



VILLAGE OF NEW PALTZ  
LOCAL GOVERNMENT OPERATIONS  
GREEN HOUSE GAS INVENTORY

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CLIMATE SMART COMMUNITIES TASK FORCE March, 2019



# Village of New Paltz Local Government Operations Green House Gas Inventory

## Contents

Foreword .....	2
Acronyms .....	3
Executive Summary .....	4
Introduction .....	5
Climate Change .....	5
Climate Smart Communities .....	8
Purpose of Green House Gas Inventory .....	9
Methodology .....	10
Results .....	11
Conclusions .....	16
Key Findings .....	16
Next Steps .....	16
Appendices .....	18
Appendix A: Facility Master List .....	19
Appendix B: Raw Data from Energy Provider Accounts .....	21
Appendix C: Fleet Fuel Data .....	23
Appendix D: Factors, Calculations, and Sources .....	24

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Foreword

Janelle Peotter, New Paltz Climate Smart Communities Task Force Chair, and Amanda Gotto, Climate Smart Communities Task Force Project Manager, would like to thank the Village of New Paltz personnel for their efforts and support in supplying the raw data used in this inventory:

Tim Rogers – Mayor

Heather Nielson – Department of Public Works Secretary

Ariana Basco - Assistant to Mayor

We would also like to thank the Climate Action Planning Institute for their invaluable support in providing the Local Government Operations Green House Gas Inventory workbook and guidance on its use:

Europa McGovern - Planner/Clean Energy Communities Coordinator, Hudson Valley Regional Council

Jim Yienger - Managing Principal, Climate Action Associates LLC

Greg Mumby - Climate Action Associates LLC

We would like to thank Central Hudson for their support in providing monthly electricity usage for the 19 accounts that comprise the Village of New Paltz government operations.

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Acronyms

BTU: British Thermal Unit, measure of heat

CAP: Climate Action Planning Institute

CH<sub>4</sub>: methane

CO<sub>2</sub>: carbon dioxide

CO<sub>2</sub>e: carbon dioxide equivalent, unit of greenhouse gas impact as related to 1 ton of carbon oxide

CSC: Climate Smart Communities

eGRID: EPA's Emissions & Generated Resource Integrated Database

EIA: US Energy Information Administration

EPA: Environmental Protection Agency

DPW: Department of Public Works

GHG: Greenhouse Gas

GWP: Global Warming Potential, measure of greenhouse gas impact

ICLEI: International Council for Local Environmental Initiatives

kWh: kilowatt-hour, measure of electricity usage

LGOP: Local Government Operations Protocol

MMBTU: million BTUs

MWh: megawatt-hour, 1000 kWh

N<sub>2</sub>O: nitrous oxide

NYSERDA: New York State Energy Research Development Authority

NYUP: New York Upstate, regional designation by EPA

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Executive Summary

A greenhouse gas (GHG) emissions inventory is one of the first and most important steps in the local climate action process. A local government operations GHG inventory is an accounting, analysis, and report of the GHG emissions resulting from the day-to-day operations of a village, town, city, or county. It summarizes the GHG emissions from the consumption of energy and materials in government buildings, from wastewater and water treatment facilities, from municipal vehicle fleets, from government-owned outdoor lighting, and from other sources. All Climate Smart Communities should prioritize GHG inventories as a foundational step toward effective action. GHG inventories provide the data needed to set realistic goals and track progress toward reducing operating costs, energy use, and emissions. GHG inventory reports identify the largest energy users and sources of GHG emissions (e.g., by building, sector, or department). As a result, GHG inventories help local governments select actions that offer a good return on investment and should be highlighted in subsequent climate action planning. Over time, as a local government builds its capacity to conduct GHG inventories on a regular basis, the process helps to increase the ability of the local government to operate efficiently and use taxpayer resources effectively.

The key findings of this initial GHG inventory for the Village of New Paltz are:

- Total GHG emissions from all energy sources for all local government operations in the Village of New Paltz were 568.1 tons of CO<sub>2</sub>e/year in 2016. Total GHG emissions dropped to 391.5 tons CO<sub>2</sub>e/year in 2017 due to the switch to a 100% green energy supplier for electricity (except streetlights/signals).
- Total usage of electricity increased slightly from 2016 to 2017: 952,436 KWh to 964,311 KWh.
- Greatest source of GHG emissions for the average of 2016-2017 are the wastewater treatment and water delivery facilities at 51% on average; vehicle fleet (Department of Public Works + Fire Department) at 25% on average; administration facilities account for 14% on average; and streetlights/ signals account for 11% on average of the total Village GHG emissions/year.
- The average total cost (2016-2017) for all energy sources used by the Village was \$164,555. Average electricity cost accounted for \$114,857 of the total, average fuel oil cost accounted for \$30,308 of the total, and average fleet fuel accounted for \$19,389 of the total.
- All energy source costs showed an increase from 2016 to 2017.

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Introduction

### Climate Change

In 2011, the New York State Energy Research and Development Authority (NYSERDA) released the first comprehensive assessment of the projected effects of climate change on the state's critical systems and natural resources over the next century. *ClimAID: the Integrated Assessment for Effective Climate Change Adaptation Strategies in New York State* was compiled by more than 50 scientists to serve as a critical tool for planners, policymakers, farmers, local governments and residents planning for New York State's future.

The report provides projections of several key climate variables in seven geographic regions of New York, assesses the projected effects of climate change in eight sectors (water resources, coastal zone, ecosystems, agriculture, energy, transportation, telecommunications and public health), and provides recommendations for adapting to the predicted changes.

Among ClimAID's most important findings:

#### **Observed Climate Change**

- Annual average temperatures have risen about 5 °F since 1900, with winter warming exceeding 4.4 °F.
- Sea level along New York's coastline has risen about a foot since 1900.
- Mean annual precipitation, intense precipitation and heavy downpours, and year-to-year variability have increased between 1900 and 2012.

#### **Climate Projections**

Without a dramatic decrease in the global generation of greenhouse gases like carbon dioxide, critical changes can be expected in New York's climate over the next century:

- Annual average temperatures in New York State will rise by 5.3 to 10.1 °F. by the 2080s.
- Average regional precipitation will increase 4 to 15 percent by the 2080s, with most of the projected increase forecast in winter months. Larger increases are projected in the frequency, intensity, and duration of extreme precipitation events.
- Short-term droughts will become more frequent.
- The number and duration of extreme heat events will increase.
- Along the seacoast and tidal portion of the Hudson River (to the Federal Dam at Troy), sea level could rise to approximately 6 feet by 2100.

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Climate Change Effects

The projected changes in climate will have effects on New Yorkers and many New York State natural and economic resources:

#### Natural resources (ecosystems, agriculture and water resources)

- Increased flooding affecting ecosystems, communities and infrastructure.
- Reduced summer flows and lowered groundwater leading to water-use conflicts.
- Negative effects on native coldwater fish due to increased water temperatures.
- Widespread shifts in species composition in the state's forests and expansion of some invasive species into New York.
- Diminished recreational opportunities because of reduced snow cover and reduced water supply and quality.
- Lost agricultural and forest productivity from temperature stresses, summer drought and invasive species.

#### Coastal zone

- Sea level rise, leading to permanent inundation of low lying areas, increased beach erosion, reduction of coastal wetland area and species, and flood events that are more frequent and more destructive.

#### Infrastructure (energy, transportation, telecommunications)

- Disruption of water, transportation, communication and energy systems due to extreme weather.

#### Public health

- Expansion of vector-borne diseases affecting humans, livestock and wildlife.
- Heat waves leading to increased illness and deaths from heat stress.
- Increased levels of air pollution, causing asthma and other respiratory illness.

All of these effects will be felt most strongly in the local communities where New Yorkers live, work and play. Response to extreme events, especially coastal storms, riverine flooding, and extreme heat will require increasing investment of municipal resources.

A major impact on climate change are greenhouse gases. Greenhouse gases warm the Earth by absorbing energy and slowing the rate at which the energy escapes to space; they act like a blanket insulating the Earth. Greenhouse gases can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years. All of these gases remain in the atmosphere long enough to become well mixed, meaning that the amount that is measured in the atmosphere is roughly the same all over the world, regardless of the source of the emissions.

## Village of New Paltz Local Government Operations Green House Gas Inventory

The most common types of greenhouse gases are:

- Carbon dioxide (CO<sub>2</sub>) - enters the atmosphere through burning of fossil fuels, solid waste, & wood products, and also as a result of certain chemical reactions (e.g., manufacture of cement).
- Methane (CH<sub>4</sub>) - emitted during the production/transport of coal, natural gas, and oil; also results from livestock & other agricultural practices and by the decay of organic waste in municipal solid waste landfills.
- Nitrous oxide (N<sub>2</sub>O) - emitted during agricultural & industrial activities, as well as during combustion of fossil fuels and solid waste.
- Fluorinated gases - hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, & nitrogen trifluoride are synthetic, powerful greenhouse gases that are emitted from a variety of industrial processes.

Some greenhouse gases are more effective than others at making the planet warmer and "thickening the Earth's blanket." For each greenhouse gas, a Global Warming Potential (GWP) has been calculated to reflect how long it remains in the atmosphere, on average, and how strongly it absorbs energy. It is a measure of how much energy the emissions of 1 ton of a gas will absorb over a given period of time (usually 100 years), relative to the emissions of 1 ton of carbon dioxide (CO<sub>2</sub>). The larger the GWP, the more that a given gas warms the Earth compared to CO<sub>2</sub> over that time period. GWPs provide a common unit of measure, to allow the addition of emission estimates of different gases (e.g., to compile a GHG inventory), and to allow comparisons of emission reduction opportunities.

The Village of New Paltz Green House Gas inventory was built on actual usage of direct emissions sources, i.e. fuel oil, gasoline, and diesel and indirect emission sources, i.e. electricity. No emissions of fluorinated gases were calculated in this initial inventory since there are no significant local government sources. All Greenhouse Gas emissions were converted to CO<sub>2</sub> equivalents (CO<sub>2</sub>e) and reported in tons. For this report CH<sub>4</sub> = 28 CO<sub>2</sub> e and N<sub>2</sub>O = 298 CO<sub>2</sub>e.

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Climate Smart Communities

The New York State Climate Smart Communities (CSC) program is an inter-agency effort of the New York State Department of Environmental Conservation (NYDEC), New York State Energy Research Development Authority (NYSERDA), New York State Department of State (DOS), New York State Department of Transportation (NYDOT), New York State Department of Health (DOH), and New York State Public Service Commission (PSC).

The goals of the CSC program are to reduce greenhouse gas emissions, prepare for the impact of climate change, and save taxpayer money.

Local governments initiate participation in the program by passage of a resolution to adopt the CSC pledge. The pledge describes ten areas of climate mitigation and adaptation action:

1. Build a climate-smart community.
2. Inventory emissions, set goals, and plan for climate action.
3. Decrease energy use.
4. Shift to clean, renewable energy.
5. Use climate-smart materials management.
6. Implement climate-smart land use.
7. Enhance community resilience to climate change.
8. Support a green innovation economy.
9. Inform and inspire the public.
10. Engage in an evolving process of climate action

Any city, town, village, or county in New York State can take a stand by adopting the Climate Smart Communities pledge. To become a Registered Climate Smart Community, the municipality's governing body must adopt a resolution that includes all ten elements of the pledge and submit the resolution. Climate Smart Communities are free to develop their own specific programs within the ten action areas, and additional pledge elements or legislative findings may be added.

The Village of New Paltz signed the CSC pledge in 2010. In addition to a number of environmentally focused actions since then, the Town and Village were awarded a joint DEC grant for CSC certification in 2016, and formed the joint CSC Task Force and appointed a Chair in 2018.

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Purpose of Green House Gas Inventory

The purpose of conducting a local government operations (LGO) GHG emissions inventory is to gain an understanding of the emissions sources, establish a baseline, and identify opportunities to reduce energy use and GHG emissions. A local government operations GHG inventory can lead to the following benefits:

**Improved ability to manage energy use.** A GHG inventory helps a local government identify the largest energy users and GHG emissions sources (e.g., by building, sector, or department), which will help to target energy efficiency strategies to the areas with the greatest opportunities.

**Leading by example.** Local governments can set an example for local businesses, the community, and their peers by developing a GHG inventory and helping others understand the results. The more others understand the benefits of measuring GHG emissions and implementing energy efficiency improvements, they will begin to take similar actions. The GHG inventory can also be the starting point to open up a dialogue and share best practices with local businesses and other organizations.

**Increased Transparency.** Publicly releasing the results of an inventory and explaining the results helps to increase transparency and accountability of local governments to their taxpayers to operate efficiently and use resources effectively.

**Cost Savings.** Energy efficiency improvement opportunities that arise from a GHG inventory can help to save taxpayer dollars. The expectation is that many energy efficiency improvements can pay for themselves within a few years or less, resulting in direct and measurable savings of both energy and costs.

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Methodology

The inventory includes GHG emissions from the following government operations sources:

- Direct GHG emissions (Scope 1) – from government-owned vehicles (gasoline and diesel) and from onsite fuel combustion (propane and fuel oil)
- Indirect GHG emissions (Scope 2) – from purchased electricity
- Other (Scope 3) - indirect GHG emissions not included in Scope 2. These include emissions resulting from the extraction and production of purchased materials and fuels, transportation in vehicles not owned or controlled by the reporting entity, outsourced activities, and waste disposal. A common source of Scope 3 emissions that is often included in government operations inventories is employee commuting. For the purpose of this first-ever GHG inventory for the Village of New Paltz Scope 3 sources were not included.

Below is a summary of the steps that were involved in creating the Village local government operations GHG inventory:

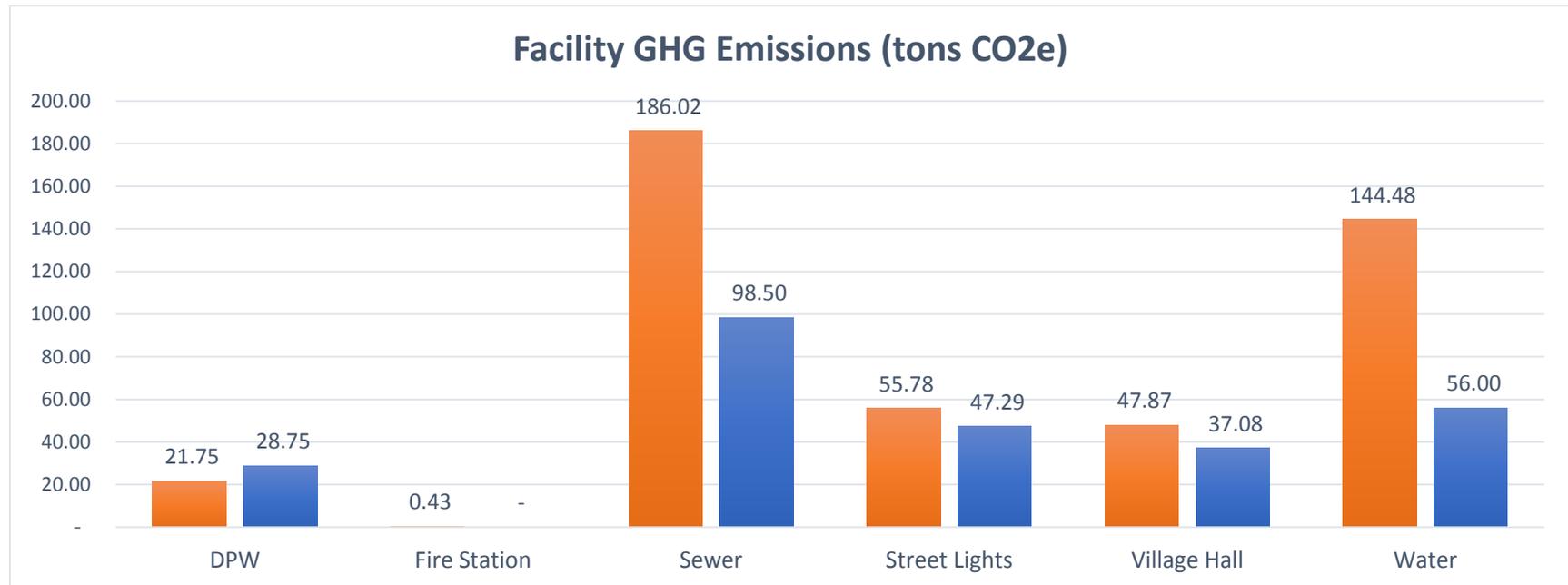
1. A CSC Task Force subteam (Janelle Peotter and Amanda Gotto) was put together to manage the GHG inventory process. The key Village contacts who provided support and data throughout the project were identified. An Excel data-collection template was provided by the Climate Action Process Institute (CAPI); these templates can be used for inventory updates going forward.
2. The CAPI protocol for collecting, calculating, and analyzing greenhouse gas emissions from Local Government Operations was chosen for the Village of New Paltz GHG inventory analysis. The CAPI GHG tool is compliant with the Local Government Operations Protocol (LGOP), a standardized set of guidelines for quantifying and reporting the GHG emissions associated with local government operations, as required by the CSC program.
3. To keep the inventory practical and cost-effective, data collection was focused on the largest sources of emissions (Appendix A) and most common greenhouse gases (carbon dioxide CO<sub>2</sub>, methane CH<sub>4</sub>, and nitrous oxide N<sub>2</sub>O) for which the Village is responsible; an inventory that covers about 95% of GHG emissions is acceptable and complies with the LGOP.
4. The years of 2016 and 2017 were an important comparison as the Village chose a 100% green electricity supplier for all accounts except Streetlights/Signals in January, 2017. For this report 2016 is used as the baseline.
5. The raw energy source data were gathered and organized using the CAPI templates (Appendix B and Appendix C). Data on actual tank and fleet fuel usage were obtained from historical bills provided by the Village Treasurer. Data on actual electricity use were obtained from monthly account reports provided by Central Hudson. All data were reviewed for completeness and accuracy. There was no use of propane by the Village facilities.
6. The data were entered and GHG emissions calculated using the CAPI inventory tool. Calculations were reviewed to confirm accuracy. Factors, calculations, and sources can be found in Appendix D.

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Results

### GHG Emissions by Facility for Electricity, Propane, and Fuel Oil

The total GHG emissions from electricity, propane, and fuel oil for Village facilities were 505 tons CO<sub>2</sub>e in 2016. In Jan 2017, the Village switched from a 20% green energy supplier to a 100% green supplier of electricity (except for streetlights/signals). While electricity consumption increased slightly in 2017, GHG emissions from electricity were reduced from 249 tons CO<sub>2</sub>e in 2016 to 47 tons CO<sub>2</sub>e in 2017. This resulted in total GHG emissions from electricity, propane, and fuel oil of 268 tons CO<sub>2</sub>e in 2017, a reduction of approximately 41% from the 2016 emissions. The Wastewater Treatment Plant + Water Delivery account for the largest source of GHG emissions from electricity, propane, and fuel oil. The graph below represents the 2016 (orange) and 2017 (blue) emissions.

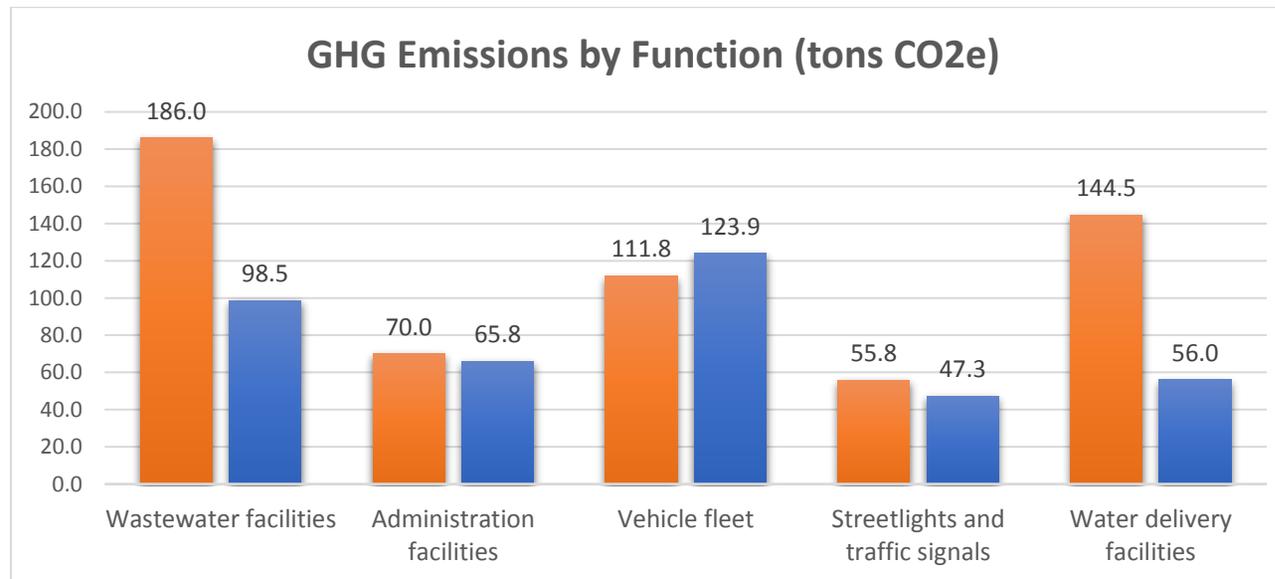


2016 = orange; 2017 = blue

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Total GHG Emissions by Function for All Energy Sources

The total GHG emissions from all sources for all functions is 391.54 tons CO<sub>2</sub>e for the year 2017 (blue), compared to 568.12 tons CO<sub>2</sub>e for 2016 (orange). Due to the elimination of GHG emissions from electricity, the wastewater treatment + water delivery facility per cent of GHG emissions dropped from 58% to 39% while the vehicle fleet per cent increased from 20% to 32% of all GHG emissions.



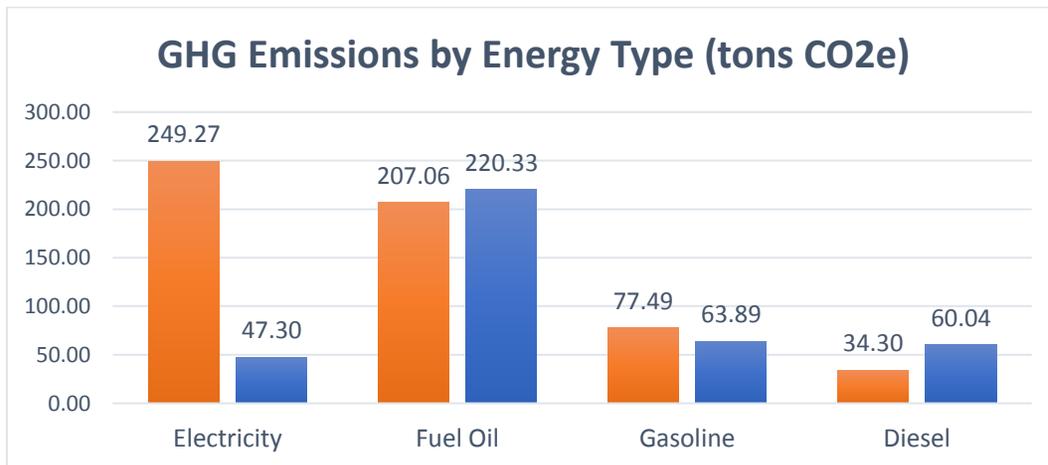
Greenhouse Gas Emissions by Function	2016	2017	Average 2016/2017
<b>All Municipal Operations</b>	<b>568.12</b>	<b>391.54</b>	<b>479.83</b>
Wastewater facilities	186.0	98.5	142.3
Administration facilities	70.0	65.8	67.9
Vehicle fleet	111.8	123.9	117.9
Streetlights and traffic signals	55.8	47.3	51.5
Water delivery facilities	144.5	56.0	100.2

## Village of New Paltz Local Government Operations Green House Gas Inventory

GHG Emission % By Function	2016	2017	Average 2016/2017
Wastewater facilities	33%	25%	30%
Administration facilities	12%	17%	14%
Vehicle fleet	20%	32%	25%
Streetlights and traffic signals	10%	12%	11%
Water delivery facilities	25%	14%	21%

### GHG Emissions by Energy Type

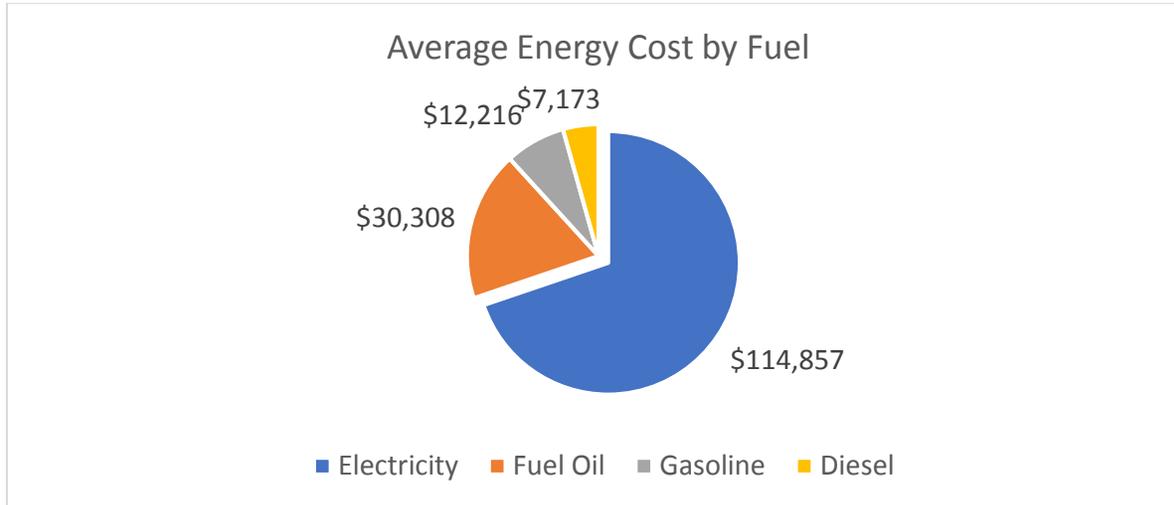
With most electricity GHG emissions eliminated in 2017, fuel oil accounts for approximately 56% of total GHG emissions, followed by gasoline at 16% and diesel at 15%. Streetlights/Signals account for 12% of total GHG emissions.



## Village of New Paltz Local Government Operations Green House Gas Inventory

### Energy Costs by Fuel Type

The costs for all energy sources averages \$164,555. Electricity accounts for ~70% of energy costs, followed by fuel oil at 18% and gasoline at 7%.



GHG Emissions and Energy Costs for All Energy Sources	2016 (tons CO2e)	2017 (tons CO2e)	Ave Energy Cost (2016-2017)
<b>All Energy Sources</b>	<b>616.5</b>	<b>391.6</b>	<b>\$164,555</b>
Electricity	297.6	47.3	\$114,857
Fuel Oil	207.1	220.3	\$ 30,308
Gasoline	77.5	63.9	\$ 12,216
Diesel	34.3	60.0	\$ 7,173

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Annual Trends in GHG Emissions

Annual GHG Emission Trends by Function, tons CO2e

<b>Function</b>	<b>2016</b>	<b>2017</b>
<b>All Municipal Operations</b>	<b>568.12</b>	<b>391.54</b>
Administration Facilities	70.05	65.83
Vehicle Fleet	111.79	123.93
Streetlights & Signals	55.78	47.29
Wastewater Facilities	186.02	98.49
Water Delivery	144.48	55.99

Annual GHG Emission Trends by Fuel Type, tons CO2e

<b>Fuel Type</b>	<b>2016</b>	<b>2017</b>
<b>All Energy Sources</b>	<b>568.129</b>	<b>391.54</b>
Electricity	297.64	47.29
Fuel Oil	207.06	220.33
Gasoline	77.49	63.89
Diesel	34.30	60.04

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Conclusions

### Key Findings

- Total GHG emissions from all energy sources for all local government operations in the Village of New Paltz were 568.1 tons of CO<sub>2</sub>e/year in 2016. Total GHG emissions dropped to 391.5 tons CO<sub>2</sub>e/year in 2017 due to the switch from a 20% green energy supplier to a 100% green energy supplier for electricity (except streetlights/signals).
- Total usage of electricity increased slightly from 2016 to 2017: 952,436 KWh to 964,311 KWh.
- Greatest source of GHG emissions for the average of 2016-2017 are the wastewater treatment and water delivery facilities at 51% on average; vehicle fleet (Department of Public Works and Fire Department) at 25% on average; administration facilities account for 14% on average; and streetlights/ signals account for 11% on average of the total Village GHG emissions/year.
- The average total cost (2016-2017) for all energy sources used by the Village was \$164,555. Average electricity cost accounted for \$114,857 of the total, average fuel oil cost accounted for \$30,308 of the total, and average fleet fuel accounted for \$19,389 of the total.
- All energy source costs showed an increase from 2016 to 2017.

### Next Steps

#### **CSC Task Force subteam and Village Treasurer to**

- Complete collection and entry of 2015 electricity usage and set average of 2015-2016 as final baseline.
- Collect and enter 2018 data
- Plan for collection of Scope 3 data such as solid waste sent out, fugitive emissions, employee commuting, etc.

#### **Village Board to**

- Accept the final 2019 Village of New Paltz GHG Inventory report and post on Village website
- Climate Action Plan, with support of CSC Task Force subteam
  - Determine an overall aspirational GHG reduction target and timeline
  - Identify priority areas for GHG reduction
  - Outline steps to achieve the GHG reductions
  - Create a draft Climate Action Plan
  - Accept the final Climate Action Plan in a resolution

## Village of New Paltz Local Government Operations Green House Gas Inventory

- Share the Climate Action Plan with the community
- Implement Climate Action Plan initiatives including seeking funding as applicable
- Monitor progress and update the GHG inventory as actions are completed, or at least every 5 years

# Village of New Paltz Local Government Operations Green House Gas Inventory

## Appendices

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Appendix A: Facility Master List

Facility/Group Name	Individual Facility Name	ICLEI GHG Reporting Sector	Electricity	Nat Gas	Fuel Oil	Propane	Kerosene	Diesel	Gasoline	Wood
Village Hall	Village Hall/FireStation/DPW	Administration Facilities	yes	--	--	--	--	--	--	--
Village Hall	Village Hall/FireStation	Administration Facilities	--	--	yes	--	--	yes	yes	
Sewer	Village Waste Water Treatment Plant	Wastewater facilities	yes	--	yes	--	--	--	--	--
Street Lights	Village Street Lighting District	Streetlights and traffic signals	yes	--	--	--	--	--	--	--
Fire Station	Village Fire Station, sub	Administration Facilities	yes	--	--	--	--	yes	yes	--
DPW	Village DPW Garage	Administration Facilities	--	--	yes	--	--	--	--	--
Sewer	Sewer Pump Station DuBois	Wastewater facilities	yes	--	--	--	--	--	--	--
Sewer	Sewer Pump Station Rte 32	Wastewater facilities	yes	--	--	--	--	--	--	--
Sewer	Sewer Pump Station Orchard	Wastewater facilities	yes	--	--	--	--	--	--	--
Sewer	Sewer Pump Station Henry Ct	Wastewater facilities	yes	--	--	--	--	--	--	--
Water	Aqueduct Water Pump Station Mt Rest	Water delivery facilities	yes	--	--	--	--	--	--	--
Water	Water Treatment Plant Mt Rest	Water delivery facilities	yes	--	yes	--	--	--	--	--
DPW	Huguenot St Pole Barn	Administration Facilities	yes	--	--	--	--	--	--	--

## Village of New Paltz Local Government Operations Green House Gas Inventory

Facility/Group Name	Individual Facility Name	ICLEI GHG Reporting Sector	Electricity	Nat Gas	Fuel Oil	Propane	Kerosene	Diesel	Gasoline	Wood
Sewer	Sewer Pump Station Hasbrouck Ave	Wastewater facilities	yes	--	--	--	--	--	--	--
Village Hall	Village EV charge station	Administration Facilities	yes	--	--	--	--	--	--	--
Village Hall	Village parking lot	Administration Facilities	yes	--	--	--	--	--	--	--
Water	Water Tower telemetry	Administration Facilities	yes	--	--	--	--	--	--	--

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Appendix B: Raw Data from Energy Provider Accounts

Facility/ Group Name	Individual Facility Name	Vendor/ Provider	Energy Source	Units	2015 Roll-Up Usage	2016 Roll-Up Usage	2017 Roll-Up Usage	2015 Roll-Up Cost	2016 Roll-Up Cost	2017 Roll-Up Cost
DPW	Village DPW Garage	Bottini	Fuel Oil	Gal	2343.6	1735.3	2557.3	\$3,645.00	\$2,191.19	\$4,902.57
DPW	Huguenot St Pole Barn	Central Hudson	Electricity	kWh	Tbd	8956	14898	Tbd	\$652.31	\$1,412.76
Fire Station	Village Fire Station, sub	Central Hudson	Electricity	kWh	Tbd	1702	2083	Tbd	\$647.36	\$530.53
Sewer	Village Waste Water Treatment Plant	Bottini	Fuel Oil	Gal	9087.3	8806.4	8760.3	\$14,133.48	\$12,614.90	\$15,170.94
Sewer	Sewer Pump Station Henry Ct	Central Hudson	Electricity	kWh	Tbd	1330	1558	Tbd	\$462.13	\$502.31
Sewer	Sewer Pump Station Hasbrouck Ave	Central Hudson	Electricity	kWh	Tbd	72	65	Tbd	\$425.35	\$426.96
Sewer	Sewer Pump Station Orchard	Central Hudson	Electricity	kWh	Tbd	261	232	Tbd	\$466.17	\$424.85
Sewer	Sewer Pump Station Rte 32	Central Hudson	Electricity	kWh	Tbd	16056	12768	Tbd	\$997.13	\$1,123.31
Sewer	Village Waste Water Treatment Plant	Central Hudson	Electricity	kWh	Tbd	292080	299160	Tbd	\$13,542.39	\$17,177.10

## Village of New Paltz Local Government Operations Green House Gas Inventory

Facility/ Group Name	Individual Facility Name	Vendor/ Provider	Energy Source	Units	2015 Roll-Up Usage	2016 Roll-Up Usage	2017 Roll-Up Usage	2015 Roll- Up Cost	2016 Roll- Up Cost	2017 Roll-Up Cost
Sewer	Sewer Pump Station DuBois	Central Hudson	Electricity	kWh	Tbd	38200	40249	Tbd	\$3,124.77	\$3,660.56
Street Lights	Village Street Lighting District	Central Hudson	Electricity	kWh	Tbd	178506	151312	Tbd	\$61,517.14	\$61,676.47
Village Hall	Village Hall/FireStation	Bottini	Fuel Oil	Gal	3990.1	2617.2	3297.7	\$6,205.80	\$3,312.56	\$6,084.33
Village Hall	Village parking lot	Central Hudson	Electricity	kWh	Tbd	23	22	Tbd	\$423.03	\$425.31
Village Hall	Village Hall/FireStation /DPW	Central Hudson	Electricity	kWh	Tbd	73760	67360	Tbd	\$5,196.71	\$6,332.97
Village Hall	Village EV charge station	Central Hudson	Electricity	kWh	Tbd	*Activat ed in 2018, no data yet	Tbd	Tbd	Tbd	Tbd
Water	Water Treatment Plant Mt Rest	Bottini	Fuel Oil	Gal	7820.1	5257.2	4980.4	\$12,162.60	\$7,425.00	\$8,913.91
Water	Water Tower telemetry	Central Hudson	Electricity	kWh	Tbd	7450	1764	Tbd	\$718.94	\$515.08
Water	Aqueduct Water Pump Station Mt Rest	Central Hudson	Electricity	kWh	Tbd	196480	231680	Tbd	\$11,244.74	\$18,208.04
Water	Water Treatment Plant Mt Rest	Central Hudson	Electricity	kWh	Tbd	137560	134000	Tbd	\$8,561.32	\$9,319.21

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Appendix C: Fleet Fuel Data

Facility/Group Name	Year	Department	Gasoline Gallons	\$ Gasoline	Diesel Gallons	\$ Diesel
DPW	2015	DPW Vehicles	5912.46	\$ 9,956.64	2539.05	\$4,038.55
Fire Station	2015	Fire Vehicles	1332.54	\$ 2,244.01	104.95	\$ 166.93
	<i>2015</i>	<i>Total</i>	<i>7245</i>	<i>\$12,200.65</i>	<i>2644</i>	<i>\$4205.48</i>
DPW	2016	DPW Vehicles	7373.03	\$11,189.10	4433.77	\$7,529.55
Fire Station	2016	Fire Vehicles	876.97	\$ 1,330.86	212.23	\$ 360.42
	<i>2016</i>	<i>Total</i>	<i>8250</i>	<i>\$12,519.96</i>	<i>4646</i>	<i>\$7889.97</i>
DPW	2017	DPW Vehicles	5978.7	\$11,196.12	5097.28	\$9,767.26
Fire Station	2017	Fire Vehicles	484.3	\$ 906.93	36.72	\$ 70.32
	<i>2017</i>	<i>Total</i>	<i>6463</i>	<i>\$12,103.05</i>	<i>5134</i>	<i>\$9837.58</i>

## Village of New Paltz Local Government Operations Green House Gas Inventory

### Appendix D: Factors, Calculations, and Sources

Emission Factors for Fuels		Units
Electric CO2	625	lb/MWh
Electric CH4	0.02482	lb/MWh
Electric N2O	0.01119	lb/MWh
Liquid Propane CO2	61.46	kg/MMBtu
Liquid Propane CH4	3.0	g/MMBtu
Liquid Propane N2O	0.6	g/MMBtu
Heating Oil CO2	10.2	kg/gallon
Heating Oil CH4	0.0015	kg/gallon
Heating Oil N2O	0.0001	kg/gallon
Gasoline CO2	8.78	kg/gallon
Diesel CO2	10.21	kg/gallon

#### Global Warming Potentials (CO2equivalents)

CO2 = 1; CH4 = 28 CO2e; N2O = 298 CO2e

#### Conversion Factors for MMBtus

1 gal diesel = 0.1396 MMBtu (from EIA)

1 kWh = 0.003412 MMBtu (from EIA)

1 gal gasoline = 0.124262 MMBtu (from EIA)

1 gal propane = 0.0916 MMBtu (Center Point Energy website)

#### Other Conversion Factors

1 kg = 0.001 metric tons

1 g = 0.000001 metric tons

## Village of New Paltz Local Government Operations Green House Gas Inventory

1 kWh = 0.001 MWh

1 metric ton = 2204.62 lbs

### Calculations Used

The following calculations with NYUP eGRID factors (2007) were used:

Electric CO<sub>2</sub> calculation = (MWh\*720.8lbs CO<sub>2</sub>/MWh)

Electric CH<sub>4</sub> calculation = (MWh\*0.02482lbs/MWh)

Electric N<sub>2</sub>O calculation = (MWh\*0.01119lbs/MWh)

Default factors for #2 fuel oil (from LGOP p. 203 and 206) were used:

Fuel Oil CO<sub>2</sub> calculation = (gal\*10.21kg CO<sub>2</sub>/gal)

Fuel Oil CH<sub>4</sub> calculation = (gal\*0.0015kg CH<sub>4</sub>/gal)

Fuel Oil N<sub>2</sub>O calculation = (gal\*0.0001kg N<sub>2</sub>O/gal)

Fuel Oil BTU calculation = (gal\*0.138 MMBTU/gal)

CO<sub>2</sub>equivalent was calculated as:

CO<sub>2</sub>e (metric tons) = (CO<sub>2</sub> metric tons\*1) + (CH<sub>4</sub> metric tons \*28) + (N<sub>2</sub>O metric tons \*298), where GWP CH<sub>4</sub> = 28 and GWP N<sub>2</sub>O = 298

### Sources:

[http://www.eia.gov/kids/energy.cfm?page=about\\_energy\\_conversion\\_calculator-basics](http://www.eia.gov/kids/energy.cfm?page=about_energy_conversion_calculator-basics)

<http://www.centerpointenergy.com/services/energymarketing/learningcenter/energyconversionfactors/>

<http://nyscrda.ny.gov/Publications/Research-and-Development/Environmental/EMEP-Publications/Response-to-Climate-Change-in-New-York.aspx>

Source of raw fuel oil, propane, gasoline, and diesel data: Village of New Paltz monthly accounts for 2015, 2016, and 2017.

Source of raw electric data for: Central Hudson monthly accounts for 2016 and 2017

LGOP referenced here is Local Governments Operations Protocol Version 1.1 (released May 2010).