

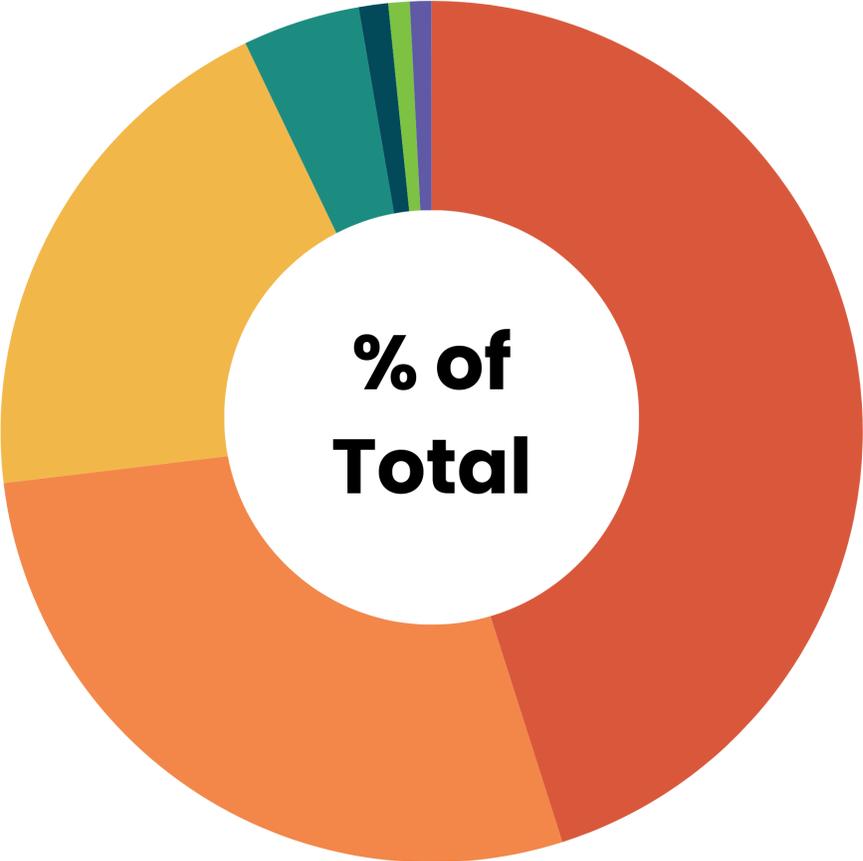
# Building Energy Savings Program

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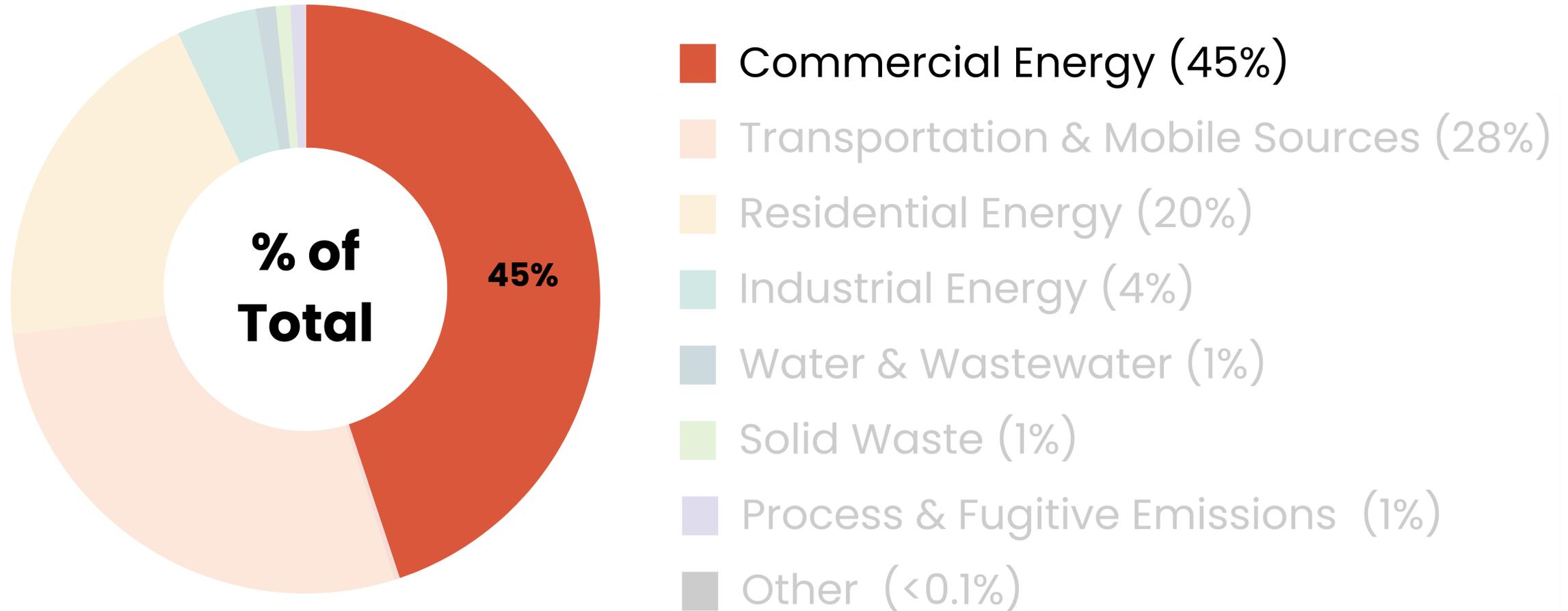
GREGG MAY & JESSICA PRICE  
SUSTAINABILITY AND RESILIENCE PROGRAM  
CITY OF MADISON | OFFICE OF THE MAYOR

# 2022 Community-wide Emissions by Sector



- Commercial Energy (45%)
- Transportation & Mobile Sources (28%)
- Residential Energy (20%)
- Industrial Energy (4%)
- Water & Wastewater (1%)
- Solid Waste (1%)
- Process & Fugitive Emissions (1%)
- Other (<0.1%)

# 2022 Community-wide Emissions by Sector



Row Labels	Number	% of Total Buildings	Average Energy Intensity (kBTU/ft2)	Total Annual Energy Use (kBTU)	% Annual Energy Use (kBTU)
0-10,000	3408	69.59%	96.5	1,138,366,018	18.94%
10,001-25,000	807	16.48%	72.6	914,120,902	15.21%
25,001-50,000	369	7.54%	81.7	1,057,859,688	17.60%
50,001-100,000	193	3.94%	90.7	1,207,115,960	20.08%
100,001-250,000	107	2.19%	81.5	1,227,707,054	20.43%
>250,000	13	0.27%	93.4	465,113,478	7.74%
<b>Grand Total</b>	<b>4897</b>	<b>100.00%</b>	<b>90.9</b>	<b>6,010,283,100</b>	<b>100.00%</b>

**14% of commercial buildings are responsible for 66% of commercial energy use**

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# Commercial Energy – Building Sizes

Top Row  
~50,000 ft<sup>2</sup>



931 East Main



16 North Carroll



406 Science Drive



2921 Landmark Place - 105,000 ft<sup>2</sup>

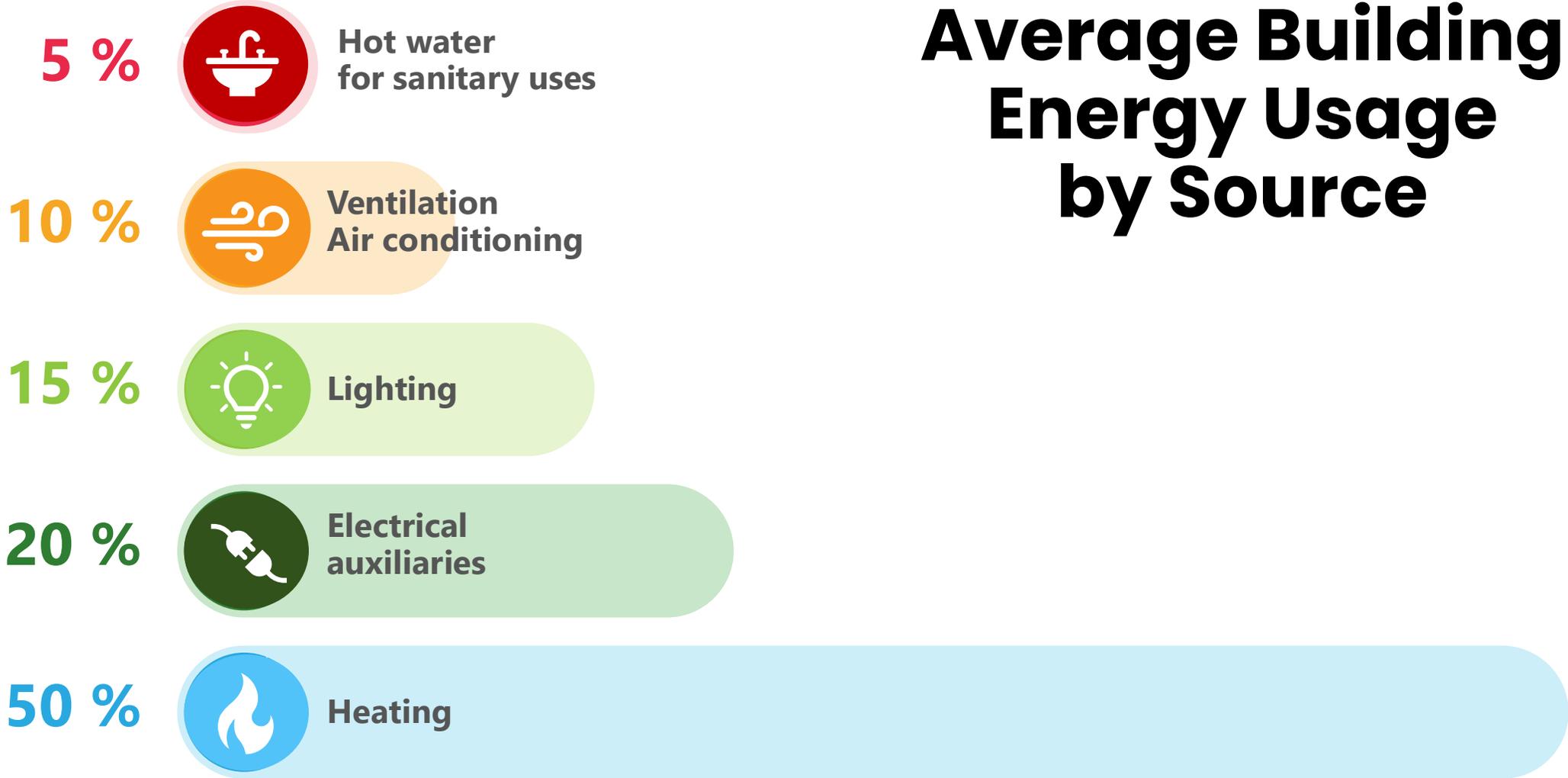


10 Terrace Ct - 154,000 ft<sup>2</sup>



525 Junction Rd – 357,106 ft<sup>2</sup>

# Average Building Energy Usage by Source



# Legistar 75280: Building Energy Savings Program (BESP)

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The program requires large, non-residential commercial buildings to do two things:



## **Annual Energy Benchmarking – Buildings 25,000 sq. ft. and larger**

Measure and report building energy use once a year.

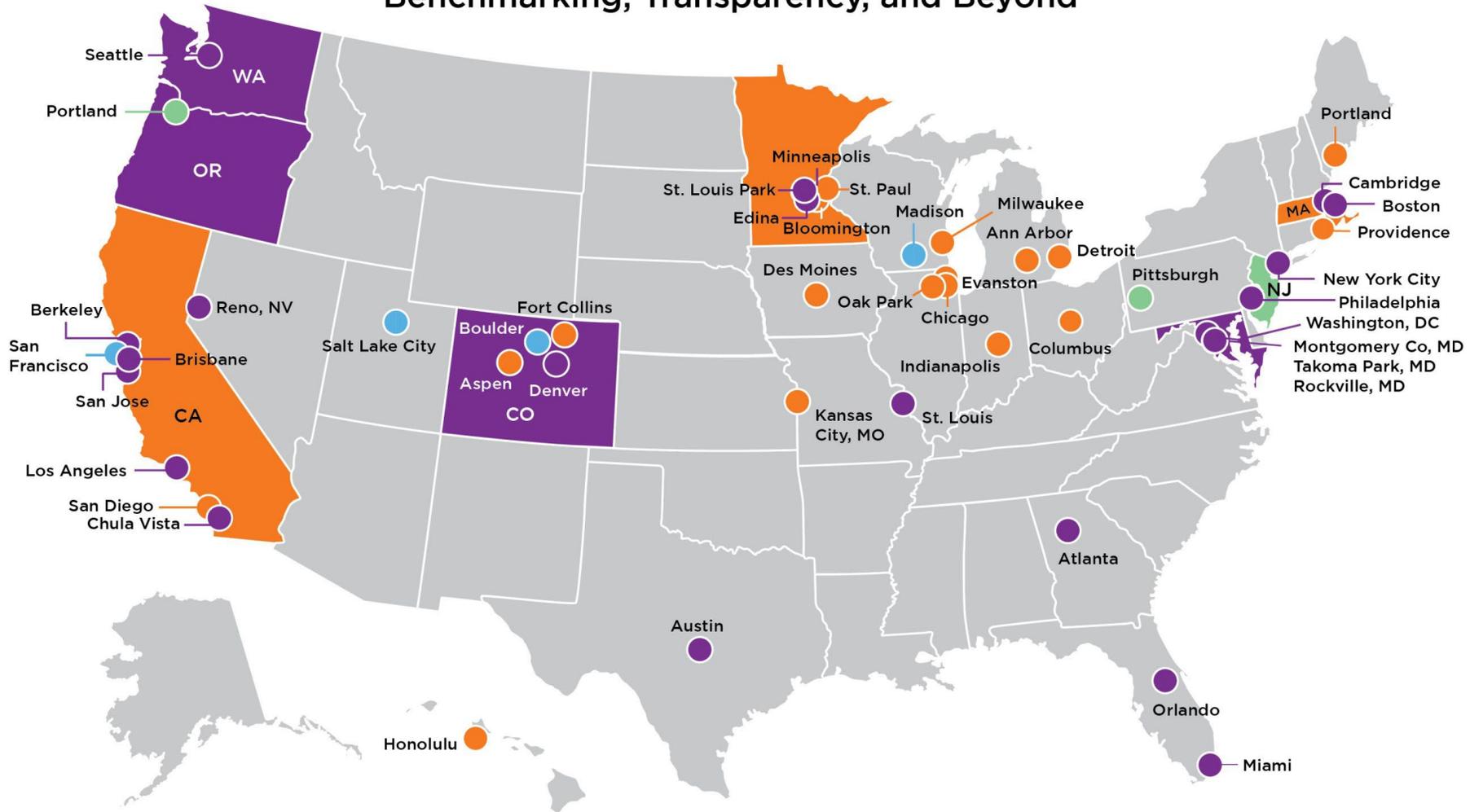


## **Building Tune-ups every four years – Buildings 50,000 sq. ft. and larger**

Check and adjust a building's existing systems, like lighting and HVAC, to make sure they are operating at their best, OR complete an alternative compliance pathway equivalent to a tune-up.

*This program does NOT apply to: 1) buildings less than 25,000 sq. ft., 2) residential buildings or residential portions of buildings, and buildings used for industrial or manufacturing purposes*

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



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



# Phased Program Start



Benchmarking Begins



First Tune-ups

2023

2024

2025

2026

2027

2028

**Large buildings**  
>100,000 ft<sup>2</sup>



**Medium buildings**  
50,000-99,999 ft<sup>2</sup>



**Small buildings**  
25,000-49,999 ft<sup>2</sup>

Do not tune up.



# Choose a Pathway

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## 1. COMPLETE A BUILDING TUNE-UP

## 2. CHOOSE ALTERNATIVE COMPLIANCE PATHWAY

- Certified ENERGY STAR score of +75
- LEED Gold or Platinum for O+M
- Commissioning or retro-commissioning
- Net Zero Energy Certification
- +10% improvement in energy efficiency
- Complete energy audit & implement actions with fast payback
- Building has low energy use per square foot

- Received a Dane County Climate Champion award
- Received a Better Buildings Challenge Goal Achiever award
- Received BOMA 360 designation or TOBY award

## 3. APPLY FOR A DEADLINE EXTENSION

- Recent change in building ownership
- Vacancy rate of 50% or more
- Building is undergoing a major renovation
- A building's owner is experiencing financial hardship such as bankruptcy or foreclosure.

# 2025 Process and Partners

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- Onboarded approximately 200 new buildings
- Increased assistance for new property owners (one-on-one sessions)
- Adapted guides and customer service approach
- Added infrastructure for enforcement and began issuing citations
- 6 City buildings received tune-ups as pilots
- Communications to ensure required buildings are prepared to comply in 2026

Customer Service	Accela Workflow	Enforcement
IT	IT	Building Inspection
MGE	Building Inspection	Attorney's Office
OPEN Tech		Municipal Court

# Outcomes

Year	# Covered Buildings	Total Square Footage	Benchmarking Compliance Rate	Tune-up Compliance
2024	148	20,856,143	76%	-
2025	386	59,177,121	92%	11%
2026	819	70,559,264	-	-

## Each building received a customized scorecard that includes:

- Year over year trends in energy use and emissions
- A breakdown the contribution of building heating, cooling, and baseloads to energy use and GHG emissions
- Recommendations for energy improvements and how much money they could save

# BESP – Scorecards



Reporting Period: 2021 Calendar Year  
 Property Type: Office  
 Gross Floor Area: 6,029m<sup>2</sup>  
 Year Built: 1999

## Your Highlights

- 50** Number of properties of the same type as yours.
- +13%** Your trend in GHGI since the previous year. (GHGI, greenhouse gas emission intensity, kgCO<sub>2</sub>e/m<sup>2</sup>)
- 6 / 50** Your rank in GHGI compared to the same property type. (where 1st is the lowest emitter)
- 24 / 333** Your rank in GHGI compared to the whole City of Ottawa dataset.

## Year-Over-Year

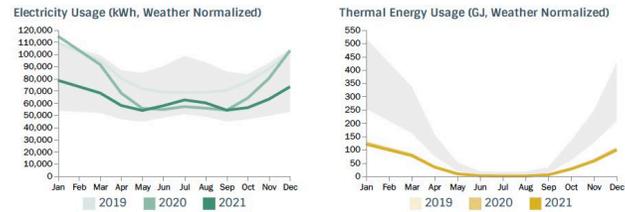
A snapshot of your yearly performance metrics compared to buildings of the same property type, including your recent trend, based on your raw, non-weather normalized, data. Note for percentiles: a high percentile means "good" performance and 100% means "best performer".

	2019	2020	2021	Since 2020
<b>GHGI</b> Greenhouse Gas Intensity	9.2 kgCO <sub>2</sub> e/m <sup>2</sup> 96th percentile	7.5 kgCO <sub>2</sub> e/m <sup>2</sup> 92nd percentile	8.5 kgCO <sub>2</sub> e/m <sup>2</sup> 88th percentile	+13% ↗ avg building +5%
<b>GHG</b> Total Greenhouse Gas	55.3 tCO <sub>2</sub> e 93rd percentile	45.3 tCO <sub>2</sub> e 92nd percentile	51.0 tCO <sub>2</sub> e 88th percentile	+13% ↗ avg building +5%
<b>Site EUI</b> Site Energy Use Intensity	186.1 ekWh/m <sup>2</sup> 88th percentile	169.4 ekWh/m <sup>2</sup> 91st percentile	166.7 ekWh/m <sup>2</sup> 90th percentile	-2% → avg building +1%
<b>ENERGY STAR</b>	78 69th percentile	86 76th percentile	87 80th percentile	+1% → avg building -1%
<b>WUI</b> Water Use Intensity	120.0 l/m <sup>2</sup> 91st percentile	50.0 l/m <sup>2</sup> 96th percentile	20.0 l/m <sup>2</sup> 100th percentile	-60% ↓ avg building +6%

## Monthly Performance

A comparison of your building's monthly energy performance, by energy type, year-over-year. When a significant correlation between energy consumption and weather was detected, the data was "weather-normalized" with the 30-year average weather. Otherwise, your billed data is presented.

Note: "thermal energy usage" combines natural gas, renewable natural gas, district hot water, district steam, propane, fuel oil, and biomass. District chilled water is not yet accounted for.

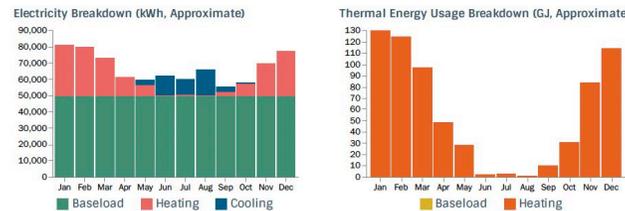


The grey band represents the 25th and 75th percentile performance for the same property type.

## Energy Load Breakdown

A modelled breakdown of your building's energy consumption into its main components: heating load, cooling load, and base load.

When there is a correlation between energy consumption and weather, the approximate load breakdown for the current year is presented. Otherwise, the billed data is shown, and the entire load is assumed to be "base load".



## How Can You Improve?

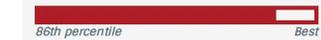
This section contains insights and recommendations based on comparing each of your energy loads (heating, cooling, base load) to those of the same property type.

For each energy end-use, your percentile ranking is provided (higher percentile ranking is better). Also provided are the carbon and dollar savings if you achieved the "75th percentile", or if you are already above the 75th percentile, 10% savings above current performance.

Energy costs are approximated and based on average blended rates, combining consumption and demand charges, at \$0.15/kWh for electricity and \$0.47/m<sup>3</sup> (\$12.23/GJ) for thermal energy, and include a \$37.50/tCO<sub>2</sub>e carbon tax.

Note: "thermal energy usage" combines natural gas, renewable natural gas, district hot water, district steam, propane, fuel oil, and biomass. District chilled water is not yet accounted for.

### Heating Energy



If you achieved a 10% improvement, you would:

Reduce: **3.84 tCO<sub>2</sub>e/yr**  
 Save: **\$3,404/yr**

### Electric Base load



If you achieved the 75th percentile, you would:

Reduce: **Less Than 1 tCO<sub>2</sub>e/yr**  
 Save: **\$1,149/yr**

### Electrical Cooling



If you achieved a 10% improvement, you would:

Reduce: **Less Than 1 tCO<sub>2</sub>e/yr**  
 Save: **\$692/yr**

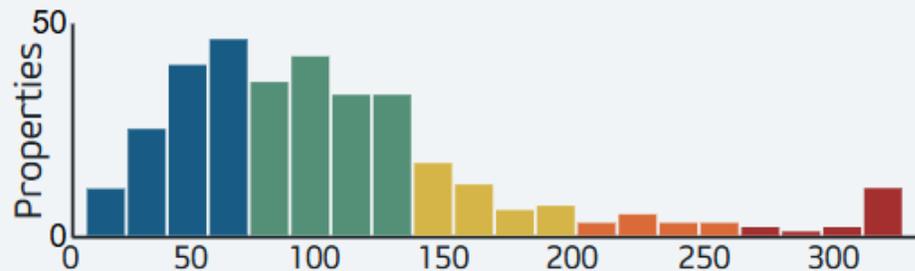
## Now What?

### Building Envelope Thermal Inspections

- Review your thermal scan results [here](#).

# Insights

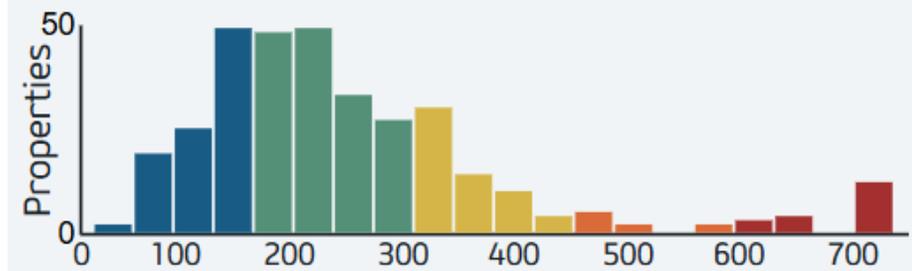
### GHG Emissions Intensity (kgCO<sub>2</sub>e/m<sup>2</sup>)



338 properties with data

Average: 135.17kgCO<sub>2</sub>e/m<sup>2</sup>

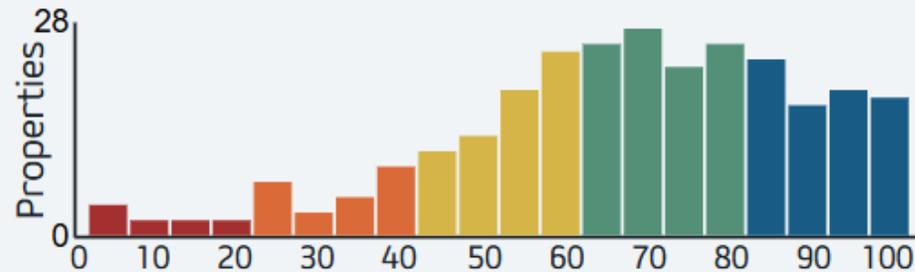
### Site EUI (ekWh/m<sup>2</sup>)



338 properties with data

Average: 323.19ekWh/m<sup>2</sup>

### ENERGY STAR Score



235 properties with data

Average: 66