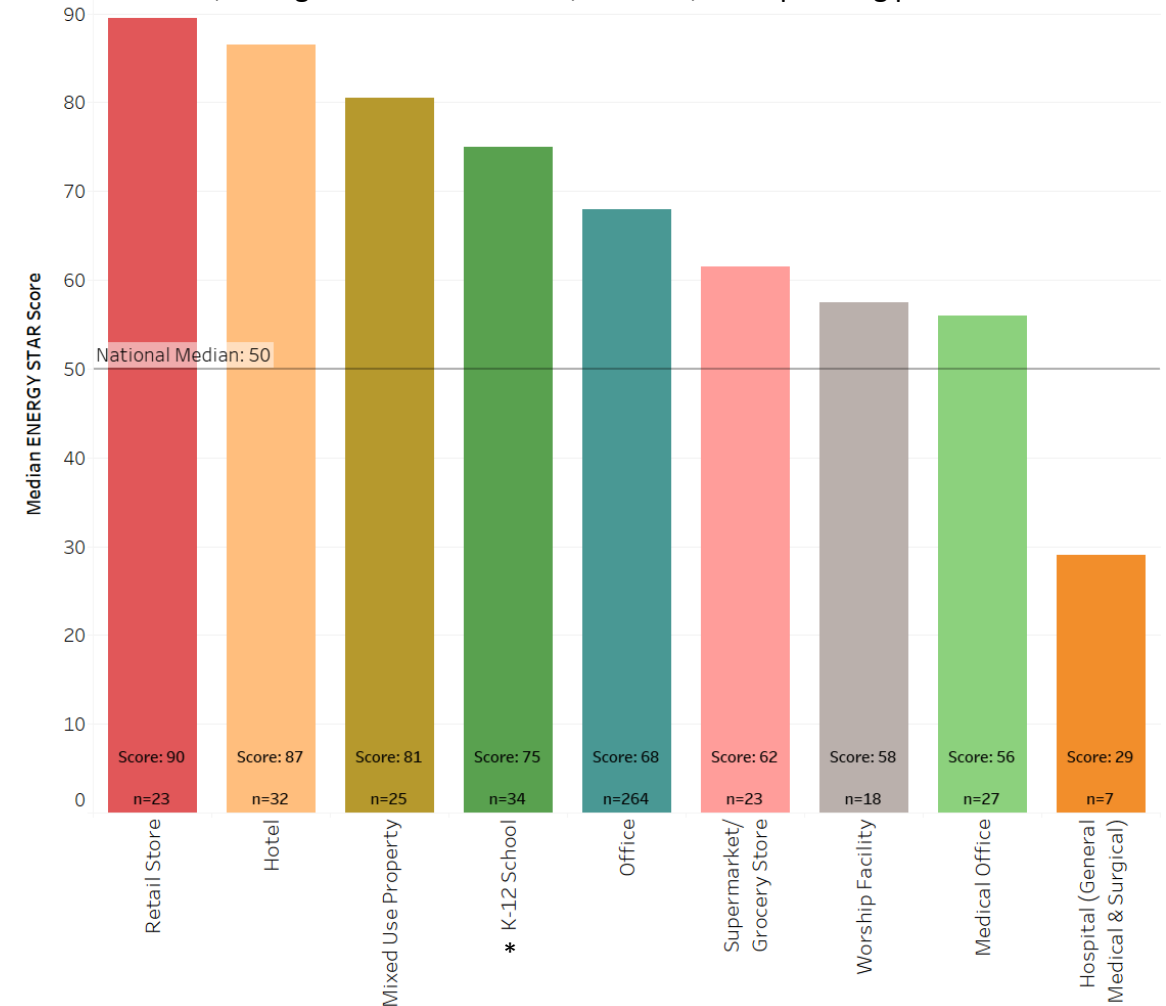
Reported in 2020: Accounts for >30% of all commercial energy use in Montgomery County.

ENERGY USE BY GROUP



ENERGY STAR SCORE BY PROPERTY TYPE

2020 median ENERGY STAR scores for the most common property types and property count are listed on each group's column. The ENERGY STAR Score is a measure of how well a property is performing relative to similar properties, when normalized for climate and operational characteristics. A score of 50 indicates that a building is performing at the national median, taking into account its size, location, and operating parameters.



* MCPS properties opted to forego voluntary reporting in 2020 due to disruptions to occupancy.

TRENDS OVER TIME

COMPLIANCE

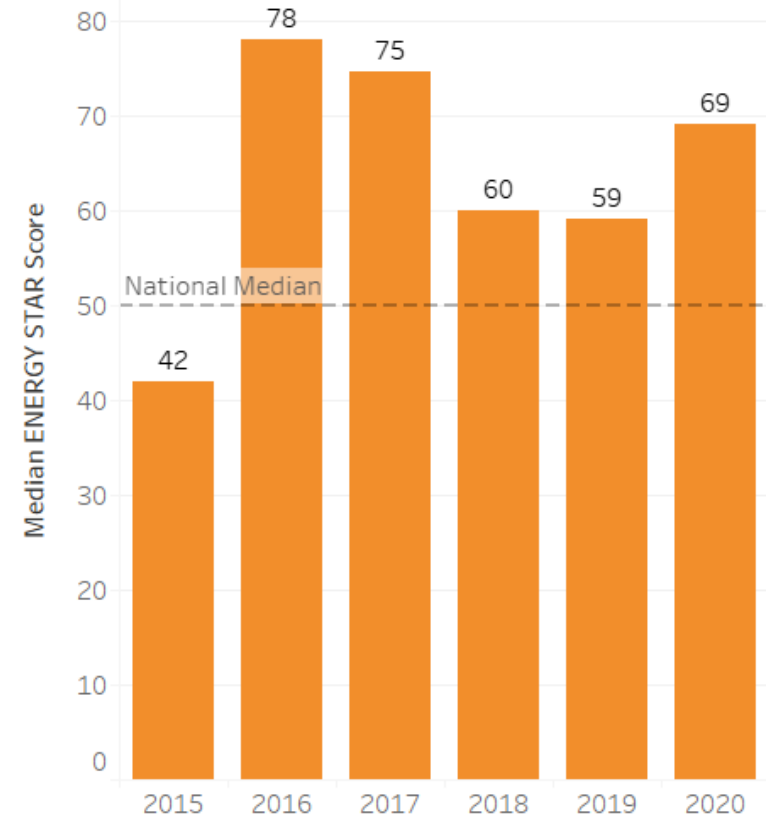
Outreach and education has been ongoing with compliance rates improving over time, particularly in the smaller, Group 2 buildings which greatly outnumber Group 1 and County buildings. 89% of covered properties submitted reports in 2020, as of October 1, 2021.

Reporting Year	Compliance Groups	County	Group 1	Group 2	Grand Total
2015	Report Received	100%			100%
2016	Report Received	100%	87%		88%
	No report received		13%		12%
2017	Report Received	100%	70%	56%	59%
	No report received		30%	44%	41%
2018	Report Received	100%	72%	64%	66%
	No report received		28%	36%	34%
2019	Report Received	100%	98%	93%	94%
	No report received		2%	7%	6%
2020	Report Received	100%	96%	87%	89%
	No report received		4%	13%	11%

ENERGY STAR SCORE

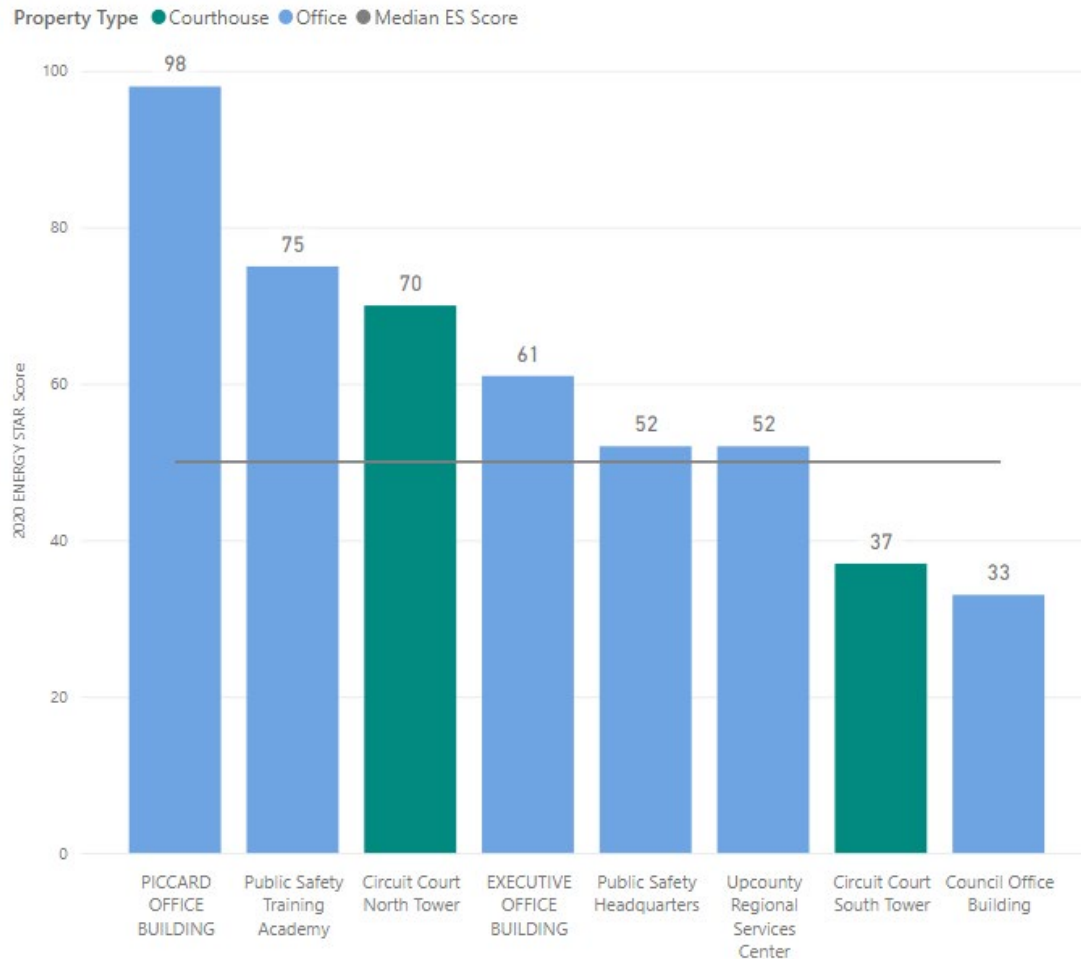
ENERGY STAR score increased abnormally with 69 as the median score of all reported properties in 2020. In 2020, many reported properties experienced a drop in occupancy and operating hours due to COVID-19. While energy use decreased as a result, many building owners may not have [updated property use details](#) that would recalculate the ENERGY STAR score to reflect the latest building operations, resulting in an inflated score.

The large score drop between 2017 and 2018 is primarily due to EPA [recalculating score](#) methodology based on a more recent reference dataset.



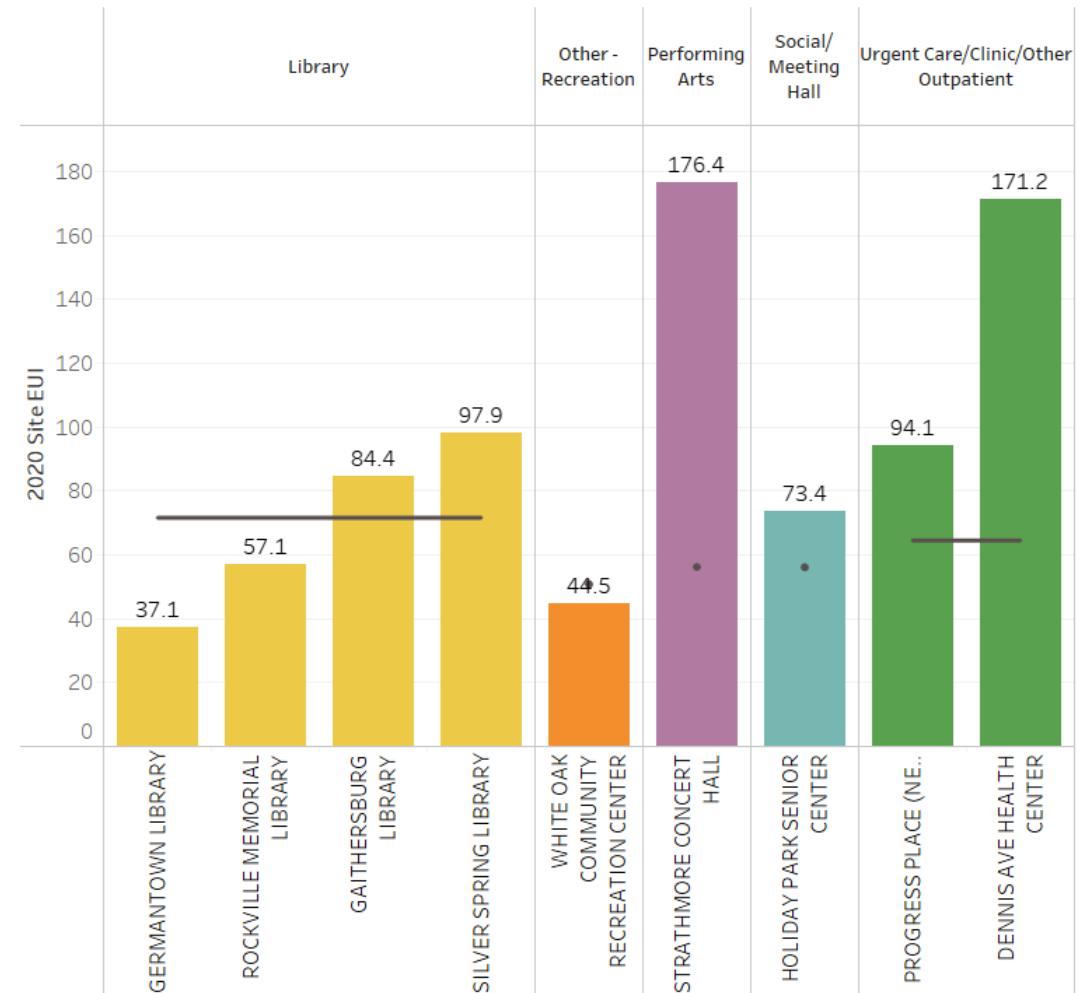
ENERGY STAR SCORE BY PROPERTY

Courthouses and Offices can receive ENERGY STAR scores. 50 is the National Average. **Higher ENERGY SCORE = better performance.**



WEATHER-NORMALIZED SITE EUI

Other space types cannot receive an ENERGY STAR score but can be assessed based on site energy use intensity (kBtu of energy use/ sq ft/year) compared to the national median for each property type (the gray line or dot)*. **Lower site EUI = better performance.**



* See [notes](#) page for numerical median site EUI by property type.

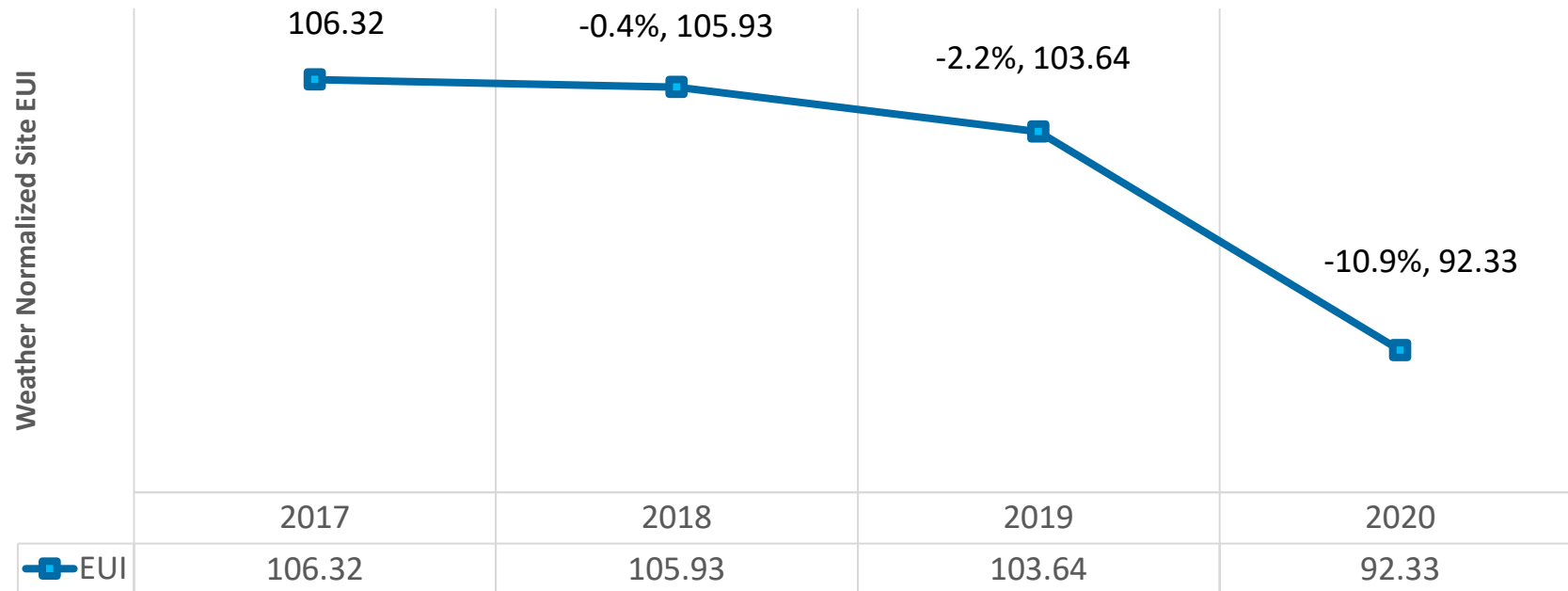
TRENDS OVER TIME: 2017 - 2020

2020 marked the fourth year of public reporting for all covered building groups, providing a robust dataset to assess energy use trends over time. Many properties have now reported consistently between 2017 and 2020, allowing for 4 years of trends. Those properties that had consistently reported over time were included in calculations below.

In 2019, consistently reported properties* realized a **2.5% reduction in weather-normalized site EUI in 2019** compared to 2017. This amounted to a reduction of over 135 million kBtu, **equivalent to an estimated \$3.06 million in utility cost savings.**** In 2020, site EUI dropped 10.9% compared to 2019 and a total of 13.2% since 2017.

The 2020 site EUI use shows a marked reduction compared to prior years, owing to many buildings being fully or partially unoccupied due to the COVID-19 health crisis. While most property types experienced an overall reduction in energy use during 2020 (see next page), [buildings still use energy](#) in HVAC, emergency lighting, elevators, data centers, and some equipment, even when empty. Many buildings also increased ventilation to ensure occupant safety.

SITE ENERGY USE INTENSITY



* 450 properties had reported each year between 2017 and 2019. 269 properties had reported each year between 2017 and 2020 and had weather-normalized site EUI available as a metric. Properties with change in sq ft +/- 50% were removed for potential data quality issues.

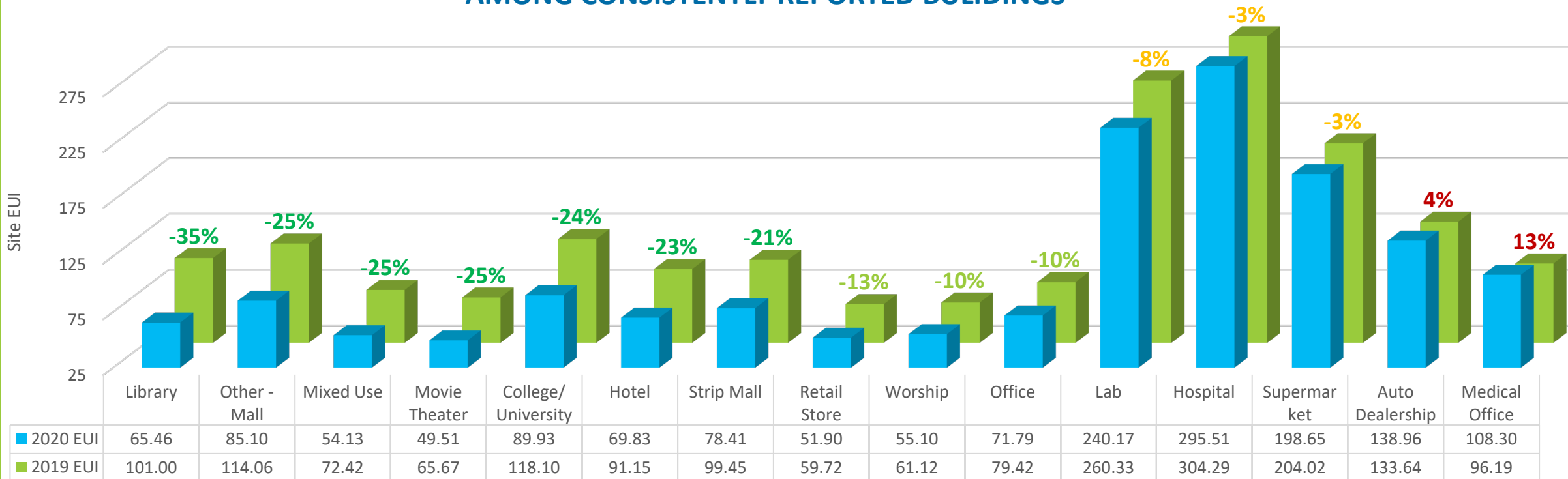
** See page 11 for notes on calculations.

COVID-19 IMPACTS BY SECTOR

As discussed on page 10, in 2020, site EUI dropped 11% compared to 2019 among all constantly-reported buildings. Between property types, libraries experienced the greatest decrease in weather normalized site EUI between 2019 and 2020 with a 35% reduction. Other – mall, mixed use properties, movie theaters, college/university, hotels, and strip malls all reduced site EUI by over 20%. Retail stores, worship facilities, and offices, had savings above 10%.

While this decrease in energy use is likely attributable to lower occupancy in 2020, these properties also took advantage of reduced occupancy to manage energy wisely with set-backs, scheduling changes, and [other strategies to curb energy waste](#).

WEATHER-NORMALIZED SITE ENERGY USE INTENSITY BY PROPERTY TYPE AMONG CONSISTENTLY REPORTED BUILDINGS



CASE STUDY: Montgomery County Rockville Campus MBCx Pilot

- **Properties:** Executive Office Building, Circuit Court Tower North & South
- **Owner:** Montgomery County
- **Type:** Office & Courthouse
- **Floor Area:** 725,060 gsf

Montgomery County's Rockville Campus consists of three large office and courthouse buildings totaling 725,060 gross square feet. The campus accounts for over \$2.4M annual utility cost - about 13.6% of the FY19 facilities utility budget. The Department of General Services (DGS) [Office of Energy & Sustainability](#) (OES) has focused on the campus for additional energy management due to its size, utility cost, intensive usage, age of equipment, and high energy use per square foot.

Since 2019, the campus has employed [Monitoring Based Commissioning \(MBCx\)](#), a process of monitoring and analysis of building data to provide actionable information for system optimization on a continuous basis.

DGS has already realized enough annual energy savings to cover the MBCx pilot project costs (e.g., energy audit, installation and integration of software, engineering analysis, ongoing monitoring) and reduced greenhouse gas emissions by over 2,000 MTCO₂e, about 4% of the 2019 emissions from all DGS-managed facilities.

Throughout the pilot program, DGS has learned that MBCx is a low-risk, high-reward process that can leverage the [EmPOWER MBCx incentive program offered by Pepco](#) to uncover low- and no-cost operations and maintenance savings that can be verified and monitored to ensure that savings persist. The cost of MBCx has also decreased in recent years as technologies have advanced and matured.

As a data-driven approach focused on evaluating and adjusting systems at scale, DGS finds MBCx as the next logical step after benchmarking and a proactive step in preparing County facilities that need to benchmark and, eventually, comply with [Building Energy Performance Standards](#).



Definitions:

- **Covered Property** – Non-residential buildings, or any group of buildings that have the same property identification number, that are 50,000 square feet and greater. Use the [online GIS map](#) created from current Maryland tax assessment records to locate the parcel that a building sits on and see what other buildings share the parcel.
- **ENERGY STAR Score** – The ENERGY STAR Score is a measure of how well a property is performing relative to similar properties, when normalized for climate and operational characteristics. The ENERGY STAR scores are based on data from national building energy consumption surveys, and this allows Portfolio Manager to control for key variables affecting a building's energy performance, including climate, hours of operation, and building size. The 1-100 scale is set so that 1 represents the worst performing buildings and 100 represents the best performing buildings. A score of 50 indicates that a building is performing at the national median, taking into account its size, location, and operating parameters. A score of 75 indicates that at a property is performing in the 75th percentile and may be eligible to earn [ENERGY STAR Certification](#).
- **Greenhouse Gas (GHG) Emissions** – The carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) gases released into the atmosphere as a result of energy consumption at the property. GHG emissions are expressed in carbon dioxide equivalent (CO₂e), a universal unit of measure that combines the quantity and global warming potential of each greenhouse gas, or as an intensity value in kilograms per square foot (kgCO₂e/ft²):
- **Gross Floor Area (GFA)** – Measured as the area between the outside surface of the exterior walls of the building(s). This includes all areas inside the building(s) including supporting areas. GFA is not the same as rentable space, but rather includes all area inside the building(s).
- **Site Energy Use Intensity (EUI)** – The annual amount of all the energy a property consumes on-site to meet the energy loads of a building, regardless of the source, divided by gross floor area. Site EUI represents energy consumed by a building relative to its size measured in kBtu per square foot per year.
- **“Special Not-Covered” Property** – Includes Montgomery County Public Schools and Montgomery College buildings. As state-owned buildings, these properties are not subject to Montgomery County's Benchmarking Law but typically report data voluntarily each year. MCPS properties opted to forego voluntary reporting in 2020 due to disruptions to occupancy.
- **Weather Normalized Site Energy Use Intensity (EUI)** – The energy use a property would have consumed during 30-year average weather conditions, divided by gross floor area. For example, if 2020 was a very hot year, then *Weather Normalized Site EUI* may be lower than *Site EUI*, because you would have used less energy if it had not been so hot. It can be helpful to use this weather normalized value to understand changes in energy when accounting for changes in weather.

Notes & Reference:

- **Voluntary Reports** – As of October 2021, DEP received 54 voluntary CY 2020 reports from buildings not covered under the current Benchmarking Law. Data from those benchmarking reports are not included in this report.
- **Numerical Site EUI by Property Type** – Library = 71.6, Other-Recreation = 50.8, Performing Arts = 56.2, Social/Meeting Hall = 56.1, Urgent Care/Clinic/Other Outpatient = 64.5
- **Calculating Utility Cost Savings Estimates** – On average, 67% of energy use in reported buildings comes from electricity. The 2019 average commercial retail price of [electricity](#) was 9.48 cents per kWh and \$12.46 per thousand cubic feet of [natural gas](#).