Town of Kirkland
Government Operations Greenhouse Gas Inventory
2018-2024

Sources of Emissions for the Town of Kirkland

The Town of Kirkland Government Operations Greenhouse Gas Inventory analyzes and reports **Scope 1 Emissions** (on-site emissions from building heating and transportation fuels, but not including fugitive refrigerants or fertilizer-associated emissions) and **Scope 2 Emissions** (emissions from purchased electricity) from government operations for the Town. All data are reported in metric tons of carbon dioxide equivalent (CO_2e).

Buildings – Scope 1 Emissions

There are two government buildings included in this inventory: (1) the Town of Kirkland office building and (2) the Town Highway Garage located on Route 12B in Kirkland. Scope 1 emissions from building heating are reported from these two buildings.

Vehicles – Scope 1 Emissions

The fuel station at the Town of Kirkland provides gasoline and diesel fuel to both Town of Kirkland vehicles, as well as Clinton Central School District school buses, Village of Clinton Department of Public Works, and the Village-managed Waste Water Treatment Plant vehicles. Disaggregating Town and Village owned vehicle data. The vehicles included in the Town's inventory include the Town Highway Department trucks and the vehicles used by the Kirkland Police Department.

Electricity – Scope 2 Emissions

Town of Kirkland electricity usage encompasses electricity to the two buildings (Town of Kirkland office building and Town Highway Garage) as well as electricity used for streetlights on Town roads with street lights: College Hill Road, Sanford Avenue, College Street, and in Clark Mills).

Methodology

To estimate Scope 1 emissions from building heating, records for natural gas usage for each of these buildings were obtained from National Grid monthly bills from 2018 to 2024. Therms of natural gas were converted to units of CO_2e using EPA's greenhouse gas conversion factor (1 therm = 0.0053 tons CO_2e) (EPA 2019).

For Scope 1 emissions associated with transportation, records of fuel purchases of diesel by the Town Highway Department were obtained from the Town of Kirkland for 2018-2024. Gasoline usage by town vehicles for the Kirkland Police Department was obtained from the Town of Kirkland for 2023-2024. Gasoline and diesel usage was converted to units of CO_2e using EPA emissions factors (8.89kg CO_2 per gallon of gasoline and 10.18kg CO_2 per gallon of diesel) (EPA 2019).

Scope 2 emissions were calculated the purchased electricity used by the Town in the two government buildings, as well as to operate the streetlights on College Hill Road, Sanford Avenue, College Street, and in Clark Mills. Monthly records of purchased electricity in kilowatt-hours were obtained from National Grid bills for all sources of electricity for which the Town is responsible for 2018-2024. Emissions for each year were calculated using New York Upstate State eGRID data for emissions factors for each year reported in Table 1 below.

Table 1 Upstate New York eGRID Emissions Factors to convert purchased kilowatt-hours of electricity into pounds of CO2e (which were then converted to metric tons CO2e). For 2024 purchased electricity, published eGRID emissions factors for 2023 were used, since they were the most recent factors available. Source: EPA (2026).

Year	eGRID Conversion Factor (lbs CO2e per kwH)
2018	**0.25389**
2019	**0.23304**
2020	**0.23450**
2021	**0.24303**
2022	**0.27539**
2023	**0.24279**
2024	**0.24279**

Greenhouse Gas Inventory Results

From 2018-2024, total emissions from government operations declined from **323 tons CO2e** to **274 tons CO2e (Figure 1)**. This decline in total emissions resulted primarily from both modest declines in Scope 1 emissions for building heating and in declines in Scope 2 emissions from purchased electricity after 2019 (**Table 2**). One of the main actions the Town has taken (as part of its Clean Energy Communities actions) was to reduce our emissions was to switch to LED-powered streetlights. LED street lights were installed in Town street lights in 2019, resulting in a reduction of emissions (**Figure 2**).

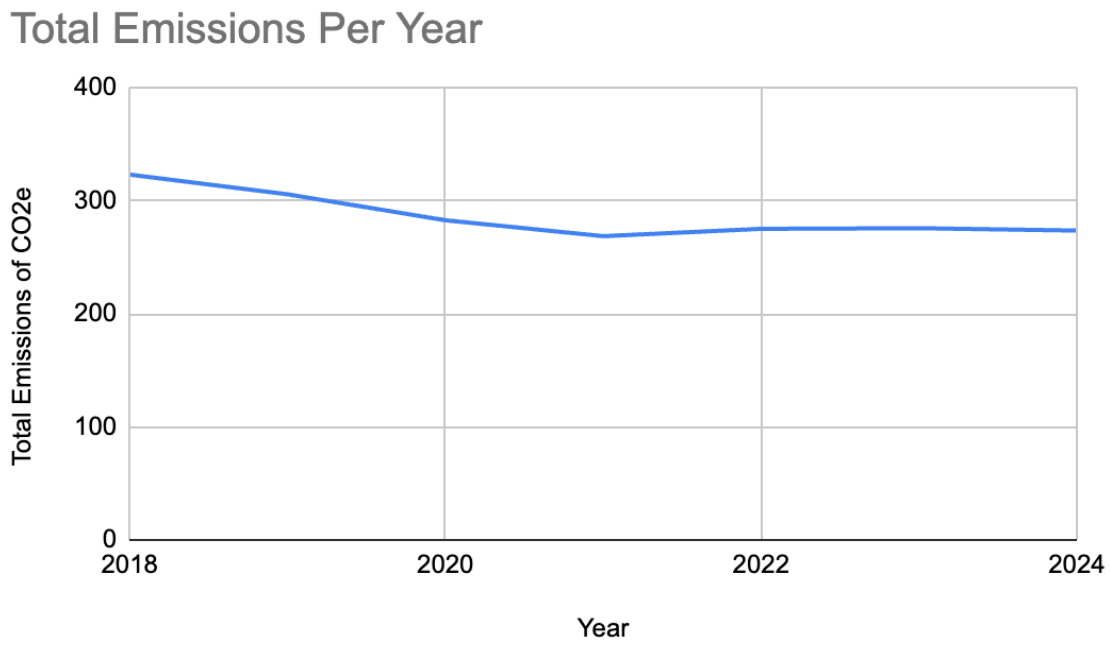

Figure 1. Total government operations emissions over time

Table 2. Emissions Per Year from Scope 1 and Scope 2 Sources (metric tons CO2e)

Year	Scope 1 Emissions from Heating Buildings	Scope 1 Emissions from Vehicles	Scope 2 Emissions from Purchased Electricity	Total Emissions
2018	84.6	219.7	19.0	**323.2**
2019	77.0	210.3	18.5	**305.8**
2020	70.7	198.5	13.6	**282.8**
20221	69.5	187.1	12.1	**268.7**
2022	72.0	189.6	13.6	**275.2**
2023	71.7	192.0	12.0	**275.8**
2024	58.2	203.8	11.7	**273.7**

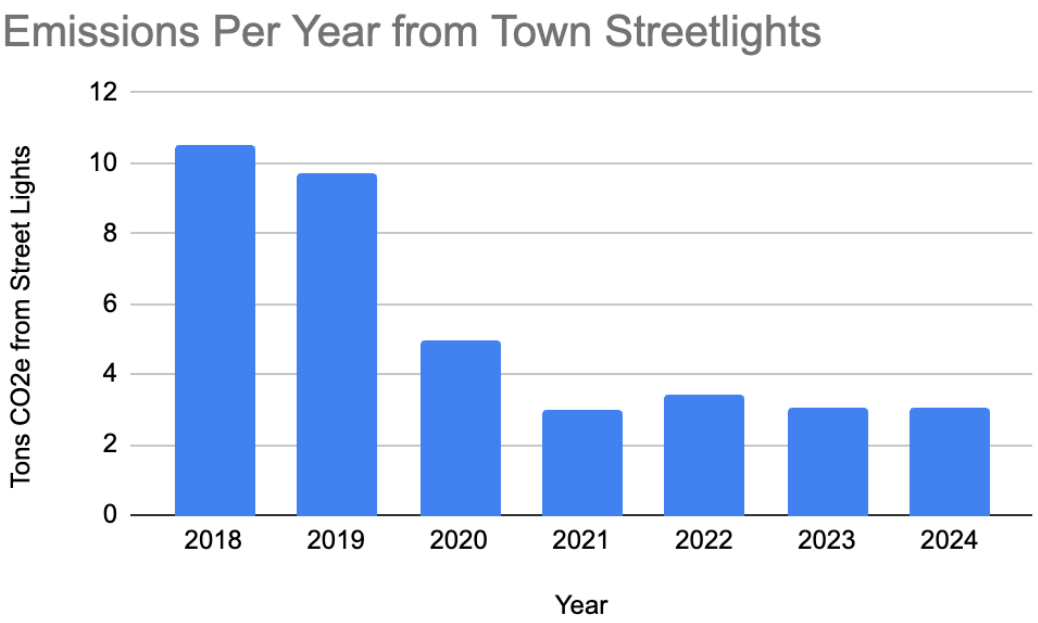

Figure 2. Tons CO2e per year associated with purchased electricity for Town of Kirkland street lights. The significant reduction after 2019 is due to the installation of LED streetlights, which was accomplished through the initiative of the Clinton Kirkland Climate Smart Task Force.

The total emissions profile of the Town is dominated by Scope 1 emissions from vehicle transportation – notably from diesel fuel used for the Town Highway Department vehicles **(Figure 3).** These snow plows and road maintenance trucks provide important functions for the Town. They are currently the largest single source of greenhouse gas emissions in the Town of Kirkland's inventory. **Highway Department Vehicle emissions account for 70% of total greenhouse gas emissions from government operations for the Town of Kirkland.**

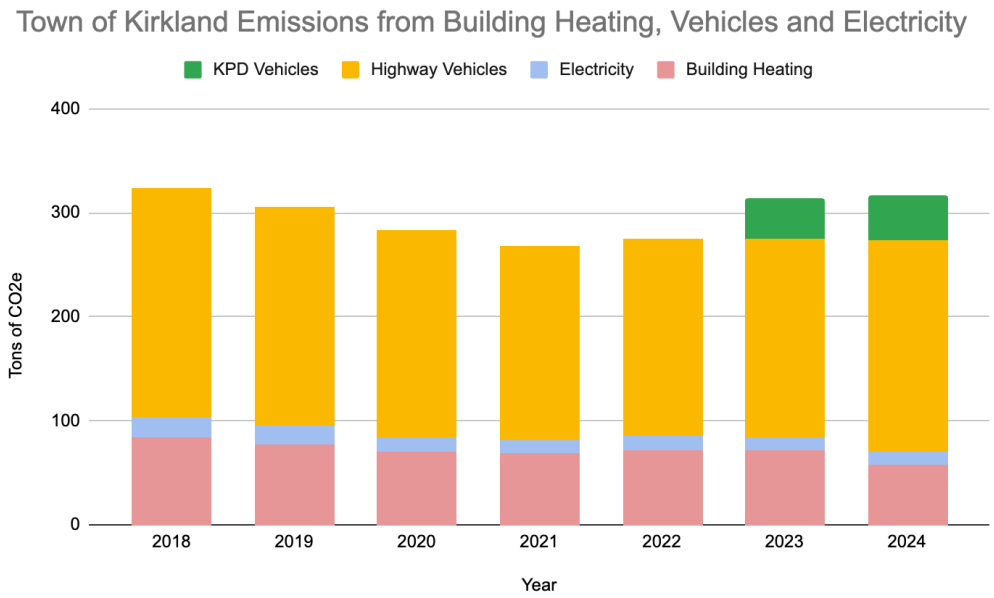

Figure 3. Emissions from all sources, including police department vehicles for 2023 and 2024 (data were not available to be disaggregated previously to 2023). Vehicle emissions from Town Highway Department Vehicles are the dominant source of greenhouse gas emissions for the Town of Kirkland.

Sources

EPA 2019 AVERT, U.S. national weighted average CO2 marginal emission rate, year 2018 data. U.S. Environmental Protection Agency, Washington, DC.

EPA 2026. Emissions & Generation Resource Integrated Database (eGRID) Emissions Factors Data. https://www.epa.gov/egrid/data-explorer