



City of Plattsburgh Government Operations GHG Inventory

NYS Climate Smart Communities Initiative



June 26, 2023

Acknowledgements

This work was made possible by funding support from the Environmental Protection Fund as administered by the New York State Department of Environmental Conservation to further New York State Climate Smart Communities Initiative



Vermont Energy Investment Corporation (“VEIC”) of 20 Winooski Falls Way, 5th Floor, Winooski, VT 05404, provided consulting services to conduct the analysis and compilation of this report.

A special thanks to:

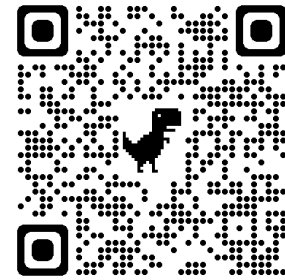
SUNY Plattsburgh Center for Earth and Environmental Science Staff & Students,
the City of Plattsburgh Climate Task Force
City of Plattsburgh Chamberlain, and other key Department heads

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Introduction

The Climate Smart Communities Initiative (CSC) is in conjunction with the New York State Climate Smart Communities Grant Program, Title 15 of the Environmental Protection Fund through the New York State Department of Environmental Conservation and for which funding, guidance, and accreditation are provided by. This program provides state support for local climate action, and provides assistance to participating communities to define their own best strategies for reducing emissions, cutting costs of energy use, and building resilience in the face of climate change. The City of Plattsburgh registered to become a Climate Smart Community on May 13, 2019, and has since been working through the preset action checklist to become a certified Climate Smart Community with the help of its Climate Task Force. To the right of the page is a QR code that will link to the CSC Action checklist.



As part of the Climate Smart Communities' Action Item number 2, the City of Plattsburgh inventoried Greenhouse Gas (GHG) emissions resulting from local government operations for which the City has operational control over. In accordance with the Local Government Operations Protocol and CSC guidelines, all relevant Scope 1 and Scope 2 emissions were evaluated. As per the EPA " Scope 1 emissions are direct greenhouse (GHG) emissions that occur from sources that are controlled or owned by an organization (e.g., emissions associated with fuel combustion in boilers, furnaces, vehicles). Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although scope 2 emissions physically occur at the facility where they are generated, they are accounted for in an organization's GHG inventory because they are a result of the organization's energy use."

Table 1, indicates (in blue) the sources considered for the City of Plattsburgh's inventory:

TABLE 1:

Source Category	Scope
Stationary Combustion of Fossil Fuels	1
Building/Facility Electricity Consumption (including streetlighting)	2
Mobile Combustion of Fossil Fuels (Fleet)	1
Solid Waste Disposal	1
Wastewater Treatment	1
Employee Commutes	3
Water Consumption in City Facilities	3
Agriculture & Land Management	3

Urban Forestry	3
Waste Generation	3
Additional Emission Sources (e.g., refrigerant leakage)	1

Baseline Year

After consideration of historical data quality and availability, 2019 was chosen as a baseline year for the following reasons:

- It was a normal weather year, i.e., weather patterns overall did not deviate substantially from historical trends.
- It precedes influences of Covid19 (2020, for example, showed a marked decrease in electricity consumption for City facilities).
- There was high quality data available, with good granularity.
- It reasonably represents a recent/current state of emissions for local government operations.

Methodology

The Government Operations Module of EPA’s Local Greenhouse Gas Inventory Tool was used to produce the City’s GHG inventory. The tool is specifically designed to develop a greenhouse gas inventory of municipal operations in accordance with the Local Government Operations Protocol (LGOP). As guided by the tool, direct consumption data and other reported municipal data was used as input for calculation-based GHG estimates. Bill analysis and delivery records were used to deduce fuel and electricity consumption, a vehicle fleet inventory enabled input of vehicle activity and characteristic data, and stakeholder outreach informed data related to refrigerant leakage and wastewater treatment.

Results by Source for Year 2019

Stationary Combustion

Nearly all stationary combustion is for the purposes of space heating the City’s building floorspace. Natural gas is the dominant fuel type, by order-of-magnitude margins with natural gas providing the majority of the City’s energy use at 6,210.81 MMBtu, or 96% of the total energy use of all fuels (see Table 2). This results in natural gas being the largest producer of

emissions for municipal operations (see Table 3), and as well for CO2 emissions of stationary combustion by fuel source (see Chart 1).

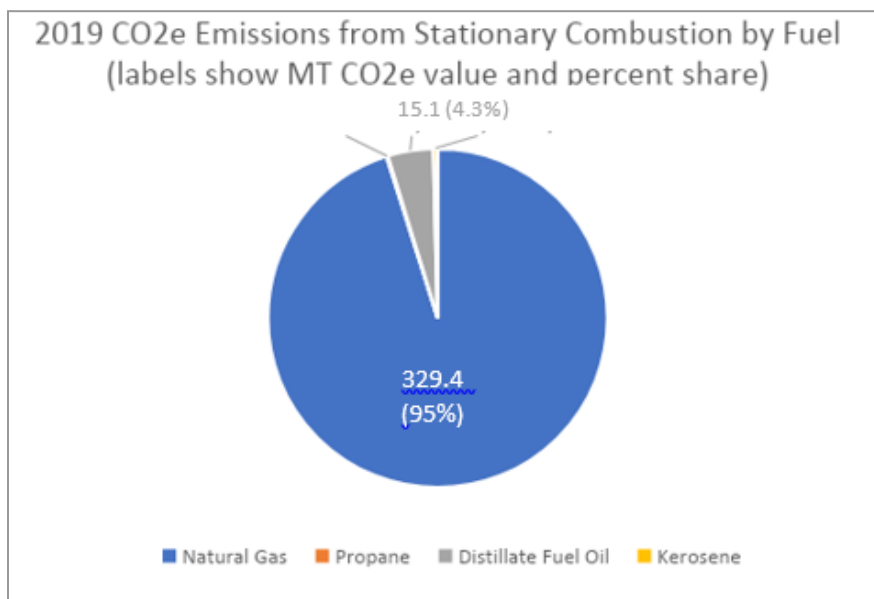
TABLE 2:

Fuel and Energy Use by Type		
Fuel Type	Fuel Used	Energy Use (MMBtu)
Natural Gas	5,983 mcf	6,210.81
Propane	76 gal	6.94
Distillate Fuel Oil	1,460 gal	202.49
Kerosene	136 gal	18.37
Total Stationary Fuel Consumed		6,438.61

TABLE 3:

Emissions by Fuel Type (MT CO2e)				
Fuel Type	CO2	CH4	N2O	TOTAL
Natural Gas	328.5	0.7	0.2	329.4
Propane	0.4	0.0	0.0	0.4
Distillate Fuel Oil	15.0	0.0	0.0	15.1
Kerosene	1.4	0.0	0.0	1.4
Total Emissions from Stationary Fuel Combustion	345.3	0.7	0.2	346.3

CHART 1:



Mobile Combustion

The City's fleet of approximately 100 vehicles is responsible for the mobile combustion portion of emissions. As expected, the Police Department and Department of Public Works consume the majority of fuel on an annual basis (see Tables 4), and therefore are the major contributors of emissions (see Table 5, and Chart 2).

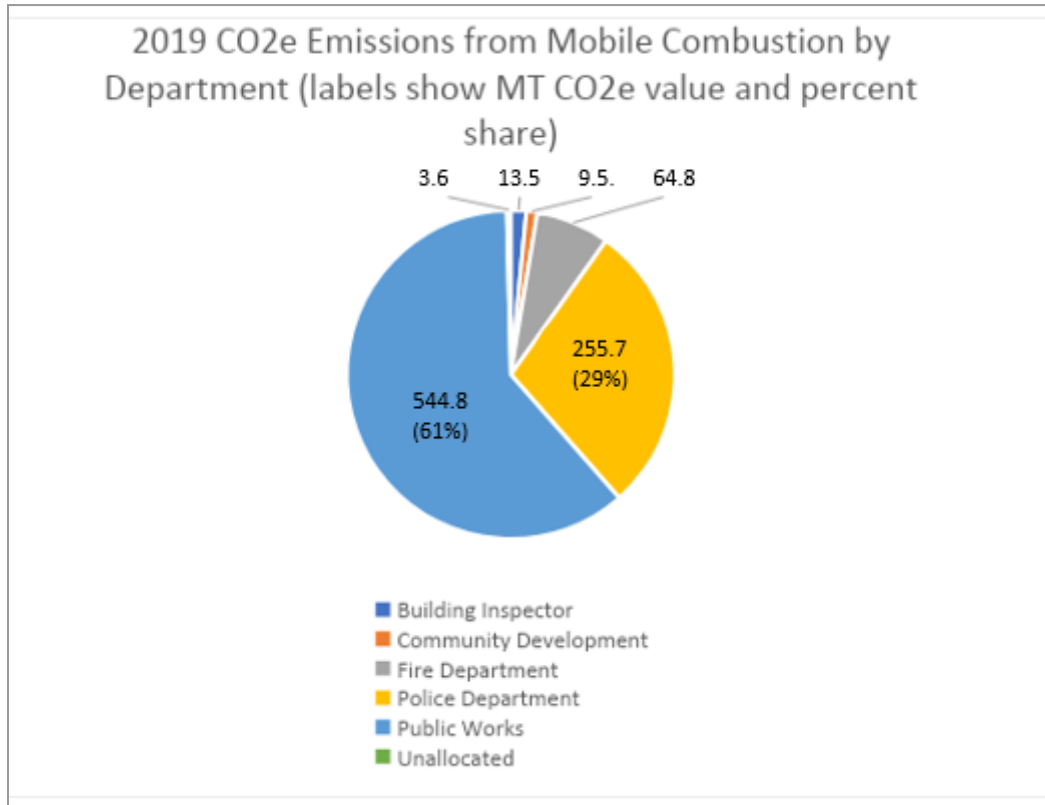
TABLE 4:

Fuel Use by Department and Fuel Type		
Department	Gasoline (gallons)	Diesel (gallons)
Building Inspector	1,417.4	-
Community Development	998.9	16.3
Fire Department	632.2	5,740.0
Police Department	27,082.7	25.8
Public Works	24,151.4	30,927.5
Unallocated	199.2	169.8
Total	54481.7	36879.4

TABLE 5:

Net Emissions By Department (MT CO₂e)				
	CO₂	CH₄	N₂O	TOTAL
Building Inspector	12.4	0.1	1.0	13.5
Community Development	8.9	0.1	0.5	9.5
Fire Department	64.2	0.0	0.6	64.8
Police Department	238.0	1.2	16.4	255.7
Public Works	527.8	1.2	15.8	544.8
Unallocated	3.5	0.0	0.1	3.6
Total Mobile Emissions	854.9	2.6	34.5	892.0

CHART 2:



Solid Waste

The City of Plattsburgh does not have operational control over landfills or other municipality solid waste services and therefore Scope 1 emissions associated with solid waste are not included in the inventory.

Wastewater

In 2019, approximately 19,200 people were served by The City of Plattsburgh Department of Water and Sewage. Although originally designed with a waste treatment capacity of 16.0 MGD, with the closure of the Plattsburgh Air Force Base, and other major users, the plant now averages a flow of only around 4 MGD and with less solid waste.

While there are no septic systems in the City, the wastewater treatment plant does accept septage from septic tank pumpings as well as leachate and concentrations of ammonia from two paper mills. This amounts to approximately 41 kg of additional Nitrogen load per day totaling approximately 51.92 MT CO2e (see Table 6). Wastewater is treated aerobically and with nitrification.

TABLE 6:

GHG Emissions Summary	
	MT CO2e
CO ₂	-
CH ₄	-
N ₂ O	51.92
Total Emissions from Wastewater Treatment	51.92

Refrigerant Leakage

The City does not own or operate major systems relying on refrigerants. All cooling, where it exists, is accomplished via self-contained window air conditioning units. Being completely sealed systems, refrigerant leakage is not expected during the useful life of the equipment and therefore no associated emissions are reflected in the inventory.

Electricity

By way of a contractual instrument, the City of Plattsburgh has an allotment of power from the New York State Power Authority sourced from the hydroelectric Niagara Power Project. With rights to 104.5 megawatts of capacity, it's only during the coldest months of the year that the City may occasionally need to source supplemental power.

To recognize this purchasing decision, two methods for accounting electric emissions are presented:

Location-based method reflects grid-average emission factors. Municipalities must report Scope 2 emissions using the location-based method, because according to section 6.2.4 of the Local Government Operations Protocol (LGOP), a local government or community “may not deduct these [contractual instrument] purchases from your Scope 2 emissions because doing so would constitute double counting. This is because the renewable energy portion of a utility’s power supply is already accounted for in the region’s eGRID factor.”

Market-based method reflects emissions from electricity that municipalities have purposefully chosen and derives emission factors from contractual instruments, such as renewable energy credits (RECs). Municipalities have the option to report Scope 2 emissions using the market-based method, in addition to the location-based method, to account for avoided emissions from renewable energy sources.

It's important to note and report, the LGOP does not support subtracting out green power purchases from the inventory, as it would constitute double counting within the region's grid

mix since other communities sharing the same grid region would be using emission assumptions that already incorporate the green component. Therefore, the location-based calculation (using an emission factor representing the regional grid mix) is summarized for the purposes of inventory reporting and a market-based result is shown (for informational purposes only) to highlight that the City is purchasing clean electricity.

Note that just a handful of accounts are used to report total electricity consumption from government operations. A clean breakout by end use or department does not currently exist and therefore total electricity use is reported for purposes of the inventory (see Table 6). Based on this, the total emissions from electricity indicate that a total of 1,383.52 MT CO₂e would be produced (see Table 7). As part of the Climate Action Plan, the City intends to further explore electricity consumption by end use and department to ensure realistic and robust goal setting.

Location-Based

TABLE 6:

Total Electricity Use (in kWh)	
Total Electricity Use	13,072,422

TABLE 7:

Emissions by Compound (in MT CO ₂ e)				
	CO ₂	CH ₄	N ₂ O	Total
Total Emissions from Electricity Use	1,377.46	2.52	3.53	1,383.52

Market-Based

***For informational purposes only**

Under the market-based accounting scheme, the City’s electric emissions are nearly zero given that the power allotment from the Niagara Power Project covers demand for all but brief moments during the winter.

Overall Results

Per the inventory results, the City produces slightly more Scope 2 emissions than Scope 1 (see Chart 3 and Table 8). When factoring Location Based Energy Production, Electricity is show to be the largest potential contributor of emissions within the City, with mobile combustions coming in as the second greatest producer (see Chart 4, and Table 9).

**Note that the electricity component of wastewater treatment is NOT included in the Wastewater Treatment slice, but rather in Electricity – Location Based.*

CHART 3:

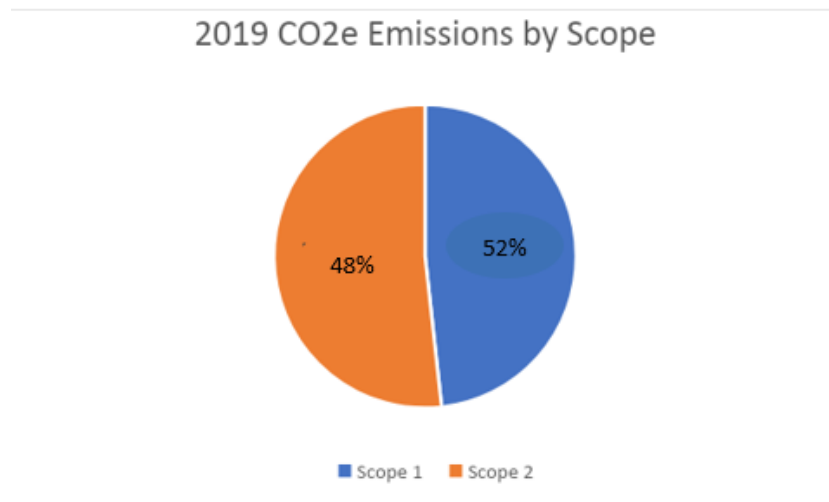


CHART 4:

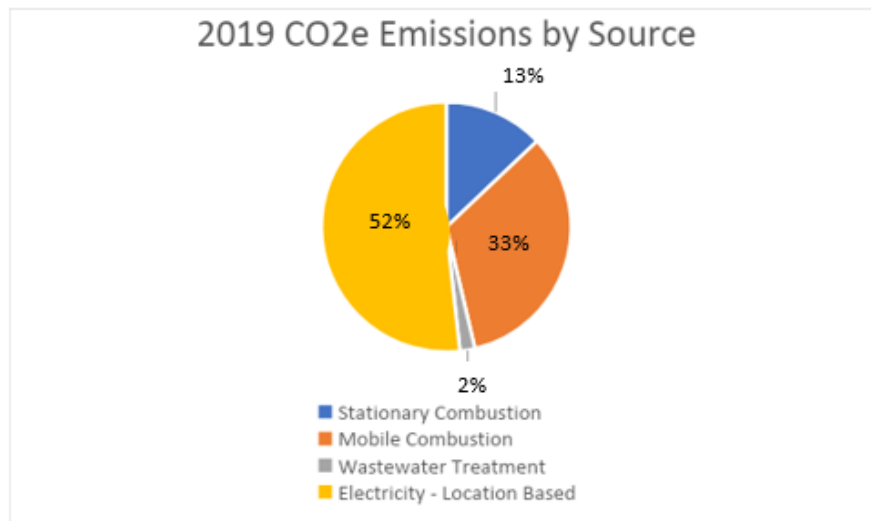


TABLE 8:

Total City of Plattsburgh Emissions, 2019 (MT CO2e)								
	CO2	CH4	N2O	HFC s	PFC s	SF 6	Total MT CO2e	Percent of Total
Scope 1	1,200.23	3.3 5	86.6 1	-	-	-	1,290.19	48%
Scope 2 - Location Based	1,377.46	2.5 2	3.53	-	-	-	1,383.52	52%
Scope 2 - Market Based (for informational purposes only)	-	-	-	-	-	-	-	-
Total Gross Emissions	2,577.69	5.8 7	90.1 5	-	-	-	2,673.71	100%
Total Net Emissions	2,577.69	5.8 7	90.1 5	-	-	-	2,673.71	100%

TABLE 9:

Emissions by Source, 2019 (MT CO2e)								
Source	CO2	CH4	N2O	HFC s	PFC s	SF 6	Total	Percent of Total
Stationary Combustion	345.34	0.75	0.23	-	-	-	346.31	13%
Mobile Combustion	854.89	2.60	34.47	-	-	-	891.96	33%
Wastewater Treatment	-	-	51.92	-	-	-	51.92	2%
Electricity - Location Based	1,377.46	2.52	3.53	-	-	-	1,383.52	52%
<i>Electricity - Market Based (for informational purposes only)</i>	-	-	-	-	-	-	-	-
Total (Gross Emissions)	2,577.69	5.87	90.15	-	-	-	2,673.71	100%
Total (Net Emissions)	2,577.69	5.87	90.15	-	-	-	2,673.71	100%

Conclusion

Location-based electricity consumption accounts for over half of the City's emissions and is therefore a prime area of focus for emission reduction activities. Exploration and implementation of electric energy efficiency opportunities should be a top priority for the City. Additionally, strategic installation of City-owned renewable capacity (sch as solar PV) could help reduce emission intensity.

Emissions from mobile combustion account for approximately one third of the City's emissions, representing an additional focus for reduction. Fleet optimization and electrification, where possible, could help lessen the impacts. Although important to note that over 60% of mobile combustion emissions is associated with the Public Works Department – heavy equipment with potentially fewer efficiency opportunities and alternatives – the Police Department, which contributes almost 30% of mobile emissions, contains primarily light-duty vehicles which may be prime for electrification.