



**Town of Bethel NY
Greenhouse Gas Inventory for Government Operations
2023 Summary Report**



Minnie Falls - Smallwood Memorial Park



Supported by Hudson Valley Regional Council through the NYSDEC Climate Smart Communities Coordinator Program

CREDITS AND ACKNOWLEDGEMENTS

This report was prepared by Jeff Allison, Sustainable Bethel Committee Chair.

The information used to prepare this report is a team effort. It is thanks to the hard work and dedication of Bethel Town employees that we are able to compile the information each year.

Thank You

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BACKGROUND

The Town of Bethel 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, on November 15, 2013, the Town of Bethel 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 2016, this GHG inventory provides a baseline for which the Town of Bethel 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 Bethel's consumption of energy and materials within town-owned buildings, the Water Treatment Plant, vehicle fleet, outdoor lighting, and other facilities. This data was generated from NYSEG utility bills and bills for propane diesel fuel, and heating oil bills for all Town of Bethel owned buildings and operations, as well as fuel records for the Town of Bethel'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).

The process for capturing this data is articulated in attachment 1.

KEY FINDINGS

In 2023, GHG emissions from Town of Bethel’s government operations totaled 606.24 MTCO₂e. Figure 1 shows the emissions for government operations broken down by department and source of emissions. Figure 2 in the *Inventory Results* section of this report shows that mobile emissions account for 64% of Bethel’s total greenhouse gas (GHG) emissions. Mobile emissions generated by the Highway Department accounts for the largest percentage of GHG emissions at 63% of the total. Non-Highway Department mobile emissions amount to about 1% of the total emissions.

The second largest contributor is Bethel’s locally based electricity emissions accounting for 20% of the total followed by stationary combustion at 16% of total emissions. Stationary combustion is the on-site combustion of fuels used to produce electricity, heat or motive power using equipment in a fixed location.

The Inventory Results section of this report provides a detailed profile of emissions sources within Bethel for 2023. In addition, the same data has been collected for 2016 Bethel’s baseline year. Bethel will be able to compare future performance and demonstrate progress in reducing emissions.

Figure 1: Data compiled and analyzed in EPA Local Greenhouse Gas Emissions Tool

2023 Total Emissions by Department and Source (MT CO ₂ e)						
Department	Location				TOTAL GROSS	TOTAL NET
	Stationary	Based Electricity	Mobile	Waste water		
Streetlights	-	5.32	-	-	5.32	5.32
Sewer Plant	37.70	99.08	1.82	0.05	138.66	138.66
Highway Depot	31.71	5.95	342.69	-	380.34	380.34
Town Hall/administration	8.77	1.65	41.09	-	51.50	51.50

Justice Court	6.61	4.41	-	-	11.02	11.02
Senior Center	12.99	0.68	-	-	13.67	13.67
Pool	-	1.96	-	-	1.96	1.96
Town Parks	-	0.26	-	-	0.26	0.26
Kennel	-	-	-	-	-	-
Transfer Station	-	3.50	-	-	3.50	3.50
Total	97.77	122.82	385.59	0.05	606.24	606.24

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. Bethel has focused first on government operations emissions to lead by example and with HVRC’s assistance has produced an inventory of community-wide emissions.

The Town Board appointed Sustainable Bethel Committee to lead the GHG Inventory data collection effort. Bethel uses EPA’s Portfolio Manager and Local Greenhouse Gas Inventory Tool (LGGIT) to track and calculate emissions.

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 Bethel’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. Bethel does not track Scope 3 emissions.

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 Town has selected 2016 as its “baseline year” because all its buildings were in operation that year and energy conservation improvements to building operations commenced after 2016. As such, year to year comparisons to the 2016 baseline year will enable the Town to assess the success of Town initiatives to reduce its energy usage, save taxpayer dollars and reduce the municipal government’s carbon footprint. Because we track data and emissions every year, we have used the most recent year (2023) data for this report.

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 gas-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. To obtain this data, the Sustainable Bethel Committee with the assistance of the Town Bookkeeper gathers and reviews all electricity, propane, heating fuel, diesel fuel, kerosene bills for Bethel’s utility and fuel provider accounts; these accounts include fuel records for gasoline and diesel used to power the Town of Bethel’s vehicle fleet.

Calculations for this inventory were made using EPA’s Portfolio Manager and Local Greenhouse Gas Inventory Tools (LGGIT). Data was first measured in kWh for grid electricity, therms for natural gas, and gallons for gasoline, fuel oil, diesel, and propane. Using the EPA tools, 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 Bethel's five buildings and four other locations using electricity only. These categories & departments are listed below. All usage and costs for utilities and fuel bills are captured in the analysis of the government greenhouse gas emissions. Mobile emissions from Department vehicles are separately captured and calculated.

1. Buildings (electricity and heating fuel):
 - a. Town Hall (Administration Department)
 - b. Highway Barn (Highway Department)
 - c. Sewer Plant and Six Pumping Stations (Sewer Department)
 - d. Senior Center (includes outdoor lighting)
 - e. Justice Court
2. Streetlighting (electricity only):
 - a. General Streetlighting
 - b. Kauneonga Streetlighting District
3. Town Parks (electricity only):
 - a. Duggan
 - b. Veterans
 - c. Gazebo
4. Transfer Station and Leachate and Kennel (electricity only)
5. Swimming Pool (electricity only)

Each building was assigned to a category to indicate the type of infrastructure and then similar facilities along with their energy use.

The Town of Bethel manages its capped landfill; it is not operational. The Town of Bethel does maintain a wastewater treatment plant providing service for 1,250 of the 3,959 total residents. Bethel does not own or operate an 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 Bethel's government operations broken down by sector. Mobile emissions account for 64% of the total. Figure 2 shows that the Highway Department accounts for a total of 63% of emissions.

After mobile emissions, Bethel’s emissions from electricity (20%) and stationary combustion (16%) are the next largest source of government operations emissions. See Figure 2 below. These figures are captured in EPA’s Local Greenhouse Gas Inventory Tool (LGGIT).

Figure 2

2023 Total Town of Bethel, NY Emissions (MT CO ₂ e)								
	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total MT CO ₂ e	Percent of Total
Scope 1	480.80	0.38	2.24	-	-	-	483.42	80%
Scope 2 - Location Based	122.23	0.22	0.37	-	-	-	122.82	20%
<i>Scope 2 - Market Based (for informational purposes only)</i>	122.23	0.22	0.37	-	-	-	122.82	
Scope 3	-	-	-	-	-	-	-	0%
Total Gross Emissions	603.04	0.60	2.61	-	-	-	606.24	100%
Total Net Emissions	603.04	0.60	2.61	-	-	-	606.24	100%

Emissions by Source (MT CO ₂ e)								
Source	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total	Percent of Total
Stationary Combustion	97.76	0.02	0.00	-	-	-	97.77	16%
Mobile Combustion	383.05	0.36	2.18	-	-	-	385.59	64%
Solid Waste	-	-	-	-	-	-	-	0%
Wastewater Treatment	-	-	0.05	-	-	-	0.05	0%
Electricity - Location Based	122.23	0.22	0.37	-	-	-	122.82	20%

<i>Electricity - Market Based (for informational purposes only)</i>	122.23	0.22	0.37				122.82	
Total (Gross Emissions)	603.04	0.60	2.61	-	-	-	606.24	100%
Total (Net Emissions)	603.04	0.60	2.61	-	-	-	606.24	100%

Figure 3

2023 Bethel Gross Emissions by Department		
Department	Total (MT CO ₂ e)	Percent of Total
Streetlights	5.32	1%
Sewer Plant	138.66	23%
Highway	380.34	63%
Town Hall/administration	51.50	8%
Justice Court	11.02	2%
Senior Center	13.67	2%
Pool	1.96	0%
Town Parks	0.26	0%
Kennel	-	0%

Transfer Station	3.50	1%
Total	606.24	100%

OPPORTUNITIES TO REDUCE GREENHOUSE GASES

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

Bethel has been proactive to reduce GHG emissions and energy costs. Major activities undertaken to date include:

- Purchasing all streetlights from NYSEG and converting them to LEDs
- Energy audits for all buildings
- Contracting with an energy developer to build a solar array on the town’s capped landfill to which all 20 Bethel Government electricity accounts are subscribed.
- Upgrading of heating and cooling systems for Justice Court.
- Putting the Sewer Plant under professional management

Most of the Town of Bethel’s fleet inventory are heavy duty vehicles used in our Highway Departments maintenance and improvement of the 147 miles of town roads it is responsible for. Of the few remaining vehicles, we have only one which is an EV vehicle. At this time heavy duty vehicles do not lend themselves to EV technology.

Bethel government operations have improved overall electrical usage by 35% over baseline with the largest improvement coming logically from streetlighting due to the conversion to LEDs. The large increase in kWh usage for the Justice Court is being analyzed to determine cause for the increase. We are exploring NYSEG billing errors due to the conversion of the account to the solar array on the capped landfill which we believe accounts for this dramatic change in usage at the Justice Court. Generally, there has been improvement at the Justice Court’s GHG emissions due to significant improvements in heating and cooling since the baseline year.

Figure 4

Location	GHG Emissions		GHG Improvement	Electricity Kwh		KWH Improvement %
	2016	2023		2016	2023	
Town Park	0.4	0.2		3280.4	1926.9	41%
Streetlighting	23.3	4.2	82%	591260.7	135203.5	77%
Pool	2.3	1.6		17078.9	14665.4	14%
Transfer Sta	4.6	2.8		34225.5	26143.1	4%
Town Hall	9.5	9		14950.9	12218.5	18%
Sewer Plant	135.8	110.1	19%	828102.8	746992.3	10%
Highway Barn	32.9	33		50138.1	45679.3	9%
Justice Court	26.1	5.9	77%	14134.7	32891.1	133%
Senior Ctr	10.9	12.5		6642.4	5104.8	24%
Total	245.8	179.3	27%	1559814.4	1020824.9	35%

Two major projects are in the planning stages:

- Construction of a new Town Hall to be built to passive house standards (bid contracts for this project are outstanding as of Feb 2024)
- Construction of a new Highway Barn with administrative portions of the facility to be built to passive house standards (bid contracts for this project are outstanding as of Feb 2024)

After implementing these proposed projects and identifying other Climate Action Plan (CAP) priorities / 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, Bethel 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. Bethel maintains its inventory figures for all years since 2013 not just every five years as recommended.

This inventory shows that it will be particularly important to focus on mobile emissions. Future emissions reductions strategies for Bethel to consider for its climate action plan include increasing energy efficiency at the Sewer Plant as well as vehicle fuel efficiency.

Appendix 1

Climate Smart Communities

PE10 Action: GHG Tracking System

Protocol for creating and maintaining Bethel's GHG Tracking System

Bethel is using the following tools to capture data about its greenhouse gas emissions for its government operations:

- EPA Portfolio Manager
- EPA Local Greenhouse Gas Inventory Tool (LGGIT)

Both are provided without cost to Bethel. They are used to calculate and track emissions as well as to over time evaluate the effectiveness of policies and procedures the town implements to reduce emissions.

Portfolio Manager tool captures annual benchmarking information about the five government buildings and meets the Clean Energy Communities benchmarking requirements.

LGGIT provides the more detailed and complete analysis of greenhouse emissions from all sources including the buildings but also including other sources of emissions—most notably mobile and wastewater treatment emissions.

These tools meet the requirements of the Climate Smart Communities program specifically action PE2 Government Operations GHG Inventory and PE10 GHG Tracking System.

This protocol document outlines the procedures already in place to capture the information and data from these tools and the parties responsible for implementing the procedures and maintaining the systems. This document identifies the steps needed to capture this tracking information and who is responsible for taking those actions.

These protocols have been in operation since 2013 and data is available for 2013 and subsequent years including 2023.

Responsible parties:

- Sustainable Bethel will identify a *committee member* as the individual to capture and maintain the GHG emissions data. (Note: Since the inception of the Sustainable Bethel this role has been assigned to Jeff Allison first co-chair and now chair of the committee.) The data is captured throughout the year, and final input into the Portfolio Manager and LGGIT should be completed by May of the following year as required by CEC Benchmarking. Note: Typically, because the collection of data occurs throughout the year, the information is available in January of the following year for review and analysis. The only outstanding data is the electricity bills that cover part of December—and these might be received as late as February.
- The *Sustainable Bethel Committee* reviews the data from these two inventory tools for its consideration and recommendations for actions to be taken.
- The *CSC coordinator* is an alternate to the responsible Sustainable Bethel committee member and is responsible for understanding the processes in place and can maintain the data collection if required.

- *Bethel Bookkeeper* maintains all bills and invoices and currently keeps logs of electricity and fuel bills and makes those available to the committee for its review. Attached are copies of the logs maintained and made available.
- *Bethel Clerk to the Highway Department* maintains all fuel logs of the fuels used by the highway vehicles. The clerk makes these logs available to the committee for its use.
- *Bethel Highway Supervisor* and the *Town Supervisor* are responsible for obtaining vehicle information required for the vehicles under their control. For example, all Highway Department vehicles are the responsibility of the Highway Supervisor. All other vehicles are the responsibility of the Town Supervisor.
- *Bethel Town Clerk* maintains a binder of all vehicles owned and used by the town. This is made available to the Sustainable Bethel committee upon request to validate the vehicles currently owned and in operation by all town departments.

Actions and Timeline

To support and ease the collection of the data, the responsible Sustainable Bethel committee member is given electronic research access to the energy and fuel providers allowing for review and capture of the information. These include NYSEG for electricity and several fuel providers.

1. Electricity Usage: Only the most recent bill for each of the towns 20 accounts is available online; however, the annual usage is maintained on the site. It is recommended that the committee member access each account monthly to review the bill. However, the usage information can be entered into the GHG tool annually for each account based on the usage. The cost can be found on the logs kept by the bookkeeper or by inspection of the actual bills if needed to verify the total.
2. Fuel Deliveries: All of the fuel delivery amounts, type of fuel, cost, payments are available online. It is recommended the committee member access these accounts quarterly and update a spreadsheet (see attached). This spreadsheet is used to input data into the EPA Portfolio Manager and the LGGIT.
3. Electricity and Fuel logs maintained by the bookkeeper are collected quarterly for review and input by the responsible committee member.

If questions arise about a particular bill, the bookkeeper makes the invoices available to the committee member for review and clarification of data.

The committee member provides the fuel delivery spreadsheet to the bookkeeper at the end of the year for use in preparing data for the auditors.