



TOWN OF ORANGETOWN

GOVERNMENT OPERATIONS GREENHOUSE GAS INVENTORY

2023 SUMMARY REPORT



CREDITS AND ACKNOWLEDGEMENTS

This report was prepared by Allison Kardon, Confidential Assistant to the Town Supervisor. Many thanks to staff at the Highway Department, Department of Environmental Management and Engineering, Parks, Recreation & Building Maintenance, and the Finance Department who provided the data necessary for the completion of this report.

BACKGROUND

The Town of Orangetown 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 May 7, 2019 the Town of Orangetown 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 2020, 2021 & 2022 this GHG inventory provides a baseline for which the Town 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 Town of Orangetown's consumption of energy and materials within town-owned buildings, vehicle fleet, outdoor lighting, and other facilities. This data was generated from electric, natural gas, fuel oil, gasoline and diesel bills for all Town owned buildings and operations, as well as fuel records for the Town'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

From 2020-2022, Orangetown’s GHG emissions from government operations averaged 3,219.54 MTCO₂e (Metric Tons of Carbon Dioxide Equivalent). Figures 1 & 2 shows the emissions for government operations broken down by sector. The Vehicle Fleet accounts for the largest percentage of GHG emissions at 49%. The second largest contributor is Wastewater Facilities, which includes the Wastewater Treatment Plant at 37%. Administration Facilities (9%) and Outdoor Lighting (5%) make up the remainder of the Town’s emissions.

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

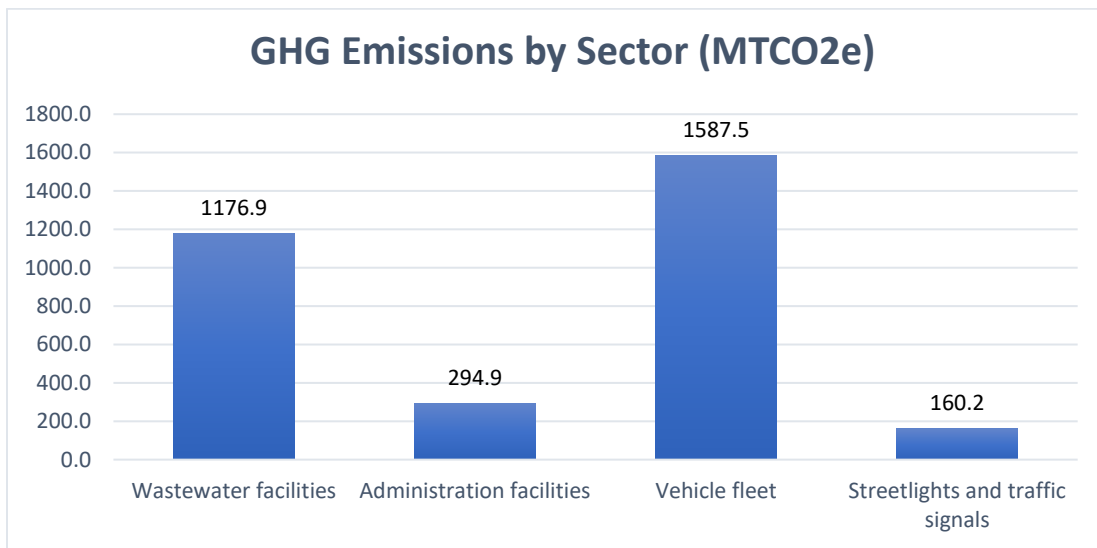


Figure 1. Town of Orangetown GHG Emissions by Sector (2020-2022)

GHG Emission % By Sector (MTCO ₂ e)	Average
Wastewater facilities	37%
Administration facilities	9%
Vehicle fleet	49%
Streetlights and traffic signals	5%

Figure 2. Town of Orangetown GHG Emissions % by Sector (2020-2022)

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 Town of Orangetown 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 Allison Kardon to lead the GHG Inventory data collection effort, with the help of Hudson Valley Regional Council (HVRC). 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 Town'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. Orangetown captured data from 2020-2022 as a baseline based on availability of complete data. This multi-year period accounts for the potential of skewed data as a result of the COVID-19 pandemic.

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 electric and natural gas bills for the Town's Orange & Rockland accounts, as well as fuel records for gasoline and diesel used to power the Town vehicle fleet. In addition, a small amount of fuel oil used to heat buildings was included.

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 natural gas, 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 75 buildings, streetlights, outdoor lighting, vehicle fleet and a wastewater treatment plant (WWTP), 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 Town of Orangetown does not own or operate a landfill or ice rink.

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. Figure 1 shows the emissions for government operations broken down by sector. The following figures show Orangetown’s government operations emissions in further detail within each sector.

The Town’s WWTP and 48 pumps stations, that serve a population of over 51,000 people, contribute to the Sewer Department’s significant emissions. On Figure 3, the Sewer Department’s blue portion is derived from the energy used to run the Town’s many pump stations, while the orange portion is calculated from the WWTP process and not from electricity or natural gas.

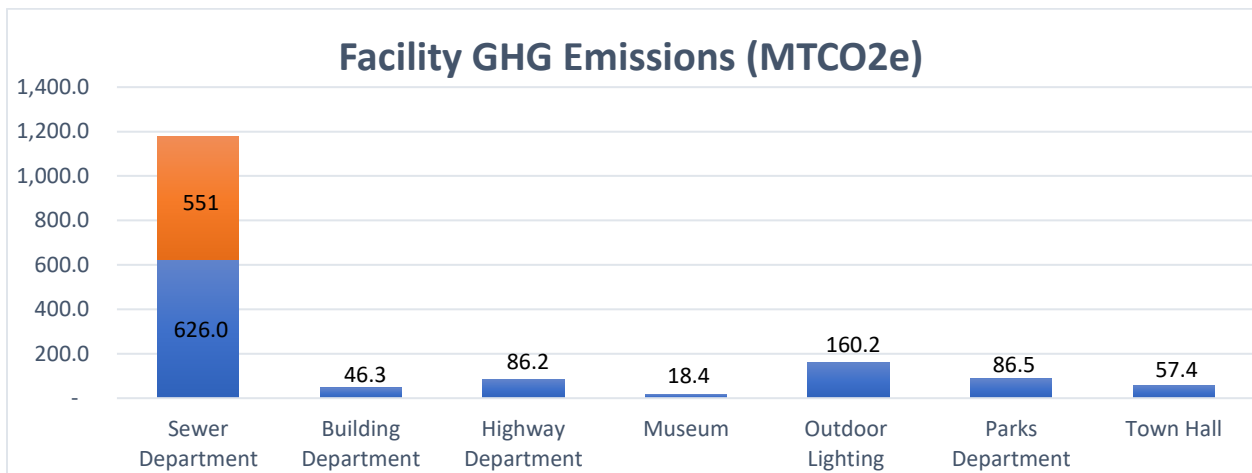


Figure 3. Town of Orangetown Facility GHG Emissions (2020-2022)

On Figure 4, the high GHG emissions from diesel can be lowered significantly from electrification of the heavy duty vehicle fleet.

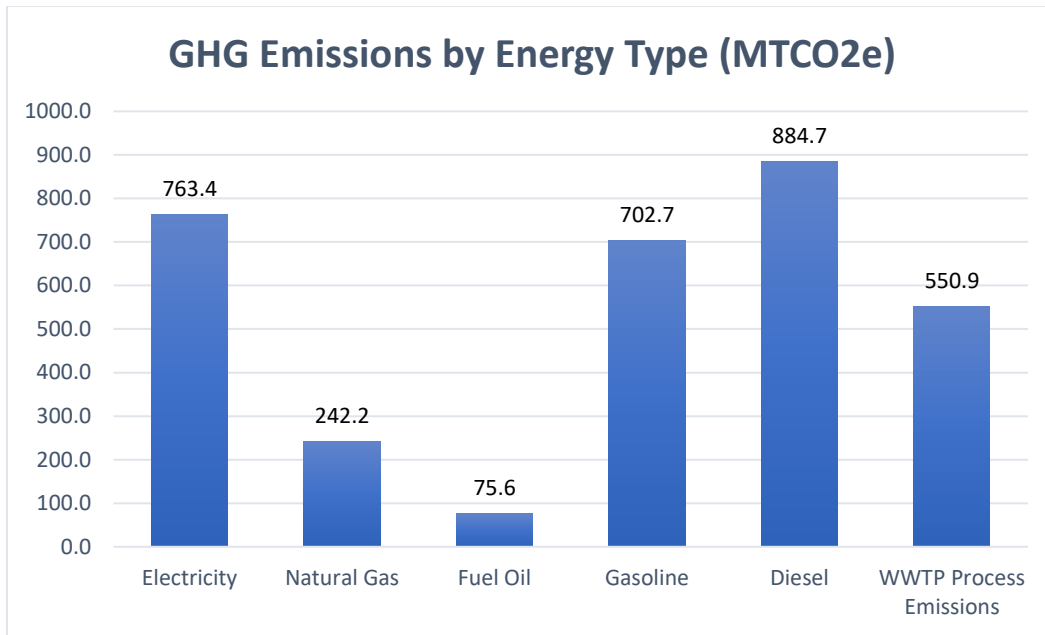


Figure 4. Town of Orangetown GHG Emissions by Fuel Type (2020-2022)

Figure 5 shows the average energy cost by fuel type.

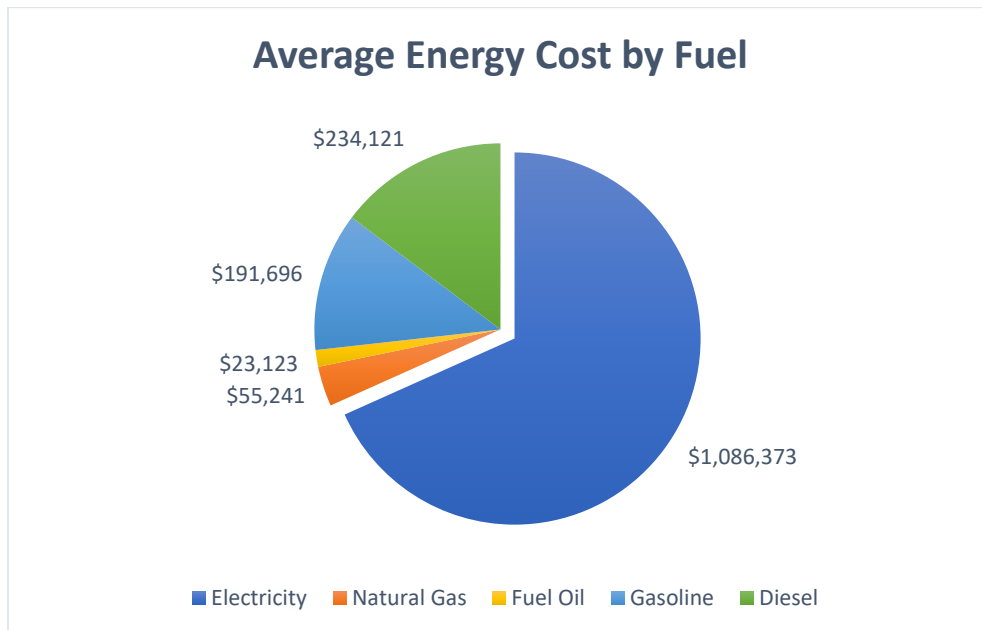


Figure 5. Town of Orangetown Cost of Energy by Fuel Type (2020-2022)

OPPORTUNITIES TO REDUCE GREENHOUSE GASES

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

The Town has been proactive in reducing GHG emissions and energy costs. The Town's energy efficiency updates include: conversion of over 2300 street lights and 9 traffic signals to LED, increased paper and plastic recycling in Town buildings, installation of water saving fixtures in Town buildings, replacement of Supervisor's vehicle with an EV, purchase of 14 hybrid police vehicles, installation of VFDs (Variable Frequency Drives) at the pump stations, participation in community solar for the Town's buildings, and built LEED compliant Town Hall addition.

The Town Hall addition also meets the requirements of the 2020 NY Stretch Energy Code and includes many energy efficiency features such as:

1. Continuous Exterior Air Barriers
2. High Efficiency Mechanical Systems with Energy Recovery
3. Building Management Systems
4. Stretch Code Compliant Exterior Envelope
5. Low flow plumbing fixtures
6. High Efficiency LED Lighting with Automated Lighting Control System
7. Code Compliant Entry Vestibules
8. Durable, low life-cycle cost interior finishes

The Town Hall addition project also includes 8 public EV charging stations and a rainwater capture irrigation system, which promote sustainability while improving building performance.

Future Projects to reduce GHG emissions:

1. Town plans to set aside 23 parking spots for Town-owned EVs and their chargers
2. Purchase additional hybrid vehicles
3. Purchase light & heavy duty electric vehicles
4. Solar canopies
5. Floating solar arrays in reservoirs

After implementing these proposed projects and identifying other Climate Action Plan (CAP) priorities and actions, total GHG emissions will inevitably be reduced.

The next steps are to set an emissions reduction target, and to develop a climate action plan that identifies specific quantified strategies that can cumulatively meet that target. In the meantime, Town of Orangetown will continue to track key energy use and emissions indicators on an ongoing basis. DEC recommends conducting a new inventory at least every five years to measure emissions reductions progress.

This inventory shows that it will be particularly important to focus on electrification of the vehicle fleet to reduce emissions from diesel, as well as choosing renewable sources for municipal electricity to lower GHG emissions.