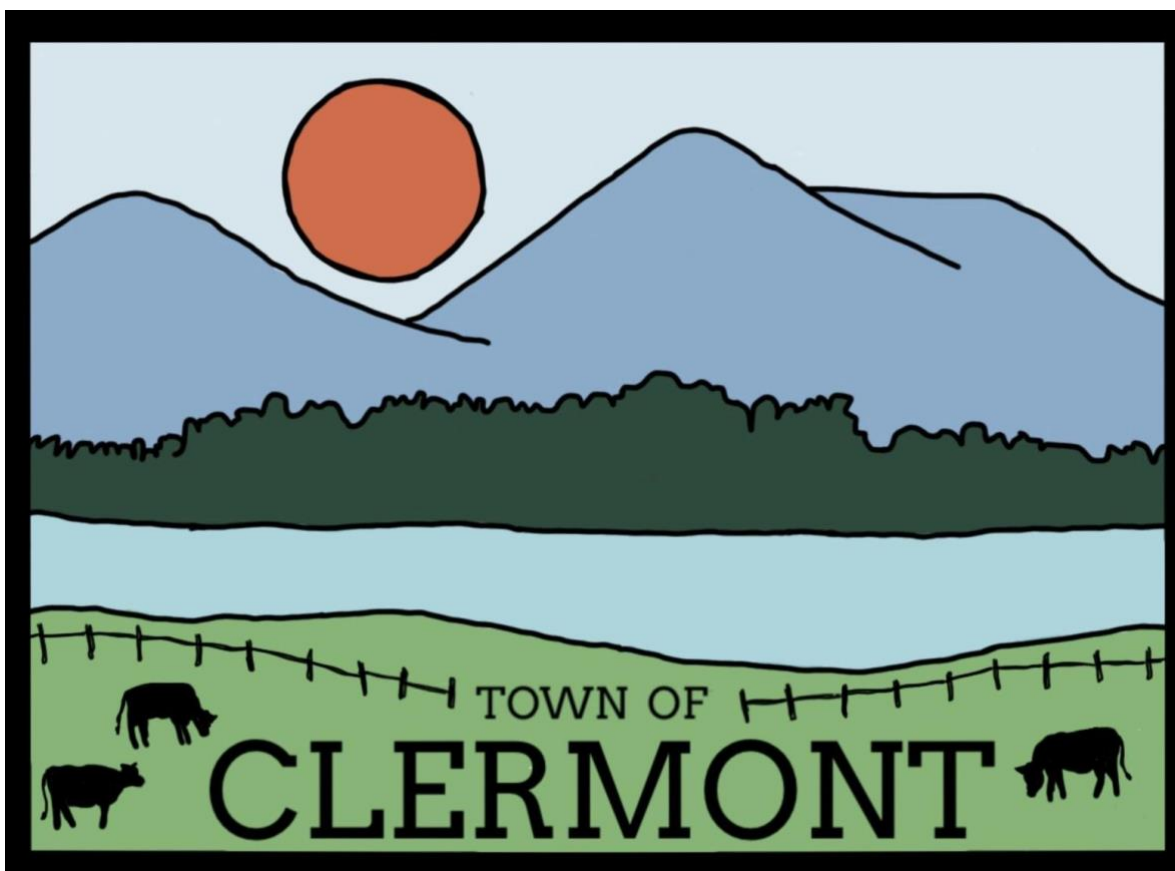


Town of Clermont, New York Government Operations Greenhouse Gas Inventory 2019-2023

March 2025



Produced by the
Clermont Climate Smart Community Task Force

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Executive Summary

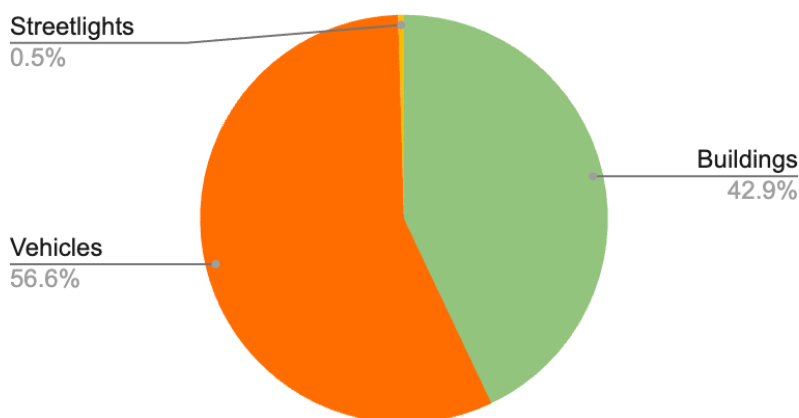
In response to increasing concern about climate change impacts, The Town of Clermont, NY, has formed a Climate Smart Communities (CSC) Task Force as defined by the New York State Climate Smart Communities program. The first responsibility of the Clermont CSC was to produce an inventory of greenhouse gas emissions from government operations in a baseline year (2019) based on energy consumption by buildings and town vehicles.

The value of such an inventory is to know what the Town's baseline emissions are and assess possible actions that the Town can take to reduce greenhouse gas emissions. Reducing emissions both contributes to NY State mitigation goals and saves the Town money.

This report presents the task force's methods and results for the time period from 2019 through 2023, concluding with initial thoughts on strategies Clermont might consider to reduce our GHG emissions.

Total greenhouse gas emissions from Government Operations in the Town of Clermont totaled just over 173 thousand pounds of CO₂ equivalent (CO₂e) in the base year of 2019 (78.59 Metric tons CO₂e) (Table 6). Energy consumption by Clermont's vehicle fleet produced the majority of the Town's GHG emissions that year, with 56.6% compared to 42.9% from buildings (Figure 1). The remainder (0.5%) was from electricity for the seven streetlights in the Town.

GHG Emissions by Sector, Baseline 2019



Government Operations percentages of greenhouse gas emissions by sector in the base year of 2019, Town of Clermont, NY.

Greenhouse gas emissions from vehicles was dominated by diesel fuel (~75% of total fuel emissions), and emissions from buildings was primarily from fuel oil used for heating. Electricity consumption contributed less than 10% of total GHG emissions from the town.

Due to the specific conditions found in Clermont and the limited number of municipal buildings and assets, it was determined that specific, individual studies of each building and vehicle would be useful to identify steps to meet the town's cost reduction and climate goals.

Introduction to Climate Change and Justification for a Greenhouse Gas Inventory

Regional Trends in Climate

Global trends in temperature and extreme climate events are making the news daily and the Northeast US is no exception. The Northeast Regional Climate Center ranked July 2024 as the hottest on record for Albany, NY.¹ Mild winters and extremes in rainfall are impacting farmers and other businesses across the Northeast, and Clermont has seen its share of climate anomalies. The Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report confirms that an increase in atmospheric greenhouse gas emissions is the primary cause of global warming and climate disruption.²

New York State's Climate Smart Communities Program Provides a Path for Local Climate Action

Towns and cities from small to large have an important role to play in mitigating and adapting to climate change. New York State has developed a framework to encourage local action through the Climate Smart Communities³ (CSC) program. Participation provides assistance in understanding and addressing sources of emissions from both government and community activities for towns across the state. As towns meet goals, access to funding and other resources are made available to help achieve further goals. The Town of Clermont has taken the pledge and is now registered as a NY Climate Smart Community. One of the first actions towns need to undertake is to perform a Greenhouse Gas Inventory (GHGI) of government operations.⁴

The Value of a Greenhouse Gas Inventory as the Basis for Municipal Decision Making

A greenhouse gas inventory of government operations documents the sources and amounts of emissions generated from day to day activities of the town government. Documenting sources and amounts of emissions provides a baseline for comparison, allowing the Town to prioritize mitigation actions. It is therefore the logical starting place for planning and decision making going forward.

¹ Northeast Regional Climate Center August 2024 blog
<https://www.nrcc.cornell.edu/services/blog/2024/08/01/index.html>

² IPCC, 2023: Summary for Policymakers. In: *Climate Change 2023: Synthesis Report*. Contribution of Working Groups I, II and III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, H. Lee and J. Romero (eds.)]. IPCC, Geneva, Switzerland, pp. 1-34, doi: [10.59327/IPCC/AR6-9789291691647.001](https://doi.org/10.59327/IPCC/AR6-9789291691647.001).

³ Climate Smart Communities website: <https://climatesmart.ny.gov/>

⁴ Climate Smart Communities Website: <https://climatesmart.ny.gov/actions-certification/actions/#open/action/6>

Organization of this Report

The following section lays out the approach used in collecting, analyzing and presenting the data for the GHGI, including the conversion factors used to translate fuel or energy consumption levels into GHG emissions. The results of the analysis are presented next, with emissions by year from 2019 to 2023, broken out by source. Finally, this report concludes with potential mitigation options based on the observed emissions for the Town of Clermont.

Inventory Methodology

Key Terms and Concepts

This inventory uses the approach and methods provided by the Local Government Operations Protocol for Accounting and Reporting Greenhouse Gas Emissions (LGO Protocol)⁵, described below.

Three greenhouse gases are included in this inventory: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). Many of the charts in this report represent emissions in “carbon dioxide equivalent” (CO₂e) values, calculated using the Global Warming Potentials (GWP) for methane and nitrous oxide from the IPCC 6th Assessment Report⁶ (Table 1). GWP is a measure of how much energy the emission of one ton of a gas will absorb over a given period of time, relative to the emission of one ton of carbon dioxide (CO₂). The larger the GWP, the more that a given gas warms the Earth compared to CO₂ over that time period.⁷ The value of using this measure is that it allows one to add up the emissions of the different gases to express the total impact.

Table 1: Global Warming Potential Values (IPCC AR6, 2021)

Greenhouse Gas	Global Warming Potential
Carbon Dioxide (CO ₂)	1
Methane (CH ₄)	28
Nitrous Oxide (N ₂ O)	273

Local Government Operations Protocol

In 2010, ICLEI, the California Air Resources Board (CARB), and the California Climate Action Registry (CCAR) released Version 1.1 of the LGO Protocol.⁸ The LGO Protocol serves as the national standard for quantifying and reporting greenhouse emissions from local government

⁵ https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/2010-05-06-LGO-1.1.pdf

⁶ <https://ghgprotocol.org/sites/default/files/2024-08/Global-Warming-Potential-Values%20%28August%202024%29.pdf>

⁷ <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials>

⁸ https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/2010-05-06-LGO-1.1.pdf

operations. The purpose of the LGO Protocol is to provide the principles, approach, methodology, and procedures needed to develop a local government operations greenhouse gas emissions inventory.

The following activities are included in this LGO inventory for the Town of Clermont:

- Energy consumption from buildings & facilities
- Electricity consumption from streetlights
- On-road transportation vehicle fleet

Following the standardized LGO Protocol⁹, emissions are divided into three categories: Scope 1, Scope 2, and Scope 3 (Table 2).

Table 2: Definitions of Scopes following the Local Government Operations Protocol¹⁰

	Sources included
Scope 1	Direct emissions from burning of fuels onsite for heating and cooling or from emissions from vehicles, emissions from wastewater treatment, landfills, or leaking refrigerants.
Scope 2	Indirect emissions from grid electricity consumed
Scope 3	Other indirect emissions from sources such as employee vehicle emissions, waste disposal, mining and other outsources activities.

This report includes Scope 1 and Scope 2 emissions for the Town of Clermont. As the Town does not have a wastewater treatment facility, and no active landfill¹¹, those Scope 3 emissions are not covered. The inclusion of employee travel (Scope 3) emissions is optional according to the CSC guidelines and given the current limited resources available, we have not included that source of emissions in this report.

Standard protocol requires the identification of a “base year” for the analysis against which future emissions can be compared. This inventory uses 2019 as the base year and extends the assessment through 2023. This period includes the period of time when Covid19 impacted operations.

⁹ ibid

¹⁰ <https://climatesmart.ny.gov/actions-certification/actions/#open/action/6>

¹¹ Clermont had a landfill until the early 1980s when it was capped and closed. The CSC protocol does not require estimation of landfills closed for more than 30 years.

Data Sources

Clermont manages four buildings: the Town Hall, the Town Garage, the Community House, and the church adjacent to the Town Hall (Map 1). The church is only used on rare occasions and is on the same electric meter at the Town Hall. The Town Garage had an addition completed in 2019 which is heated with propane rather than fuel oil as is the rest of the garage. The addition is sometimes referred to as the “new town garage” in supporting documents but the addition is functionally part of the old garage and is therefore referenced in this report as a single building. Building age and condition was not evaluated as part of this study.

There are seven streetlights in the town, with two on Route 9 (one at Lasher Ave and one at Route 6) and five decorative lights in front of the Town Hall (Map 1).



Map 1: Town of Clermont, Buildings and Street Lights

The source of data utilized for each activity covered in this report is detailed in Table 3. Data were assumed to be complete for each activity other than street lights (see note under data gaps and assumptions). Data for fuel oil, propane, diesel and gasoline is based on the sum of deliveries made by the Town’s local suppliers.

Table 3: Data source by activity and assumptions made

Activity	Data Sources	Data Gaps / Assumptions
Energy		
Electricity	Town Clerk, National Grid	Meters located at Town Hall, Town Garage, and Community House are assumed to be correct. For street lights, data was only available for 2023 and 2024, so we used the mean from those two years as the estimate for 2019, 2020, & 2022 on the assumption that lighting is not very sensitive to annual variability in weather. Data for 2023 is based on meter readings.
Propane	Town Clerk, Suppliers (Main-Care)	Propane is only used in the New Truck Garage. Data assumed to be correct.
Fuel Oil	Town Clerk, Suppliers (Main-Care, Long Energy, Valley Energy)	Fuel oil is used in the Town garage, Town Hall, and the Community House, with deliveries indicating destination. Data assumed to be correct.
Transportation		
Diesel	Town Clerk, Supplier (Valley Energy)	Deliveries from suppliers assumed to be the only diesel consumed.
Gasoline	Town Clerk, Supplier (Valley Energy)	Deliveries from the suppliers assumed to be the only gasoline consumed.

The Town owns a number of vehicles and pieces of equipment that run on fossil fuels (Table 4). Fuel deliveries for these items are delivered by local energy companies and stored onsite for use.

Table 4: Vehicles and Landscape Equipment owned by the Town, by Fuel Used

Fuel	Type	Number
Gasoline	Pickup truck	1
	Wood chipper	1
	Lawn mower	3
	Chain saw	1
	Weed whacker	1
	Sander attachment	1
Diesel	Diesel trucks	4
	Front End loader	1
	Backhoe	1

Quantifying Greenhouse Gas Emissions

Greenhouse gas emissions can be quantified in two ways:

- *Measurement-based methodologies* refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility. In Clermont, we do not have any sources from government operations that can be quantified with direct measurements.
- *Calculation-based methodologies* calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used:

$$\text{Activity Data} \times \text{Emission Factor} = \text{Emissions}$$

All emissions sources in this inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other greenhouse gas-generating processes such as fuel consumption by fuel type, and metered annual electricity consumption. We used monthly fuel delivery records summed to annual totals.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO₂e per kWh of electricity). The emissions factors used to convert fuel consumption and electricity by the Town to emissions are shown in Tables 5 and 6.

Table 5: Emissions Factors for Fuels (2023-2 CSC Govt GHG Inventory Tool)

Source	Emissions Factor (lbs CO ₂ e/gal)
Propane	12.68
Heating Oil	22.47
Diesel	22.47
Gasoline	19.36

In the case of electricity (Table 6), emissions are associated with grid-wide emissions for the mix of sources in the region in which we are located, and are expressed as “Grid Carbon Intensity” in units of CO₂e per MWh. The carbon intensity for our subregion (eGRID’s NPCC Upstate NY) is substantially lower than either the nationwide average or the State-wide average intensity because our region gets a large portion of our electricity from hydropower.

Table 6: Carbon Intensity for eGRID Subregion NPCC Upstate NY by year, 2019-2023¹²

Year	Carbon Intensity (lbs CO ₂ e/MWh)
2019	233.04
2020	234.50
2021	233.08
2022	233.08
2023	233.08 ¹³

¹² <https://www.epa.gov/egrid/download-data>

¹³ 2022 and 2023 sub-grid emissions are estimated pending data from the eGRID national database. (<https://www.epa.gov/egrid/frequent-questions-about-egrid#How%20do%20eGRID%20subregion%20rates%20compare>)

Government Operations Emissions Inventory

Results for the Town of Clermont, NY

Overview

Total greenhouse gas emissions from Government Operations in the Town of Clermont totaled just over 173 thousand pounds of CO₂ equivalent (CO₂e) in the base year of 2019 (78.59 Metric tons CO₂e) (Table 7). Energy consumption by Clermont’s vehicle fleet produced the majority of the Town’s GHG emissions that year, with 56.6% compared to 42.9% from buildings (Figure 1). The remainder (0.5%) was from electricity for the seven streetlights in the Town.

Table 7: Emissions by Sector and Fuel Type for the Base Year (2019)

Sector		
Buildings and Facilities	Usage	CO₂e (pounds)
Electricity (KWh)	16489	3842
Fuel Oil (gal)	3030	68093
Propane (gal)	195	2479
		Sector Total 74414
Streetlights		
Electricity (KWh)	3417	796
		Sector Total 796
Vehicle Fleet		
Gasoline (gal)	1135	21974
Diesel (gal)	3386	76074
		Sector Total 98048
	All sectors	Total 173258

GHG Emissions by Sector, Baseline 2019

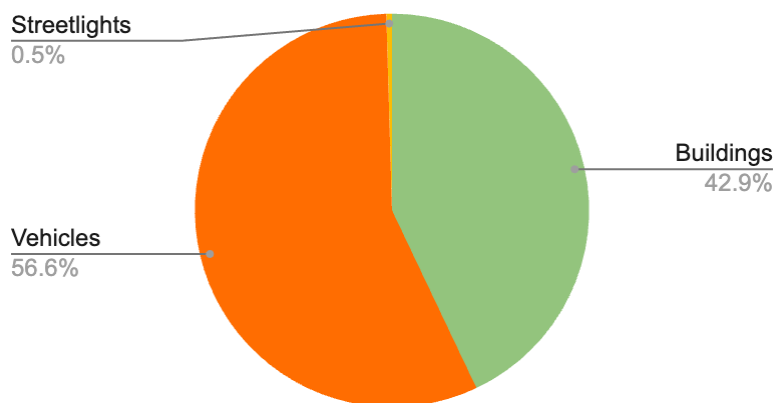


Figure 1: Government Operations percentages of greenhouse gas emissions by sector in the base year of 2019, Town of Clermont, NY.

The time series of GHG emissions by sector from 2019 through 2023 (Figure 2) clearly reveals the impact of the Covid19 pandemic in 2020 and 2021, with a decrease in emissions of approximately 18% from the base year in those two years from both the vehicle fleet and buildings followed by a rebound in 2022. Emissions in 2023 fell again, primarily due to a decrease in consumption of vehicle fuel and fuel oil due to a mild winter.

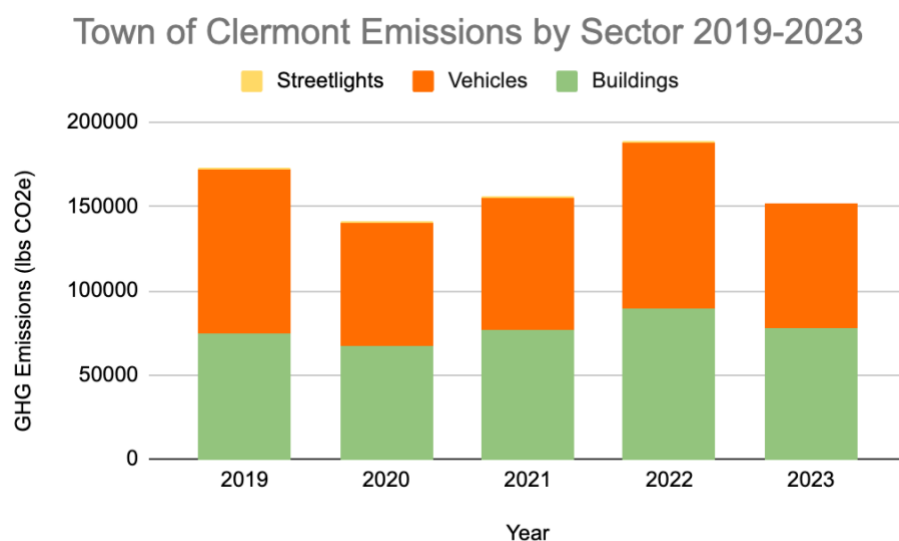


Figure 2: Government operations greenhouse gas emissions by sector, 2019-2023 for the Town of Clermont, NY (lbs of CO₂e).

Emissions by Sector

Buildings

The time series of GHG emissions from buildings by fuel type (Figure 3) shows that fuel oil is by far the largest source of emissions. Fuel oil is used for heat in the Town Hall, the Community House, and the old garage, while the new garage is heated with propane which is a tiny fraction of total building emissions. Figure 4, which shows the percent of building emissions by building, makes it clear that emissions from fuel oil to heat the Town garage make up the highest percentage of emissions from the sector. The Community House and the Town Hall are roughly equal with respect to emissions. Given that the Community house is used far less than the Town Hall, this may reflect poor insulation in the Community House.

Building Sector GHG Emissions by Fuel Type

Town of Clermont, NY 2019-2023

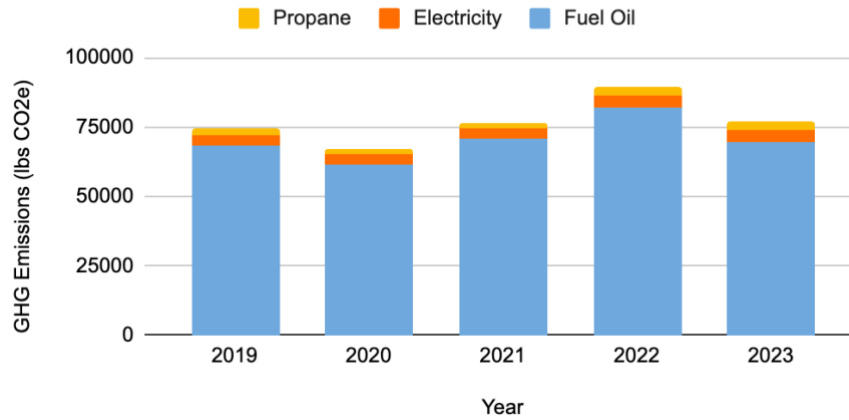


Figure 3: Government operations greenhouse gas emissions from the building sector by fuel type from 2019-2023 for the Town of Clermont, NY (lbs CO2e).

Building Sector GHG Emissions by Building

Town of Clermont, NY 2019-2023

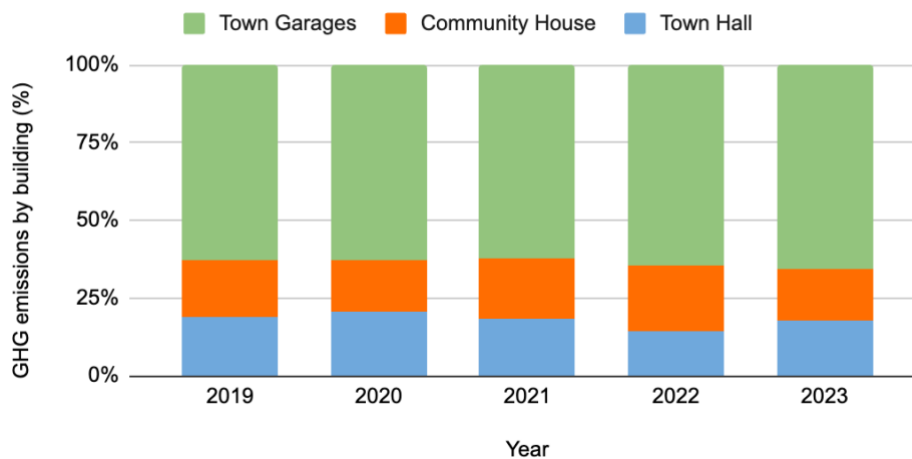


Figure 4: Government operations greenhouse gas emissions by building from 2019-2023 as a percent of total emissions from the building sector for the Town of Clermont, NY (%).

Similarly, looking at emissions from just electricity consumption (Figure 5), we can see that the garage emits almost twice as much as the Community House and the Town Hall, perhaps since it is in use every day. Note that CO₂e emissions from the seven streetlights in Clermont is almost as high as emissions from electricity use in the Town Hall. Electricity use by LED streetlights is known to be approximately half as much as standard bulbs currently used in the streetlights in Clermont. This presents an opportunity to reduce emissions in Clermont by taking advantage of the streetlight replacement program run by National Grid.

GHG Emissions from Electricity Use: Buildings & Streetlights

Town of Clermont, NY 2019-2023

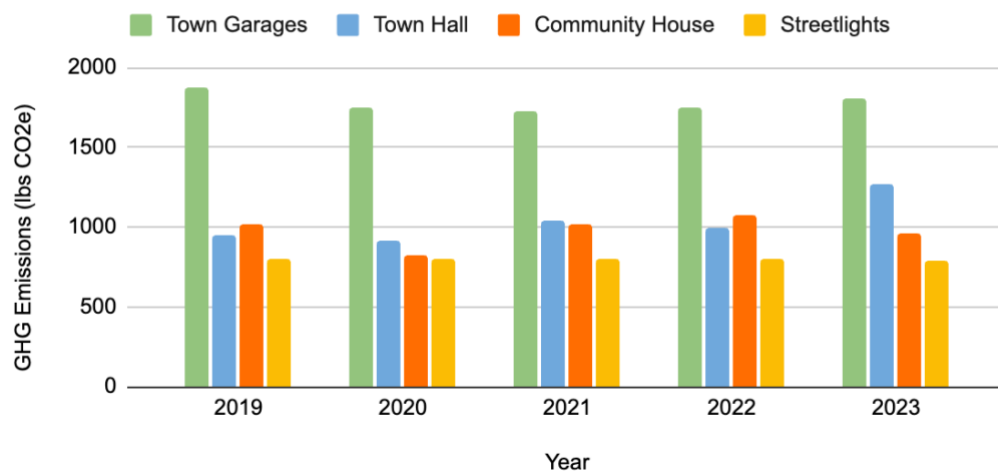


Figure 5: Greenhouse gas emissions from the Town of Clermont’s three government buildings and streetlights, 2019-2023 (lbs CO₂e).

Transport and other equipment

Approximately 75% of the GHG emissions from the Clermont vehicle fleet are from diesel fuel. In figure 6, the impact of the COVID19 pandemic is seen in the data from 2020 and 2021. The relatively lower values for diesel emissions in 2023 was the result of a mild winter and therefore less snow plowing, though gasoline emissions are also lower that year compared to any other year.

GHG Emissions from the Vehicle Fleet by Fuel Type

Town of Clermont, NY 2019-2023

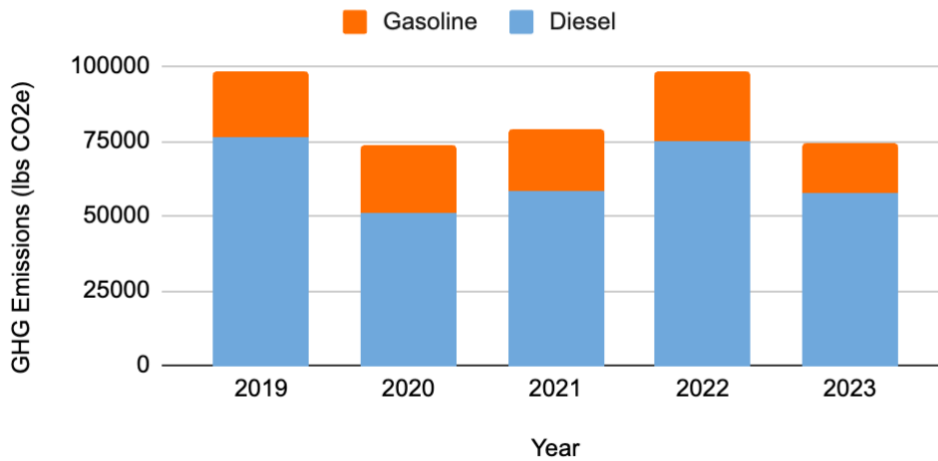


Figure 6: Greenhouse gas emissions from the Town of Clermont NY vehicle fleet and landscape equipment by fuel type, 2019-2023 (lbs CO2e).

Cost by Sector and Fuel Type

By expressing the energy consumption as the dollar amount paid for that energy, we can see that efforts to reduce the Town's energy use can save money. Averaged across the five years studied in this analysis, the Town of Clermont spends over \$7,000 per year on fuel oil to heat the town buildings (Figure 7). Electricity costs are relatively low in comparison to fuel oil.

Average Annual Cost for Building Energy by Fuel Type

Average consumption in Clermont 2019-2023 at current prices

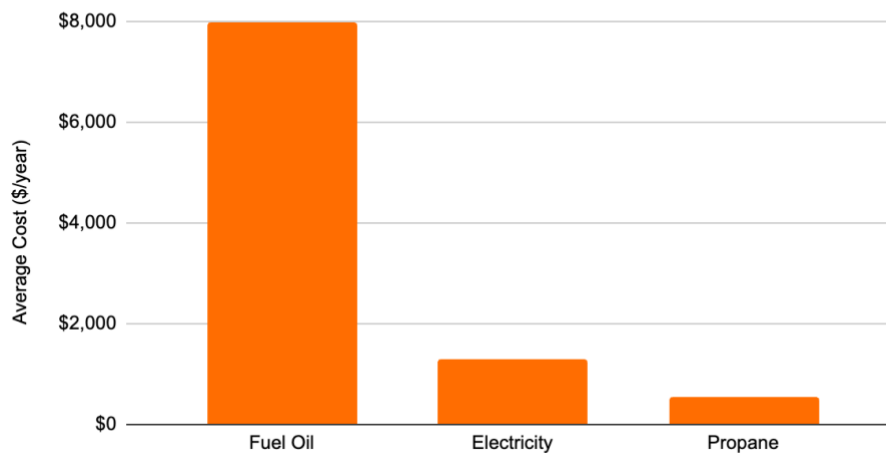


Figure 7: Cost of energy supply by fuel type averaged across all buildings in the Town of Clermont, 2019-2023 at current 2024 prices.

Propane is only used to heat the new addition to the Town garage and therefore represents a minor cost. Figure 8 shows the costs for electricity consumption based on kW hours used (excluding basic service and tariffs) by building, revealing that the Community House is costing the town almost as much per year as the Town Hall for electricity. Conducting an energy audit is likely to point out improvements that could be made to reduce electrical costs.

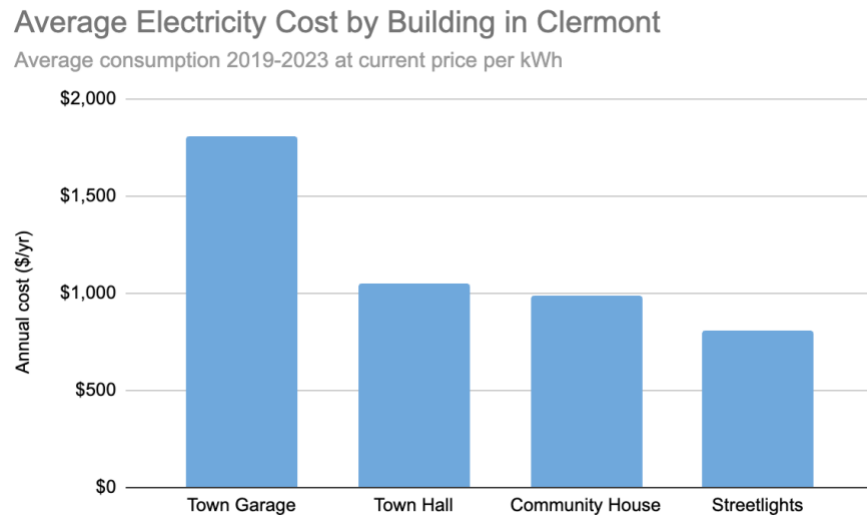


Figure 8: Cost of electricity supply by building plus streetlights for the Town of Clermont. Consumption in kWh averaged across 2019-2023, presented at 2024 per kWh rates.

Fuel costs for the Town of Clermont vehicles and landscape maintenance equipment costs the town over \$10,000 per year (Figure 9). There is interest by the Highway Department to investigate electric alternatives, particularly mowing and other landscape equipment which may reduce both costs and emissions. Electric alternatives are also less noisy and smelly and are therefore more pleasant to operate for both our Highway Department crew and the neighbors of the work.

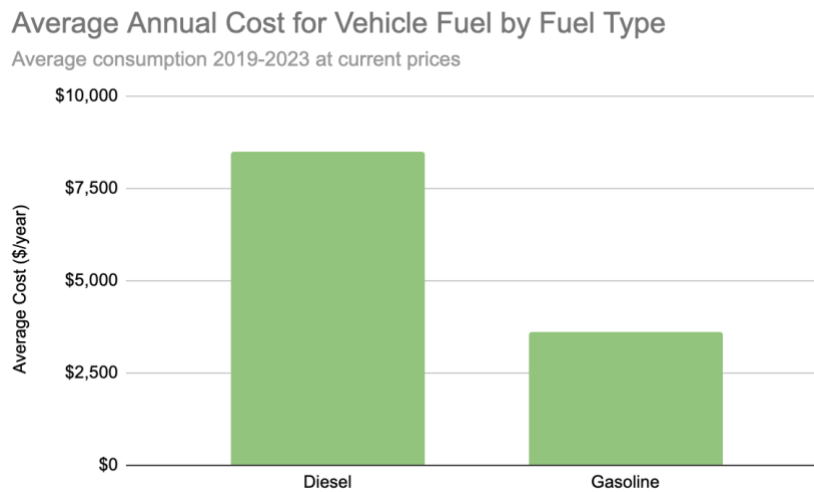


Figure 9: Average annual cost by fuel type for the Clermont vehicle and landscape equipment fleet. Consumption is averaged over 2019-2023, using current prices.

Conclusions and Recommendations

Based on the data and analysis and knowledge of the available NYS programs, the Clermont Climate Smart Community Taskforce has the following summary observations:

Observations:

- In general, the Town has more control to affect change in emissions and cost to operate buildings, with less opportunity to improve the vehicle fleet. There are currently not viable alternatives to the existing diesel snow plow trucks or equipment like the backhoe or front end loader. There are currently some alternatives for pickup trucks and more options for all our vehicle needs are expected in the next ten years.
- As fleet vehicles near end of life, EV and hybrid replacements should be researched and considered ahead of time to access and leverage State and Federal incentives. This equipment is quickly evolving and incentives are rewritten annually.
- Due to changing government policy, uncertain geopolitical conditions, and market volatility in recent years, the cost of energy continues to rise year over year. We should expect energy costs to continue increasing and should therefore seek to reduce energy use to control Town spending along with reducing our emissions.
- The town currently has no energy inputs (solar, geothermal, etc) that would potentially offset cost to operate and mitigate market volatility.
- NY State, NYSERDA and the Federal government all offer incentives and rebates for municipalities to take actions to limit greenhouse gas emissions, electrify, and install renewable sources of energy.

Following the presentation of this report, the Clermont CSC Taskforce has several next steps to continue reducing costs and emissions for Clermont. The proposed next steps are (in priority order):

- Engage NYSERDA to conduct individual building energy audits through the Flextech or Green Jobs / Green NY program. This inexpensive report will detail opportunities to improve building envelope and mechanical systems,

improve operational efficiency and save money on utilities. Use the recommendations of this audit to research and propose building changes to the Town Board

- CSC taskforce to optimize the Town Hall's heating system set up by investigating (and replacing if needed) its current thermostat set up, authoring an operation manual and training Town staff and volunteers on how best to use the existing heat pumps in Town Hall.
- Coordinate with National Grid to replace existing street lights with high efficiency LEDs to reduce cost and further lower GHG emissions.
- Investigate opportunity and cost analysis of adding solar to Town buildings.
- In a collaboration with the Clermont CSC and Highway Department, detail the use and function of each vehicle in the fleet, identifying opportunities for improved operator efficiency and to establish a replacement schedule for vehicles with EV or hybrid options.
- Establish a plan to replace existing lawn care equipment with electric equipment at end of life, following the NYS DEC recommendations and the Highway Department's preferences.
- Investigate opportunities for land management plans with less intervention and mowing to reduce emissions and cost.