



Town of Ghent Greenhouse Gas Inventory for Government Operations 2019-2021 Summary Report

BACKGROUND

The Town of Ghent's Town Board approved Resolution in May of 2016 to become a Climate Smart Community (CSC), including creation of a Climate Smart Task Force to undertake this effort. An action item in the CSC Certification process is *PE2 Action: Government Operations GHG Inventory*.

This GHG Inventory for Government Operations Report summarizes the GHG emissions from the Town of Ghent's consumption of energy and materials within town-owned buildings, vehicle fleets, and outdoor lighting. Developing this GHG Inventory is the first step towards tangible climate action, the development of a Climate Action Plan (CAP) and enabling the Town to identify realistic goals and track progress towards reducing operation costs, energy use and GHG emissions.

DATA GATHERING AND METHODOLOGY

The town's CSC Task Force appointed Kathryn Beilke to lead the GHG Inventory data collection effort, with the help of Town Clerk Michelle Radley and technical support from Capital District Regional Planning Commission (CDRPC) Sustainability Planner Tara Donadio. The GHG Inventory spreadsheet used was developed by Climate Action Associates, LLC (CAA).

The inventory includes Scope 1 and Scope 2 GHG emissions from government operations, as defined below. The CSC optional Scope 3 [Other Indirect GHG emissions such as town employee commuting] is not included because the minimal amount of emissions generated (perhaps a fraction of a percent) by the small community of Ghent in this scope doesn't justify the work required to obtain this data. This scope is option in the DEC's Climate Smart Communities Program.

- **Scope 1:** Direct GHG emissions from government-owned vehicles and onsite fuel combustion (kerosene, propane and fuel oil) for Town Hall, West Ghent Community Center, and the Highway Garage.
- **Scope 2:** Indirect GHG emissions from purchased electricity.

Baseline Year

The inventory process requires the selection of a baseline year. Local governments examine the range of data they have over time and select a year that has the most accurate and complete data for all key emission sources. It is also preferable to establish a base year several years in the past to be able to account for the emissions benefits of recent actions. A local government's emissions inventory should comprise all greenhouse gas emissions occurring during the selected baseline year. The data collected for this inventory represents years 2019-2021, using 2019 as a baseline. Because it is likely that facilities operated at a reduced capacity during 2020 and 2021 due to the Covid-19 pandemic, therefore using those years solely as a baseline would misrepresent the energy used by the Town.

Quantification Methods

Greenhouse gas emissions in this inventory are quantified using calculation-based methodologies. Calculation-based methodologies calculate emissions using activity data and emissions factors. To calculate emissions accordingly, the basic equation is used:

$$\text{Activity Data} \times \text{Emissions Factor}_{(\text{Fuel, GHG})} = \text{GHG Emissions}_{(\text{Fuel, GHG})}$$

Activity data refer to the relevant measurement of energy use or other greenhouse has-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. To obtain this data, the town gathered and reviewed all **electricity, propane, and fuel oil** bills for the **town's** accounts, as well as fuel records for gasoline and diesel used to power the **town's** vehicle fleet.

Calculations for this inventory were made using CAA's GHG Inventory Tool. Data was first measured in kWh for grid electricity and gallons for gasoline, fuel oil, diesel, and propane. Using the CAA tool, this data was multiplied by emission factors published by the EPA and EIA to convert the energy usage, or other activity data in quantified emissions.

Emissions Factors

Each GHG has an emission factor unique to each fuel. The electricity emission factor is based on the EPA eGRID subregion, which in this case is **NYUP (Upstate)**. The propane, heating oil/diesel, and gasoline emissions factors are taken from the EIA database on carbon dioxide emissions coefficients. The GHG emissions in this inventory are measured in metric tons of CO2 equivalents (CO2e).

Facilities Master List

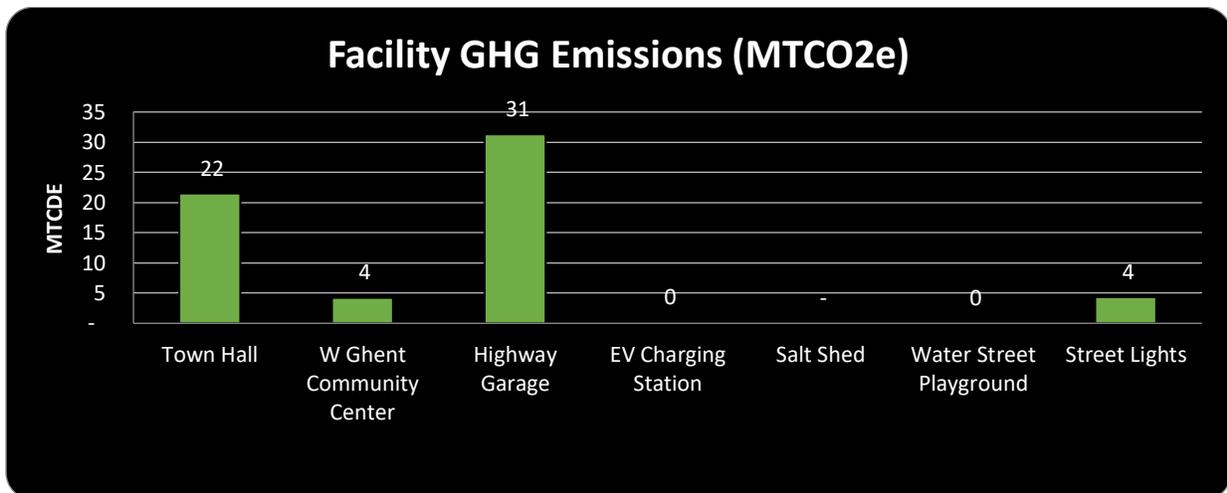
A key step in creating the GHG inventory is to compile a facility master list that includes the **town's buildings** (including streetlights) that use at least one form of energy. Each was assigned to a category to indicate the type of infrastructure and then similar facilities along with their energy use.

This table shows the Town buildings and energy providers included in the Ghent GHG Inventory:

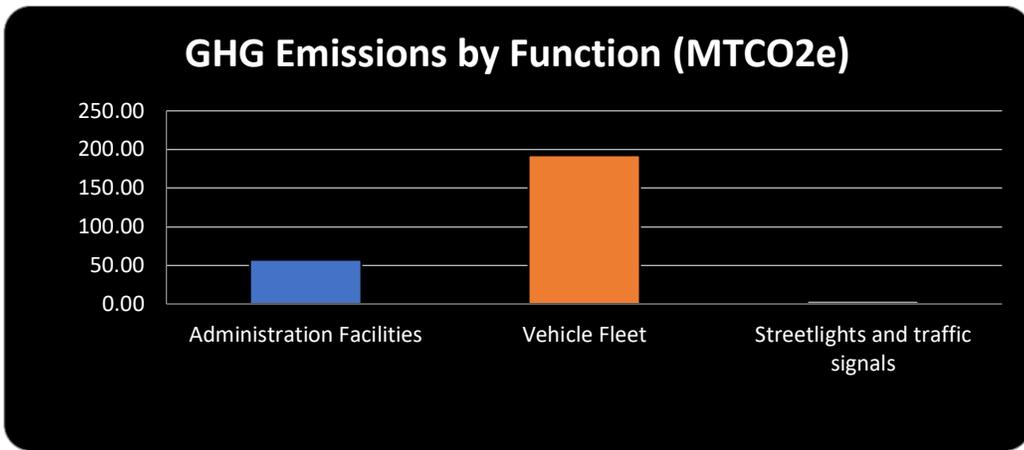
Town Building	Energy Providers
Town Hall	NYSEG, Main Care
Town Highway Garage	NYSEG, Nolan Propane
W Ghent Community Center	NYSEG, Main Care
Water Street Playground	NYSEG
Street Lights	NYSEG
EV Charging Station	NYSEG

KEY FINDINGS

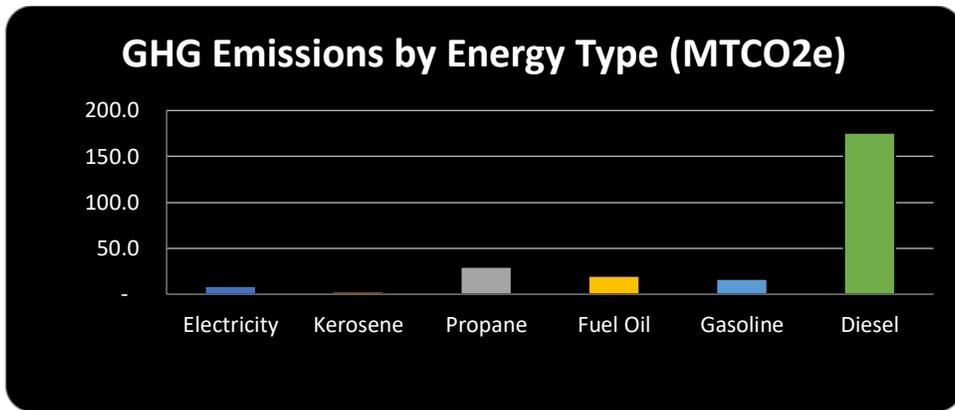
The average GHG emissions produced by the Town of Ghent’s municipal facilities from 2019-2021 was 254 metric tons of CO₂. The largest energy user and source of GHG emissions in Ghent is the vehicle fleet, which produces an average of 192.6 tons of GHG emissions annually and contributes to 75.8 % of the Town’s total GHG emissions. The highest administrative facility use is by the Highway Garage with 31.3 metric tons of CO₂.



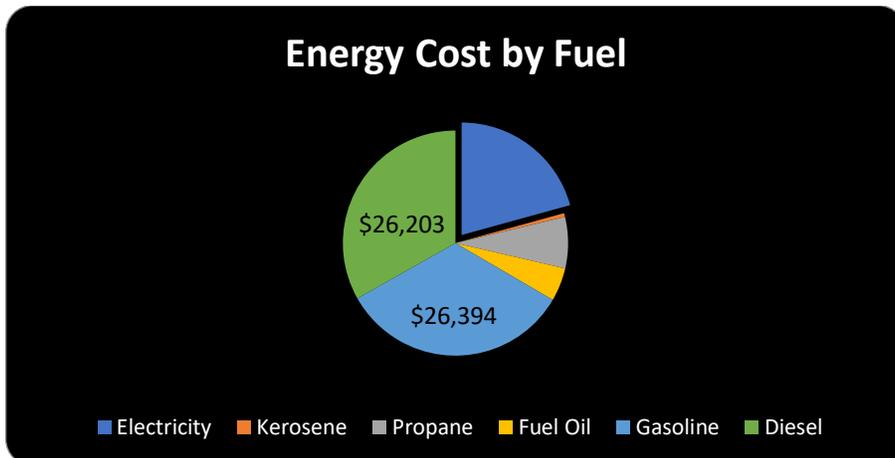
As noted above, energy used by vehicle fleets averaged 192.6 tons of GHG emissions: 16.7 tons for gasoline and 175.9 tons for diesel. The chart below illustrates how vehicle fleet emissions compare to other facilities by function.



Diesel also outweighs all other energy types as far as GHG emissions tons are concerned, at about 69% of the town’s GHG emissions. The chart below shows the breakdown of emissions by energy type.



The Town spends an average of \$78,992 annually on energy for facilities and operations. When assessing cost of energy, fuel for the vehicle fleet contributes to 66.5% of the Town’s energy cost - outweighing fuel oil, propane, and electricity (and kerosene from 2019-2020, that system has since been converted to propane). The average annual costs for each are broken down in the charts below.



Developing a GHG emissions baseline enables the Town to set goals and targets for future reduction of GHG emissions.

The Town has made strides in reducing GHG emissions and energy costs. Lighting in all interior buildings has been retrofitted with LED lighting as well as all 82 street lights within the jurisdiction. The West Ghent Community Center heating was converted from kerosene to propane in 2021. A 5.53kw solar array on the town highway garage became operational in May of 2020. These improvements would account for the gradual reduction in GHG emissions over the 3 years studied; total emissions for all operations have gone from 267 in 2019 to 242 in 2020 to 253 in 2021. Comparing 2021 to baseline year 2019, there has been a reduction by 14 MTCO₂ or 5.25%.

Since the majority of Town GHG emissions come from diesel and gasoline, converting the fleet to EV could accomplish a large emissions reduction.

Further conversion to electrified sources of energy or moving these emissions to “Scope 2” will allow the Town to offset GHGs with renewable energy, such as on-site solar arrays.

Electrification of the Town Hall heating with heat pumps has been explored by the Town.

Climate Action Planning is a next step for the Town to identify reduction targets and strategies/funding to achieve these targets.

Submitted by Kathryn Beilke, CSC Task Force Coordinator