



VILLAGE OF CLAYTON

Greenhouse Gas Inventory for Government Operations 2024 Summary Report

CREDITS AND ACKNOWLEDGEMENTS

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BACKGROUND

The Village of Clayton recognizes that greenhouse gas (GHG) emissions from human activity are causing climate change, the consequences of which pose substantial risks to the future health and well-being of our community. To demonstrate its commitment to addressing the growing threat of climate change, in 2023 the Village of Clayton became a registered Climate Smart Community by formally adopting the New York State Climate Smart Communities (CSC) pledge.

The CSC program, administered by the New York State Department of Environmental Conservation (DEC), is a certification program that provides a robust framework to guide the actions local governments can take to reduce GHG emissions and adapt to the effects of climate change. The first step in this process is to perform a GHG Inventory for all buildings, vehicles and operations controlled by the local government. Using data from 2024, this GHG inventory provides a baseline for which the Village can set emissions and operation costs reduction goals, determine ways in which those goals can be reached, and track progress.

This GHG Inventory for Government Operations Report summarizes the GHG emissions from the Village's consumption of energy and materials within Village-owned buildings, the Water Treatment Plant, vehicle fleet, outdoor lighting, and other facilities. This data was generated from electric, propane, and fuel oil bills for all Village owned buildings and operations, as well as fuel records for the Village's vehicle fleet. The GHG emissions for all local government operations are measured in metric tons of CO₂ equivalents (CO₂e) and were calculated using emissions factors by the US Energy Information Administration (EIA), US Environmental

Protection Agency (EPA) and the Climate Action Associates (CAA), LLC's GHG Inventory Tool.

KEY FINDINGS

In 2024, GHG emissions from the Village of Clayton's government operations totaled 232.9 MTCO₂e. Figure 1 shows the emissions for government operations broken down by sector. The vehicle fleet accounts for the largest percentage of GHG emissions at 37%. The second largest contributor is the Village's wastewater treatment facilities at 27%. Administration facilities and water delivery facilities follow close behind and a small percentage of emissions coming from streetlights and traffic signals.

The Inventory Results section of this report provides a detailed profile of emissions sources within the Village of Clayton. This data will also provide a baseline from which the Village will be able to compare future performance and demonstrate progress in reducing emissions.

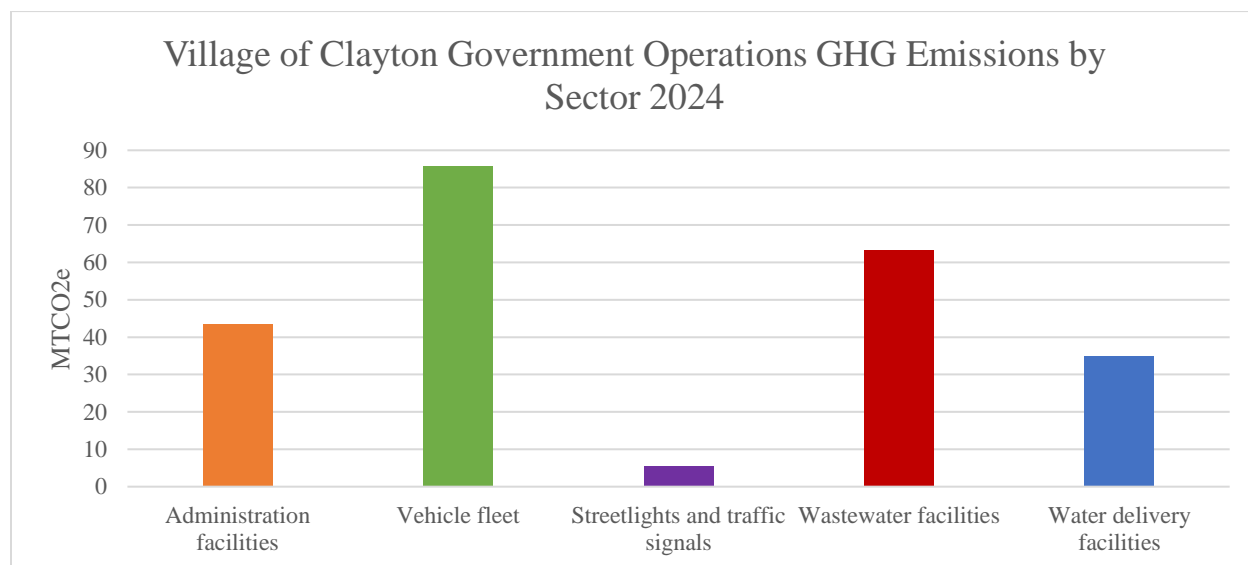


Figure 1: Village of Clayton Government Operations Emissions by Sector 2024

DATA GATHERING AND METHODOLOGY

The first step toward achieving tangible greenhouse gas emission reductions requires identifying baseline emissions levels and sources and activities generating emissions in the community. The Village of Clayton is focusing first on government operations emissions to lead by example and will inventory community-wide emissions in a future report.

The CSC Task Force appointed Michael Kinnie to lead the GHG Inventory data collection effort, with the help of the Adirondack North Country Association (ANCA). The GHG Inventory spreadsheet used was developed by Climate Action Associates, LLC.

Emissions Scopes

For the government operations inventory, emissions are categorized by scope. Using the scopes framework helps prevent double counting. There are three emissions scopes for government operations emissions, as defined below:

- Scope 1: All direct emissions from a facility or piece of equipment operated by the local government, usually through fuel (natural gas, propane, and fuel oil) combustion. Examples include emissions from fuel consumed by the Village's vehicle fleet and emissions from a furnace in a municipal building.
- Scope 2: Indirect GHG emissions from purchased electricity. This refers to operations powered by grid electricity.
- Scope 3: All other indirect GHG emissions not covered in scope 2. Examples include contracted services, emissions in goods purchased by the local government and emissions associated with disposal of government generated waste.

This inventory only accounts for Scope 1 and 2 emissions, as they are the most essential components of a government operations greenhouse gas analysis and are most easily affected by local policy making. Under the DEC's CSC program, tracking Scope 3 is encouraged, but optional.

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 Village of Clayton chose 2024 as the baseline year because it was a normal weather year, reflects current operations, and a full year of data was available.

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 Village gathered and reviewed all electricity, propane, and fuel oil bills for the Village's accounts, as well as fuel records for gasoline and diesel used to power the Village vehicle fleet.

Calculations for this inventory were made using CAA's GHG Inventory Tool. Data was first measured in kWh for grid electricity, therms for natural gas, 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, fuel 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 Village's facilities (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. The Village's emissions were organized into five categories: administration facilities, vehicle fleet, streetlights and traffic signals, wastewater facilities, and water delivery facilities. Administration facilities includes municipal buildings, parks, and other miscellaneous accounts. The vehicle fleet includes all diesel and gasoline usage. Streetlights and traffic signals includes all outdoor lighting that is not directly associated with a building. Wastewater facilities includes the energy use at the wastewater treatment plant, the fugitive emissions from processing wastewater, and any pumps used to move wastewater. Water delivery facilities includes water treatment and pumps to deliver water.

INVENTORY RESULTS

For developing emissions reduction policies, it is often most useful to look at emissions broken down by sector, as each sector will have a particular set of strategies to reduce emissions. Figures 1-3 and Tables 1 show the Village of Clayton’s government operations emissions broken down by sector and broken down by source.

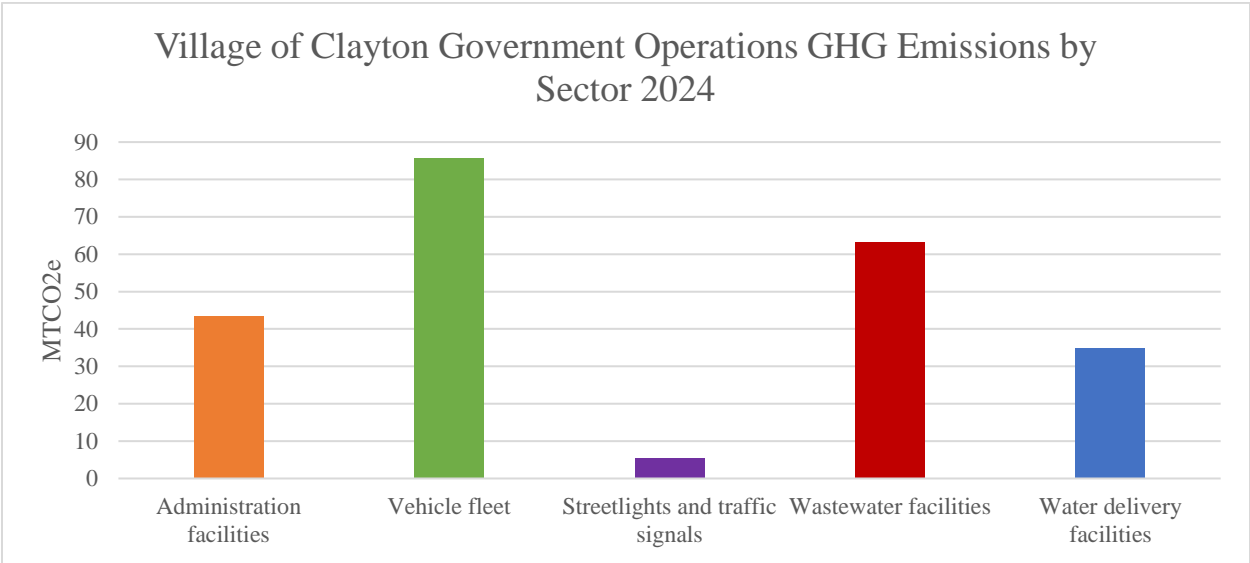


Figure 1: Village of Clayton Government Operations GHG Emissions by Sector 2024

Year: 2024	GHG Emissions (MTCO2e)	Percentage
All Municipal Operations	232.9	100%
Administration Facilities	43.6	19%
Vehicle Fleet	85.7	37%
Streetlights and traffic signals	5.5	2%
Wastewater facilities	63.1	27%
Water delivery facilities	35	15%

Table 1: Village of Clayton Government Operations GHG Emissions by Sector for 2024 in MTCO2e and Percentage

The vehicle fleet is the highest source of emissions for the Village of Clayton’s government operations. Wastewater treatment facilities are also a significant contributor to emissions.

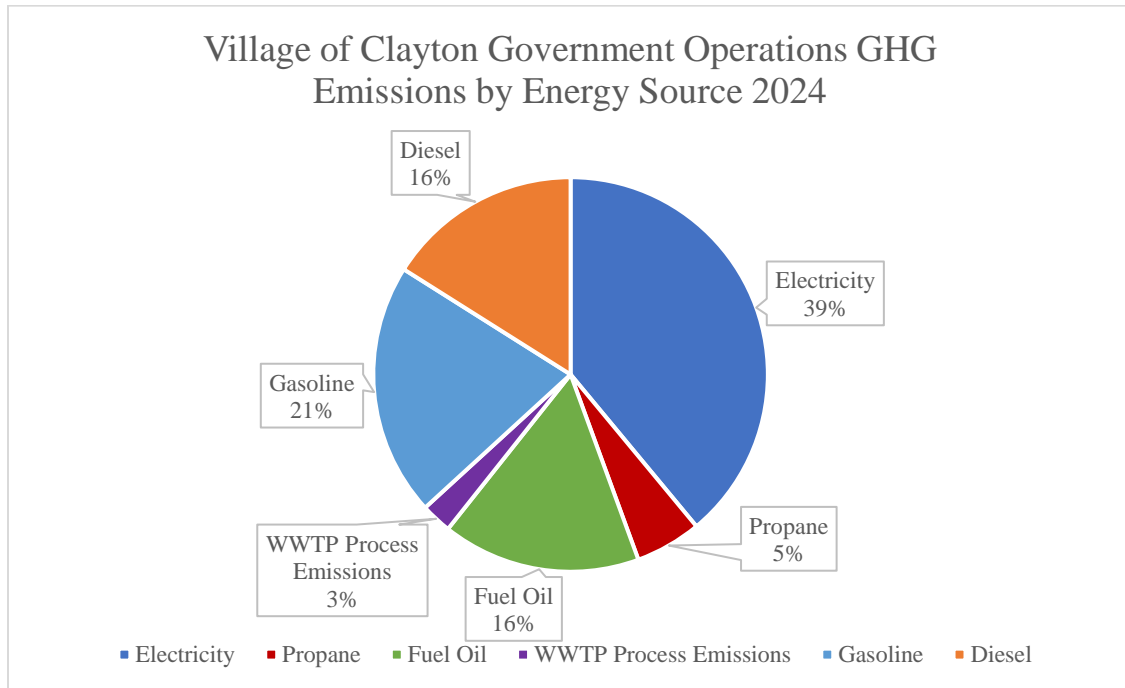


Figure 2: Village of Clayton Government Operations GHG Emissions by Energy Source 2024

Electricity is the largest contributor to emissions for the Village by energy source. Diesel and gasoline are the next highest emitters. Targeting these emission sources will have the largest impact on emission reductions for the Village.

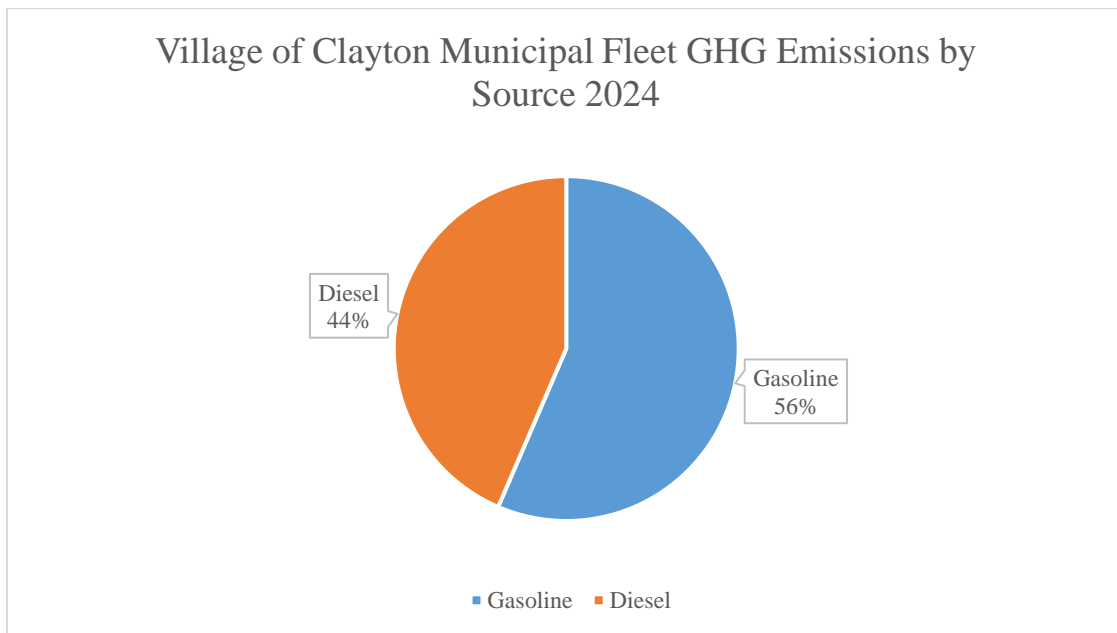


Figure 3: Village of Clayton Vehicle Fleet GHG Emissions by Source 2024

Gasoline and diesel emissions for the Village's government operations are split quite evenly. Reductions in gasoline usage will likely be more feasible in the short term based on replacement options available and financial feasibility.

OPPORTUNITIES TO REDUCE GREENHOUSE GASES

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

The Village has been proactive to reduce GHG emissions and energy costs. Actions to date: cobra head streetlights converted to LED, decorative streetlights converted to LED, benchmarking municipal building energy use, purchasing electric landscaping equipment, heat pump installation in municipal buildings, and conducting a fleet inventory.

This inventory shows that it will be particularly important to focus on finding renewable and affordable sources of electricity as well as converting the vehicle fleet to zero-emissions vehicles. Electricity accounts for 39% of emissions and gasoline accounts for 21% of overall emissions. Targeting the highest energy source emitters will reduce the Village's emissions in a significant way.

The Village of Clayton has written a Climate Action Plan (CAP) that includes an emission reduction target and a prioritized list of actions to reduce emissions focused on improving efficiency of buildings and operations, reducing reliance on fossil fuels, ensuring electricity is coming from renewable and affordable sources, and implementing an outreach and engagement program for Village residents and visitors. After implementing these proposed projects total GHG emissions will inevitably be reduced. DEC recommends conducting a new inventory at least every five years to measure emissions reductions progress. The Climate Smart Communities (CSC) Task Force will lead this update.