

# TOWN OF WOODSTOCK

## CLIMATE SMART TASK FORCE

Erin Moran, Coordinator  
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Application for 5 Points

January 17, 2021

### PE10 Action: GHG Tracking system

5 Points

The Woodstock GHG Tracking Report is updated for the quantities of fossil fuels and electricity used in 2019 for governmental operations. This report also reflects the March 2020 update to the eGRID emission factors. Beginning with 2011, the tracking report provides a consistent and accurate year-by-year assessment of Woodstock's government carbon footprint.

## Woodstock GHG Tracking System 2019 Recalibrated

In 2007, the Woodstock town board committed that town governmental operations would be carbon neutral by year-end 2017. The town achieved carbon neutrality in 2015 and was recognized for its accomplishment at the 2017 annual meeting of the New York State Association of Conservation Commissions. Woodstock began systematically tracking its carbon emissions in 2011 using a four part process, which is briefly discussed below.

- 1) Woodstock's GHG tracking system is based on energy use and cost data collected for the town's yearly financial report to the Office of the NY State Comptroller. The energy consumption and cost report documents all of Woodstock's Scope 1 and Scope 2 GHG sources.
- 2) Carbon emissions for fossil fuels are calculated using the protocol and default emission coefficients published by the California Air Resources Board, "Local Government Operations Protocol for the Quantification and Reporting of Greenhouse Gas Emissions Inventories," Version 1.1, May 2010.
- 3) Carbon emissions from the town's electrical usage are calculated using the EPA's Power Profiler and emission values from eGRID for the Upper New York Region, adjusted for the contribution of local hydroelectric generation. The eGRID reports contain the GHG emissions for grid generated electricity. There's no need to calculate CO<sub>2</sub>e for electricity because it's included in eGRID.
- 4) A Quantrix model is used to summarize the town's carbon dioxide emissions, measured in metric tons. An Excel spreadsheet is used for graphics. (The graphics in this are based on the original estimates for CO<sub>2</sub>, and will be upgraded to full LGOP compliance when the 2020 usage data becomes available.)

## 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," is an exhibit that has been included since 2008. Below are the tables beginning with 2011 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.

TOWN OF Woodstock Energy Costs and Consumption For the Fiscal Year Ending 2019				
Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$39,991	20,390	gallons	
Diesel Fuel	\$49,396	23,555	gallons	
Fuel Oil	\$5,985	2,814	gallons	
Natural Gas			cubic feet	
Electricity	\$121,884	808,484	kilowatt-hours	
Coal			tons	
Propane	\$5,870	4,786	gallons	

TOWN OF Woodstock Energy Costs and Consumption For the Fiscal Year Ending 2018				
Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$44,011	20,800	gallons	
Diesel Fuel	\$56,938	24,845	gallons	
Fuel Oil	\$6,187	2,762	gallons	
Natural Gas			cubic feet	
Electricity	\$123,529	823,883	kilowatt-hours	
Coal			tons	
Propane	\$8,696	5,825	gallons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2017

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$35,654	19,988	gallons	
Diesel Fuel	\$39,943	22,520	gallons	
Fuel Oil	\$5,199	2,500	gallons	
Natural Gas			cubic feet	
Electricity	\$111,186	764,419	kilowatt-hours	
Coal			tons	
Propane	\$6,243	4,915	gallons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2016

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$32,539	20,724	gallons	
Diesel Fuel	\$33,873	22,193	gallons	
Fuel Oil	\$4,231	2,454	gallons	
Natural Gas			cubic feet	
Electricity	\$110,398	732,875	kilowatt-hours	
Coal			tons	
Propane	\$4,296	4,808	gallons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2015

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$36,118	19,780	gallons	
Diesel Fuel	\$46,018	23,891	gallons	
Fuel Oil	\$6,040	2,631	gallons	
Natural Gas			cubic feet	
Electricity	\$121,430	747,877	kilowatt-hours	
Coal			tons	
Propane	\$5,465	5,592	gallons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2014

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$56,043	20,031	gallons	
Diesel Fuel	\$76,735	23,739	gallons	
Fuel Oil	\$12,610	3,504	gallons	
Natural Gas	\$10,557	5,733	<del>cubic feet</del>	gallons LP gas
Electricity	\$131,042	724,325	kilowatt-hours	
Coal			tons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2013

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$61,075	20,576	gallons	
Diesel Fuel	\$78,773	23,176	gallons	
Fuel Oil	\$15,723	5,024	gallons	
Natural Gas			cubic feet	
Electricity	\$113,179	729,123	kilowatt-hours	
Coal			tons	

TOWN OF Woodstock  
Energy Costs and Consumption  
For the Fiscal Year Ending 2012

Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$67,263	21,786	gallons	
Diesel Fuel	\$76,973	22,258	gallons	
Fuel Oil	\$16,389	4,691	gallons	
Natural Gas			cubic feet	
Electricity	\$108,017	639,570	kilowatts	
Coal			tons	

TOWN OF Woodstock Energy Costs and Consumption For the Fiscal Year Ending 2011				
Energy Type	Total Expenditures	Total Volume	Units Of Measure	Alternative Units Of Measure
Gasoline	\$70,666	23,150	gallons	
Diesel Fuel	\$80,595	23,500	gallons	
Fuel Oil	\$21,750	6,767	gallons	
Natural Gas			cubic feet	
Electricity	\$100,499	617,410	kilowatts	
Coal			tons	

## Fossil Fuel Emissions

Fossil fuel emissions are calculated using the protocol described in LGOP and the default emission factors from Appendix G of LGOP. The details of the methodology used by Woodstock are explained in Pledge Element 2, PE2 Government Operations GHG Emissions.

### Appendix G Default Emissions Factors Local Government Operations Protocol

		Emission Factor kg CO <sub>2</sub> /Gallon	Methane kg/gallon	Nitrous Oxide kg/gallon
Stationary Combustion	Distillate Fuel Oil #2 (Heating Fuel)	10.21	0.0015	0.0001
	Propane	5.59	0.0001	0.0001
Mobile Combustion	Gasoline	8.78		
	Distillate Fuel Oil #2 (Diesel)	10.21		
	Kerosene	10.15		
GWP		1	21	310

# Fossil Fuels GHG Emissions

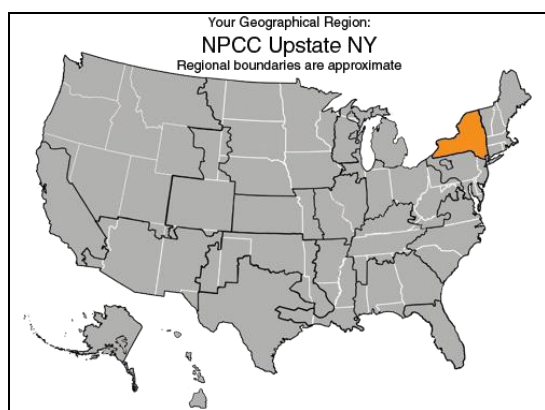
				Expenditures	Volume	Metric Tons CO2e equivalent	Metric Tons CO2	Methane Kgm	Nitrous Oxide Kgm	Unit Price
2011	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$21,750	6,767	69.5	69.1	10.1505	0.6767	\$3.214
			Propane (gals)	\$9,341	4,064	22.9	22.7	0.5689	0.4064	\$2.299
		Mobile Combustion	Gasoline (gals)	\$70,666	23,150	203.3	203.3			\$3.053
			Diesel Fuel (gals)	\$80,595	23,500	239.9	239.9			\$3.430
			Kerosene (gals)	\$4,910	882	8.9	8.9			\$5.570
2012	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$16,389	4,691	48.2	47.9	7.0365	0.4691	\$3.494
			Propane (gals)	\$6,326	3,283	18.5	18.4	0.4596	0.3283	\$1.927
		Mobile Combustion	Gasoline (gals)	\$67,263	21,786	191.3	191.3			\$3.087
			Diesel Fuel (gals)	\$76,973	22,258	227.3	227.3			\$3.458
			Kerosene (gals)	\$2,552	359	3.6	3.6			\$7.115
2013	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$15,723	5,024	51.6	51.3	7.5360	0.5024	\$3.130
			Propane (gals)	\$6,934	4,704	26.5	26.3	0.6586	0.4704	\$1.474
		Mobile Combustion	Gasoline (gals)	\$61,075	20,576	180.7	180.7			\$2.968
			Diesel Fuel (gals)	\$78,773	23,176	236.6	236.6			\$3.399
			Kerosene (gals)			0.0	0.0			#DIV/0!
2014	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$12,610	3,504	36.0	35.8	5.2560	0.3504	\$3.599
			Propane (gals)	\$10,557	5,733	32.2	32.0	0.8027	0.5733	\$1.841
		Mobile Combustion	Gasoline (gals)	\$56,043	20,031	175.9	175.9			\$2.798
			Diesel Fuel (gals)	\$76,735	23,739	242.4	242.4			\$3.232
			Kerosene (gals)			0.0	0.0			#DIV/0!
2015	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$6,040	2,631	27.0	26.9	3.9465	0.2631	\$2.296
			Propane (gals)	\$5,465	5,592	31.4	31.3	0.7829	0.5592	\$0.977
		Mobile Combustion	Gasoline (gals)	\$36,118	19,780	173.7	173.7			\$1.826
			Diesel Fuel (gals)	\$46,016	23,891	243.9	243.9			\$1.926
			Kerosene (gals)			0.0	0.0			#DIV/0!
2016	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$4,231	2,454	25.2	25.1	3.6810	0.2454	\$1.724
			Propane (gals)	\$4,296	4,808	27.0	26.9	0.6731	0.4808	\$0.894
		Mobile Combustion	Gasoline (gals)	\$32,539	20,724	182.0	182.0			\$1.570
			Diesel Fuel (gals)	\$33,873	22,193	226.6	226.6			\$1.526
			Kerosene (gals)			0.0	0.0			#DIV/0!
2017	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$5,199	2,500	25.7	25.5	3.7500	0.2500	\$2.080
			Propane (gals)	\$6,243	4,915	27.6	27.5	0.6881	0.4915	\$1.270
		Mobile Combustion	Gasoline (gals)	\$35,654	19,988	175.5	175.5			\$1.784
			Diesel Fuel (gals)	\$39,943	22,520	229.9	229.9			\$1.774
			Kerosene (gals)			0.0	0.0			#DIV/0!



## Fossil Fuels GHG Emissions (Continued)

				Expenditures	Volume	Metric Tons CO2e equivalent	Metric Tons CO2	Methane Kgm	Nitrous Oxide Kgm	Unit Price
2018	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$6,187	2,762	28.4	28.2	4.1430	0.2762	\$2.240
			Propane (gals)	\$8,690	5,825	32.8	32.6	0.8155	0.5825	\$1.492
		Mobile Combustion	Gasoline (gals)	\$44,011	20,800	182.6	182.6			\$2.116
			Diesel Fuel (gals)	\$56,938	24,845	253.7	253.7			\$2.292
			Kerosene (gals)			0.0	0.0			#DIV/0!
2019	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$5,985	2,814	28.9	28.7	4.2212	0.2814	\$2.127
			Propane (gals)	\$5,870	4,786	26.9	26.8	0.6701	0.4786	\$1.226
		Mobile Combustion	Gasoline (gals)	\$39,991	20,390	179.0	179.0			\$1.961
			Diesel Fuel (gals)	\$49,396	23,555	240.5	240.5			\$2.097
			Kerosene (gals)			0.0	0.0			#DIV/0!
2020	Scope 1	Stationary Combustion	Fuel Oil (gals)			0.0	0.0	0.0000	0.0000	#DIV/0!
			Propane (gals)			0.0	0.0	0.0000	0.0000	#DIV/0!
		Mobile Combustion	Gasoline (gals)			0.0	0.0			#DIV/0!
			Diesel Fuel (gals)			0.0	0.0			#DIV/0!
			Kerosene (gals)			0.0	0.0			#DIV/0!

## GHG Emissions from Electric Generation



The EPA's Emissions & Generation Resource Integrated Database (eGRID) documents carbon dioxide, methane, nitrogen oxides, sulfur dioxide, and nitrous oxide emissions from electric generation by geographic region.<sup>1</sup> Upstate New York is one of the regions tracked in eGRID. By Googling 'EPA Power Profiler' and entering a ZIP code, the carbon dioxide emissions and fuel composition of power in any geographic region can be found.

<sup>1</sup> Environmental Protection Agency, "Emissions & Generation Resource Integrated Database (eGRID)", Available at <https://www.epa.gov/energy/emissions-generation-resource-integrated-database-egrid>

## eGRID Naming Conventions and Release Dates

Previous Naming Convention	Current Naming Convention	Data Year(s)	Edition	Release Date(s)
eGRID96	eGRID1996	1996	First	12/1/1998
eGRID97	eGRID1997	1996-1997	Second	12/1/1999
eGRID2000	eGRID1998	1996-1998	Third	3/1/2001 9/1/2001
eGRID2002	eGRID1999 eGRID2000	1996-2000	Fourth	v1- 12/2002 v2- 4/2003 v2.01- 5/2003
eGRID2006	eGRID2004	2004	Fifth	v1- 12/21/2006 v2- 4/2007 v2.1- 5/2007
eGRID2007	eGRID2005	2005	Sixth	v1- 10/16/2008 v1.1- 1/2009
eGRID2010	eGRID2007	2007	Seventh	2/23/2011
eGRID2012	eGRID2009	2009	Eighth	5/10/2012
eGRID2014	eGRID2010	2010	Ninth	2/24/2014
	eGRID2012	2012	Tenth	10/8/2015
	eGRID2014	2014	Eleventh	v1- 1/13/2017 v2- 2/27/2017
	eGRID2016	2016	Twelfth	2/15/2018
	eGRID2018	2018	Thirteenth	1/28/2020 v2 - 3/9/2020

## eGRID Database – Upstate New York

The eGRID database is periodically updated to account for changes in the generation profile and fuel sources. Carbon Dioxide emissions in upstate NY have been declining with the retirements of coal-fired power plants. Because of substantial hydroelectric and nuclear resources, EPA's Upstate NY sub-region has the lowest level of emissions in the country from electric generation.

Fiscal Year	eGRID Version	eGRID Release	Upstate NY CO <sub>2</sub> lbs./MWh <sup>2</sup>
2019	eGRID2018 Version 2	9-Mar-20	<b>253.1</b>
2018	eGRID2016	15-Feb-18	<b>294.1</b>

<sup>2</sup> Environmental Protection Agency, "Power Profiler," Available at <https://www.epa.gov/energy/power-profiler/>



# PE10 – Woodstock GHG Emissions Tracking System

2017	eGRID2014 version 2	27-Feb-17	<b>366</b>
2016	eGRID2014	13-Jan-17	<b>377</b>
2015	eGRID2012	8-Oct-15	<b>409</b>
2014	eGRID2010	24-Feb-14	<b>546</b>
2013	eGRID2009	10-May-12	<b>498</b>
2012	eGRID2009	10-May-12	<b>498</b>
2011	eGRID2009	10-May-12	<b>498</b>

## eGRID Emissions by Version

	CO2 lbs/MWh	Methane lbs/GWh	Nitrous Oxide lbs/GWH	CO2e lbs/MWh	Fiscal Year
eGRID2018	253.1	18.0	2.0	253.9	2019
eGRID2016	294.7	21.0	3.0	295.9	2018
eGRID2014V2	365.7	30.7	4.1	367.6	2017
eGRID2014	377.2	32.3	4.4	379.2	2016
eGRID2012	408.80	15.59	3.83	410.31	2015
eGRID2010	545.79	16.30	7.24	548.37	2014
eGRID2009	497.92	15.94	6.77	500.35	2013
eGRID2009 1	497.92	15.94	6.77	500.35	2012
eGRID2009 2	497.92	15.94	6.77	500.35	2011

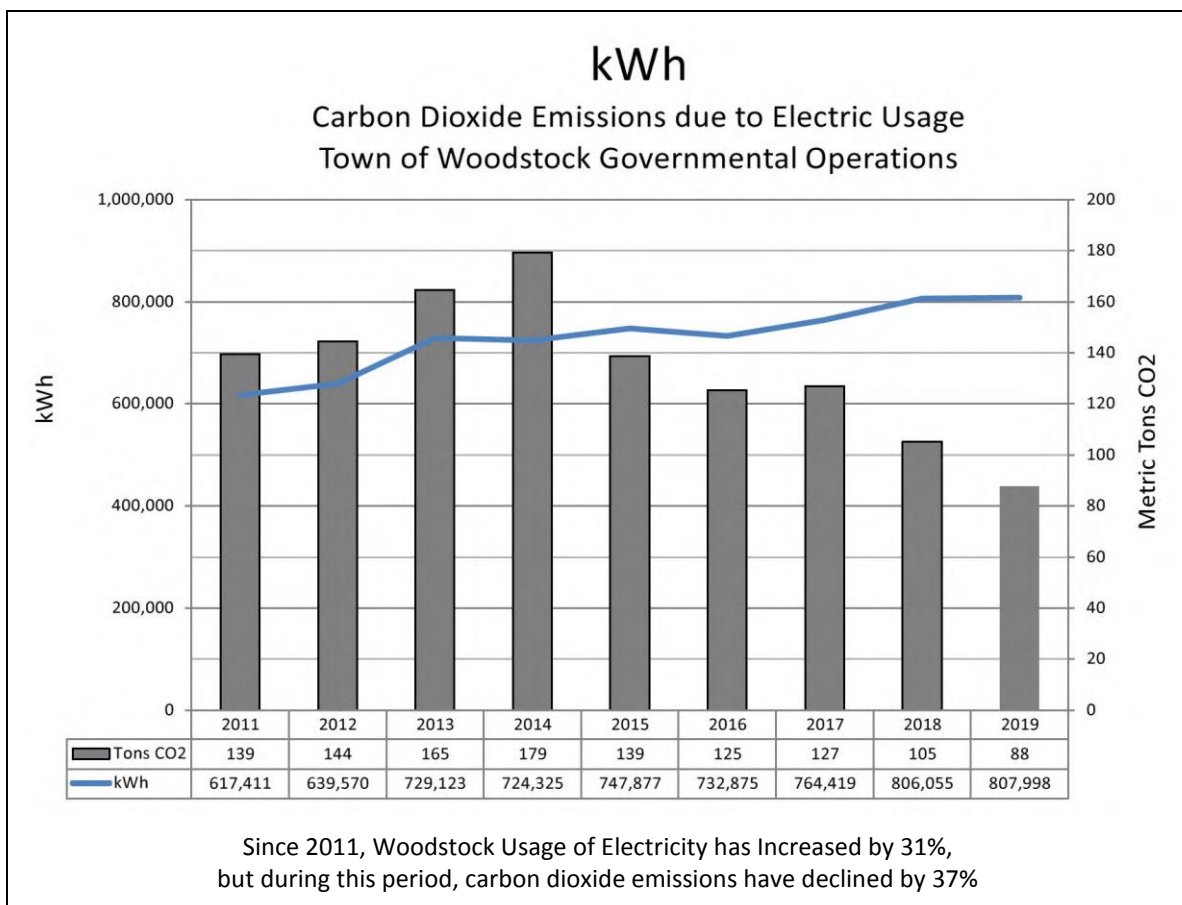
## GHG Emissions due to Electricity

			Expenditures	Volume	Metric Tons CO <sub>2</sub> e equivalent	Metric Tons CO <sub>2</sub>	Methane Kgm	Nitrous Oxide Kgm
2011	Scope 2	Grid Electricity (kWh)	\$100,499	617,410	140.1	139.4	4.5645	1.9386
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$100,499	617,410	140.1	139.4	4.5645	1.9386
2012	Scope 2	Grid Electricity (kWh)		639,570	145.2	144.4	4.7283	2.0082
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$108,017	639,570	145.2	144.4	4.7283	2.0082
2013	Scope 2	Grid Electricity (kWh)		729,123	165.5	164.7	5.3904	2.2894
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$113,179	729,123	165.5	164.7	5.3904	2.2894
2014	Scope 2	Grid Electricity (kWh)		724,325	180.2	179.3	5.4759	2.4322
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$131,042	724,325	180.2	179.3	5.4759	2.4322
2015	Scope 2	Grid Electricity (kWh)		747,877	139.2	138.7	5.4076	1.3285
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$121,430	747,877	139.2	138.7	5.4076	1.3285
2016	Scope 2	Grid Electricity (kWh)		732,875	126.1	125.4	10.9800	1.4847
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$110,398	732,875	126.1	125.4	10.9800	1.4847
2017	Scope 2	Grid Electricity (kWh)		764,419	127.5	126.8	10.8843	1.4536
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ	\$111,186	764,419	127.5	126.8	10.8843	1.4536
2018	Scope 2	Grid Electricity (kWh)		805,383	108.1	107.6	7.8443	1.1206
		Hydro Electricity (kWh)		18,500	0.0	0.0	0.0000	0.0000
		Sum of Scope 2 (Electricity) Σ	\$123,529	823,883	108.1	107.6	7.8443	1.1206
2019	Scope 2	Grid Electricity (kWh)		764,484	88.0	87.8	6.3822	0.7091
		Hydro Electricity (kWh)		44,000	0.0	0.0		
		Sum of Scope 2 (Electricity) Σ	\$121,184	808,484	88.0	87.8	6.3822	0.7091
2020	Scope 2	Grid Electricity (kWh)			0.0	0.0	0.0000	
		Hydro Electricity (kWh)						
		Sum of Scope 2 (Electricity) Σ		0	0.0	0.0	0.0000	0.0000

## Woodstock Carbon Dioxide Emissions due to Electricity

Since 2011, the town's electrical usage for governmental operations has grown by 31%, and during this period, carbon dioxide emissions attributable to electrify have dropped by about 37%. Woodstock's increase in electricity usage has been driven by geothermal and air-sourced heat pumps used for heating and cooling the town's buildings. After the renovation of the town offices on Comeau, usage is expected to reach 900,000 kWh by 2021.

Closing of upstate coal-fired generators and the town's contracts for hydroelectric power from the Natural Power Group, a local operator of hydroelectric generators, has reduced the town's carbon dioxide emissions attributed to electricity. It is expected carbon dioxide emissions due to electricity will be substantially eliminated in 2021.



## Adjustments for Zero-Carbon Hydroelectric Power

In 2018, the Woodstock Town Board signed contracts with the Natural Power Group (NPG) 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. It's expected that carbon dioxide emissions from town governmental operations will drop to a level 30% below 2011 by 2021.

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 electricity usage.

The table below summarizes the usage, source, and carbon dioxide emissions for Woodstock's electric supply.

kWh		2018	2019	2020 (est)
Woodstock Usage		823,883	808,484	810,000
Wallkill Hydro	(Note 1)	18,500	44,000	70,000
Wappinger Falls Hydro	(Note 2)			678,000
Total Hydroelectric		18,500	44,000	748,000
Central Hudson (Grid)	(Note 3)	805,383	764,484	62,000
Metric Tons CO2	(Note 4)	108	88	7

**Note 1:** Only six months of the contracted 37,000 kWh was delivered in 2018. Credit for the full 44,000 kWh contracted amount was received in 2019. To cover usage by the EV charging station at the Rock City Rd Restrooms in 2020, the town increased its Wallkill subscription to 70,000 kWh.

**Note 2:** Because of a rupture in the penstock at Wappingers Falls, no power was delivered in 2019.

**Note 3:** Amount of electricity sourced from the grid after deducting hydroelectric power.

**Note 4:** Hydroelectric power has zero carbon dioxide content. Power sourced from the grid in 2018 had a carbon dioxide content of 294.7 lbs./MWh, based on EPA's upstate New York region eGRID2016. In 2019, power sourced from the grid had a carbon dioxide content of 253.1 lbs./MWh.

Woodstock does not purchase "green power," "renewable power," or "renewable energy certificates" from an electric utility or an independent power provider. The contract with Natural Power Group is for kWh of hydroelectric generation. Because of their age, the hydroelectric plants do not qualify as renewable generators.

## Woodstock Total GHG Emissions

				Expenditures	Volume	Metric Tons CO2e equivalent	Metric Tons CO2	Methane Kgm	Nitrous Oxide Kgm	
2011	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$21,750	6,767	69.5	69.1	10.1505	0.6767	
			Propane (gals)	\$9,341	4,064	22.9	22.7	0.5689	0.4064	
		Mobile Combustion	Gasoline (gals)	\$70,666	23,150	203.3	203.3			
			Diesel Fuel (gals)	\$80,595	23,500	239.9	239.9			
			Kerosene (gals)	\$4,910	882	8.9	8.9			
	Scope 2	Grid Electricity (kWh)			\$100,499	617,410	140.1	139.4	4.5645	1.9386
		Hydro Electricity (kWh)								
		Sum of Scope 2 (Electricity) $\Sigma$			\$100,499	617,410	140.1	139.4	4.5645	1.9386
Total by Year $\Sigma$			\$287,762		684.6	683.4	15.2839	3.0217		
2012	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$16,389	4,691	48.2	47.9	7.0365	0.4691	
			Propane (gals)	\$6,326	3,283	18.5	18.4	0.4596	0.3283	
		Mobile Combustion	Gasoline (gals)	\$67,263	21,786	191.3	191.3			
			Diesel Fuel (gals)	\$76,973	22,258	227.3	227.3			
			Kerosene (gals)	\$2,552	359	3.6	3.6			
	Scope 2	Grid Electricity (kWh)				639,570	145.2	144.4	4.7283	2.0082
		Hydro Electricity (kWh)								
		Sum of Scope 2 (Electricity) $\Sigma$			\$108,017	639,570	145.2	144.4	4.7283	2.0082
Total by Year $\Sigma$			\$277,520		634.0	632.9	12.2244	2.8056		
2013	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$15,723	5,024	51.6	51.3	7.5360	0.5024	
			Propane (gals)	\$6,934	4,704	26.5	26.3	0.6586	0.4704	
		Mobile Combustion	Gasoline (gals)	\$61,075	20,576	180.7	180.7			
			Diesel Fuel (gals)	\$78,773	23,176	236.6	236.6			
			Kerosene (gals)			0.0	0.0			
	Scope 2	Grid Electricity (kWh)				729,123	165.5	164.7	5.3904	2.2894
		Hydro Electricity (kWh)								
		Sum of Scope 2 (Electricity) $\Sigma$			\$113,179	729,123	165.5	164.7	5.3904	2.2894
Total by Year $\Sigma$			\$275,684		660.8	659.5	13.5849	3.2622		
2014	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$12,610	3,504	36.0	35.8	5.2560	0.3504	
			Propane (gals)	\$10,557	5,733	32.2	32.0	0.8027	0.5733	
		Mobile Combustion	Gasoline (gals)	\$56,043	20,031	175.9	175.9			
			Diesel Fuel (gals)	\$76,735	23,739	242.4	242.4			
			Kerosene (gals)			0.0	0.0			
	Scope 2	Grid Electricity (kWh)				724,325	180.2	179.3	5.4759	2.4322
		Hydro Electricity (kWh)								
		Sum of Scope 2 (Electricity) $\Sigma$			\$131,042	724,325	180.2	179.3	5.4759	2.4322
Total by Year $\Sigma$			\$286,987		666.7	665.4	11.5345	3.3559		

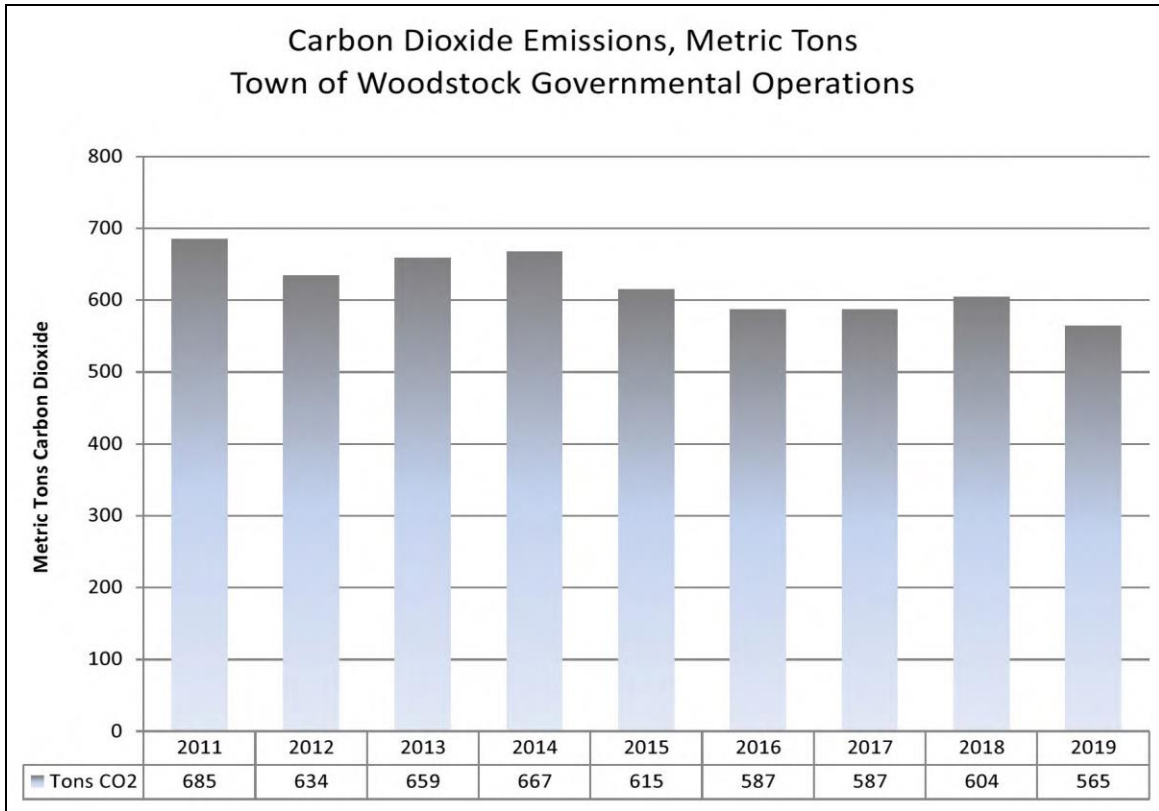
## Woodstock Total GHG Emissions (Continued)

				Expenditures	Volume	Metric Tons CO <sub>2</sub> e equivalent	Metric Tons CO <sub>2</sub>	Methane Kgm	Nitrous Oxide Kgm
2015	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$6,040	2,631	27.0	26.9	3.9465	0.2631
			Propane (gals)	\$5,465	5,592	31.4	31.3	0.7829	0.5592
		Mobile Combustion	Gasoline (gals)	\$36,118	19,780	173.7	173.7		
			Diesel Fuel (gals)	\$46,016	23,891	243.9	243.9		
			Kerosene (gals)			0.0	0.0		
	Scope 2	Grid Electricity (kWh)			747,877	139.2	138.7	5.4076	1.3285
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		Σ \$121,430	747,877	139.2	138.7	5.4076	1.3285
		Total by Year		Σ \$215,069		615.3	614.4	10.1370	2.1508
2016	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$4,231	2,454	25.2	25.1	3.6810	0.2454
			Propane (gals)	\$4,296	4,808	27.0	26.9	0.6731	0.4808
		Mobile Combustion	Gasoline (gals)	\$32,539	20,724	182.0	182.0		
			Diesel Fuel (gals)	\$33,873	22,193	226.6	226.6		
			Kerosene (gals)			0.0	0.0		
	Scope 2	Grid Electricity (kWh)			732,875	126.1	125.4	10.9800	1.4847
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		Σ \$110,398	732,875	126.1	125.4	10.9800	1.4847
		Total by Year		Σ \$185,337		586.9	585.9	15.3341	2.2109
2017	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$5,199	2,500	25.7	25.5	3.7500	0.2500
			Propane (gals)	\$6,243	4,915	27.6	27.5	0.6881	0.4915
		Mobile Combustion	Gasoline (gals)	\$35,654	19,988	175.5	175.5		
			Diesel Fuel (gals)	\$39,943	22,520	229.9	229.9		
			Kerosene (gals)			0.0	0.0		
	Scope 2	Grid Electricity (kWh)			764,419	127.5	126.8	10.8843	1.4536
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		Σ \$111,186	764,419	127.5	126.8	10.8843	1.4536
		Total by Year		Σ \$198,225		586.2	585.2	15.3224	2.1951
2018	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$6,187	2,762	28.4	28.2	4.1430	0.2762
			Propane (gals)	\$8,690	5,825	32.8	32.6	0.8155	0.5825
		Mobile Combustion	Gasoline (gals)	\$44,011	20,800	182.6	182.6		
			Diesel Fuel (gals)	\$56,938	24,845	253.7	253.7		
			Kerosene (gals)			0.0	0.0		
	Scope 2	Grid Electricity (kWh)			805,383	108.1	107.6	7.8443	1.1206
		Hydro Electricity (kWh)			18,500	0.0	0.0	0.0000	0.0000
		Sum of Scope 2 (Electricity)		Σ \$123,529	823,883	108.1	107.6	7.8443	1.1206
		Total by Year		Σ \$239,355		605.5	604.7	12.8028	1.9793



## Woodstock Total GHG Emissions (Continued)

				Expenditures	Volume	Metric Tons CO <sub>2</sub> e equivalent	Metric Tons CO <sub>2</sub>	Methane Kgm	Nitrous Oxide Kgm
2019	Scope 1	Stationary Combustion	Fuel Oil (gals)	\$5,985	2,814	28.9	28.7	4.2212	0.2814
			Propane (gals)	\$5,870	4,786	26.9	26.8	0.6701	0.4786
		Mobile Combustion	Gasoline (gals)	\$39,991	20,390	179.0	179.0		
			Diesel Fuel (gals)	\$49,396	23,555	240.5	240.5		
			Kerosene (gals)			0.0	0.0		
	Scope 2	Grid Electricity (kWh)			764,484	88.0	87.8	6.3822	0.7091
		Hydro Electricity (kWh)			44,000	0.0	0.0		
		Sum of Scope 2 (Electricity)		Σ \$121,184	808,484	88.0	87.8	6.3822	0.7091
		Total by Year		Σ \$222,426		563.4	562.8	11.2734	1.4692
2020	Scope 1	Stationary Combustion	Fuel Oil (gals)			0.0	0.0	0.0000	0.0000
			Propane (gals)			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)				0.0	0.0	0.0000	
		Hydro Electricity (kWh)							
		Sum of Scope 2 (Electricity)		Σ	0	0.0	0.0	0.0000	0.0000
		Total by Year		Σ \$0		0.0	0.0	0.0000	0.0000



Beginning in 2011, Woodstock's total carbon dioxide emissions have dropped from 685 to 565 metric tons in 2019, a 18% reduction in CO2 emissions from governmental operations