



# From Disclosure to Performance: What Eleven Years of Harmonized BERDO/BEUDO Data Reveal

A Better City

Energy & Environment Advisory Committee

October 2026

# Agenda

- ▶ EH&E Introduction
- ▶ Key Findings
- ▶ Demonstrate Consolidated Ordinances Dashboard
- ▶ Questions



EH&E provides expertise in environmental health and safety, building science and engineering, and data analytics across Boston, Cambridge, the Commonwealth, and nationally.

- **Advanced Analytics**
- **Accreditation & Regulatory Compliance**
- **Environmental Compliance & Management**
- **Commissioning, Engineering & Energy**
- **Biosafety**
- **Health & Safety**
- **Indoor Environmental Quality**
- **Industrial Hygiene**
- **Contamination Prevention & Control**
- **Strategic Staffing (EHS)**

# Markets We Serve



Healthcare



Higher Education



Life Sciences

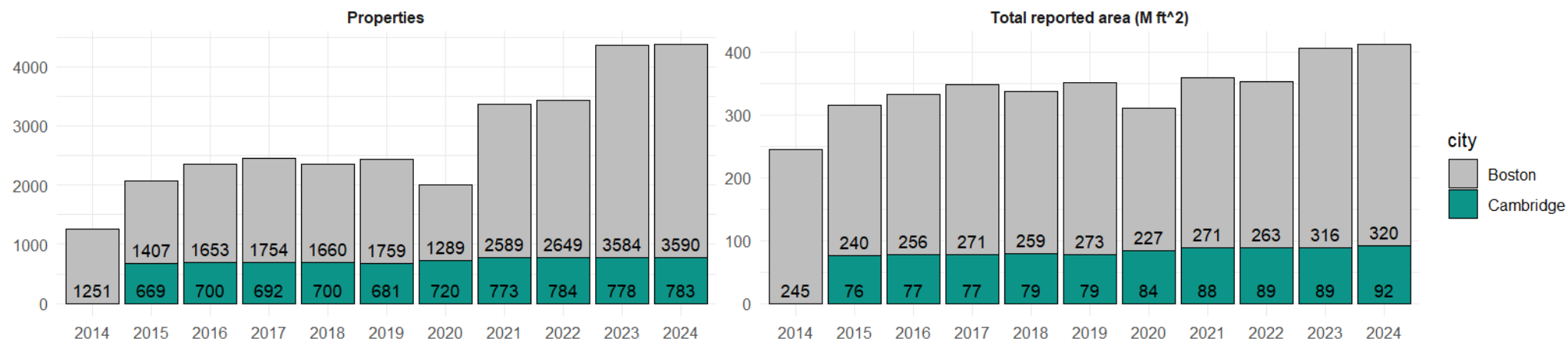


Commercial

## STUDY AT A GLANCE

# Eleven years, two cities, one harmonized dataset

30,465 property-year records (2014-2024), 4,373 properties and 412M ft<sup>2</sup> in 2024



## Methods

- Boston + Cambridge records harmonized into 13 standardized building-use sectors
- Modeled energy use, GHG emissions, energy use intensity (EUI), and carbon intensity (CI) vs. year, controlling for building-use sector, city, floor area (if applicable), heating degree days, and building repeated measures

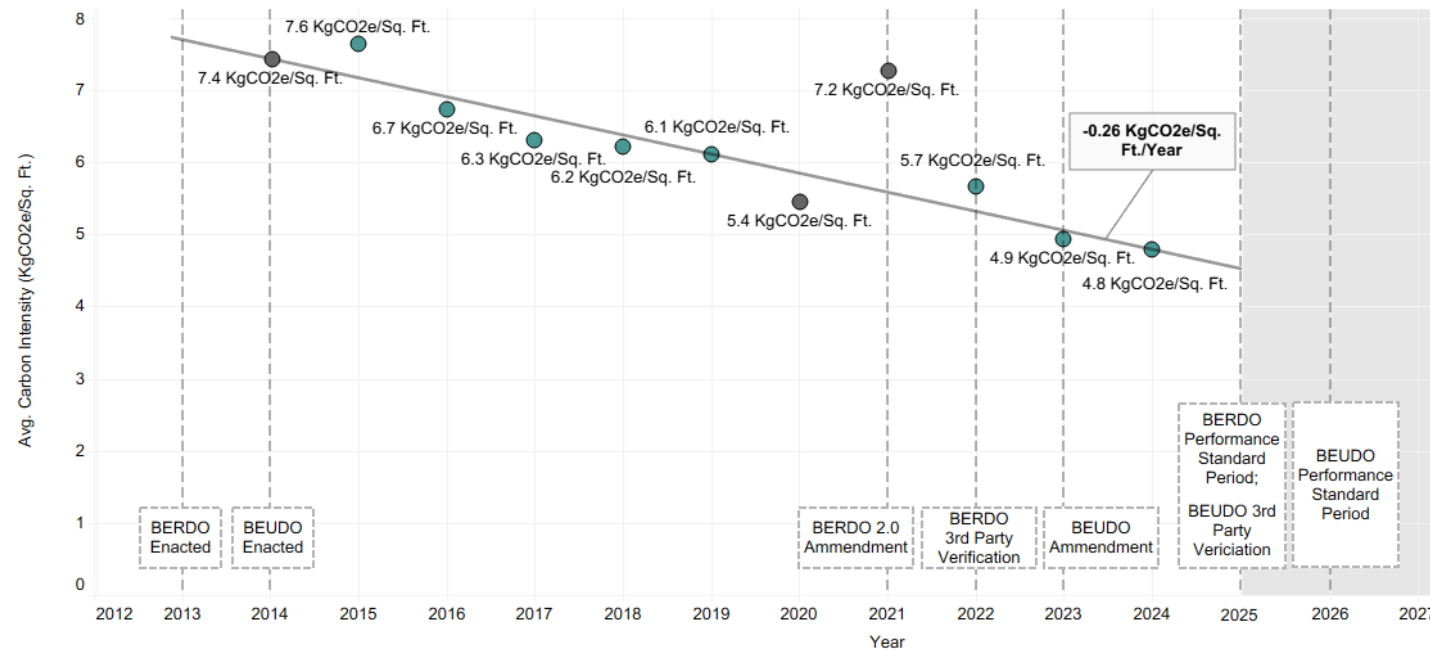
## Data Quality Notes

- 30.7% of raw records excluded for duplicates, missing data, or implausible values
- Third-party verification began in Boston (2022) and Cambridge (2025)
- 2014, 2020, & 2021 excluded from models – reporting inception, COVID-19 disruption, missing emissions

## KEY FINDINGS

# Emissions and CI fell even as the building stock grew (2015-2024)

**-14%** reduction in absolute GHG emissions (~363,000 MTCO<sub>2</sub>e avoided)



**+31%** growth in reporting floor area

**-24%** decrease in EUI: 110 → 83 kBtu/ft<sup>2</sup>

**-37%** decrease in CI: 7.6 to 4.8 kg CO<sub>2</sub>e/ft<sup>2</sup>

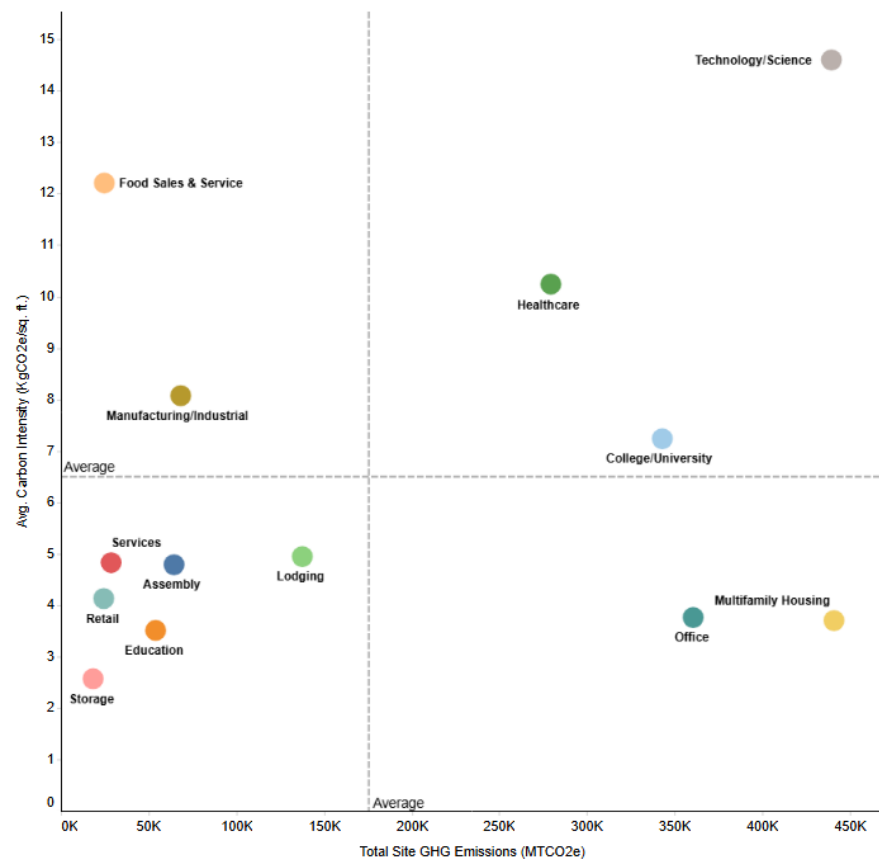
*CI fell further than EUI – a signal that fuel switching and grid decarbonization, not efficiency alone, are driving trends.*

*Total energy use was essentially flat ( $p = 0.595$ )*

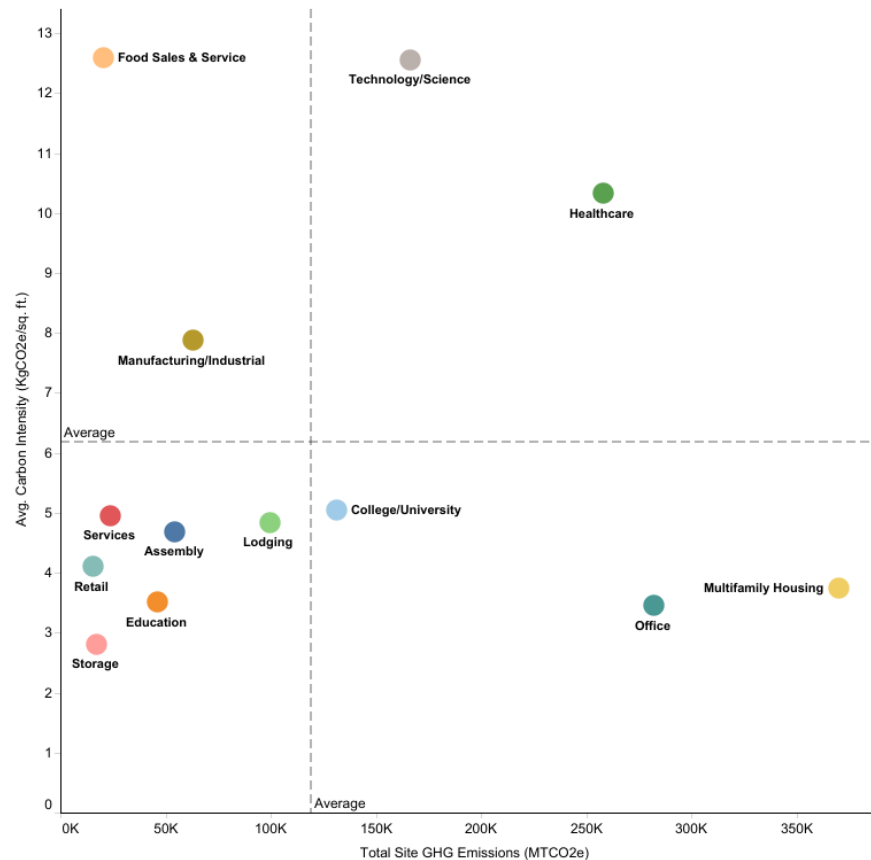
## SECTORAL HETEROGENEITY

# Emissions and average CI varies by building sector

Boston & Cambridge data



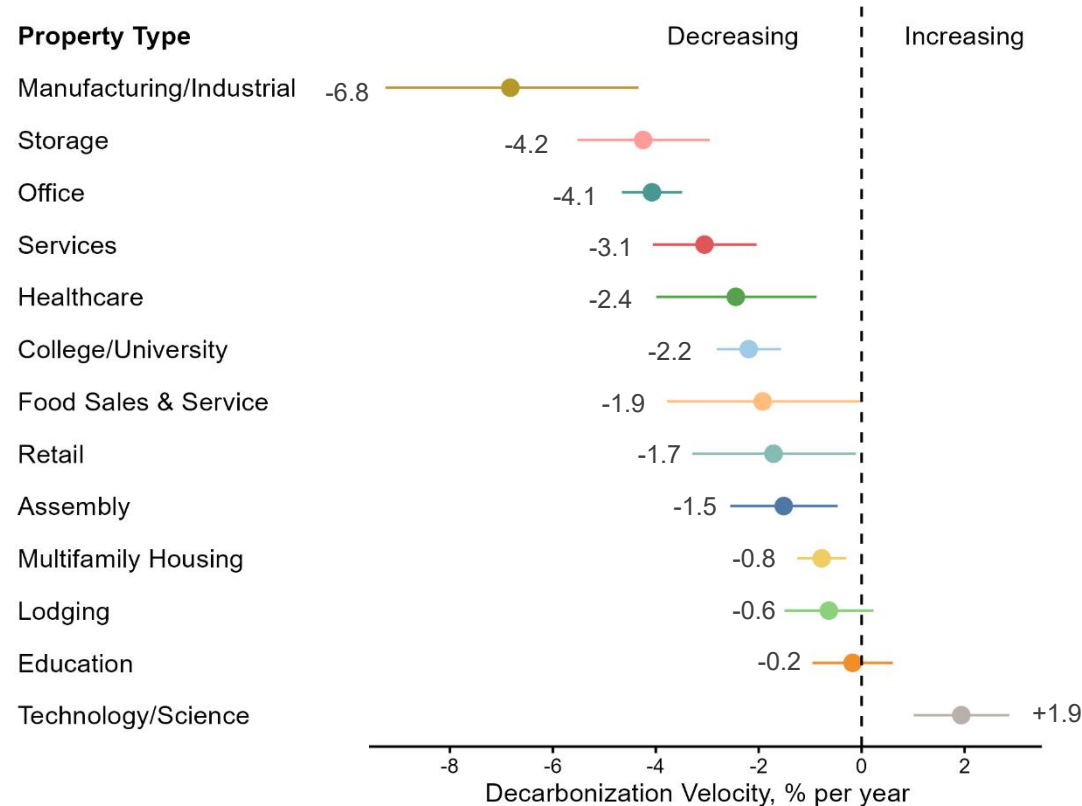
Boston data only



[BERDO/BEUDO dashboard](#)

## SECTORAL HETEROGENEITY

# Decarbonization velocity varies sharply by building sector



**-6.8%/yr to +1.9%/yr** sector-specific CI trends

- A single 2015-2024 portfolio-wide trend obscures sector-specific CI trajectories
- Efficiency upgrades, fuel switching, and grid decarbonization drove CI declines
- Technology/Science increase reflects new lab occupancy (mainly in Cambridge), not real intensification

*Differences between buildings account for 62% of the variability in CI, far more than any one building changes year to year*

## MECHANISMS

# What's driving sector CI declines

### Manufacturing/Industrial -6.8%/yr

79% of individual buildings show declining CI (median -6.9%/yr); one brewery having a dedicated 250 kW CHP is a notable example. Some buildings reflect operational changes (e.g., shutdown), not efficiency gains.

### Healthcare -2.4%/yr

24/7 schedules, specialized HVAC, and energy-intensive equipment drive high operational intensity. Documented CHP, solar arrays, fuel cells, low-carbon steam/electricity contracts, and RECs are driving the decline.

### Food Sales & Service -1.9%/yr

Driven largely by chain supermarkets and reflect sector-wide investments in building-level energy efficiency. Refrigeration and lighting upgrades have a large impact, since they account for over half of average supermarket energy use.

**Office (-4.1%/yr) and Multifamily Housing (-0.8%/yr):** have high absolute emissions from sheer floor area, below-average CI. A 25% CI cut across both would avoid 220,442 MTCO<sub>2e</sub> (9.7% of total 2024 emissions) via, for example, recommissioning and distributed electric power generation.

# What the findings mean for building owners

### What the data show

- Reported emissions and CI decreased even as reported floor area increased, an encouraging overall trend
- CI trends vary widely by sector, so a single average would overstate progress for some buildings and understate it for others
- Differences between individual buildings explain 62% of the variation in CI, so decarbonization planning should start with each building's data

### More information

- Public dashboard:  
[https://public.tableau.com/app/profile/environmental\\_health\\_engineering/viz/BERDOEnergyGHGAnalysis/BERDOEnergyUseGHG](https://public.tableau.com/app/profile/environmental_health_engineering/viz/BERDOEnergyGHGAnalysis/BERDOEnergyUseGHG)
- Study preprint:  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=7270660](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=7270660)
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