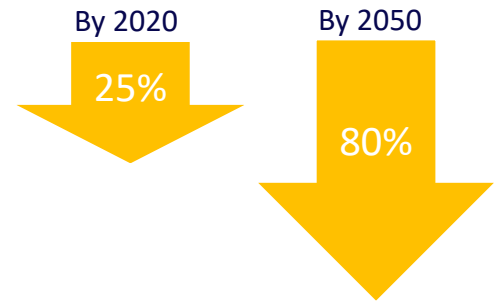




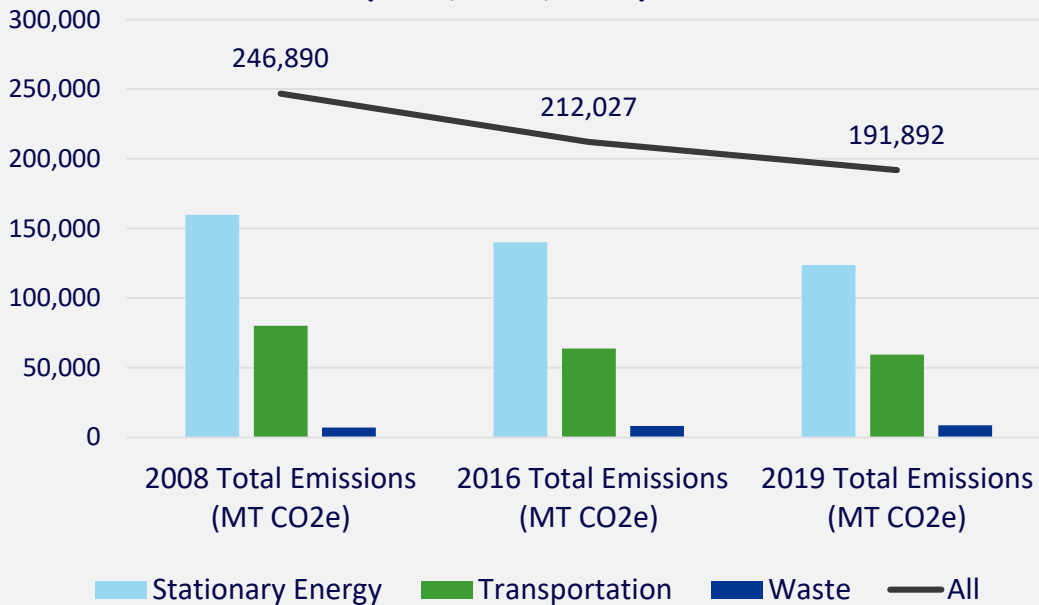
Greenhouse Gas Emissions in Concord

Concord's climate goals were established at 2017 Annual Town Meeting. A greenhouse gas (GHG) inventory is the standard approach to measuring community-wide GHG emissions. Two previous GHG inventories were conducted for years 2008 and 2016 using the Global Protocol for Cities. A 2019 inventory was conducted using the same methodology. This report summarizes trends in GHG emissions between inventory years and progress toward Concord's GHG reduction goals.

Concord's GHG Reduction Goals



Concord's Community-Wide GHG Emissions (2008, 2016, 2019)



Progress Toward Goals

The Town of Concord's total greenhouse gas emissions from 2008 to 2019 **decreased 22%**.

The emissions decrease was largely driven by:

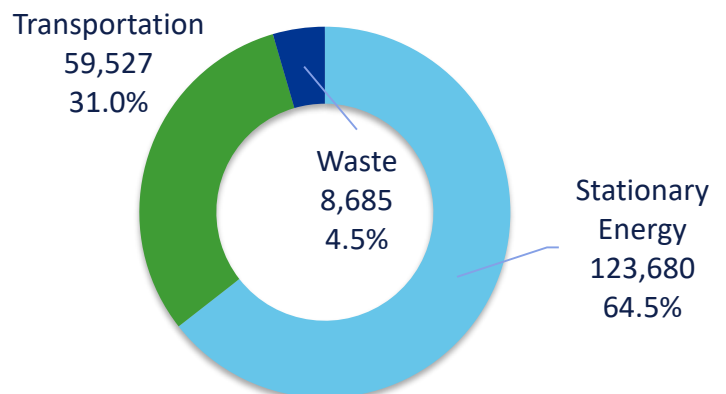
- Increasingly decarbonized electricity supply
- More Concord residents driving electric vehicles and more efficient vehicles on the road overall
- A trend in switching from fuel oil to natural gas for heating
- More efficient energy use in buildings overall

2019 GHG Inventory Summary

Concord's 2019 GHG inventory shows:

- Energy consumed in buildings is the largest driver of community-wide emissions, with commercial buildings contributing 30% and residential buildings contributing 32%
- Transportation makes up a significant portion of community-wide emissions, primarily from residential vehicles
- Waste and wastewater treatment represents a small, but not insignificant, portion of overall emissions

2019 Community-wide Emissions (MT CO2e) by Sector



For more details about Concord's 2019 emissions, please reference the 2019 GHG Inventory Report.



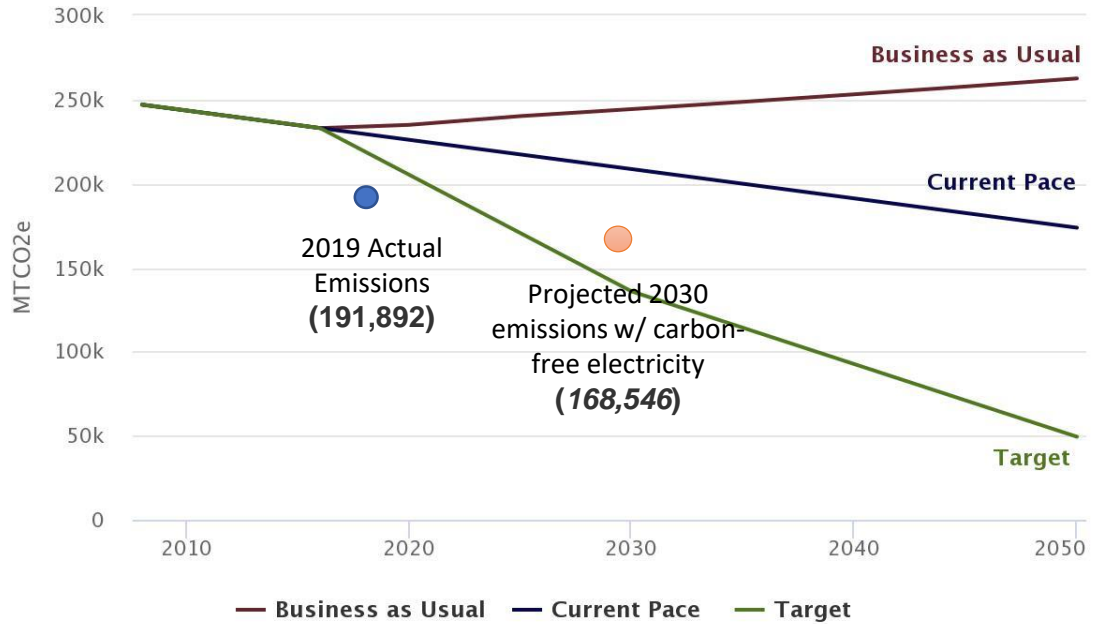
Pathways to GHG reduction goals

The graph to the right is from the *Sustainable Concord* climate action and resilience plan released in summer 2020.

- **Target** shows that in order to meet the town’s 80% reduction goal, an average annual reduction of 2.5% is needed.
- **Current Pace** shows that an average annual reduction of 1%, as experienced between 2008 and 2016, falls far short of achieving the town’s 80%.

The blue circle indicates 2019 actual emissions and the orange circle indicates projected 2030 emissions with a carbon-free electricity supply, assuming business-as-usual consumption.

Concord GHG Pathways



The updated inventory indicates that 2019 emissions are below the target line. However, without further implementation of climate strategies in *Sustainable Concord*, Concord will fall far short of its 2030 and 2050 climate goals.

- A significant driver of the emissions reduction seen between 2019 and earlier inventory years was a less carbon-intensive electricity supply. In 2019, Concord Municipal Light Plant (CMLP) reported 50% carbon-free electricity.
- As CMLP moves toward the Town’s goal of 100% carbon-free electricity by 2030, emissions from the electricity sector will continue to decrease.
- Even with 100% carbon-free electricity by 2030, if the same types of fuels are consumed at the same rate in 2030 as 2019, Concord’s community-wide emissions will only decrease 32%.

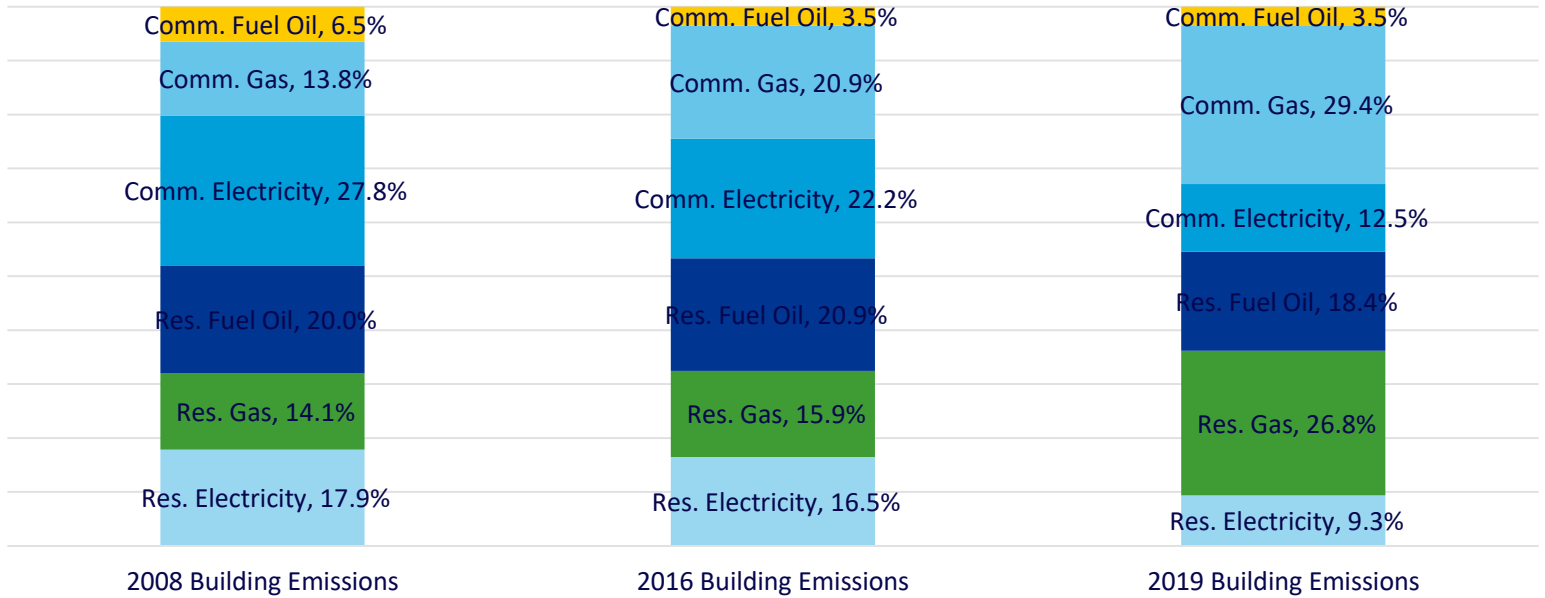
2008, 2016 Actual Emissions and Projected 2030 Emissions* with 100% carbon-free electricity

Sector	2008 Total Emissions (MT CO ₂ e)	2016 Total Emissions (MT CO ₂ e)	2019 Total Emissions (MT CO ₂ e)	2030 Projected Emissions* (MT CO ₂ e)	Percent Change from 2008 to Projected 2030
Stationary Energy	159,779	140,072	123,680	100,561	-37%
Transportation	80,100	63,829	59,527	59,300	-26%
Waste	7,011	8,126	8,685	8,685	24%
Total	246,890	212,027	191,892	168,546	-32%

*Projected 2030 emissions were calculated using 100% carbon-free electricity and 2019 activity-level data for energy consumption.

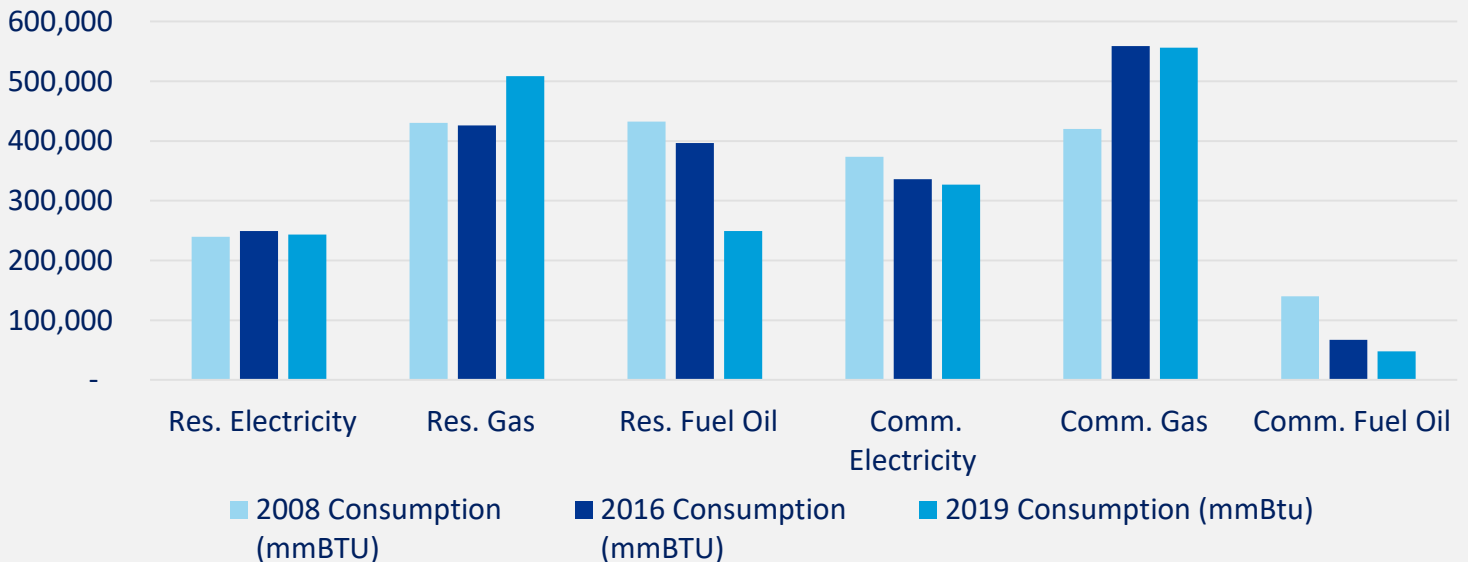


Building Emissions by Fuel and Sector



A trend of fuel switching in buildings is evident in the 2008, 2016 and 2019 data. Emissions from fuel oil as a percentage of total building emissions shrunk in both commercial and residential buildings. Emissions from gas grew in both sectors, more significantly in residential buildings. Emissions from electricity as a percentage of overall building emissions shrunk as a result of the lower emissions factor as well as efficiency.

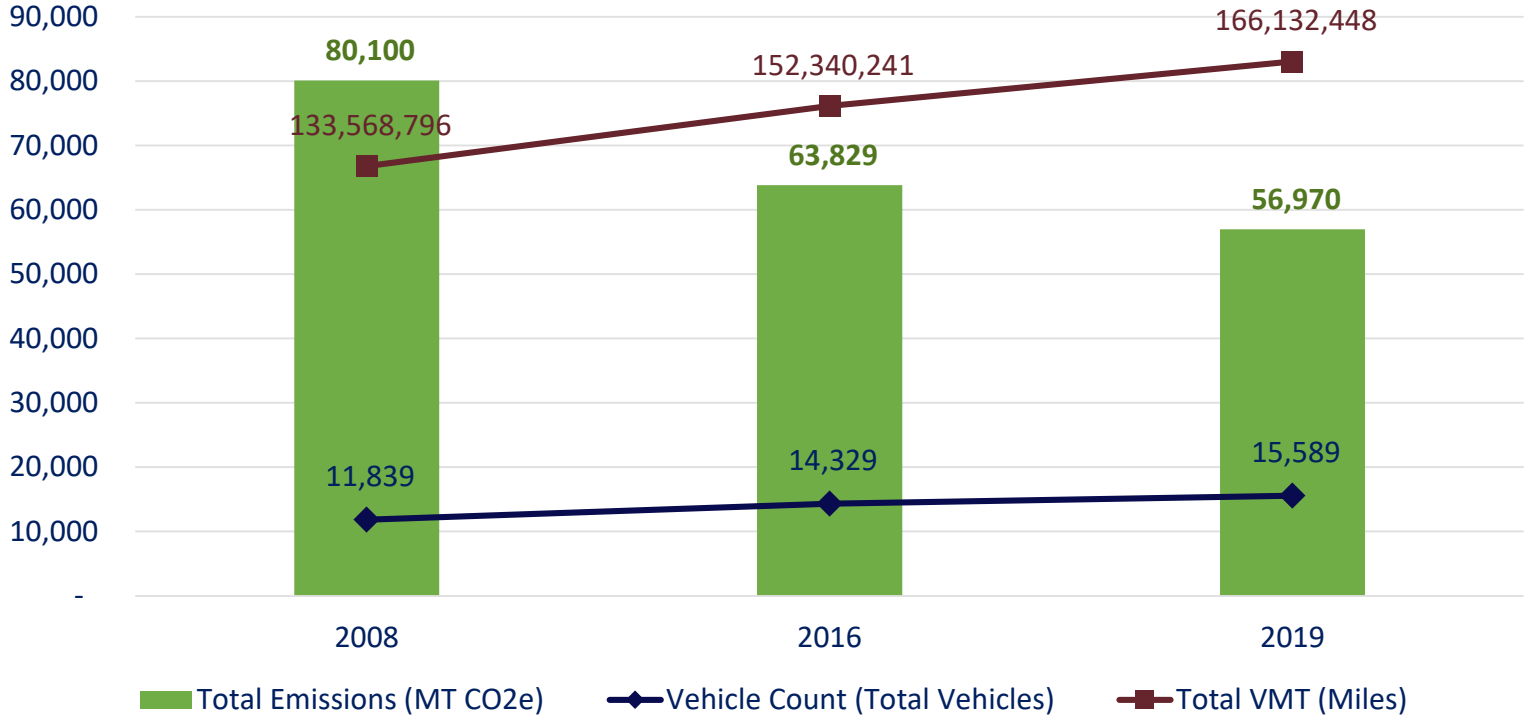
Building Energy Consumption by Fuel and Sector



While emissions from buildings dropped 23% between 2008 and 2019, energy consumption fell by only 5%. This suggests that the emissions reduction was partly due to reduced consumption, but more significantly as a result of fuel switching and a cleaner electricity supply. The most significant decrease in consumption is seen in fuel oil, where consumption fell in both residential and commercial buildings. From 2016 to 2019, consumption of gas in residential buildings increased while remaining relatively stable in commercial buildings. Electricity consumption decreased in residential buildings and more so in commercial buildings from 2016 to 2019.



Vehicle Emissions with Vehicle Count & VMT



Vehicle emissions dropped 26% between 2008 and 2019. Over the same time period, the total number of vehicles registered in Concord, and consequently the total vehicle miles traveled by car, increased. This suggests that the reduction in emissions was due to overall improvements to average vehicle fuel efficiency and the increasing number of electric vehicles driven by Concord residents.

Community-wide Emissions Summary by Sector & Scope: 2008 - 2019

Sector	2008 Total Emissions (MT CO2e)	2016 Total Emissions (MT CO2e)	2019 Total Emissions (MT CO2e)	Change from 2008 -> 2019
Stationary Energy	159,779	140,072	123,680	-23%
Transportation	80,100	63,829	59,527	-26%
Waste	7,011	8,126	8,685	24%
All	246,890	212,027	191,892	-22%

For past GHG inventory reports, information about climate and sustainability in Concord, and to get started reducing your GHG emissions, please visit concordma.gov/sustainability.

Report produced completed by Kate Hanley, Director of Sustainability, March 25, 2021. Analysis completed using MAPC tool and GPC. See 2019 GHG Inventory Report and 2019 GHG Inventory Methodology report for details.