WOODSTOCK, N.Y.
COLONY OF THE ARTS

Town of Woodstock Governmental Climate Action Plan

Application for 16 Points

July 30, 2024

PE2 Action: Government Operations Climate Action Plan

12 Points | 16 Points | BRONZE PRIORITY | SILVER PRIORITY

Woodstock Governmental Climate Action Plan

Preface

Woodstock's planning for climate change began with Al Gore's 2006 documentary, *An Inconvenient Truth*, a film about the threat of climate change – it's causes, effects, history, and potential solutions. The film concludes with Gore addressing common misconceptions surrounding global warming and challenging viewers to bring about needed changes to reduce greenhouse gas emissions. The Woodstock Environmental Commission accepted this challenge. On March 13, 2007, the Woodstock Town Board adopted the Carbon Neutral Resolution, committing that town governmental operations would be carbon neutral by year-end 2017.

In 2009, the Woodstock Environmental Commission released the 'Green Guide,' providing recommendations and identifying resources for achieving sustainability. The guide was designed to complement the town's carbon neutral initiative, to illustrate the holistic nature of the initiative, and identify actions that would contribute to the town's carbon neutral goal.

At the time, the Carbon Neutral Resolution was an audacious statement. There was little understanding about how carbon neutrality could be achieved, but by 2015, Woodstock was formally recognized for its accomplishment at the 2017 annual meeting of the New York State Association of Conservation Commissions.

Municipal Solar

Beginning in 2012, the town board reviewed proposals for a large scale, 750 KW solar array, with the intention of supplying all town government electrical needs with solar. Although there was broad support for the proposals, the financial conditions were problematic. Several

vendors withdrew because they were unable to obtain financing, and over its twenty-year term, the Power Purchase Agreement would have increased the town's cost of electricity by almost a million dollars. In April 2016, the town board abandoned the proposal.

But in its analysis of the solar proposal, the town board completed the first detailed study of the town's electrical usage and carbon emissions associated with the use of electricity. Data on electrical usage, along with fossil fuel consumption, establish a baseline of governmental carbon emissions for the year 2011.

The baseline documentation was important for the town's participation in the Climate Smart Communities program, but the data also supported the justification for converting municipal buildings to heat-pump technology. It's expected that within a few years, the town's buildings will be entirely free of fossil fuels.

The analysis of electrical usage also identified opportunities for consolidating and reducing the number of electric meters. The overall use of electricity for heating and cooling has increased, but the increases have been moderated by opportunities for reducing electrical usage.

Climate Smart

In August 2009, Governor Patterson signed Executive Order #24 Establishing a Goal to Reduce greenhouse gas emissions 80% by 2050 and directed the development of a New York State Climate Action Plan. One result of this action was the creation of the Climate Smart Communities Program, a program that provides municipalities with a broad set of recommended initiatives to reduce greenhouse gas emissions and adapt to climate change.

The Woodstock Town Board adopted the Climate Smart Communities Pledge at its June 21, 2016 meeting. Woodstock's updated comprehensive plan, adopted November 20, 2018, assigned the responsibility for the Climate Smart Communities initiative to the Environmental Commission, and on October 15, 2019, Woodstock Supervisor Bill McKenna established the Climate Smart Community Task Force with the Environmental Commission as its core group.

Bronze Certification – September 2020

Considering the amount of climate work the town had completed, we thought complying with Climate Smart requirements for Bronze Level certification would be straightforward. Not a chance. Unknown was the extraordinary demand for documentation and adherence to technical standards beyond municipal convention required by the Climate Smart Program. Obtaining documentation for completed work was a major challenge, but in September 2020, Woodstock was certified Climate Smart Bronze.

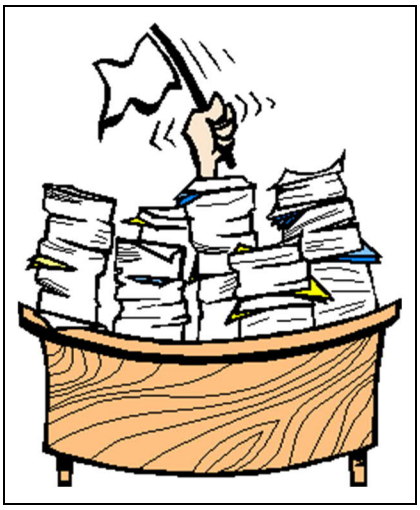
Bronze Recertification – September 2021

Achieving a forty percent reduction in greenhouse gas emissions is an established New York climate objective, and Climate Smart Action Item PE12 awards points for reductions in emissions from municipal facilities. Woodstock submitted documentation showing that between 2011 and 2019, greenhouse gas emissions from Woodstock's governmental operations were reduced by 95.9 metric tons CO2e, or 41.2%. At this time, Woodstock is the only Climate Smart community that has been recognized for achieving the 40% reduction in

GHG emissions. On September 25, 2021, Woodstock was recertified Bronze with 220 points earned from 21 completed actions.

Bronze Recertification – September 2026

Bronze level certification is valid for five years, and Woodstock's certification is scheduled to expire on September 30, 2026. In anticipation of the upcoming expiration, the Woodstock Town Board reauthorized the Climate Smart Task Force to update the town's application and qualify for recertification.



This isn't the first time Woodstock has submitted a Government Operations Climate Action Plan, but the previous plans were trashed by the Climate Smart administrators for not following the proper documentation outline. Although the administrators gave Woodstock credit for demonstrating exceptional leadership and vision by committing in 2007 to no net greenhouse gas emissions from government operations by 2017, Woodstock was criticized for its failure to align its submission with the required documentation structure of the CSCC action.

This version of Woodstock Governmental Operations Climate Action Plan follows the template provided by and with support from the Hudson Valley Regional Council (HVRC) for use by local governments taking action to reduce greenhouse gas emissions within their municipalities. The template is designed to be used as a guide for a final CAP report.

Although Woodstock demonstrated that it had reduced emissions from government buildings and facilities by 40% between 2011 and 2019, the administrators cited Woodstock for failing to "include at least one GHG reduction target specific to the local government." This document contains specific forecasts for 2030 of fuel oil, propane, and scope 2 electricity for every governmental building and facility, and calculates estimated emission reductions compared to the base year 2011.

Hopefully, this time, the Climate Smart administrators will be more sympathetic about Woodstock's achievements and plans.

Respectfully submitted,

Kenneth S. Panza, Secretary

Woodstock Climate Smart Committee

Acknowledgements

Beginning in 2007, many individuals have contributed to Woodstock climate efforts, and it was the Environmental Commission, Town Board, town employees, and many contributors from different organizations that kept Woodstock focused on reducing its carbon footprint.

Town Board Members

Jeremy Wilber
Steve Knight
Elizabeth Simonson
Bill McKenna
Chris Collins
Jackie Earley, Town Clerk
Jeff Moran
Terrie Rosenblum
Jay Wenk
Cathy Magarelli
Kenneth Panza
Laura Ricci
Richard Heppner
Lorin Rose
Reggie Earls
Maria-Elena Conte
Bennet Ratcliff
Anula Courtis

Town Employees

Pam Boyle, Bookkeeper
Larry Allen, Woodstock Water & Sewer

Environmental Commission

Mary Phillips-Burke
David Gross
Ann Brandt
Stuart Auchincloss
David Lewis
Megan Reynolds
Michael Veitch
Grace Bowne
Bobbie Cooper
Bill Dubilier
Jim Hanson
Jonathan Heppner
Liam Kahn
Gabi Raphael
Julia Blelock
David Martindale
Kealey Viglielmo
Erin Moran
Arlene Weissman
Alex Bolotow
Nick Foad
Bob Wolff
Christopher Compton
Raye Lankford
Susan Paynter
Michael Kolber
Stacey Anderson

Climate Smart Task Force Structure and Responsibilities

On October 15, 2019, Woodstock Supervisor McKenna established the Woodstock Climate Smart Community Task Force, appointed the Environmental Commission as its members, and charged the task force to develop a comprehensive approach to reducing greenhouse gas emissions and increase energy efficiencies, as well as related topics. On February 11, 2020, the Woodstock Town Board, by resolution 71-2020, adopted the required authorizing resolution establishing a Climate Smart Task Force.

On September 25, 2021, Woodstock was certified Bronze Level with 220 points earned from 21 completed actions, but Bronze Level certification is valid for five years, and will expire on September 30, 2026. On July 16, 2024, the Woodstock Town Board reauthorized the Woodstock Climate Smart Task Force and its mission.

The task force shall:

1) Recertify the Town of Woodstock as a Bronze Level Climate Smart community before the September 30, 2026 expiration date; and
2) Work with the Woodstock Highway Department and Building Department to define a hazard mitigation plan that will prepare Woodstock for an environment with increasingly heavy rainfall and flooding.

The responsibilities of the Task Force Coordinator shall include:

- Schedule and chair meetings of the task force.
- Nominate a Task Force Secretary and, as needed, other Task Force officers for the Task Force to approve.
- Recommend additional Task Force members to the Town Board to approve.
- Organize and coordinate the efforts of Task Force members.
- Represent the Woodstock Climate Smart Task Force at meetings and forums.

The Woodstock Climate Smart Task Force will consist of seven members, and may consist of members of the Environmental Commission, town employees, and Woodstock residents with an interest in addressing climate change.

Contributors

Matthew Immergut, Carbon Neutral Task Force

Candace Balmer, RCAP Solutions

Mary McNamara, Hudson River Watershed Alliance

Elizabeth Reichheld, Section Chief, Bureau of Water Supply

Howard Harris, former chair, ZBA

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Pat Courtney-Strong, NYSERDA Contractor

Vern Benjamin, Saugerties Climate Smart

Melissa Everett, Sustainable Hudson Valley

Manna Jo Greene, Ulster County CSC

Jess Lunt, Woodstock Farm Festival

Judith Karpova, Green energy consultant

Laurie Husted, Bard College Office of Sustainability

Ingrid Haeckel, DEC Hudson River Estuary Program

Nate Nardi-Cyrus, DEC Hudson River Estuary Program

Tom Konrad, Chair, Marbletown ECC

Steve Winkley, New York Rural Water Association

Tim Koch, Ashokan Watershed Stream Management Program

Jerry Washington, GIS Water & Aquifer Mapping

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Eleanor Peck, Hudson Valley Regional Council

Kai Lord Farmer, Ulster County Planning

Table of Contents

Introduction

Woodstock has long recognized that greenhouse gas emissions (GHG) are causing the climate to change from long established and expected patterns that may increase precipitation, storm severity, and cause flooding. Woodstock joined a number of municipalities in the Climate Smart Communities Program that are committed to reducing greenhouse gas emissions. This Climate Action Plan is a document that identifies a strategy, defines initiatives, and set goals for reducing local greenhouse emissions.

Beginning with a greenhouse gas emission inventory, the Climate Action Plan sets targets for reducing greenhouse gas emissions, provides a framework for achieving those targets, and establishes methods for tracking and assessing progress in reducing emissions.

This isn't Woodstock's first climate action plan. Woodstock's first complete greenhouse gas inventory was completed in 2011, during the town's evaluation of a large-scale solar project, and was accepted for the town's Bronze Level certification in September 2020. A second greenhouse gas inventory, fully compliant with *Local Government Operations Protocol for Greenhouse Gas Assessments,* was completed in 2019. In its Bronze Level recertification, September 2021, Woodstock was recognized for achieving a 40% reduction in greenhouse gas emissions from governmental facilities and buildings.

Climate Smart requires governmental greenhouse emissions to be updated every five years, and Woodstock's current estimate of governmental greenhouse emissions will expire on September 30, 2024. A third GHG emissions inventory for the year 2023 has been accepted by the town board and will be submitted as the current inventory for this Climate Action Plan.

The overall purpose of the plan is to show how the town, by 2030, can reduce greenhouse gas emissions by 85% compared with the 2011 base case inventory. Fossil fuel and electricity usage for every town facility and building has been projected for 2030, and compared with the 2011 base case to determine the change in usage and reduction in greenhouse gas emissions.

Three initiatives are utilized to achieve these results. First, the replacement of fossil fuel heating with ground-sourced or air-sourced heat pumps. This initiative avoids emissions from fossil fuel combustion, but substantially increases the electricity used. Second, replace grid supplied electricity with carbon-free, hydroelectric power sourced from the Wappingers Falls and Wallkill hydroelectric power plants. And third, convert the town's vehicle fleet to a combination of hybrid and full battery electric operation.

These initiatives were the basis for Woodstock achieving a 40% reduction in greenhouse gas emissions from governmental facilities and buildings during, and these initiatives, continued into 2030, is the basis for the town's governmental Climate Action Plan.

Woodstock 2023 Governmental GHG Inventory

Woodstock was certified Bronze Level on September 25, 2021, having submitted governmental GHG inventories for the years 2011 and 2019.

Woodstock's calculations of GHG emissions are totally consistent with the relevant provisions of the Local Government Operations Protocol (LGOP), a standardized set of guidelines for quantifying and reporting GHG emissions associated with government operations. Full details of Woodstock's calculations and adherence to LGOP standards is explained in Woodstock's 2019 GHG inventory report.

Woodstock's governmental GHG emissions for 2023, calculated in full compliance with LGOP, are provided as part of this submission. The 2023 inventory includes all Scope 1 and Scope 2 GHG emissions for governmental operations. Scope 3 GHG emissions, which are optional, are not included. Many of the common governmental Scope 3 emissions – vehicles not owned or controlled by Woodstock, waste disposal, and employee commuting – are accounted for as Scope 1 emissions in Woodstock's community GHG inventory.

The results of the GHG emissions inventory for 2023 were released to the public, town board, and other interested governmental agencies in Woodstock's Climate Smart Report for April 22, 2024. The full report is available on the town's website.

Woodstock 2023 Governmental GHG Inventory

The last table in this section shows a side-by-side comparison of the 2011, 2019, and 2023 GHG inventories.

Town of Woodstock
Governmental GHG Inventory
Local Government Operations Protocol
Fiscal Year: '2023'

				Expenditures	Volume	CO2e equilvant Metric Tons	CO2 Metric Tons	Methane Kgm	Nitrous Oxide Kgm
Buildings & Other Facilities	Scope 1	Stationary Combustion	Fuel Oil (gals)	$4,434	1,410	14.5	14.4	2.1150	0.1410
			Propane (gals)	$7,825	5,180	29.2	29.0	5.1800	0.5180
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)			146,091	18.2	18.2	0.9940	0.1325
		Hydro Electricity (kWh)			193,559				
		Sum of Scope 2 (Electricity)		$69,174	339,650				
	Total GHG for Year					62.0	61.5	8.2890	0.7915
Water District	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)	$185	125	0.7	0.7	0.1250	0.0125
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)							
		Hydro Electricity (kWh)		$18,403	90,521				
		Sum of Scope 2 (Electricity)		$18,403	90,521				
	Total GHG for Year					0.7	0.7	0.1250	0.0125
Waste Water Treatment Facility	Scope 1	Stationary Combustion	Fuel Oil (gals)	$4,434	1,396	14.3	14.3	2.0940	0.1396
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)							
		Hydro Electricity (kWh)		$31,713	213,920				
		Sum of Scope 2 (Electricity)		$31,713	213,920				
	Total GHG for Year					14.3	14.3	2.0940	0.1396
Lighting Districts	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)		$25,663	23,782	3.0	3.0	0.1618	0.0216
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		$25,663	23,782				
	Total GHG for Year					3.0	3.0	0.1618	0.0216

Town of Woodstock
Governmental GHG Inventory
Local Government Operations Protocol
Fiscal Year: '2023'

				Expenditures	Volume	CO2e equilvant Metric Tons	CO2 Metric Tons	Methane Kgm	Nitrous Oxide Kgm
Vehicles	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)	$58,821	20,906	183.6	183.6		
			Diesel Fuel (gals)	$54,089	16,553	169.0	169.0		
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)							
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)							
	Total GHG for Year					352.6	352.6	0.0000	0.0000
Woodstock Totals	Scope 1	Stationary Combustion	Fuel Oil (gals)	$8,868	2,806	28.8	28.6	4.2090	0.2806
			Propane (gals)	$8,010	5,305	29.9	29.7	5.3050	0.5305
		Mobile Combustion	Gasoline (gals)	$58,821	20,906	183.6	183.6		
			Diesel Fuel (gals)	$54,089	16,553	169.0	169.0		
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)			169,873	21.2	21.2	1.1558	0.1541
		Hydro Electricity (kWh)			498,000				
		Sum of Scope 2 (Electricity)		$144,953	667,873				
	Total GHG for Year					432.5	432.0	10.6698	0.9652

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Application for 16 Points June 19, 2024

PE2 Action: Government Operations GHG Inventory

16 Points BRONZE PRIORITY SILVER PRIORITY

GHG Inventory for 2023
Town of Woodstock Government Operations
Local Government Operations Protocol (LGOP)

Beginning with 2011, reports about Woodstock's progress on achieving carbon neutrality have been issued annually. In addition to greenhouse gas (GHG) emissions, the reports included explanations of actions taken related to town government's energy usage. Issues concerning construction, problems encountered, new opportunities, programs and suggestions, etc. were included. The reports reflected the year's accomplishments, problems, and opportunities, and recommended actions for the following year.

Woodstock Energy Costs and Consumption

New York government entities are required to file a yearly financial report with the Office of the State Comptroller. Pursuant to Section 21, Subdivision 10A of Town Law, the Supervisor shall submit to the Town Board, the Town Clerk and the New York State Comptroller within sixty days after the close of the fiscal year a copy of the Annual Report, as required by law, and the Town Clerk shall publish within ten days in the official newspapers the fact that such annual report is available for inspection in the Town Clerk's office.

A table titled, "Energy Costs and Consumption," has been included in the accountant's report since 2008. Below is the table for 2023 showing Woodstock's governmental energy usage and expenditures submitted to the Office of the New York State Comptroller. These exhibits, which are available on April 1 of the following year, form the basis for Woodstock's GHG tracking system. On April 1, 2024, the town released its annual financial report, which contains the table, shown below, detailing the town's energy costs and consumption for the fiscal year 2023.

TOWN OF WOODSTOCK
Energy Costs and Consumption
For the Fiscal Year Ending 2023

Energy Type	Total Expenditures	Total Volume	Units of Measure
Gasoline	$58,821	20,906	gallons
Diesel Fuel	$54,089	16,553	gallons
Fuel Oil	$8,868	2,806	gallons
Natural Gas			cubic feet
Electricity	$144,953	667,873	kilowatt-hours
Coal			tons
Propane	$8,010	5,305	gallons

Woodstock Governmental Electric Usage Report – 2023

After several years of delay, Woodstock finally began receiving in 2023 electric power from locally sourced hydroelectric facilities. A combination of technical problems, business problems, and Central Hudson billing issues were finally resolved, and in April 2023, more of Woodstock's governmental facilities began receiving zero-carbon, hydroelectric energy.

Although overall electric usage remained steady, GHG emissions due to electricity dropped from 83 metric tons the year before to 28 metric tons CO_2 in 2023. It's expected that the full value of hydroelectric power with a corresponding drop in emissions will be realized during 2024.

Between 2018 and 2023, electric usage has dropped by about 100,000 kWh. About 60% of this decline was attributed to resolving technical issues at the highway garage, waste water treatment facility, and with the water wells. Another 40% of the decline in usage was due to the complete conversion of municipal street lighting to LEDs. Cutbacks in electrical usage attributed to the pandemic have mostly recovered.

The substantial reductions in GHG emissions during the 2010s were due to the closure of New York's coal fired power plants, which were replaced by lower emission, natural gas generators. No coal fired generators remain in New York, and currently, grid GHG emissions are at low of 233.1 pounds/MWh. Woodstock's emissions from electricity used for governmental operations will further decline as the conversion to carbon-free hydroelectric power is completed.

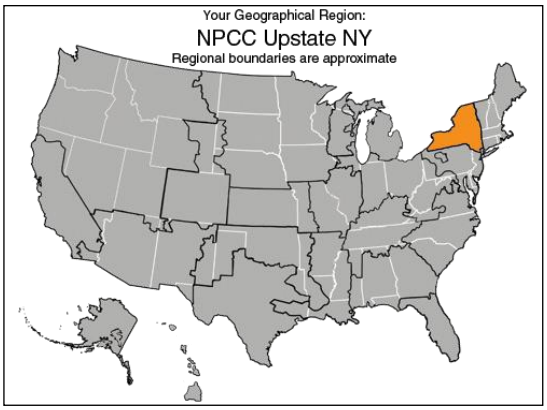
EPA eGRID Emissions Rate Increases 17%

As a consequence of the closure of the Indian Point nuclear power plant and the increased use of natural gas for electricity generation in 2022, GHG emissions attributed to electricity increased by 17% in the Upstate New York subregion.

The Emissions and Generation Resource Integrated Database (eGRID) is a comprehensive inventory of environmental attributes of the electric power system. Released for the first

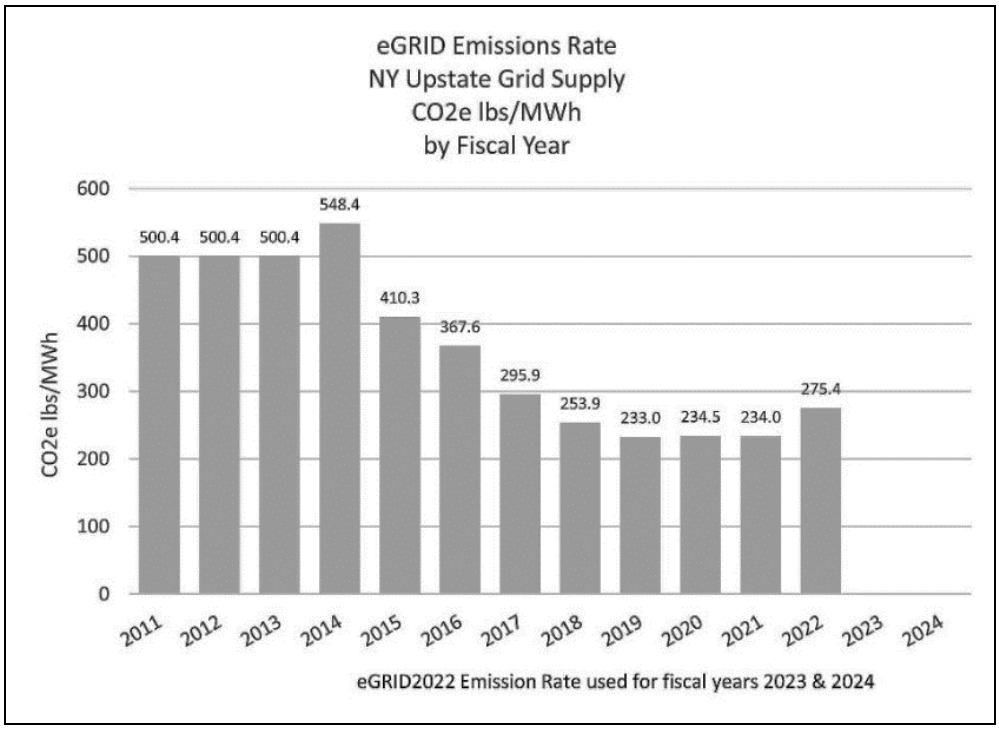
time in 1998 (and about every other year thereafter), eGRID includes data about emissions rates, net generation, resource mix, air emissions for nitrogen oxides, sulfur dioxide, carbon dioxide, methane, nitrous gas, and other properties for electric generating plants in the United States.

Electricity emission factors represent the quantity of GHG emissions per unit of electricity, and is usually reported in units of pounds of GHG per kWh or MWh. Woodstock uses eGRID emission factors for the Upstate New York subregion. Carbon dioxide emissions in upstate NY have been declining for the past several years due to the retirement of coal-fired power plants and because of substantial upstate hydroelectric and nuclear resources.



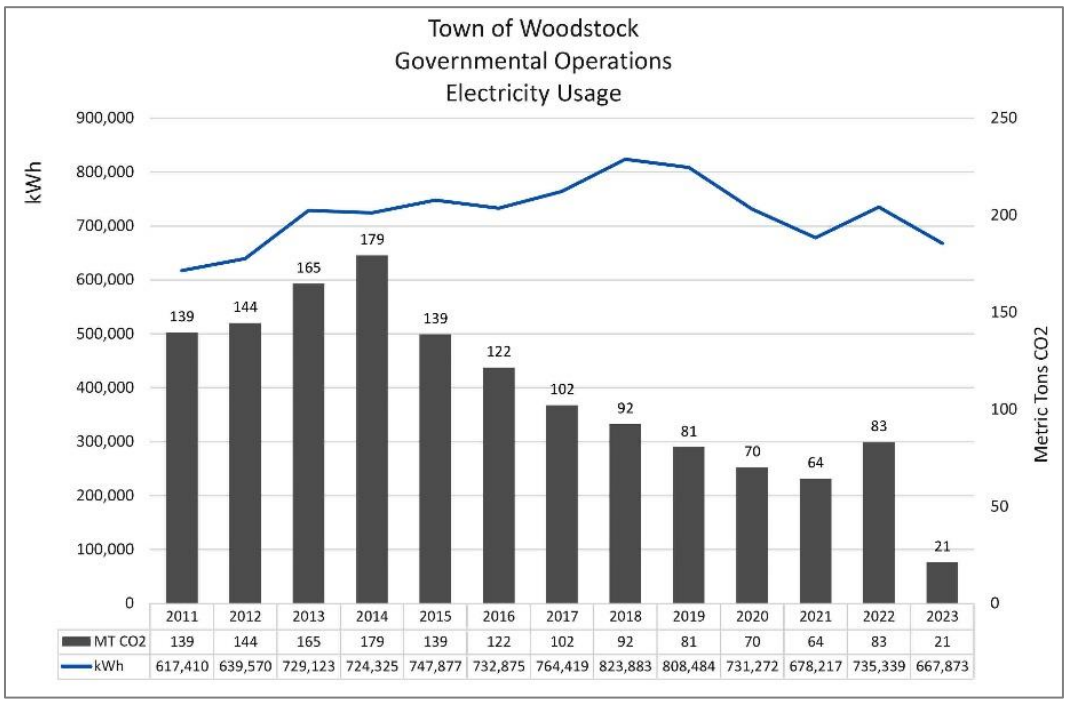
The bar chart below shows eGRID emissions rates by year. Beginning in 2015, due to the retirement of New York state's coal-fired power plants, the emissions rate dropped. From 2018 to 2021, the emissions rate was essentially flat until the closure of Indian Point.

Two new natural gas power plants — Cricket Valley and CPV Valley Energy Center — were built to replace Indian Point, and the emissions resulting from increased natural gas generation are reflected in eGRID2022 emissions rates.



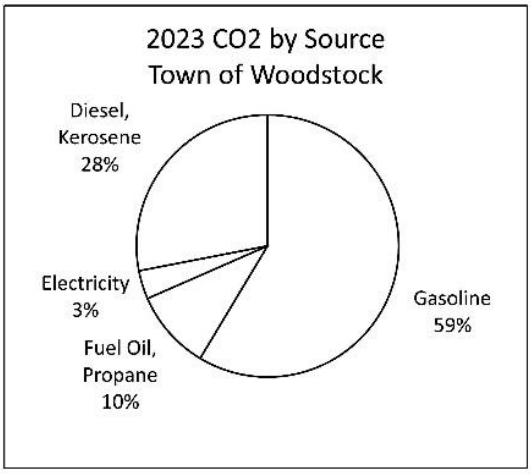
Recalculated Governmental Emissions

The release of eGRID2022 and the emission rates for 2022 required the recalculation of Woodstock's 2022 and 2023 GHG emissions attributed to electricity. Emissions for 2022, which were originally estimated at 70 metric tons, have been increased to 83 metric tons.



Fiscal Year 2023 Governmental GHG Emissions

Fiscal year 2023, emissions compared with previous years, were lower because of the substantial increase in the use of zero-emission hydroelectric power. Electricity now accounts for only 3% of the town's total governmental emissions, and it is expected is be further reduced in 2024.



An unexpected reduction in the use of Diesel fuel reduced total 2023 emissions. The town budgets for about 20,000 gallons of Diesel each year, but only about 16,500 gallons were used in 2023, reducing the town's carbon footprint by about 40 metric tons.

No action was taken by the town to reduce the use of Diesel fuel, but the lack of snow reduced the need for snow plowing. One consequence of climate change is more rain and less snow, which reduces the need for snow plowing and the use of Deisel fuel. The reduction of 40 metric tons represents almost 10% of the town government emissions.

Next Steps

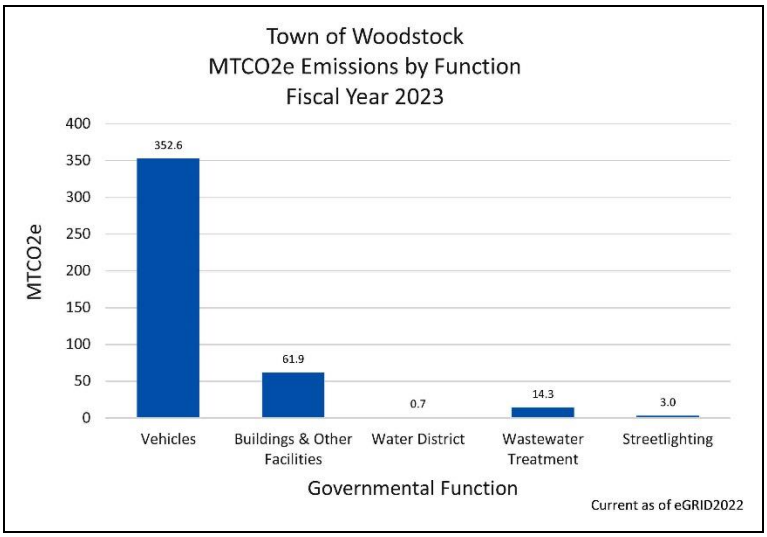
The highway garage and town hall are expected to receive zero-carbon hydroelectric power in 2024, further reducing GHG emissions attributed to electricity. The renovation of the town offices on Comeau will be completed in 2024, which will cut the town's use of fuel oil for heating by half. A renovation of the youth center is now being planned, which will reduce the town's use of propane. Within a few years, the town will reach the limits of existing technology for reducing emissions from governmental operations.

Vehicle Emissions

Gasoline is a substantial contributor to the town's GHG emissions, and a conversion of police vehicles to hybrid technology could reduce the use, cost, and emissions from gasoline by about 25%. Efforts to acquire hybrid vehicles faltered during the pandemic because of supply chain issues, and recently, service and reliability problems experienced by the Town of Ulster with hybrid police vehicles suggests caution. It's not clear that existing hybrid vehicle technology is reliable enough for police and public safety vehicles.

Hudson Valley Regional Council CAPI Emissions

The Hudson Valley Regional Council has its own methodology for creating and presenting municipal greenhouse gas inventories. The CAPI recommended bar chart shows fiscal year the 2023 GHG emissions for Woodstock's governmental sectors.



The Climate Action Planning Institute (CAPI) is a facilitated, collaborative working group (cohorts) through which a select group of local governments develop individual government operations greenhouse gas emissions inventories and government operations climate action plans.

Cohort meetings cover the basics of government operations greenhouse gas inventories, including emissions factors, emission scopes, global warming potentials, data sectors, and data collection. The focus is on the Climate Smart Communities (CSC) requirements and guidelines and learning from cohort participants and other municipalities that have done this work.

Local Government Operations Protocol (LGOP)

The California Air Resources Board (ARB) issued a 237-page document defining the Local Government Operations Protocol (LGOP), which is designed to provide a standardized set of guidelines for local governments to quantify and report GHG emissions. The Climate Smart Communities Program requires that local governments report GHG emissions in conformance with LGOP.

The LGO Protocol is a collaboration between ICLEI, the California Air Resources Board, the California Climate Action Registry, and The Climate Registry. The leading organizations in local GHG accounting collaborated on a single protocol, which is now the official standard for all local governments that wish to prepare and report GHG emissions. The LGO Protocol was formally approved by the boards of ICLEI USA, the California Climate Action Registry and the California Air Resources Board.

LGOP Chapter 13 describes a standardized form that mirrors the guidance in the LGO Protocol and provides a common mechanism for reporting emissions quantified under this protocol. The Standard Inventory Report is intended for use by all local governments utilizing this protocol.

Respectfully submitted,

Kenneth S. Panza, Secretary

Woodstock Climate Smart Committee

Attachments: The 2023 GHG emissions report for Woodstock governmental sectors, formatted as prescribed by LGOP Chapter 13.

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Fiscal Years: 2011, 2019, 2023

				2011		2019		2023	
				Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons
Buildings & Other Facilities	Scope 1	Stationary Combustion	Fuel Oil (gals)	5,154	52.9	1,384	14.2	1,410	14.5
			Propane (gals)	3,912	22.1	4,758	26.8	5,180	29.2
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)		166,783	37.9	326,984	34.6	146,091	18.2
		Hydro Electricity (kWh)		0		44,000		193,559	
		Sum of Scope 2 (Electricity)		166,783		370,984		339,650	
	Total GHG for Year				112.9		75.6		62.0
Water District	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)	152	0.9	28	0.2	125	0.7
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)		137,979	31.3	136,341	14.4		
		Hydro Electricity (kWh)						90,521	
		Sum of Scope 2 (Electricity)		137,979		136,341		90,521	
	Total GHG for Year				32.2		14.6		0.7
Waste Water Treatment Facility	Scope 1	Stationary Combustion	Fuel Oil (gals)	1,613	16.6	1,430	14.7	1,396	14.3
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)		242,634	55.1	241,400	25.5		
		Hydro Electricity (kWh)						213,920	
		Sum of Scope 2 (Electricity)		242,634		241,400		213,920	
	Total GHG for Year				71.6		40.2		14.3
Lighting Districts	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)						
			Diesel Fuel (gals)						
			Kerosene (gals)						
	Scope 2	Grid Electricity (kWh)		70,014	15.9	59,759	6.3	23,782	3.0
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		70,014		59,759		23,782	
	Total GHG for Year				15.9		6.3		3.0

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Fiscal Years: 2011, 2019, 2023

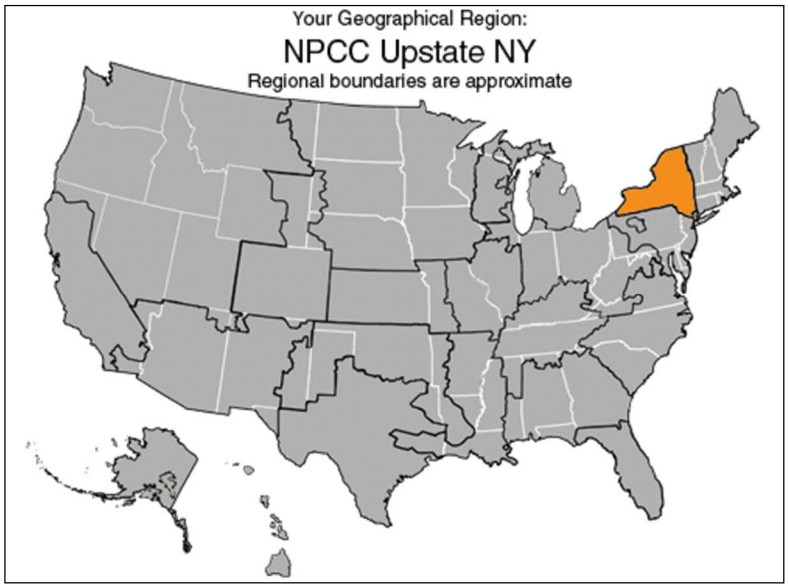
				2011		2019		2023	
				Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons
Vehicles	Scope 1	Stationary Combustion	Fuel Oil (gals)						
			Propane (gals)						
		Mobile Combustion	Gasoline (gals)	23,150	203.3	20,390	179.0	20,906	183.6
			Diesel Fuel (gals)	23,500	239.9	23,555	240.5	16,553	169.0
			Kerosene (gals)	882	9.0				
	Scope 2	Grid Electricity (kWh)							
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)							
	Total GHG for Year				452.1		419.5		352.6
Woodstock Totals	Scope 1	Stationary Combustion	Fuel Oil (gals)	6,767	69.5	2,814	28.9	2,806	28.8
			Propane (gals)	4,064	22.9	4,786	27.0	5,305	29.9
		Mobile Combustion	Gasoline (gals)	23,150	203.3	20,390	179.0	20,906	183.6
			Diesel Fuel (gals)	23,500	239.9	23,555	240.5	16,553	169.0
			Kerosene (gals)	882	9.0				
	Scope 2	Grid Electricity (kWh)		617,410	140.1	764,484	80.8	169,873	21.2
		Hydro Electricity (kWh)		0		44,000		498,000	
		Sum of Scope 2 (Electricity)		617,410		808,484		667,873	
	Total GHG for Year				684.7		556.2		432.5

Woodstock Governmental Electric Supply

The Climate Act (CLCPA) charges the Public Service Commission with establishing a program to require that by 2030, 70 percent of electric energy provided to customers of the State's jurisdictional electric utilities be generated by "renewable energy systems," and that by 2040, 100 percent of the "statewide electrical demand system will be zero emissions."[1]

EPA eGRID Database

The Emissions and Generation Resource Integrated Database (eGRID) is a comprehensive inventory of the environmental attributes of the electric power system.



Released for the first time in 1998 (and about every other year thereafter), eGRID includes data about emissions rates, net generation, resource mix, air emissions for nitrogen oxides, sulfur dioxide, carbon dioxide, methane, nitrous gas, and other properties for electric generating plants in the United States.

Electricity emission factors represent the quantity of GHG emissions per unit of electricity, and is usually reported in units of pounds of GHG per MWh. Woodstock uses eGRID emission factors for the Upstate New York subregion.

eGRID is periodically updated to account for changes in generation profile and fuel sources. Carbon dioxide emissions in upstate NY have been declining during the past several years due to the retirement of coal-fired power plants and because of substantial hydroelectric and nuclear resources.

But beginning in 2022, as a consequence of the closure of the Indian Point nuclear power plant and the increased use of natural gas for electricity generation, GHG emissions attributed to electricity increased by 17% in the Upstate New York subregion.

[1] PSL § 66-p (2).

Emissions associated with electricity in Woodstock's updated climate action plans were calculated using the eGRID2021 emission rate of 233.1 lbs. CO_2/MWh for the Upstate New York (NYUP) subregion.

eGRID emission rates are available from the EPA Power Profiler website at https://www.epa.gov/egrid/power-profiler#/

Forecasting Emissions for Electricity Usage

CLCPA assigns responsibility for achieving zero-emission electricity by 2040 to the jurisdictional electric utilities.

The Woodstock Community Climate Action Plan requires that emissions associated with electricity usage be projected to 2030. The use of air-source heat pumps for residential heating and cooling and at-home electric vehicle charging stations will increase electricity consumption between now and 2030. To account for emissions from increased electricity usage, it is also necessary to account for a zero-emission electricity supply by 2040.

Using linear interpolation between 233.1 lbs. CO_2/MWh, the emission rate for 2021, and zero-emissions in 2040, it is possible to assign an estimated emission rate for planning to each year between 2021 and 2040. The EPA regularly releases actual emission rates for each year, which is the Key Performance Indicator (KPI) for this goal.

There is a time lag between when eGRID data is collected and when the EPA makes it public. It should be understood that because of the time required to acquire data and the time necessary to calculate the yearly emission rate, the 2040 zero-emission imperative won't be verified before spring of 2042.

EPA eGRID NYUP Emission Rates Forecast

Year	lbs/MWh
2021	233.1
2022	220.8
2023	208.6
2024	196.3
2025	184.0
2026	171.8
2027	159.5
2028	147.2
2029	135.0
2030	122.7
2031	110.4
2032	98.1
2033	85.9
2034	73.6
2035	61.3
2036	49.1
2037	36.8
2038	24.5
2039	12.3
2040	0.0

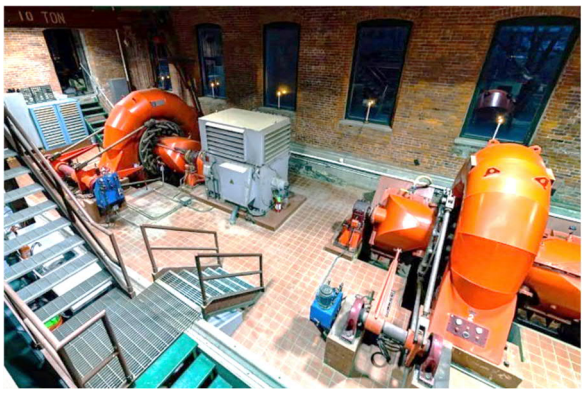
For planning purposes, the 2030 eGRID emission rate is set at 122.7 lbs CO2/MWh.

Renewable Energy

Woodstock town government installed two PV (photovoltaic) solar arrays: a 16.8-kilowatt rooftop solar array on Town Hall and a 16.6-kilowatt rooftop solar array on the Highway Garage. Combined, these two systems produce an estimated 33,000 kWh of electricity per year. The solar costs were heavily subsidized by NYSERDA and each system had a payback period of about 9 years.

Hydroelectric Power

In 2018, the Woodstock Town Board signed contracts with the Natural Power Group for power sourced from the Wappingers Falls and Wallkill hydroelectric generating facilities under the terms of Community Distributed Generation (CDG). Under these contracts, Woodstock will receive over 90% of its electric power for governmental usage from zero-carbon sources.



Woodstock has two Community Distributed Generation (CDG) contracts with the Natural Power Group. The contract for the Wallkill plant was signed in May 2018 for 37,000 kWh, and then upgraded in 2019 to 44,000 kWh. A second contract for the Wappingers Falls plant was signed in December 2018 for 681,000 kWh. Combined, these two contracts account for over 90% of Woodstock's electrical usage.

Woodstock does not purchase "green power," "renewable power," or "renewable energy certificates" from an electric utility or an independent energy provider. The contract with Natural Power Group is for kWh of hydroelectric generation. Hydroelectric power is carbon free and qualifies as zero-emission power, but because of the age of the hydroelectric plants, they do not qualify as renewable generators.

Respectfully submitted,

Kenneth S. Panza, Secretary

Woodstock Climate Smart Committee

WOODSTOCK, N.Y.
COLONY OF THE ARTS

Town of Woodstock Governmental Climate Action Plan

Woodstock Buildings and Facilities 2030 GHG Emissions

Woodstock's Governmental Climate Action Plan is a plan to reduce greenhouse gas emissions from government facilities and operations. Beginning in 2011, Woodstock has documented significant reductions in greenhouse gas emissions, including a 40% reduction during the period 2011 to 2019 from Woodstock's buildings and facilities. This plan establishes a goal of an 85% reduction below 2011 levels in greenhouse gas emissions by 2030.

Woodstock's GHG inventory lists four major sectors under governmental operations: buildings and facilities, the water district, waste water treatment, and municipal street lighting. Greenhouse gas emissions for each of these areas were established for each of these sectors.

Emissions from the Buildings & Other Facilities sector account for most of Woodstock's governmental emissions. To estimate emissions for 2030, it is necessary to forecast the fossil fuel and electricity usage for each building within the sector.

Beginning on the next page is a listing of all the facilities included in the Buildings & Other Facilities sector, a 2030 forecast of fossil fuel and electricity usage by building, and an explanation of the actions taken to support the 2030 forecasts.

In many cases, actions that reduced GHG emissions were taken before 2023, and will be included in the descriptions of proposed actions to reach 2030 targets.

Town of Woodstock
Governmental GHG Inventory
Local Government Operations Protocol
Fiscal Year: '2023'

				Volume	CO2e equilvant Metric Tons
Buildings & Other Facilities	Scope 1	Stationary Combustion	Fuel Oil (gals)	1,410	14.5
			Propane (gals)	5,180	29.2
	Scope 2	Grid Electricity (kWh)		146,091	18.2
		Hydro Electricity (kWh)		193,559	
		Sum of Scope 2 (Electricity)		339,650	
	Total GHG for Year				62.0
Water District	Scope 1	Stationary Cc	Propane (gals)	125	0.7
	Scope 2	Hydro Electricity (kWh)		90,521	
		Sum of Scope 2 (Electricity)		90,521	
	Total GHG for Year				0.7
Waste Water Treatment Facility	Scope 1	Stationary Cc	Fuel Oil (gals)	1,396	14.3
	Scope 2	Hydro Electricity (kWh)		213,920	
		Sum of Scope 2 (Electricity)		213,920	
	Total GHG for Year				14.3
Lighting Districts	Scope 2	Grid Electricity (kWh)		23,782	3.0
		Sum of Scope 2 (Electricity)		23,782	
	Total GHG for Year				3.0

Major Initiatives

Major initiatives to reduce GHG emissions from buildings and facilities include:

1) Replace fossil fuel heating systems with ground-based or air-source heat pumps, which not only replaces the hearing system, but also provides air-conditioning,
2) Convert to carbon-free, hydroelectric power from the Natural Power Group,
3) Recognize the improvements in grid electricity driven by the closure of New York's coal fired power plants (eGRID lbs/MWh),
4) Recognize the improvement in grid electricity driven by CLCPA objective of zero-emissions electricity by 2040 (eGRID lbs/MWh).

List of Other Buildings & Facilities

Town of Woodstock
Other Buildings and Facilities
2030 Energy Forecast
Header:Volume

				2023	2030
Highway Garage	Scope 1	Stationary Combustion	Propane (gals)		150
	Scope 2	Grid Electricity (kWh)		137,700	
		Hydro Electricity (kWh)			140,000
Town Hall	Scope 1	Stationary Combustion	Propane (gals)	0	150
	Scope 2	Grid Electricity (kWh)		89,660	
		Hydro Electricity (kWh)			90,000
Town Offices	Scope 1	Stationary Combustion	Fuel Oil (gals)	1,396	
			Propane (gals)	985	1,000
	Scope 2	Hydro Electricity (kWh)		19,286	120,000
Supervisors Cottage	Scope 1	Stationary Combustion	Propane (gals)	14	0
	Scope 2	Hydro Electricity (kWh)		21,363	0
Community Center	Scope 1	Stationary Combustion	Propane (gals)		150
	Scope 2	Hydro Electricity (kWh)		59,280	60,000
Youth Center	Scope 1	Stationary Combustion	Propane (gals)	1,835	
	Scope 2	Hydro Electricity (kWh)		10,814	30,000
Rock City Rd Restrooms	Scope 2	Hydro Electricity (kWh)		21,826	24,000
Highway Landfill Storage	Scope 1	Stationary Combustion	Propane (gals)	647	800
	Scope 2	Grid Electricity (kWh)		5,949	6,000
Sand & Salt Shed	Scope 2	Grid Electricity (kWh)		3,067	3,000
Police Antenna	Scope 1	Stationary Combustion	Propane (gals)		100
	Scope 2	Grid Electricity (kWh)		1,832	2,000
Village Green	Scope 2	Grid Electricity (kWh)		323	400
Mainteance Sheds	Scope 1	Stationary Combustion	Propane (gals)	1,699	1,700
Rick Voltz Field	Scope 2	Grid Electricity (kWh)		2,429	2,500
Misc Pumps, etc	Scope 2	Grid Electricity (kWh)		1,301	1,300
Woodstock Buildings Totals	Scope 1	Stationary Combustion	Propane (gals)		4,050
	Scope 2	Grid Electricity (kWh)			15,200
		Hydro Electricity (kWh)			464,000
		Sum of Scope 2 (Electricity)			479,200

Woodstock Highway Department

The old highway garage was a significant threat to the Sawkill. Road salt was stored as an uncovered pile, the town's gasoline and Diesel storage tanks were on-site, and the site was subject to possible flooding. There was a high risk of environmental contamination of the Sawkill. The old building was a wreck, in a state of disrepair, without adequate facilities for the employees.

In 2006, the old highway garage was demolished and replaced with a new, larger facility incorporating a geothermal heating & cooling system. The highway garage project was a multistage project requiring the relocation of the sand & salt pile to an enclosed facility at the landfill and relocation of Diesel and gasoline storage tanks. The objective was to remove all fossil fuels from the site.

The new highway garage became fully operational in 2007. The removal of the fossil fuel heating system and installation of an all-electric geothermal heating & cooling system is reflected in energy costs beginning in 2007. The fossil fuel component of the energy cost represents fuel oil used for heating at the highway garage storage facility at the landfill. In 2012, a 16.2 KW solar array was installed on the Highway Garage generating an estimated 16,000 kWh. [1]

Highway CO2 Emissions – 2030 Forecast

Beginning in late 2023, the highway garage began receiving carbon free, hydroelectric power from the Natural Power Group's Wappinger Falls generator. Because of Central Hudson billing problems, the acquisition of hydroelectric power was delayed.

Beginning in 2024, the highway garage will use 140,000 kWh/year, of zero carbon electricity. The conversion to hydroelectric power does not include the highway storage facility and the sand & salt shed located at the closed landfill.

The highway garage has a back-up propane generator, and 150 gallons of propane are allocated for the purpose of generator maintenance and testing.

Highway CO2 Emissions and Expenditures, 2011 and 2019

The highway garage was converted to ground-based geothermal heating and cooling in 2006, well before the 2011 baseline for this analysis. The geothermal system is a prodigious user of electricity, and the highway garage has benefited from the reductions in emission identified

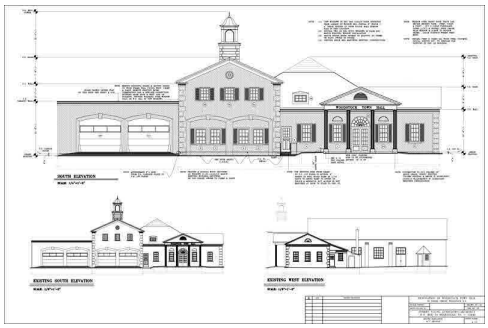
[1] Action Submission: Action PE4: Heat Pumps, "Woodstock's Geothermal Systems," January 26, 2020

in EPA's eGRID data for upstate New York's electricity supply. Heating at the highway landfill storage facility was converted from fuel oil to propane in 2014, cutting in half its carbon footprint. All exterior lighting was converted to LED fixtures.

Highway Department Facilities
CO2 Emissions and Expenditures
2011 and 2019

			2011					2019				
			Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons	Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons
Highway Department Totals	Highway Garage	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh	$19,846.35	134,640	67,051	30.414		$19,315.39	150,000	37,965	17.221	
		Electricity Source: Electricity Grid kWh		134,640					150,000	37,965		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$19,846.35			30.414		$19,315.39			17.221	
	Highway Sand & Salt Shed	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		3,317	1,652	0.749			529	134	0.061	
		Electricity Source: Electricity Grid kWh		3,317					529	134		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$0.00			0.749		$0.00			0.061	
	Highway Landfill Storage	#2 Fuel Oil, Gallons	$3,006.78	935	20,943	9.499				0	0.000	
		Propane, Gallons		0	0	0.000		$789.90	616	7,826	3.550	
		Electricity, Total kWh		5,490	2,734	1.240			4,589	1,161	0.527	
		Electricity Source: Electricity Grid kWh		5,490					4,589	1,161		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$3,006.78			10.740		$789.90			4.077	
	Sum of Highway Department Totals	#2 Fuel Oil, Gallons	$3,006.78	935	20,943	9.499		$0.0		0	0.000	
		Propane, Gallons	0	0	0	0.000		$789.90		0	3.550	
		Electricity, Total kWh	$19,846.35		0	32.403		$19,315.39		0	17.808	
		Electricity Source: Electricity Grid kWh	0	0		0.000		$0.00	0	0	0.000	
		Electricity Source: Hydroelectric kWh	0			0.000		$0.00		0	0.000	
		Department Total	$22,853.13			41.903	41.903	$20,105.29			21.358	21.358

Woodstock Town Hall



The Woodstock Town Hall, originally built in the 1930s, had three heating systems: a fuel oil system for the police, a fuel oil system for dispatch, and a propane heating system for the courts. The renovation was essentially complete in April, 2013, when the town departments returned to the building. The renovation substantially improved the building's energy efficiency with improved insulation, new windows, and sealing of cracks and leaks. The fossil fuel heating systems were replaced by an integrated geothermal heating & cooling system. Combined with electric costs, the total energy cost for the Town Hall in 2011 was about $16,000. With the new geothermal heating & cooling system, the total energy cost for the period of April 2013 through March 2014 was about $12,000. The buildings carbon footprint dropped from 40 metric tons in 2011 to about 19 metric tons.[2]

Town Hall CO2 Emissions – 2030 Forecast

Beginning in late 2023, the town hall began receiving carbon-free, hydroelectric power from the Natural Power Group's Wappinger Falls generators. Because of Central Hudson billing

[2] Ibid.

problems, the acquisition of hydroelectric power was delayed. Beginning in 2024, the town hall will use 90,000 kWh/year, of zero carbon electricity.

The town hall has a back-up propane generator, and 150 gallons of propane are allocated for the purpose of generator maintenance and testing.

Town Hall CO2 Emissions and Expenditures, 2011 and 2019

The Town Hall, in addition to its public areas, houses the court and the offices of the police department and dispatch, each of which had its own heating system. Fuel oil was used in the public part of the building and propane heating systems were used by the court, police, and dispatch. In 2013, a major renovation replaced the fossil fuel heating systems with a ground-based geothermal system. Although electrical usage increased, the results documented in PE4 Geothermal Installation, showed a significant decrease in emissions.

Woodstock Town Hall
CO2 Emissions and Expenditures
2011 and 2019

			2011					2019				
			Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons	Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons
Town Hall Totals	Town Hall	#2 Fuel Oil, Gallons	$7,363.23	2,290	51,286	23.263				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		36,960	18,406	8.349			87,600	22,172	10.057	
		Electricity Source: Electricity Grid kWh		36,960					87,600	22,172		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$7,363.23			31.612		$0.00			10.057	
	Town Hall, Court	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons	$1,742.17	758	9,624	4.365				0	0.000	
		Electricity, Total kWh			0	0.000				0	0.000	
		Electricity Source: Electricity Grid kWh		0					0	0		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$1,742.17			4.365		$0.00			0.000	
	Town Hall, Police	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons	$1,903.62	828	10,516	4.770				0	0.000	
		Electricity, Total kWh			0	0.000				0	0.000	
		Electricity Source: Electricity Grid kWh		0					0	0		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$1,903.62			4.770		$0.00			0.000	
	Sum of Town Hall	#2 Fuel Oil, Gallons	$7,363.23	2,290	51,286	23.263		0		0	0.000	
		Propane, Gallons	$3,645.79	1,586	20,140	9.135		0		0	0.000	
		Electricity, Total kWh	0		0	8.349		0		0	10.057	
		Electricity Source: Electricity Grid kWh	0	0		0.000		0	0	0	0.000	
		Electricity Source: Hydroelectric kWh	0			0.000		0		0	0.000	
		Department Total	$11,009.02			40.747	**40.747**	$0.00			10.057	**10.057**

Town Offices on Comeau

Postponed by the Covid Pandemic, the renovation of the town offices began in 2023, and aren't expected to be fully completed until 2025. As with the other renovations, the fossil fuel heating systems will be replaced with air-source heat pumps. The supervisor's cottage, now a separate building, will be rebuilt with converted to air-sourced heat pump heating and cooling.

Comeau Town Offices CO2 Emissions – 2030 Forecast

Before the renovation, the town offices used about 1,400 gallons of fuel oil and 35,000 kWh/year. The supervisor's cottage was heated with propane and used about 20,000 kWh/year.

All fossil fuels will be removed from the office buildings, and electricity usage is expected to increase to about 120,000 kWh/year. Both buildings are currently supplied with carbon-free, hydroelectric power, sourced from the Natural Power Group's Wallkill power plant. Included in the town office complex are maintenance and equipment storage sheds, which will continue to use about 1,000 gals of propane a year.

Comeau Town Offices Renovation: 2023-2024

The Comeau town office renovation has been discussed for decades, and was a high priority of the late Supervisor Jeremy Wilber. With other major projects, such as renovation of Town Hall, the Community Center and reconstruction of the Highway Garage completed, Supervisor Bill McKenna and the Town Board decided it is time to renovate the town offices on Comeau.[3]

File cabinets that are spread through the entire building will be consolidated into a large file room. With offices and file storage out of the second floor and attic, committees and boards will have meeting or conference areas. Considerable weight will be removed when the files are moved. The addition will have a lunchroom for employees and large windows will let in plenty of light and offer a view of the lawn.

Behind the garage, the supervisor's cottage will get a raised floor, better insulation, new energy-efficient windows, modern wiring and a new heating, ventilation and air-conditioning system as will the main building.

The addition will be 2500 square feet featuring a sloped roof that will extend the east and south sides of the existing building. It will include some basement space for the safe housing of computer equipment.

[3] Nick Henderson, "Renovation of Woodstock town offices to cost $2.3 million," HV1 Hudson Valley One, January 17, 2020

Hornbeck Community Center, Andy Lee Field

The community center is a complex of buildings located at Andy Lee Field, the town's recreation area. Included in this complex is the Mescal Hornbeck Community Center, a swimming pool, picnic pavilion, and craft barn. The community center heating system used fuel oil, and each of the other facilities had its own electric service and utility meter.

A major renovation initiated in 2014 replaced the fossil fuel heating system with air-sourced heat pumps for heating and cooling, substantially reducing the carbon footprint and energy expenses for the complex. Individual electric services for the other facilities were consolidated into the community center saving about $500 per year/meter in fixed, basic service charges.

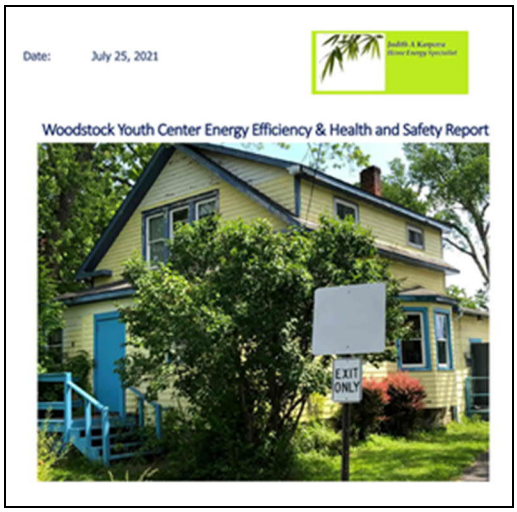
Community Center CO2 Emissions – 2030 Forecast

The community center currently uses about 60,000 kWh of carbon-free, hydroelectric power, sourced from the Natural Power Group's Wallkill power plant. This is not expected to change in 2030. The community center has a back-up propane generator, and 150 gallons of propane are allocated for the purpose of generator maintenance and testing.

Woodstock Community Center
CO2 Emissions and Expenditures
2011 and 2019

			2011					2019				
			Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons	Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons
Community Center Totals	Community Center	#2 Fuel Oil, Gallons	$5,506.39	1,712	38,353	17.397				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		22,305	11,108	5.038			55,200	13,971	6.337	
		Electricity Source: Electricity Grid kWh		22,305					55,200	13,971		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$5,506.39			22.435		$0.00			6.337	
	Summer Rec Swimming Pool	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		7,461	3,716	1.685				0	0.000	
		Electricity Source: Electricity Grid kWh		7,461					0	0		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$0.00			1.685		$0.00			0.000	
	Pavilion	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		31	15	0.007				0	0.000	
		Electricity Source: Electricity Grid kWh		31					0	0		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$0.00			0.007		$0.00			0.000	
	Craft Barn	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		851	424	0.192				0	0.000	
		Electricity Source: Electricity Grid kWh		851					0	0		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$0.00			0.192		$0.00			0.000	
	Σ Sum of Community Center Totals	#2 Fuel Oil, Gallons	$5,506.39	1,712	38,353	17.397		0		0	0.000	
		Propane, Gallons	0	0	0	0.000		0		0	0.000	
		Electricity, Total kWh	0		0	6.923		0		0	6.337	
		Electricity Source: Electricity Grid kWh	0	0		0.000		0	0	0	0.000	
		Electricity Source: Hydroelectric kWh	0			0.000		0		0	0.000	
		Department Total	$5,506.39			24.320	24.320	$0.00			6.337	6.337

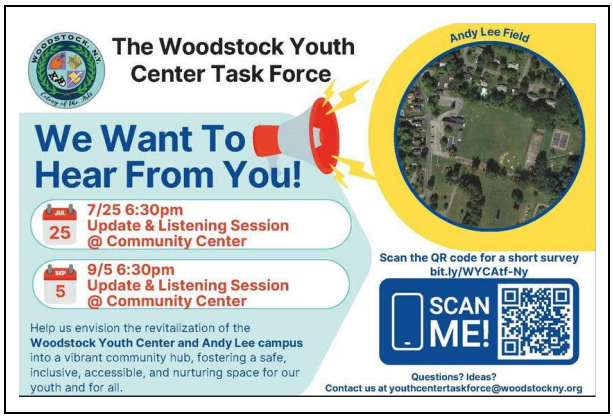
Woodstock Youth Center



Woodstock Environmental Commission initiated an assessment of the Woodstock Youth Center in 2020 to identify issues of energy efficiency, indoor air quality, and problems such as moisture incursion, etc., and to solicit recommendations that would allow the building to continue to be used by the Town, A final report was delivered in July 2021.

Citizens for Local Power (CLP) sponsored the energy and efficiency audit of the Youth Center under the auspices of CLP's Green Jobs Internship program. Judith A Karpova, home energy specialist, and a group of interns performed the audit during three site visits to the Youth Center in June 2021.

In 2023, the Town Board established a Youth Center Capital Fund with an initial $100,000 allocation from the General Fund Unassigned Fund Balance. At its May 23, 2023 meeting, the Town Board transferred $200,000 from the General Fund Unassigned Fund Balance to the Youth Center Building Capital Fund, .094, and invited interested residents to participate in a task force to develop a proposal. The youth center task force began meeting in January 2024.



Youth Center CO2 Emissions – 2030 Forecast

The youth center currently uses about 11,000 kWh of carbon-free, hydroelectric power, sourced from the Natural Power Group's Wallkill power plant, and over 1,800 gallons of propane for heating.

The expected renovation will replace the propane heating system with air-sourced heat pumps, with an expected increase in electric power consumption. By 2030, the renovated youth center is forecasted to use 30,000 kWh of carbon-free, hydroelectric power. All fossil fuels will be removed from the site.

Other Miscellaneous Facilities

There are a variety of other miscellaneous facilities, such as storage sheds, community restrooms, water and sewer pumps, and ball fields that will continue to use energy without any significant change from 2023 totals. As the state makes progress on meeting the Climate Law's zero-emission electricity by 2040, the facilities attached to the electrical grid are expected to follow the 2030 eGRID emission rate of 122.7 lbs CO2/MWh.

Woodstock Lighting Districts

By 2019 through normal maintenance, approximately 20% of the Lighting District's fixtures had been replaced with LEDs reducing usage by about 10,000 kWh. The use of LEDs and the reduction in CO2e emissions in the grid electric supply contributed to the drop in GHG emissions attributed to municipal streetlighting. The expenditures identified under Scope 2 include the rental fees for fixtures and poles.

Woodstock Lighting Districts CO2 Emissions – 2030 Forecast

By 2023, all of street lighting fixtures had been converted to LEDs, reducing electrical usage to 24,000 kWh. The district electricity is supplied from the grid, and by 2030, grid electricity emissions is set at 122.7 lbs CO2/MWh.

Town of Woodstock
Local Government Operations Protocol
Using eGRID2019 for Scope 2 GHG Emissions
Sector:Lighting Districts

			2011						2019					
			Expenditures	Volume	Metric Tons CO2e equivalent	Metric Tons CO2	Methane Kgm	Nitrous Oxide Kgm	Expenditures	Volume	Metric Tons CO2e equivalent	Metric Tons CO2	Methane Kgm	Nitrous Oxide Kgm
Scope 1	Stationary Combustion	Fuel Oil (gals)			0.0	0.0	0.0000	0.0000			0.0	0.0	0.0000	0.0000
		Propane (gals)			0.0	0.0	0.0000	0.0000			0.0	0.0	0.0000	0.0000
	Mobile Combustion	Gasoline (gals)			0.0						0.0			
		Diesel Fuel (gals)			0.0						0.0			
		Kerosene (gals)			0.0						0.0			
Scope 2	Grid Electricity (kWh)			70,014	15.9	15.8	0.5176	0.2198		59,759	6.3	6.3	0.4712	0.0554
	Hydro Electricity (kWh)													
	Sum of Scope 2 (Electricity) Σ		$23,938	70,014	15.9	15.8	0.5176	0.2198	$29,749	59,759	6.3	6.3	0.4712	0.0554
Total by Year Σ			$23,938		15.9	15.8	0.5176	0.2198	$29,749		6.3	6.3	0.4712	0.0554

Woodstock Water District

The two water district buildings house water treatment equipment for the well pumps. The pumps are heavy users of electricity and benefited from the reduction of emissions in the electricity supply in the period from 2011 to 2019.

Water District CO2 Emissions – 2030 Forecast

Electricity, estimated at 100,000 kWh, used by the water district pump houses and water wells is now zero-carbon, hydroelectric power provided by the Natural Power Group. In 2030, 150 gallons of propane is allocated for the back-up generator maintenance and testing.

Woodstock Water District
CO2 Emissions and Expenditures
2011 and 2019

			2011					2019				
			Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons	Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons
Water District Totals	Pump House #1	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons	$349.83	152	1,933	0.877		$32.07	28	351	0.159	
		Electricity, Total kWh	$21,303.27	66,529	33,131	15.028		$16,860.65	64,389	16,297	7.392	
		Electricity Source: Electricity Grid kWh		66,529					64,389	16,297		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$21,653.10			15.905		$16,892.72			7.551	
	Pump House #2	#2 Fuel Oil, Gallons		0	0	0.000				0	0.000	
		Propane, Gallons		0	0	0.000				0	0.000	
		Electricity, Total kWh		69,812	34,766	15.770			46,077	11,662	5.290	
		Electricity Source: Electricity Grid kWh		69,812					46,077	11,662		
		Electricity Source: Hydroelectric kWh								0		
		Department Total	$0.00			15.770		$0.00			5.290	
	Sum of Water Department Totals	Σ #2 Fuel Oil, Gallons	0	0	0	0.000		0.0		0	0.000	
		Propane, Gallons	$349.83	152	1,933	0.877		$32.07		0	0.159	
		Electricity, Total kWh	$21,303.27		0	30.798		$16,860.65		0	12.682	
		Electricity Source: Electricity Grid kWh	0	0		0.000		0	0	0	0.000	
		Electricity Source: Hydroelectric kWh	0			0.000		0		0	0.000	
		Department Total	$21,653.10			31.675	31.675	$16,892.72			12.841	12.841

Waste Water Treatment Facility

The waste water treatment facility is a heavy user of electricity and benefited from the reduction of emissions in the electricity supply in the period from 2011 to 2019. All external lighting and most internal lights were replaced with LED fixtures.

Waste Water Treatment Facility CO2 Emissions – 2030 Forecast

About 1,400 gallons of heating fuel oil is used at the waste water treatment facility, but the heating system will be replaced by an air-sourced heat pump for heating and air conditioning in 2024. Electricity, estimated at 230,000 kWh, used by the waste water treatment facility is now zero-carbon, hydroelectric power provided by the Natural Power Group.

By 2030, because of the use of air-sourced heat pumps will increase electricity consumption to 250,000 kWh/year. In 2030, 150 gallons of propane is allocated for the back-up generator maintenance and testing.

Waste Water Treatment Facility
CO2 Emissions and Expenditures
2011 and 2019

		2011					2019				
		Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons	Expense (Actual)	Quantity	CO2 Lbs	CO2 Metric Tons	Facility Metric Tons
Waste Water Treatment Facility	#2 Fuel Oil, Gallons	$5,185.90	1,613	36,121	16.384		$3,046.96	1,430	32,039	14.533	
	Propane, Gallons		0	0	0.000				0	0.000	
	Electricity, Total kWh	$23,111.72	241,400	120,217	54.530		$22,665.33	236,360	59,823	27.135	
	Electricity Source: Electricity Grid kWh		241,400					236,360	59,823		
	Electricity Source: Hydroelectric kWh								0		
	Department Total	$28,297.62			70.914	70.914	$25,712.29			41.668	41.668

Summary: GHG Emissions
Woodstock Government Facilities
2030 Goals and Targets

Summary by Sector

The table below shows that Woodstock can achieve an 88.5% reduction in GHG emissions by 2030, compared with 2011, for government buildings and facilities. Another table shows the changes in fuel usage. Fuel oil for heating has essentially been eliminated, the use of propane remains about the same, and in Scope 2, there's been a massive switch from grid supplied electricity to zero-carbon, hydroelectric power.

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Summary of Government Facility GHG Reductions
Fiscal Year 2011 and 2030 Projections

	Metric Tons, CO2e			
	Base Year 2011	Forecast Year 2030	Difference	Percent Reduction
Buildings & Other Facilities	112.9	23.7	89.2	79.0%
Water District	32.2	0.8	31.3	97.4%
Waste Water Treatment Facility	71.6	0.8	70.8	98.8%
Lighting Districts	15.9	1.3	14.6	91.6%
Woodstock Facilities Totals	232.6	26.7	205.8	88.5%

Woodstock Government Facilities
Details by Sector

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Government Buildings and Other Facilities
Fiscal Years: 2011, and 2030 Forecast

				2011		2030	
				Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons
Buildings & Other Facilities	Scope 1	Stationary Combustion	Fuel Oil (gals)	5,154	52.9	0	0.0
			Propane (gals)	3,912	22.1	4,050	22.9
	Scope 2	Grid Electricity (kWh)		166,783	37.9	15,200	0.8
		Hydro Electricity (kWh)		0		464,000	
		Sum of Scope 2 (Electricity)		166,783		479,200	
	Total GHG for Year				112.9		23.7
Water District	Scope 1	Stationary Combustion	Propane (gals)	152	0.9	150	0.8
	Scope 2	Grid Electricity (kWh)		137,979	31.3		
		Hydro Electricity (kWh)				100,000	
		Sum of Scope 2 (Electricity)		137,979		100,000	
	Total GHG for Year				32.2		0.8
Waste Water Treatment Facility	Scope 1	Stationary Combustion	Fuel Oil (gals)	1,613	16.6		
			Propane (gals)			150	0.8
	Scope 2	Grid Electricity (kWh)		242,634	55.1		
		Hydro Electricity (kWh)				250,000	
		Sum of Scope 2 (Electricity)		242,634		250,000	
	Total GHG for Year				71.6		0.8
Lighting Districts	Scope 2	Grid Electricity (kWh)		70,014	15.9	24,000	1.3
		Sum of Scope 2 (Electricity)		70,014		24,000	
	Total GHG for Year				15.9		1.3

Woodstock Government Facilities
Details by Fuel Type

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Government Buildings and Other Facilities
Fiscal Years: 2011, and 2030 Forecast

				Volume		CO2e equilvant Metric Tons	
				2011	2030	2011	2030
Scope 1	Stationary Combustion	Fuel Oil (gals)	Buildings & Other Facilities	5,154	0	52.9	0.0
			Waste Water Treatment Facility	1,613		16.6	
		Propane (gals)	Buildings & Other Facilities	3,912	4,050	22.1	22.9
			Water District	152	150	0.9	0.8
			Waste Water Treatment Facility		150		0.8
Scope 2	Grid Electricity (kWh)		Buildings & Other Facilities	166,783	15,200	37.9	0.8
			Water District	137,979		31.3	
			Waste Water Treatment Facility	242,634		55.1	
			Lighting Districts	70,014	24,000	15.9	1.3
	Hydro Electricity (kWh)		Buildings & Other Facilities	0	464,000		
			Water District		100,000		
			Waste Water Treatment Facility		250,000		
	Sum of Scope 2 (Electricity)		Buildings & Other Facilities	166,783	479,200		
			Water District	137,979	100,000		
			Waste Water Treatment Facility	242,634	250,000		
			Lighting Districts	70,014	24,000		
Total GHG for Year			Buildings & Other Facilities			112.9	23.7
			Water District			32.2	0.8
			Waste Water Treatment Facility			71.6	0.8
			Lighting Districts			15.9	1.3

Summary: GHG Emissions Woodstock Government Vehicles 2030 Goals and Targets

It's expected that by 2030, the town will be able to reduce GHG emissions from government vehicles by 37%, compared to the baseline year of 2011.

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Summary of Government Vehicle GHG Reductions
Fiscal Year 2011 and 2030 Projections

	Metric Tons, CO2e			
	Base Year 2011	Forecast Year 2030	Difference	Percent Reduction
Vehicles	452.1	284.9	167.3	37.0%

Gasoline Vehicles

The town has a fleet of gasoline fueled light trucks and police vehicles, and it's expected that by 2030, much of the town's fleet will be replaced with hybrid electric, battery electric, and ICE vehicles with improved gasoline milage. These replacements will result in a 25% reduction in the consumption of gasoline by 2030, compared with usage in 2023.

Diesel Vehicles

Diesel and other heavy-duty vehicles are used mostly by the highway department. The town budgets for over 24,000 gallons of Diesel fuel a year, but last year, because of lack of snow, only 16,000 gallons of Diesel were consumed. One side effect of climate change is more rain, but reduced snowfall. For the purpose of this action plan, it's assumed that reduced snowfall will constrain the use of Diesel fuel, and that the Diesel usage in 2023 reflects continuing weather patterns in 2030.

Town of Woodstock
Governmental GHG Inventories
Local Government Operations Protocol
Fiscal Years: 2011, 2023, and 2030 Projections
Government Vehicles

			2011		2023		2030	
			Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons	Volume	CO2e equilvant Metric Tons
Scope 1	Mobile Combustion	Gasoline (gals)	23,150	203.3	20,906	183.6	15,000	131.7
		Diesel Fuel (gals)	23,500	239.9	16,553	169.0	15,000	153.2
		Kerosene (gals)	882	9.0				
Total GHG for Year				452.1		352.6		284.9