

# City of Rye GHG Emissions Inventory 2023 Community and Municipal

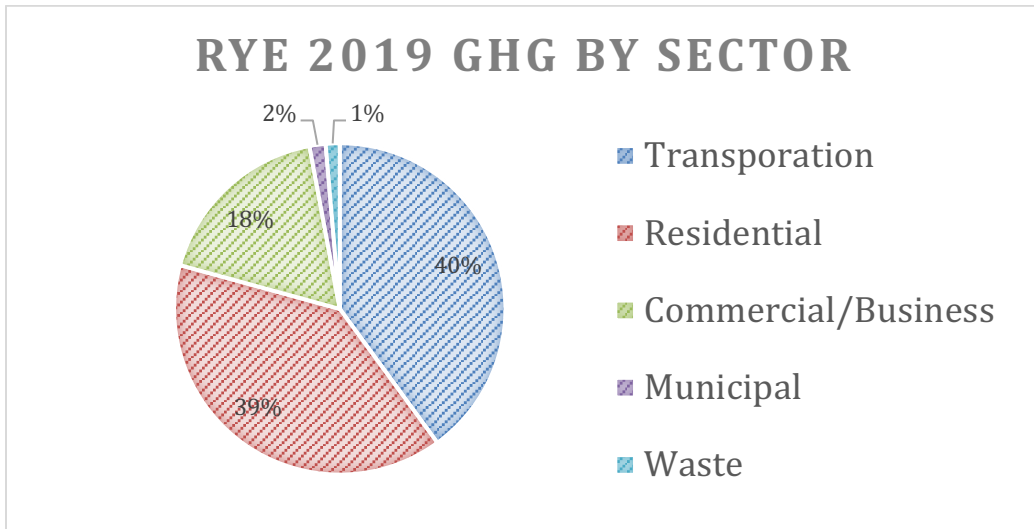
(Based on 2019 Data)



## I. Executive Summary

The Rye Sustainability Committee has created an updated GHG Emissions Inventory for the City of Rye Community and the Municipal Government based on 2019 data. The new emissions estimates are shown alongside the first GHG Inventory that was completed in 2010 using 2009 data. The Committee has used generally accepted methods to estimate greenhouse gas emissions based on data collected in 2020. As methods and the accuracy around collecting data have evolved greatly since the initial 2009 inventory, efforts were made to update the 2009 numbers so that to the best extent possible a like-to-like comparison can be made. These numbers are shown in the table below and are characterized as “revised”. This is not a critique of the original estimate which was carefully carried out with the best available data and methods at the time, but instead a testament of those efforts and how far we have come.

Understanding the sources of greenhouse gas (GHG) emissions is critical to developing a plan to reduce energy use and emissions. This report shows the emissions resulting from transportation fuels, energy usage in buildings and waste. The Committee will endeavor to undertake more frequent measures of the City’s GHG inventory using better methods. The Committee will also work with the community and municipality to reduce the City’s carbon footprint.



## II. Methodology

Where possible direct observations of greenhouse gas emitting sources were used (e.g., direct billing from the electric supplier). In some cases, estimates were made using state-wide data and then proportioning for the City of Rye or some other method of apportioning. All translations of relevant metrics to GHG emissions were performed using the International Council for Local Environmental Initiatives (aka ICLEI) proprietary application known as “ClearPath.” the leading on-line software for completing greenhouse gas inventories at the municipal and community levels. ClearPath follows established protocols by carrying out calculations according to methods provided in the industry. These protocols

are used in the Inventory Module of ClearPath, which allows users to manage multiple government operations and community-scale inventories simultaneously.

## **Scope**

Greenhouse Gas (GHG) emissions are typically categorized into three scopes according to the GHG Protocol.

**Scope 1 Emissions:** These are direct GHG emissions that occur from sources that are controlled or owned by an organization. Examples include emissions associated with fuel combustion in boilers, furnaces, vehicles, etc.

**Scope 2 Emissions:** These are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Although these 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.

**Scope 3 Emissions:** These are all other indirect emissions that occur in an entity's value chain. They are usually the largest source of an entity's carbon footprint, covering emissions associated with business travel, procurement, waste, and water.

For the municipality, the calculations are entirely Scope 1 and Scope 2. However, for the community calculation the calculations include waste which has some Scope 3 aspects to it. Although, in this addition, commercial traffic is likely included in the calculation as a Scope 1 measure.

For the 2019 GHG Inventory, data was collected from the following sources:

### **Municipal**

- Electricity usage figures obtained from Con Edison and NYPA bills.
- Natural gas usage figures obtained from Con Edison bills.
- Actual figures for electricity, natural gas, gasoline and diesel usage were provided by the City of Rye

### **Residential**

- Includes all residences with the 10580-zip code.
- Electricity and gas usage figures obtained from Con Edison Annual Reports
- Fuel Oil and kerosene usage were estimated by calculating the ratio of the number of homes heating with fuel oil or kerosene in Rye to the total number of homes heating with fuel oil in New York State (both figures derived from the U.S. Census American Community Survey) and applying that fraction to the total New York State 2019 fuel oil or kerosene usage as per the DOE.

### **Commercial**

- Includes all commercial and business buildings within the 10580-zip code.

- Electricity and gas usage figures obtained from Con Edison annual reports.
- Fuel oil usage was estimated by calculating the ratio of Rye’s population to New York State population and applying that fraction to a total commercial fuel oil consumed in New York State (U.S. Energy Information Administration)

**Waste**

- Waste emissions are based on solid waste generated by the City of Rye as published in the City Annual Reports Data obtained from Westchester County.

**Transport**

- Emissions based on the total vehicle miles traveled (“VMT”) in Rye. VMT was calculated by multiplying Rye’s population by annualized Westchester daily average VMT per capita. Data was obtained from the New York Department of Transportation as published on their website for 2017.

**III. Community Inventory Results**

**The City of Rye Community Inventory - Sector Analysis 2019 vs. 2009**

Sector	2019		2009		% Chg	
	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU
Transportation	58,356	813,357	69,126	975,861	-16%	-17%
Residential	57,356	970,895	58,300	953,010	-2%	2%
Commercial/Business	26,003	408,918	27,734	407,432	-6%	0%
Municipal	2,287	34,607	2,366	33,949	-3%	2%
Waste	1,989	51,879	1,969	56,255	1%	-8%
<b>Total</b>	<b>145,991</b>	<b>2,279,656</b>	<b>159,495</b>	<b>2,426,507</b>	<b>-8%</b>	<b>-6%</b>

**The City of Rye Community Inventory - Source Analysis 2019 vs. 2009**

Sector	2019		2009		% Chg	
	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU
Gasoline	40,978	578,835	57,918	824,575	-29%	-30%
Electricity	26,932	364,983	30,560	375,674	-12%	-3%
Natural Gas	48,505	911,976	44,297	832,853	10%	10%
Fuel Oil	9,099	122,212	12,256	164,605	-26%	-26%
Diesel	18,268	246,862	12,039	162,832	52%	52%
Waste	1,989	51,879	1,969	56,255	1%	-8%
Kerosene	220	2,909	421	5,559	-48%	-48%
Wood	-	-	35	4,153	-100%	-100%
<b>Total</b>	<b>145,991</b>	<b>2,279,656</b>	<b>159,495</b>	<b>2,426,507</b>	<b>-8%</b>	<b>-6%</b>

1. Community Emissions by Sector - The City of Rye is estimated to have emitted 145,991 tons of CO<sub>2</sub>e in 2019. Transportation (40%) and Residential buildings (39%) were the greatest contributors of greenhouse gas emissions. The Commercial sector contributed 18% of total emissions, Municipal was 2% and the Waste sector was 1%.
2. Compared to the 2009 estimate, there appears to be a 16% emissions reduction in the Transportation sector, which drove overall emissions down by 8%. We would recommend using caution in any interpretation of this number in a positive way. Although fuel efficiency standards have gone up, that is generally thought to be offset by an increase in vehicle miles traveled. We therefore attribute this decline as a difference of measurement methodologies period-on-period. Additionally, no effort was made to impute the impact of electric vehicle usage which has increased over time but was still low at the time of measurement. We will endeavor to bring this analysis up to date in the coming years.
3. Community Emissions by Energy Source - Natural Gas accounts for the largest emissions source at 33%, followed by Gasoline (28%), Electricity (18%), Diesel (13%) and Fuel Oil, Waste and Kerosene were less than 10%.
4. Gasoline sector was down by 29% from 2009 most likely attributable to measurement methodologies. Natural Gas emissions were up 10% with fewer residents using fuel oil and all newer builds predominantly using natural gas. Wood usage was deemed negligible and no reliable statistic on the number of homes in Rye that use Wood as primary heating method. Excessive burning of wood either recreationally or as a primary concern was not reliably captured in our report.

## IV. Municipal Inventory Results

### Municipal Inventory - Sector Analysis 2019 vs. 2009

Sector	2019		2009		% Chg	
	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU
Buildings & Facilities	1,127	18,588	1,118	17,257	1%	8%
Vehicle Fleet	890	12,340	832	11,546	7%	7%
Street and Traffic Light	195	2,641	333	4,095	-41%	-36%
Wastewater Facilities	75	1,038	83	1,051	-9%	-1%
<b>Total</b>	<b>2,287</b>	<b>34,607</b>	<b>2,366</b>	<b>33,949</b>	<b>-3%</b>	<b>2%</b>

### Municipal Inventory - Source Analysis 2019 vs. 2009

Sector	2019		2009		% Chg	
	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU	CO2e (MT)	MMBTU
Electricity	762	10,321	971	11,933	-22%	-14%
Natural Gas	635	11,946	538	10,123	18%	18%
Gasoline	436	6,203	425	6,048	3%	3%
Diesel	454	6,137	407	5,498	12%	12%
Fuel Oil	-	-	26	347	-100%	-100%
<b>Total</b>	<b>2,287</b>	<b>34,607</b>	<b>2,366</b>	<b>33,949</b>	<b>-3%</b>	<b>2%</b>

- Government operations in Rye are estimated to constitute less than 2% of the City's total emissions. Local government operations typically account for less than 3% of the overall community emissions so this result does not appear anomalous. The City does not own nor operate a landfill, wastewater treatment plant, or ice rink. Wastewater facilities emissions include the electricity used to operate sewer pumps.
- As a minor contributor to total emissions, actions to reduce municipal energy use may have a limited impact on Rye's overall community emissions levels. However, municipal action has a symbolic value and demonstrates leadership in decarbonization.
- Municipal Emissions by Energy Sector. In 2019, the government of the City of Rye emitted 2,287 metric tons of CO2e. Buildings and Facilities contributed the greatest portion of emissions at 49%. The Vehicle Fleet accounted for 39%, Street Lights were 9% and Wastewater Facilities were 3% of total emissions. In Comparison to 2009 emissions from Street Lights were down by 41% after the City introduced LED lighting in 2016.
- Municipal Emissions by Energy Source. Electricity accounts for the largest emission source at 33%, followed by natural gas (28%), diesel (20%) and gasoline (19%). Electricity emissions in 2019 are 22% lower than in 2009. This is likely due to a reduction of overall electricity usage and a slightly lower carbon footprint in the grid. The lower electricity usage is not attributed to anything specific.
- The 2009 GHG Emissions data in the tables above differs from the data that was originally used for Rye's first GHG Inventory analysis in 2010. The difference in the

data can be explained by improvements made over the years to GHG Inventory methodologies and more accuracy with energy usage data.

## **V. Future Areas of Focus**

1. Clearly much work must be done to bring the City of Rye Community GHG Inventory to levels in line with those goals of the State of New York and the nation as a whole.
2. Technology has advanced in many areas that make greener products not only better but cheaper than their fossil fuel counterparts. Solar, heat pumps, geothermal and electric vehicles and equipment (e.g., lawn mowers and weed whackers) have become readily available and more affordable.
3. The City of Rye formed the Climate Smart Communities (CSC) Task Force in 2023 with the goal of fulfilling our pledge as a Climate Smart Community. The Task Force, together with City Operations and the Sustainability Committee will pursue the comprehensive guidelines set out by the CSC program, to reduce emissions as rapidly and effectively as possible.

## VI. Appendix

### 1. Source estimates for Municipal Numbers

Electricity		KwH	CO2e (MT)	g/KwH
2019 Streetlights		636,783	160.368	251.84
2019 Traffic Signals		136,986	34.499	251.84
2019 Municipal Bldgs		1,960,763	493.799	251.84
2019 Wastewater Treatment		134,856	33.962	251.84
2019 Solid Waste Disposal		154,640	38.945	251.84
<b>Total</b>		<b>3,024,028</b>	<b>761.572</b>	
Natural Gas		Therms	CO2e (MT)	g/Therm
2019 Municipal Buildings		118,959	632.701	5,318.64
2019 Wastewater Buildings		499	2.654	5,314.36
<b>Total</b>		<b>119,459</b>	<b>635.355</b>	
Fuel For Fleet		Gallons	CO2e (MT)	kg/Gal
2019 Diesel Fuel		44,459	453.930	10.21
2019 Gasoline		49,644	435.870	8.78
<b>Total</b>		<b>94,103</b>	<b>889.800</b>	
<b>Total</b>			<b>2,286.73</b>	



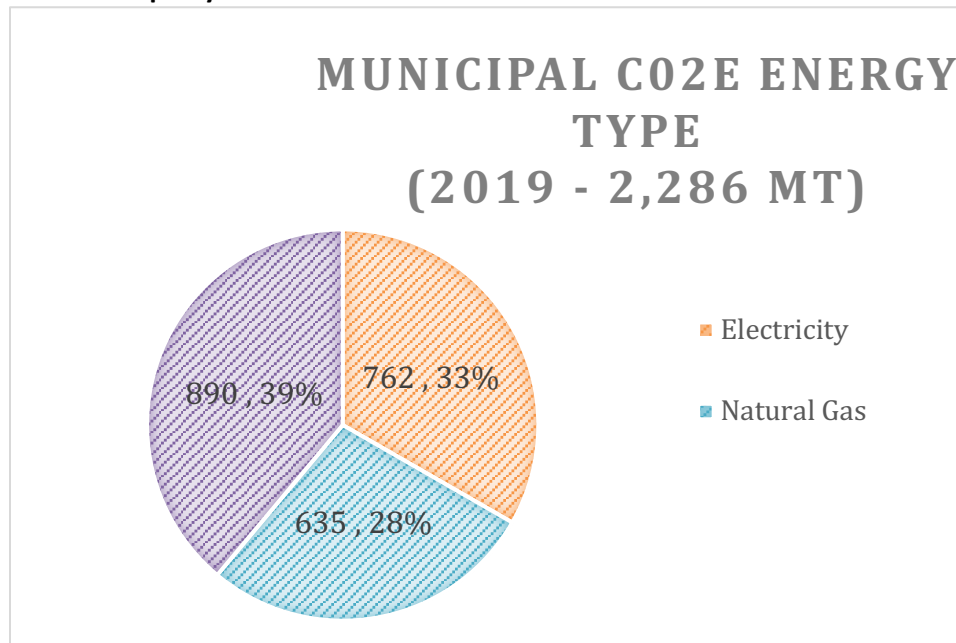
## 2. Electricity and Natural Gas Usage by Service

Electricity Usage by Service	KwH	MMBTU	CO2e (MT)
Golf Club (including Whitby Castle)	961,728	3,282	242
Street and Traffic lights	773,769	2,641	195
Police and Fire Stations	421,788	1,440	106
City Hall, Library, and Other Buildings	400,898	1,368	101
Boat Basis, Rec Center and Disbrow	176,349	602	44
Water and Waste Treatment	289,496	988	73
Sub Total	3,024,028	10,321	762
% of Total Electricity	100%	100%	100%

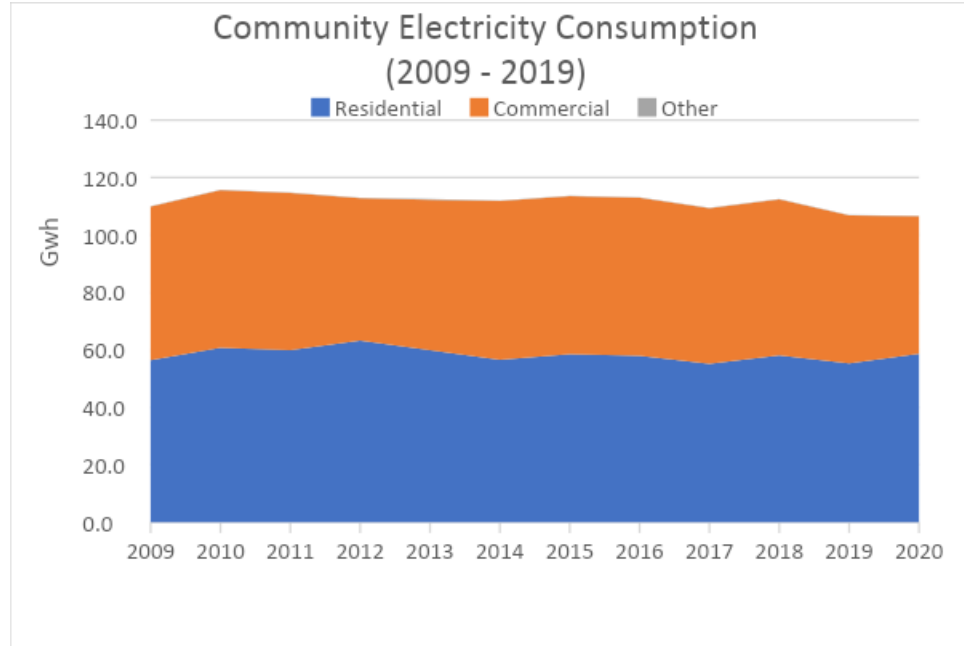
  

Natural Gas Usage By Service	Therms	MMBTU	CO2e (MT)
Golf Club (including Whitby Castle)	47,174	4,715	251
Police and Fire Stations	23,845	2,384	127
City Hall, Library, and Other Buildings	40,604	4,059	216
Boat Basis, Rec Center and Disbrow	7,336	733	39
Water and Waste Treatment	499	50	3
Sub Total	119,459	11,941	635
% of Total Natural Gas	100%	100%	100%

## 3. Graph by Sector



**4. Community Electric Usage Per ConEd (Rye 10580)**



**5. Community Gas Usage Per ConEd**

