



Town of Mamaroneck, NY

Inventory of Municipal Operations' Greenhouse Gas (GHG) Emissions

2013 to 2019 Years' Comparison



ToM Sustainability Collaborative, and



Produced in June 2022

Credits and Acknowledgements

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Town of Mamaroneck:

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- Kat Warwick, 2021-2022 Supervisor Intern

Notice

This report was prepared by Denise Dunn of the Sustainability Collaborative for the Town of Mamaroneck (ToM). Based on the ToM GHG Inventory Review that was developed and facilitated by Climate Action Associates LLC in Spring 2022, our government operations were documented to assist our local climate action process. The associate served under contract with the New York State Energy Research and Development Authority (NYSERDA). The author would like to thank the ToM staff for providing much insight and local information necessary for the completion of this report.

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Executive Summary

The Town of Mamaroneck has been and continues to be at the forefront of the environmental arena. The goal is to reduce our energy use and our carbon footprint. Not only is this good for the environment, but it saves us money. In February 2022, the Town was recognized for being the only municipality in New York State to be recertified at the bronze level in the New York State's Climate Smart Community (CSC).

Further, the development of this GHG inventory was chosen as one of the prioritized actions to help manage GHG risks, identify reduction opportunities, and meet our unique CSC pledge to combat climate change. The emissions inventory covers the years of 2013 (base year) and 2019, inclusive of the identified seven emission sources.

Using up-to-date methods and data sources, a calculation tool was applied to develop this GHG emissions inventory for our continued recertification in the CSC Program. This inventory is planned to help understand our Town's GHG emissions, plan for emission reductions, and forecast emission estimates based on a set of projections.

Introduction

We have an active volunteer committee named the Sustainability Collaborative which advises the Town Board on environmental issues. On November 17, 2021, Town of Mamaroneck Board adopted a Climate Emergency Declaration resolution. Sections of this resolution that relate to greenhouse gas emissions are included below.

- WHEREAS, the Town of Mamaroneck recognizes the local adverse impacts of climate change, most recently from the widespread, large-scale, and costly damages due to storms Henri and Ida, and the need for local action to reduce flooding, extreme heat health risks, **Greenhouse Gas Emissions**, energy costs, Sewer System Ground Water Infiltration, Waste Management Emissions and Costs, Residential Insurance Costs and to improve air quality and Clean Emergency Power Production; and
- WHEREAS, on July 18, 2019, Governor Andrew M. Cuomo signed into law the Climate Leadership and Community Protection Act (Climate Act). New York State's Climate Act is the among the most ambitious climate laws in the world and requires New York to reduce economy-wide **greenhouse gas emissions** 40 percent by 2030 and no less than 85 percent by 2050 from 1990 levels; achieve 100% zero-emission electricity by 2040 and statewide carbon neutrality by 2050; and
- RESOLVED, as part of the update to the Sustainability Plan, the Sustainability Collaborative is directed to provide options for interim targets to accelerate the reduction pathway to achieve the goals for **greenhouse gas emissions** reductions outlined in New York State's Climate Act.

Summary of Town of Mamaroneck's 2019 Municipal GHG Inventory

Summary of Organization's Emissions:

Scope 1 Emissions			
Go To Sheet	Stationary Combustion	371	CO ₂ -e (metric tons)
Go To Sheet	Mobile Sources	601	CO ₂ -e (metric tons)
Go To Sheet	Refrigeration / AC Equipment Use	0	CO ₂ -e (metric tons)
Go To Sheet	Fire Suppression	0	CO ₂ -e (metric tons)
Go To Sheet	Purchased Gases	0	CO ₂ -e (metric tons)
Location-Based Scope 2 Emissions			
Go To Sheet	Purchased and Consumed Electricity	505	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)
Market-Based Scope 2 Emissions			
Go To Sheet	Purchased and Consumed Electricity	505	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)
Total organization Emissions			
Total Scope 1 & Location-Based Scope 2		1,477	CO ₂ -e (metric tons)
Total Scope 1 & Market-Based Scope 2		1,477	CO ₂ -e (metric tons)
Reductions			
Go To Sheet	Offsets	0	CO ₂ -e (metric tons)
Net Scope 1 and 2 Location-Based Emissions		1,477	CO ₂ -e (metric tons)
Net Scope 1 and 2 Market-Based Emissions		1,477	CO ₂ -e (metric tons)
Scope 3 Emissions			
Go To Sheet	Employee Business Travel	0	CO ₂ -e (metric tons)
Go To Sheet	Employee Commuting	0	CO ₂ -e (metric tons)
Go To Sheet	Product Transport	0	CO ₂ -e (metric tons)
Go To Sheet	Waste	0	CO ₂ -e (metric tons)
Required Supplemental Information			
Go To Sheet	Biomass CO ₂ Emissions from Stationary Sources	0	CO ₂ -e (metric tons)
Go To Sheet	Biomass CO ₂ Emissions from Mobile Sources	0	CO ₂ -e (metric tons)

Summary of Town of Mamaroneck's 2013 Municipal GHG Inventory

Summary of Organization's Emissions:

Scope 1 Emissions

Go To Sheet	Stationary Combustion	459	CO ₂ -e (metric tons)
Go To Sheet	Mobile Sources	653	CO ₂ -e (metric tons)
Go To Sheet	Refrigeration / AC Equipment Use	0	CO ₂ -e (metric tons)
Go To Sheet	Fire Suppression	0	CO ₂ -e (metric tons)
Go To Sheet	Purchased Gases	0	CO ₂ -e (metric tons)

Location-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	638	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)

Market-Based Scope 2 Emissions

Go To Sheet	Purchased and Consumed Electricity	638	CO ₂ -e (metric tons)
Go To Sheet	Purchased and Consumed Steam	0	CO ₂ -e (metric tons)

Total organization Emissions

Total Scope 1 & Location-Based Scope 2	1,749	CO ₂ -e (metric tons)
Total Scope 1 & Market-Based Scope 2	1,749	CO ₂ -e (metric tons)

Reductions

Go To Sheet	Offsets	0	CO ₂ -e (metric tons)
	Net Scope 1 and 2 Location-Based Emissions	1,749	CO ₂ -e (metric tons)
	Net Scope 1 and 2 Market-Based Emissions	1,749	CO ₂ -e (metric tons)

Scope 3 Emissions

Go To Sheet	Employee Business Travel	0	CO ₂ -e (metric tons)
Go To Sheet	Employee Commuting	0	CO ₂ -e (metric tons)
Go To Sheet	Product Transport	0	CO ₂ -e (metric tons)
Go To Sheet	Waste	0	CO ₂ -e (metric tons)


Required Supplemental Information

Go To Sheet	Biomass CO ₂ Emissions from Stationary Sources	0	CO ₂ -e (metric tons)
Go To Sheet	Biomass CO ₂ Emissions from Mobile Sources	0	CO ₂ -e (metric tons)

Progress Report

Electricity was the largest contributor to municipal emissions, followed by natural gas and diesel.

ToM Municipal Operations-wide GHG emissions for 2013 and 2019 are shown in Figure 1 (Energy Use and GHG Emissions by Town Operations Group), Figure 2 (2013-2019 GHG Emission Reductions, Figure 3 (What caused a **22.8% real reduction change**), and an overall 22.8% attribution savings made responsibility by major local actions of our Town and State.



2013-2019 Town Operations GHG Emissions Inventory and Savings Attribution

1. Energy Use and GHG Emissions by Town Operations Groups

Facility / Operations Group	Electricity (kWh)		Natural Gas (therms)		Fuel Oil #2 (gallons)		Diesel (gallons)		Gasoline (gallons)	
	2013	2019	2013	2019	2013	2019	2013	2019	2013	2019
Ice Rink	1,086,440	1,117,640	43,072	27,453	1,234	871				
Senior Center	64,990	67,640	711	589						
Town Hall	362,000	314,560	140	15,337	8,250	-				
Garage	165,600	112,480	18,120	18,879						
Fire Station	158,960	133,680	6,059	5,869						
Street Lights	565,881	250,770								
Chatsworth PKGL	80,484	4,911								
Lakeside PGKL	2,997	768								
Ambulance Corps	45,540	5,579								
Town Fleet							35,528	29,936	33,036	33,626
Total Energy	2,532,892	2,008,028	68,103	68,126	9,484	871	35,528	29,936	33,036	33,626
Total GHG Emissions (MTCDE)	805.2	504.4	368.3	368.4	98.2	9.0	367.84	309.94	299.28	304.63

2. 2013-2019 GHG Emission Reductions (all units Metric Tons of Carbon Dioxide Equivalent - MTCDE)

2013 Emissions (MTCDE)	1,939	
2019 Emissions (MTCDE)	1,496	
Reductions (MTCDE)	442	22.8% GHG Emissions Reductions Between 2013 and 2019
Percent Reduction	22.8%	

3. What caused a 22.8% reduction? [A combination of State and Local Action!]

3.1 State Policy Action: a cleaner electricity grid (7.4% reduction)

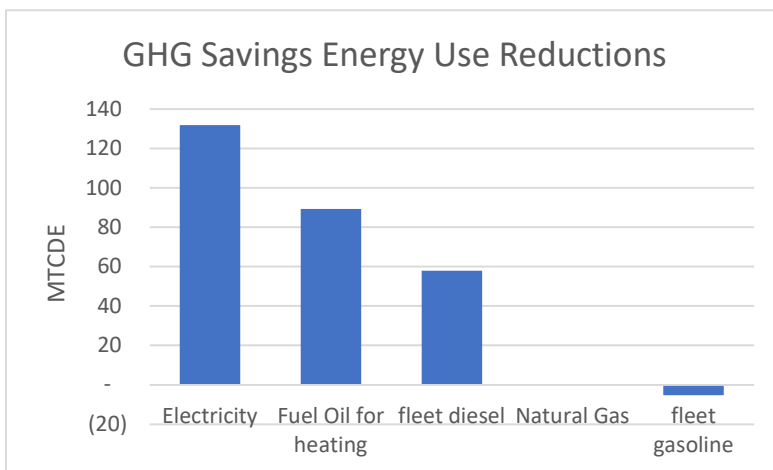
2013 Emissions (MTCDE)	1,939	
2013 Emissions (restated) (MTCDE)	1,770	State energy policy can impact emissions with no local action needed. The state added more renewables to the grid between 2013 and 2019 and the carbon intensity dropped from 700 to 553 lbs CO2e/MWh. The Town's electricity-related impact reduced. To estimate and eliminate this effect, the Town recalculated the 2013 GHG inventory using the 2019 carbon intensity and found that it reduced emissions by 15.4% through local action to reduce energy use alone. Therefore, the difference of 22.8% and 15.4% (=7.4%) is roughly the savings contribution from state policy to clean the grid.
2019 Emissions (MTCDE)	1,496	
Reductions (restated) (MTCDE)	273	
Percent Reduction (restated)	15.4%	
Impact of cleaner grid	7.4%	

3.2 Local Energy Conservation (15.4% reduction)

	Fuel Change	Units	GHG savings	% of total
Electricity	524,864	kWh	132	48%
Fuel Oil for heating	8,613	gallons	89.17	33%
fleet diesel	5,592	gallons	57.90	21%
Natural Gas	(23)	Therms	(0)	0%
fleet gasoline	(590)	gallons	(5.35)	-2%
TOTAL			273.44	100%

Attribute Savings to Changing Amounts of Energy Use

The remaining 15.4% reduction (273 MTCDE) is from **local action**. One way to evaluate what caused the savings is to look at gross changes of fuel by type (see chart below on right). The town reduced electricity by 524,864 kWh - mostly from its LED streetlighting and lighting measures in Town Hall, Garage, and Firestation, and this created half of all GHG reductions (132 MTCDE). Eliminating fuel oil from the Town Hall reduced fuel oil overall and is responsible for about a third of all savings (89 MTCDE). The balance of reductions (58 MTCDE) came from reducing fleet diesel. Natural gas use remained constant overall, though there were major savings achieved at the icerink offset by switching the Town Hall from fuel oil to natural gas. Consumption of fleet gasoline rose slightly.

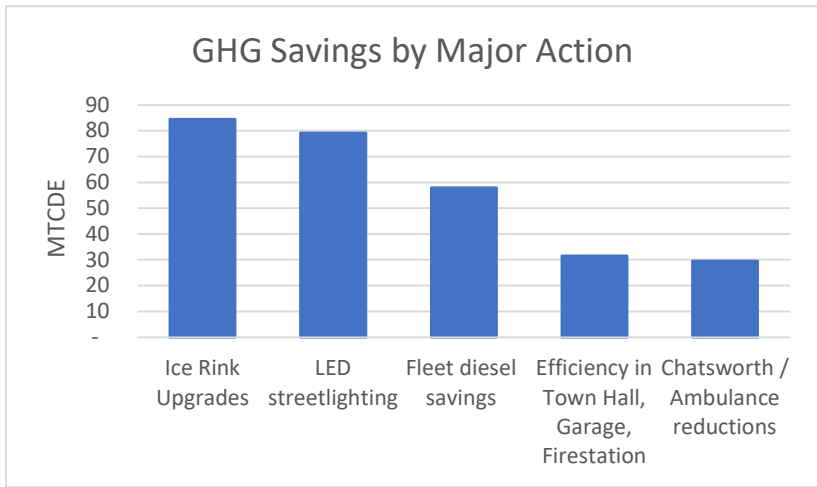


3.3 Major Actions taken by the Town

	Fuel	Fuel Change	Units	GHG savings	% of total
Ice Rink Upgrades	Natural Gas	15,620	therms	84	30%
LED streetlighting	Electricity	315,111	kWh	79	28%
Fleet diesel savings	Diesel	5,592	gallons	58	20%
Efficiency in Town Hall, Garage, Firest	Electricity	125,840	kWh	32	11%
Chatsworth / Ambulance reductions	Electricity	117,763	kWh	30	10%

Attribute Savings to Major Actions

A second (alternative) way to attribute GHG reductions to **local action** is to associate them with Major Actions. This provides different view. For example, the Town's natural gas reduction measures at the Ice Rink are the single largest contributor to GHG savings at 84 MTCDE. Even though natural gas use remained constant townwide, that was because of a switch to gas at Town Hall. Consequently, the conversion of Town Hall from fuel oil to natural gas did not register as a Major Action because both oil and gas are fossil fuels resulting in few net savings. The next Major Action is LED streetlights, followed by reduction in fleet diesel usage.



OVERALL:



Profile of Town of Mamaroneck

Town of Mamaroneck Supervisor Jaine Elkind Eney has stated, "We are proud to achieve this milestone towards reducing greenhouse gas emissions and once again, illustrate that the Town continues to be a leader in NYS in environmental initiatives." The Town of Mamaroneck has made the reduction of greenhouse gas emissions a priority for over a decade through their energy and cost-saving programs such as installing EV charging stations, retrofitting Town buildings to reduce energy usage, retrofitting all streetlights with LED bulbs, purchasing electric vehicles for municipal use, initiating a food scrap recycling program, joining Westchester Power to control residents' electricity costs and increase the use of renewable energy and so much more. The certification program was launched in 2014 to document and celebrate the accomplishments of communities taking climate action. For more information, see the online certification reports that describe all the actions that each certification accomplished.

Objective

The objective of the GHG emissions inventory is to track and report on energy use of municipal buildings for our unique indirect and direct sources, such as:

- *Indirect sources* include purchased and consumed electricity; and
- *Direct sources* include stationary combustion (facilities that burn fuels on-site from natural gas and distillate fuel oil #2) and mobile sources (owned and leased fleet gasoline and diesel vehicles that fall within the town boundary, such as passenger cars and medium and heavy-duty trucks).

Inventory Methodology

The EPA Simplified GHG Emissions Calculator ("the Calculator") is designed as a simplified calculation tool to help organizations estimate and inventory their annual greenhouse gas (GHG) emissions for US-based operations. All methodologies and default values provided are based on the most current Center for Corporate Climate Leadership Greenhouse *Gas Inventory Guidance Documents* and the *Emission Factors Hub*. The Calculator quantified the direct and indirect emissions from the seven emission sources within the Town when activity data had been entered into the various sections of the workbook for one annual period which included 2013 and 2019. Specifically,

(1) **DEFINE:** The first step in completing the GHG inventory is determining the boundaries and emissions sources within those boundaries. Next, the Town defined the organizational and operational boundaries using the questions on the "Boundary Questions" worksheet that helped determine which of the seven emissions sources was relevant to the Town.

(2) **COLLECT:** The second step is to collect data for the defined annual periods in review. This step was the most time consuming since the data needed to be gathered from original bills and interviews with staff. This Calculator had 'help' sheets with suggestions and guidance for each emissions source and a general 'help' sheet for data management.

(3) **QUANTIFY:** The third step is to calculate emissions. This Calculator is designed to complete the emissions quantification step. Once the user enters data in this MS Excel spreadsheet, the emissions was calculated and totaled on the "Summary" sheet.

Further details:

Emission sources of all seven major GHGs are accounted for in the inventory and in this Calculator: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF₆), and nitrogen trifluoride (NF₃) as appropriate. The Calculator allows the user to estimate GHG emissions from scope 1 (direct), scope 2 (indirect), and some scope 3 (other indirect) sources.

The Calculator uses U.S.-specific cross-sector emission factors from the *Emission Factors Hub*. Many industrial sectors also have process-related emissions sources that are specific to their sector. EPA's Greenhouse Gas Reporting Program provides guidance and tools that can aid in the calculation and reporting of these emissions: <https://www.epa.gov/ghgreporting>. The GHG Protocol also provides guidance on calculating emissions from industrial processes.

Data Collection & Research

For stationary combustion sources, data collection consisted of type and amount of fuel consumed.

Benchmarking

Since 2011, the Town of Mamaroneck has taken numerous steps to reduce energy use and greenhouse gas emissions. One of the benefits of those efforts is reduced costs. Initially, there were periodic efforts to measure energy and cost savings. In 2013, the Town engaged an outside company to help measure the reductions and savings. The Town began to use the NYSERDA ENERGY STAR Portfolio Manager program to track energy data and costs.

GHG Analysis & Opportunities

The GHG comparable analysis shows our direct and indirect sources under management or influence with state, regional, and local policy. Based on the inventory comparisons, government operations (as a whole) had identified opportunities to help reduce emissions:

- For ice rink refrigeration management (modest community impact), this facility should be prioritized because of the level of electricity & natural gas usage is highest in comparison of facilities.
- Continued energy efficiency improvements to prioritize conversion of heating fuel oil at the ice rink.
- Where feasible, replacing fleet vehicles with electric vehicles, or with more efficient vehicles.

Major actions included (1) reduction of natural gas at the Hommocks ice rink; (2) credible LED street light installations and conversions, with energy-efficient LED technology, which benefited our community with operational efficiencies and improvements in public safety for the interaction of streetlighting and people; and (3) overall, a significant 22.8% real change reduction in GHG emissions from 2013 to 2019.

Communication

Our Town is an open and transparent government to inform about the goings on within the Town Government and how it impacts its residents. Please go to our website www.townofmamaroneckny.org to find out the latest information on municipal services and special projects. Residents can sign up for board agendas and meeting notices, including the Sustainability Collaborative.

Conclusion

Annual tracking of energy use in municipal buildings and facilities, with completion of another complete GHG inventory in two to five years, is recommended to assess progress resulting from any local, state or federal actions implemented. The detailed methodology section of this report, as well as internal notes and data files will be helpful to address the climate change threat with ongoing updates of the inventory consistent with 'ToM GHG Inventory Review' spreadsheet.

This GHG inventory is suitable by design for use as the baseline for a climate action plan, measure progress in reduction carbon emissions, set targets for these reductions, and further plan on more opportunities to reduce emissions. With planning, these local actions help make high impact, promoted economies of scale in GHG inventory development, provide a framework to share GHG management responsibility, and promotes high quality of life for Town of Mamaroneck residents.

Respectfully submitted