

City of Cambridge Municipal Operations
**Greenhouse Gas Emissions
2030 Target**

December 2023

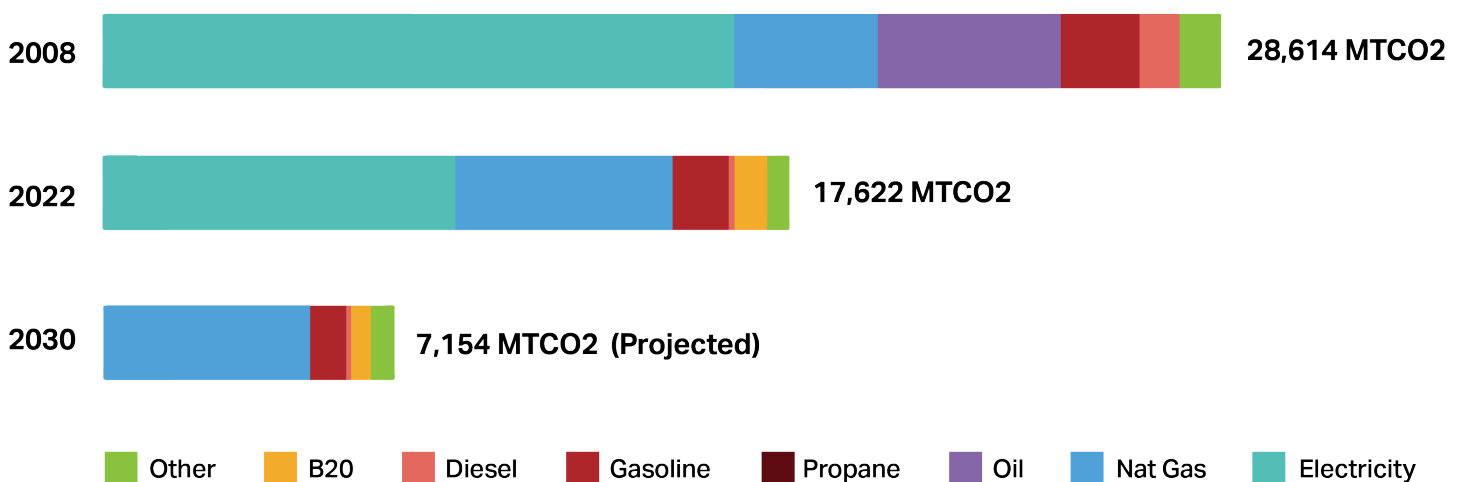
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Overview

The City of Cambridge has committed to developing a 2030 target for greenhouse gas emissions for municipal operations. In this document the City presents its progress to date and sets a 75% reduction target for 2030 from a 2008 baseline.

City of Cambridge Municipal Operations GHG Emissions Actual and Projected
in Metric Tons of CO₂ (MTCO₂)



Background

In 2016, Cambridge established a municipal greenhouse gas (GHG) emissions reduction target for 2020 as an expression of its commitment to climate protection and to support planned improvements of municipal facilities. At that time, the City committed to achieving a 30% reduction from a baseline year of 2008, with a stretch target of 35%. The City achieved this stretch target one year early, by 2019. These accomplishments were brought about by high performance school reconstruction projects, energy efficient building improvements, large rooftop photovoltaic installations as well as a cleaner regional electricity grid.

That same year the City also achieved another target, that of generating 5% of municipal electricity use from onsite solar PV systems. The City is currently undertaking a municipal PV study to further develop the City's approach to onsite solar PV systems.

Emissions from Cambridge's municipal operations are small relative to many sources of emissions worldwide, and even to emissions from other cities' municipal operations. Nonetheless, it is important that the City address its greenhouse gas (GHG) emissions in order to take responsibility for its own impact, and to demonstrate what is possible with leadership and innovation. The City of Cambridge is taking responsibility for its emissions by annually measuring the emissions from our municipal operations, setting targets and taking actions to achieve those targets.

Greenhouse Gas Emissions: What is Included?

Cambridge follows the Climate Registry's Local Government Operations Protocol and General Reporting Protocol for quantifying its emissions. Included are

- Scope 1 & 2 – onsite combustion and indirect emissions for sources owned by or within the City's control (such as purchased electricity).
- The City does not include Scope 3 emissions, such as those associated with supply and contractor emissions.



The City's GHG emissions comprise the emissions from all energy sources used in City operations. This includes building use (such as schools, office buildings, youth centers, public safety facilities), water treatment facility operations, outdoor lighting (such as streetlights, traffic lights, park lighting), municipal vehicles and City-owned water and sewer pumping facilities.

Energy sources contributing to greenhouse gas emissions include electricity purchased from the grid, natural gas, gasoline, diesel, biodiesel and propane.

Emissions Trajectory

2008 to 2020

The City has been using 2008 (28,614 MTCO₂) as a baseline year to measure energy and emissions from operations. As the chart on page 8 shows, 2022 emissions were 17,622 metric tons, representing a 38% decrease from 2008 (10,992 MTCO₂ reduction). As stated previously, the City exceeded its 2020 target of 30-35% reduction by 2019.

The significant decrease from 2008 to 2020 can be attributed to:

- Conversions of building heating systems from heating oil to natural gas or electricity, which are cleaner burning than oil.
- School reconstruction projects that produced high-efficiency, high performance buildings with large solar installations, such as the MLK, Jr. school and King Open/Cambridge Street Upper Schools & Community Complex.
- Continued smaller scale building improvements, such as HVAC, building envelope and lighting retrofits.
- Fleet modernizations with newer, more fuel-efficient vehicles available for purchase.



- Cleaner electric grid, as the last coal-fired power plant in Salem closed and Mystic Generating station began closing dirtier power plants, replaced by natural gas.
- Installation of rooftop solar systems. These onsite solar installations reduce emissions by replacing purchased grid electricity with emissions-free power. The City currently has fifteen solar systems with a total capacity of 2,630 kW.

Municipal Solar PV

Capacity (kilowatt)

<i>City Hall Annex</i>	27
<i>Russell Youth and Community Center</i>	10
<i>DPW Frazier Building</i>	2
<i>Frisoli Youth Center</i>	3
<i>Cambridge Rindge & Latin High School</i>	31
<i>Martin Luther King, Jr. School</i>	592
<i>Sullivan Water Treatment Facility</i>	171
<i>Citywide Senior Center</i>	12
<i>Kennedy Longfellow School</i>	174
<i>Fletcher Maynard Academy</i>	97
<i>Cambridge Public Library</i>	61
<i>859 Mass Ave</i>	16
<i>King Open & Cambridge Street Upper School and Community Complex Project</i>	1,324
<i>Taylor Square Fire House</i>	24
<i>DPW Simard Maintenance Building (Projected Summer 2024)</i>	86

Community Solar

<i>Graham & Parks School**</i>	244
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** *Community Solar (Graham & Parks School) constructed for the benefit of Cambridge Community Choice Aggregation; GHG emissions reductions are not included in Municipal GHG inventory.*



2020 to 2021

Not surprisingly, emissions dropped in 2020 due to the pandemic with building and workplace shutdowns. In 2021, emissions bumped back up as buildings reopened and staff returned to work. In addition, the City (as did many organizations) added COVID-19 prevention and mitigation measures that increased energy use, including increased ventilation and adding air purification systems, extended building HVAC runtimes to provide more air exchanges and personal separation to reduce vehicle sharing.

In the more recent period, from 2020 to 2022, as pandemic risks subsided, emissions again began decreasing. This can be attributed to several factors, including:

- Modifications to building control schedules post-COVID.
- Continuing installation of high-efficiency LED lighting systems with occupancy- and photosensors.
- A three-month temporary switchover from the City's water treatment plant to the Massachusetts Water Resources Authority System for drinking water while implementing a PFAS reduction project.
- An anti-idling program launched by the Department of Public Works, which included staff briefings, awareness campaigns and alerts to supervisors.

2030 Target

The City is now committing to reduce GHG emissions by 75% by 2030 from the 2008 baseline. This represents reducing emissions by an additional 10,468 metric tons of CO₂ between 2022 and 2030. The City will achieve this through the following actions:

Reductions in energy use and emissions from:

- Initial phases of large building decarbonization projects, as will be informed by the School master planning process and municipal facility decarbonization roadmap currently underway.



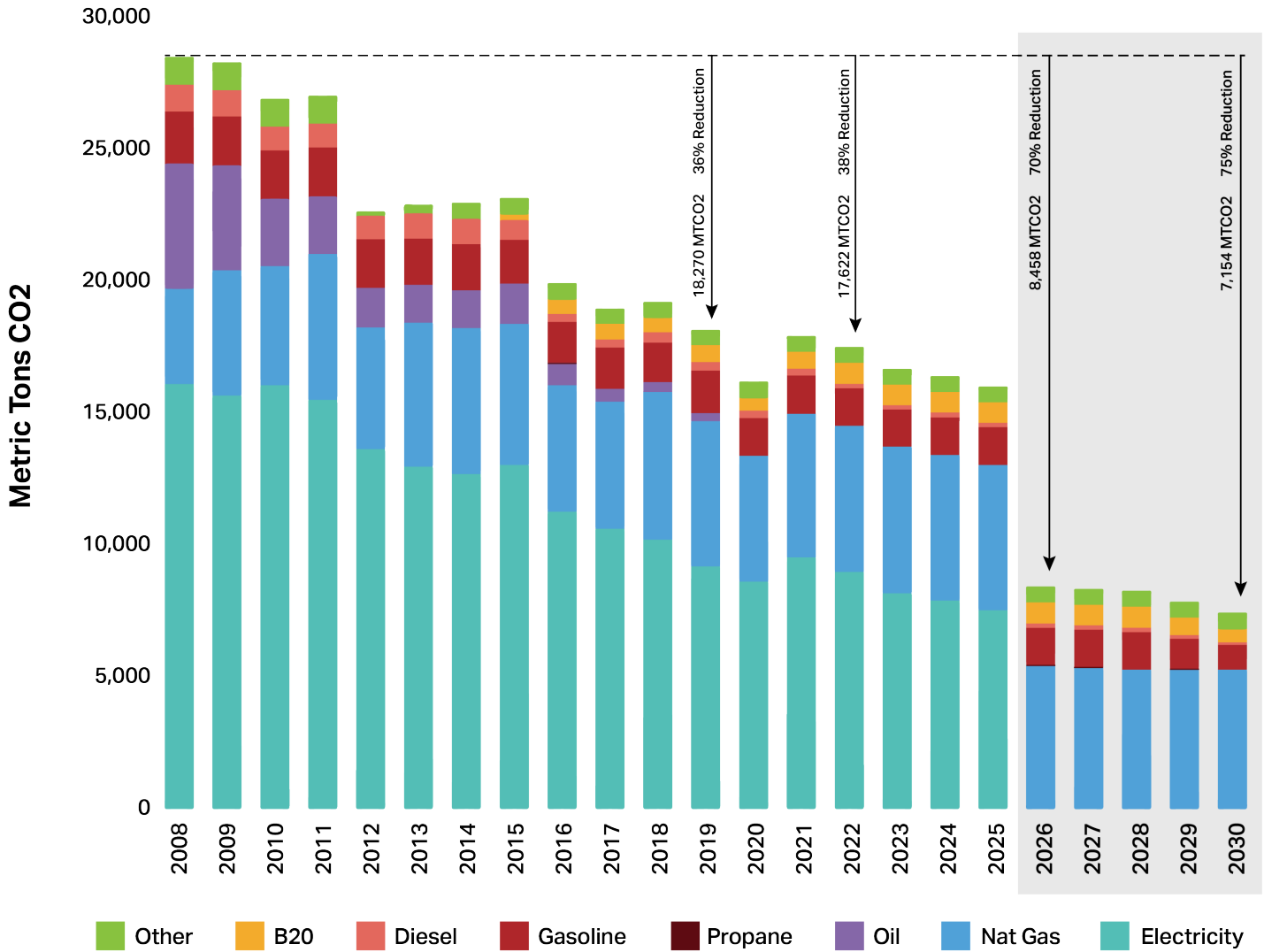
- Roof replacements with white “cool” roofs and increased insulation.
- Recommissioning of large buildings, including Cambridge Rindge and Latin High School, War Memorial Recreation Center, Cambridge Public Library and others. Recommissioning ensures that buildings are operating as designed and identifies new opportunities for performance improvements.
- Continued energy efficiency retrofits for lighting and mechanical equipment.
- Replacement of heating, ventilation and air conditioning (HVAC) systems at the end of their useful life with high efficiency equipment.
- Continued implementation of the new Clean Fleet policy launched in February 2023, which will reduce gasoline and diesel use in favor of electric vehicles or advanced fuel reduction and idle reduction technologies when electric vehicles are not available.

Renewable Electricity:

- Execution of virtual Power Purchase Agreements (vPPAs) that will provide a 100% renewable electricity supply beginning in 2026 from new offsite renewable electricity systems for all municipal operations. This is the most significant reduction in GHG emissions, as all electricity used to support municipal operations will be 100% renewable, with no GHG emissions.
- Onsite solar installations, as appropriate, based on recommendations of municipal PV study currently underway.



City of Cambridge Municipal Operations GHG Emissions Actual and Projected



Next Steps

It is important to acknowledge that this is a living document that is likely to change. The Building Energy Use Disclosure Ordinance (BEUDO) amendments adopted in 2023 require commercial buildings greater than 100,000 square feet to achieve net zero emissions by 2035 and buildings between 25,000 and 100,000 square feet by 2050. The City has several initiatives underway that will help inform future decarbonization actions:



- School Facility Master Plan evaluating current conditions of school buildings and developing a comprehensive upgrade program.
- Decarbonization Roadmap for other City-owned buildings such as office buildings, public safety, libraries, recreation, public works and others.
- Central Square City Lots Study of public buildings and parcels for future programming analysis.
- Onsite Solar Photovoltaic Study to identify the optimal criteria for installing onsite solar after the City has achieved a 100% renewable electricity supply by signing virtual power purchase agreements for new, renewable offsite systems.

As these plans are completed and implementation schedules are developed, the City will continue to assess progress in meeting the 2030 GHG target and will update the target, if needed, by December 2026. At that time, the City will also set interim targets in five-year intervals for 2035, 2040, 2045 and 2050.

