Greenhouse Gas Inventory Report for 2023



Village of New Paltz, New York

Prepared For:
Town of New Paltz NY

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Village of New Paltz Executive Summary

The NYS program ‘Climate Smart Communities’ has an important role in helping local governments reduce their greenhouse gas emissions to mitigate climate change and adapt to impending extreme weather changes. A Greenhouse Gas Inventory is a collection of organized data that correlates to the amount of greenhouse gas emissions produced by a source. For the purposes of this report, the source is the Village of New Paltz (“Village”) government operations and the community.

This report is intended to be used to show which areas of the government operations and community warrant support for further reductions of greenhouse gas emissions.

Thank you to our dutiful volunteers, Dr. Yvonne Posey, Joe Londa and Izzy Defino of the New Paltz Climate Smart Communities Task Force. This report is a crucial component for resubmission of our village’s Bronze Certification.

Credits and Acknowledgements

Yvonne Posey, Joseph Londa and Izzy Defino of the New Paltz Climate Smart Communities Task Force would like to thank the Village of New Paltz officials for their efforts and support in supplying the raw data used in this inventory including:

Tim Rogers – Mayor
Heather Nielson – Department of Public Works

We would like to thank Melanie Patapis (former HVRC representative) for her support and for the Government Operations Greenhouse Gas Inventory report template

We would also like to thank Madison Hodges, the local ICLEI representative, and Amanda Gotto, the Town of New Paltz Supervisor, for their support in providing inventory software and guidance on its use.

Acronyms

CH4: methane

CLCPA: Climate Leadership and Community Protection Act (New York State)

CO2: carbon dioxide

CO2e: carbon dioxide equivalent, unit of greenhouse gas impact as related to 1 metric ton of carbon dioxide

CSC: Climate Smart Communities

eGRID: EPA's Emissions & Generated Resource Integrated Database

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

MT: metric ton CO2(e) = a unit that the CO2 is measured in (equal to 2,204 lbs.)

MWh: megawatt-hour, 1000 kWh

N2O: nitrous oxide

NYSERDA: New York State Energy Research Development Authority

NYUP: New York Upstate, eGRID regional designation by EPA

VMT: Vehicle miles traveled

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Key Findings

These findings are based on the 2023 Greenhouse Gas (GHG) Inventory and Report and with comparison from the 2017 GHG Inventory Report for both the Government Operations and the community for the Village of New Paltz (also referred to as "Village").

Community

- The 2023 GHG emissions following our methodology for the Village was 23,688 CO2 equivalent (CO2e) metric tons (MT).

- Commercial is the primary source of emissions for the Village at 12,733 CO2e MT or 54% of the total, of which Natural Gas usage created 9,467 CO2e MTs.

- Residential is the next largest sector with 5,828 CO2e MT or 25%.
  Fuel Oil usage was the largest source of emissions at 3,412 CO2e MT.

- Transportation contributed 3,990 CO2e MT, a reduction from 2017, and is 17% of the total Village emissions. This can be attributed to both walkability and low total miles of road in the Village which is the basis for allocation of the Vehicle Miles Traveled (VMT).

- Electricity Usage for Residential and Commercial both increased as might be expected with the introduction of more heat pumps, work from home, and transition to Electric Vehicles.

- Agriculture, Solid Waste, Water and Wastewater, and Fugitive Emission are negligible contributors for the Village.

Greenhouse Gas (GHG) Inventory Report for 2023

Government Operations

- In 2023, total GHG emissions were 384 MT CO2e. This represents a decrease from total 2017 GHG emissions (463 MT CO2e) by 17%.

- The largest source of GHG emissions came from fuel oil mainly from the water and wastewater treatment plants for both 2017 and 2023. This was followed by electricity as the second largest source of GHGs again mainly from the water and wastewater treatment plants for both 2017 and 2023.

- The difference in total electricity usage was negligible between 2017 and 2023 (957,151 kWh vs 957,129 kWh), however GHG emissions decreased significantly (31%) due to a decrease in the emission factors (274.9 for 2017 vs 241.7 for 2023 according to the EPA eGRID for Upstate New York's NYUP subregion).

Greenhouse Gas (GHG) Inventory Report for 2023

Introduction to Climate Change

As defined by NASA, “Climate change is a long-term change in the average weather patterns that have come to define Earth’s local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term.”

While Earth naturally has fluctuations in its temperatures and weather patterns, it has been proven that human activities have greatly altered these through burning fossil fuels, destruction of natural ecosystems, population growth, economic development at a global level, and modern agriculture practices.

It is to our benefit on a local and global level to take steps toward functioning as a Net Zero Government Operations and community. Other Towns/Villages will see the fiscal and health benefits and will want to emulate our process.

Extreme Weather – Mitigation & Adaptation

The Government Operations and Community member response to extreme weather events should include both mitigation and adaptation. We’ve seen the following extreme weather events and anticipate more in the future. Due to climate change the Town and Village of New Paltz and neighboring municipalities are at greatest risk to:

- Flooding
- Extreme temperatures
- Drought
- Wildfires and Air pollution from them

Local governments have a responsibility in reducing greenhouse gas emissions within their area(s) because their local facilities and policies tend to directly or indirectly generate emissions. They also can provide emergency services, provide public education of disaster preparedness and integrate disaster mitigation in municipal planning.

ICLEI uses Milestones as part of the process for mitigation beginning with the GHG Inventory as a basis for establishing reduction targets and developing and monitoring a Climate Action Plan. This report represents the completion of ICLEI’s Climate Mitigation Milestone 1 and provides a foundation for future work to reduce greenhouse gas emissions in New Paltz, NY for both the Town and Village on an ongoing basis.

Greenhouse Gas (GHG) Inventory Report for 2023

Inventory Methodology

It was agreed by resolution in 2022 that the Village and Town of New Paltz perform a GHG inventory no less than 5 years apart. This means that the gap between inventories can be no more than 5 years and that from the 2017 inventory the next inventory must be for 2023 and then no later than 2029.

With the period between inventories being significant in time, it's easy for institutional memory to be lost. That's why documentation of the methodology used for each inventory is important.

The inventory includes GHG emissions from the following sources:

- Direct GHG emissions (Scope 1) – from government-owned vehicles (gasoline and diesel) and from onsite fuel combustion (natural gas, 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 purposes of this GHG inventory for the Village of New Paltz Scope 3 sources were not included.

Community Wide

The community inventory methodology is mostly a top down process that gathers data from New York State, Ulster County, and nonprofit organizations that can be either aggregated or specific to the Town or Village. From 2017 to 2023 we have seen improvement in data quality from these sources. While this produces greater confidence in our 2023 inventory it also highlights under reporting concerns over the 2017 GHG Inventory. Consequently, reductions of GHG emissions over 2017 are encouraging and increases should not discourage the reader of this report. The details of the methodology are captured in Appendix A.

The boundaries of the Village represent the scope of the analysis and this includes the Vehicle Miles Traveled (VMT) and can change over time.

Greenhouse Gas (GHG) Inventory Report for 2023

Government Operations

Below is a summary of the steps that were involved in creating the Village local government operations GHG inventory. The details of the methodology are captured in Appendix B.

- A CSC Task Force subteam (Yvonne Posey, Joseph Londa and Izzy Defino) was organized to manage the GHG inventory process.

- Key Town and Village contacts who provided support and data throughout the project were identified. A spreadsheet was created for GHG inventory data entry.

- ICLEI software was used for collecting, calculating, and organizing GHG emissions from Local Government Operations for the Town and Village of New Paltz. To keep the inventory practical and cost-effective, data collection was focused on the largest sources of emissions (Appendix D) and most common GHG emissions for which the village is responsible. An inventory that covers about 95% of GHG emissions is acceptable and complies with the Local Government Operations Protocol.

- The year 2017 submission was used as the baseline. A new 2017 inventory was revised using emissions factors that were published in 2018 and 2020. There is a two year lag in release of eGRID data.

- Data on actual tank and fleet fuel usage were obtained from historical bills provided by the Town and Village. Data on actual electricity use was obtained from Village monthly Central Hudson bills for all active accounts. All data was reviewed for completeness and accuracy.

- The data was entered and GHG emissions calculated using the ICLEI inventory tool. ICLEI calculations were reviewed to confirm accuracy. Factors, calculations, and sources can be found in Appendix E.

Greenhouse Gas (GHG) Inventory Report for 2023

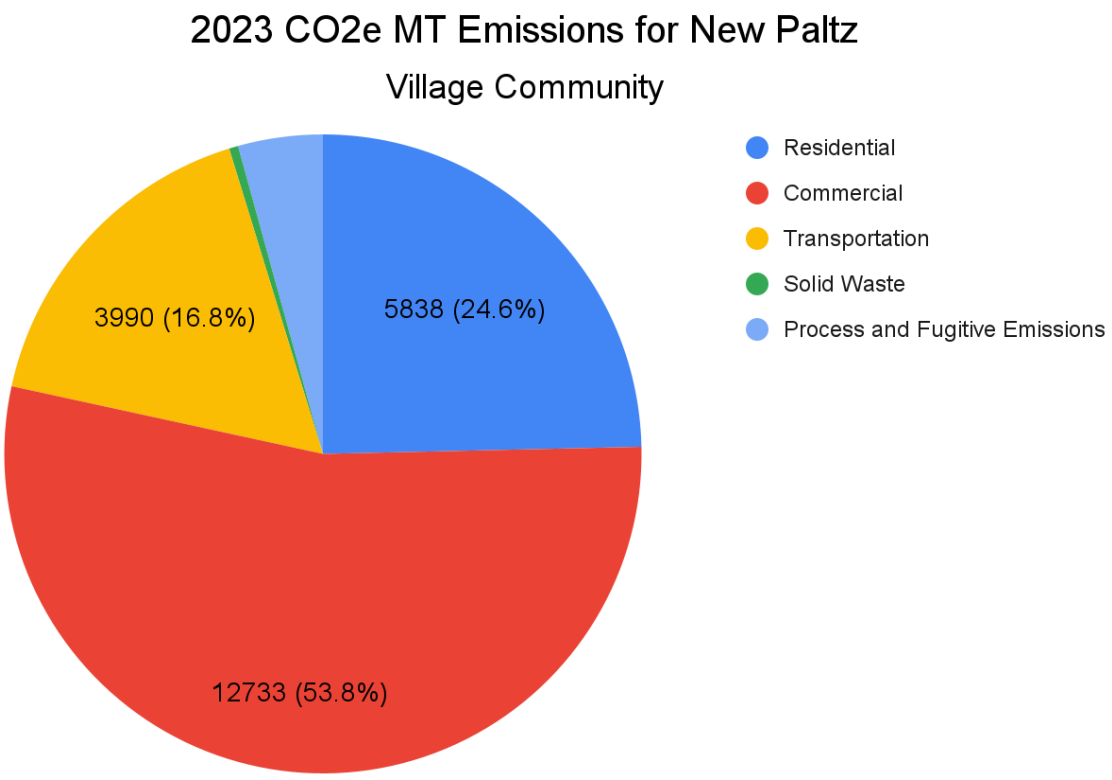
Emissions Inventory Results

The units for GHG emissions are in CO2 equivalent Metric Tons (MT). A metric ton is equal to 2,204 lbs. CO2e is the representation of all GHG gases and the weighting of them using Global Warming Potential (GWP) into the equivalent of (CO2). For further explanation see wikipedia page: https://en.wikipedia.org/wiki/Global_warming_potential

Community

The GHG Emissions sectors for Community Wide are:

- Residential
- Commercial
- Transportation
- Solid Waste
- Water and Wastewater (septic systems)
- AFLOU (By ordinance no Agriculture livestock is allowed in the Village.)
- Process and Fugitive Emissions (Natural Gas escape)



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A comparison of the 2017 to 2023 GHG Emissions is depicted in the table below. These increases in Residential and Commercial emissions are from the fact that the 2017 data was not fully reporting usage and thus creating artificially low emission calculations.

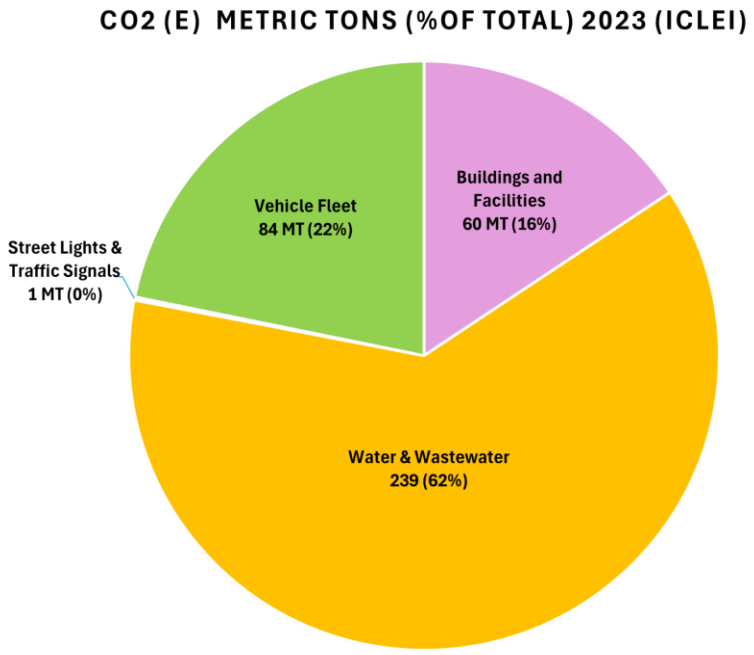
	Community CO2e MT		
	2017 Village	**2023 Village**	**% Change**
Residential	2265	5838	157.75%
Commercial	1450	12733	778.14%
Transportation	4328	3990	-7.81%
Solid Waste	151.8	109	-28.19%
Water and Waste Water	34	0	0.00%
AFLOU	0	0	0.00%
Process and Fugitive Emissions	654	1018	55.63%
Total	8883	23688	**166.67%**

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Government Operations

The GHG Emissions sectors for Government Operations are:

- Vehicle Fleet
- Buildings and Facilities
- Water and Wastewater
- Streetlights and Traffic Signs

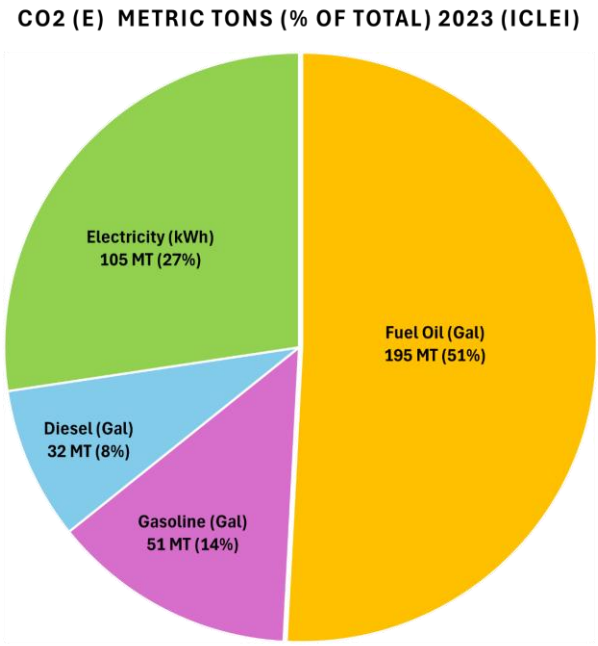


ICLEI Reporting Sector	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	CO_2 (e) Metric Tons 2017 (Village Report)	CO_2 (e) Metric Tons 2017 (ICLEI)	CO_2 (e) Metric Tons 2023 (ICLEI)	% Change
Buildings and Facilities	$19,263.16	$30,702.22	59%	66	71	60	-16%
Water & Wastewater	$75,442.27	$132,801.37	76%	154	237	239	1%
Street Lights & Traffic Signals	$62,101.78	$673.08	-99%	47	43	1	-98%
Vehicle Fleet	$21,940.63	$27,732.54	26%	124	112	84	-25%
Totals	$178,747.84	$191,909.21	7%	392	463	383	-17%

- Water and Wastewater was the greatest source of GHG emissions for 2017 and 2023.
- The change in GHG emissions between 2017 and 2023 was not significant for Water and Wastewater (1%).
- The greatest decrease was seen with Streetlights and Traffic Signals (98%).

Greenhouse Gas (GHG) Inventory Report for 2023

GHG emissions by Energy Source are:

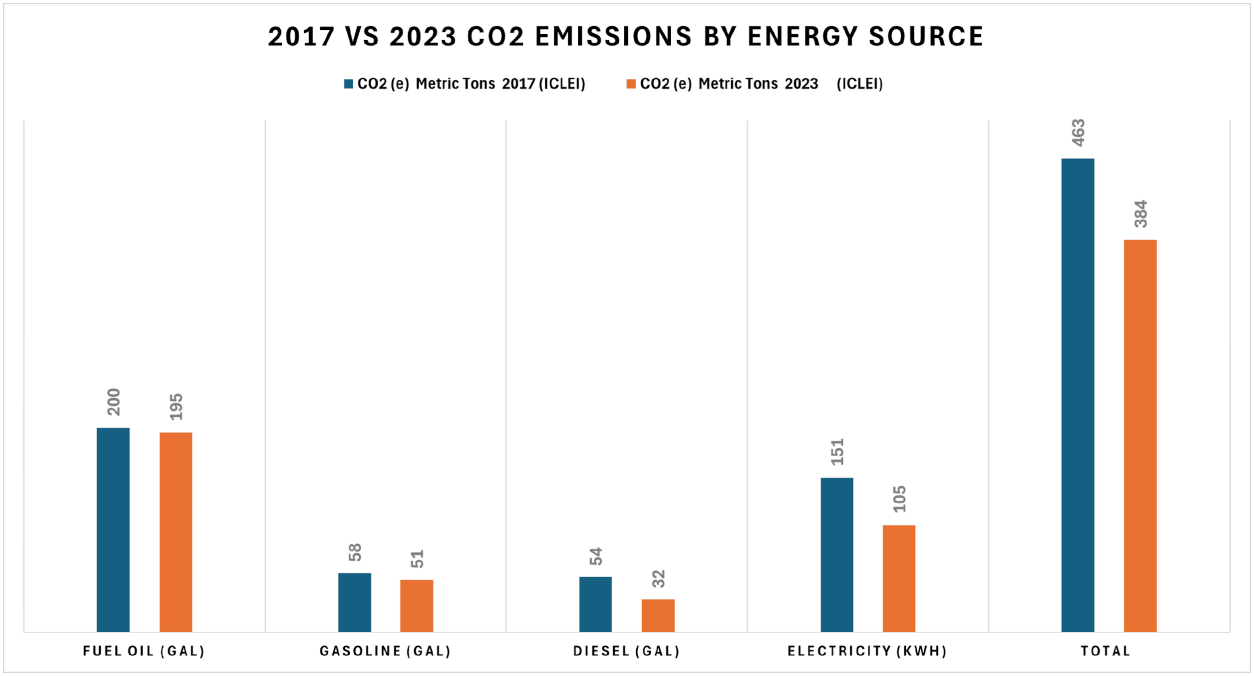


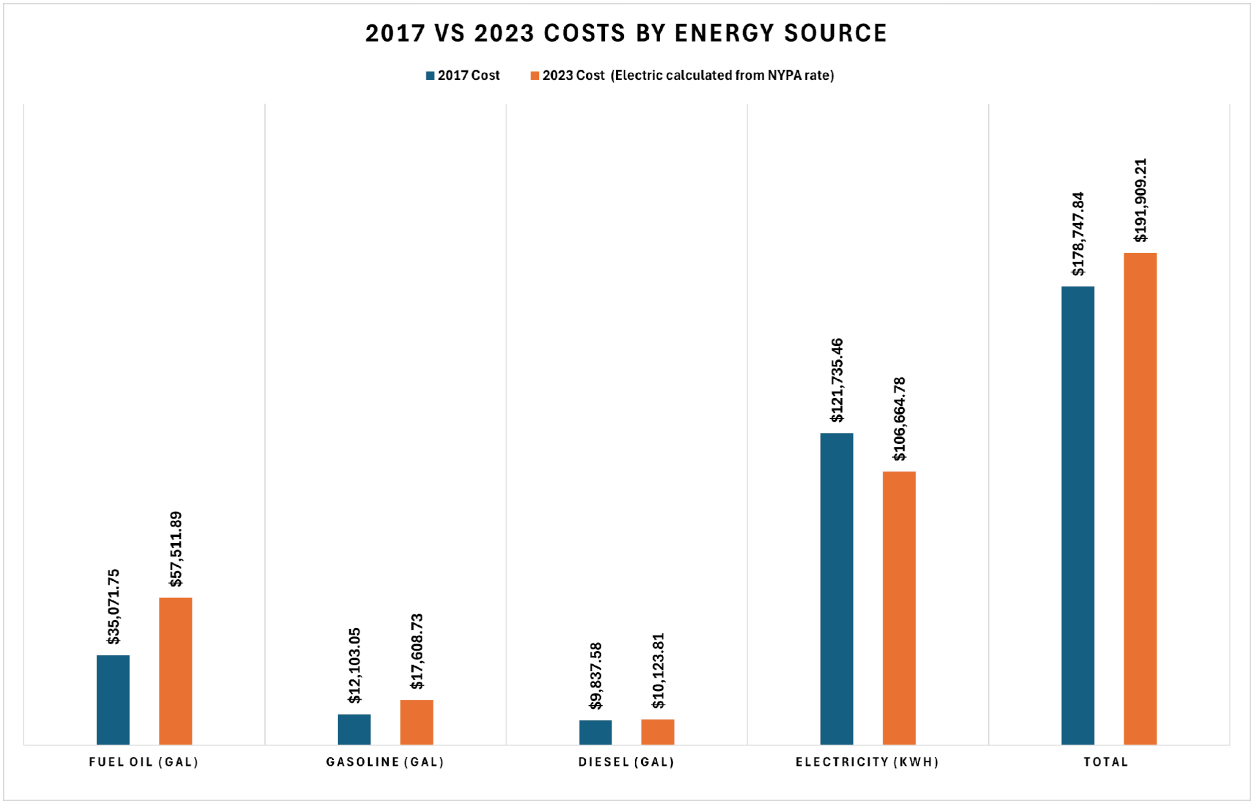
Energy Source	2017 Usage	2023 Usage	% Change	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	CO_2 (e) Metric Tons 2017 (Village Report)	CO_2 (e) Metric Tons 2017 (ICLEI)	CO_2 (e) Metric Tons 2023 (ICLEI)	% Change
Fuel Oil (Gal)	19596	18970	-3%	$35,071.75	$57,511.89	64%	?	200	195	-2%
Gasoline (Gal)	6463	5855	-9%	$12,103.05	$17,608.73	45%	?	58	51	-11%
Diesel (Gal)	5134	3148	-39%	$9,837.58	$10,123.81	3%	?	54	32	-40%
Electricity (kWh)	957151	957129	0%	$121,735.46	$106,664.78	-12%	?	151	105	-31%
Total				$178,747.84	$191,909.21	7%	391.5	463	384	-17%

- Fuel oil was the largest source of GHG emissions for 2017 and 2023.
- Fuel oil usage decreased by 3%, but costs increased by 64% between 2017 and 2023.
- Electricity was the second largest source of GHG emissions for both years. Although emissions due to electricity decreased between 2017 and 2023 (151 MT CO2e vs 105 MT CO2e), there was essentially no difference in electricity usage. Still, electricity was the largest energy expense for the Village.
- Diesel usage decreased by 39% but cost increased by 3%. Gasoline usage decreased by 9% but costs increased by 45%.

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Using bar charts for emissions and cost data:





Conclusions

Both the Village Community and Local Government Operations results show reductions in GHG emissions for 2023. The Government Operations method of bottoms up creates greater confidence in these results, whereas the community method of tops down has greater dependency on the data quality.

Community

- The Commercial Sector was the largest contributor for GHG emissions in 2023 at 12,744 CO2e MT gases and Natural Gas is the primary source at 75% of the total as reported by Central Hudson. Ongoing education of Restaurant owners on electric appliance alternatives will be needed if we are to make progress in this sector.

- The Residential Sector still has a significant amount of emissions from fuel oil. Steady progress is visible in the transition to heat pumps as can be observed by the increased requests for permits.

- Residential and Commercial sectors are seeing more indirect GHG emissions from electricity. This is an important trend to be monitored and to encourage renewable generation both locally and from utility companies such as:
    - supporting battery storage
    - local government policy change
    - code change for electrification, including EV charging
    - supporting CCAs

Progress on reducing GHG emissions in the Village Community is evident, however, these results can be used to focus on areas for further improvement.

Greenhouse Gas (GHG) Inventory Report for 2023

Government Operations

- Total GHG emissions from all energy sources for local government operations in the Village of New Paltz decreased from 463 MT CO2e/year for 2017 to 383 MT CO2e/year for 2023, a 17% decrease.
- The overall cost increased slightly (7.4%) from $178,748 in 2017 to $191,909 in 2023 primarily due to an increase in fossil fuel costs. However, it is noteworthy that an increase of $13,161 in electricity expenditure over 5 years is commendable.
- The greatest source of GHG emissions for the Village of New Paltz in 2017 and 2023 by reporting sector was from the Water and Wastewater sector (237 MT CO2e vs 239 MT CO2e, respectively).
- Total electricity usage was essentially unchanged from 2017 (957,151 kWh) to 2023 (957,129 kWh), 0.0%. However, emissions were decreased due to the increased efficiency of the regional electric grid (274.9 lbs. CO2e/MWh used for 2017 vs 241.7 lbs. CO2e/MWh in 2023).
- The greatest improvement in GHG emissions was seen with streetlights which became 100% LED by 2023 (43 MT CO2e in 2017 vs 0.7 MT CO2e in 2023, a 99% decrease).
- Total electricity costs in the Village of New Paltz decreased by 12.4% from $121,735 in 2017 to $106,665 in 2023. Factors that contributed to this decrease include the change to all LED streetlights, upgraded insulation at the DPW Pole Barn and better electricity rates. This decrease occurred despite the added electrical burden that came from updating equipment at the water treatment plant, the addition of ductless heat pumps at the village hall (offset by savings on fuel oil), and the addition of a new all electric firehouse. The electric vehicle charging station was not operational in 2017 or 2023.
- The overall goal of the Village of New Paltz is to become a net zero community by replacing all sources of energy with renewable energy as the technology becomes available and accessible and to meet the New York state CLCPA mandate to reduce GHGs by 40% by 2030 and 85% by 2050.

Progress on reducing GHG emissions in the Village is evident, however, these results can be used to focus on areas for further improvement.

Greenhouse Gas (GHG) Inventory Report for 2023

Closing Thoughts

Our local efforts to combat climate change through mitigation are evident in our 2023 GHG Inventory Local Government Operations GHG reductions. This should motivate us to invest in and create code for mandated solar arrays to reduce both cost and emissions, be that for new roof tops array, ground arrays, or distributed energy resources across the grid.

Transportation for Community and Water and Wastewater treatment for Local Government Operations are the largest contributors for GHG emissions and will require changes in technology, lifestyle, and infrastructure to see further reductions. We should continue to promote walking and biking as a lifestyle choice and actively support this transition in how we live. In addition, charging infrastructure needs to be established pervasively, perhaps by code, to support the transitions to EV's for all vehicles. Our largest DPW vehicles will need additional technological advancement to meet their needs, but we will need to explore what is available as alternatives to gas and diesel.

Climate Change is a global problem and the mitigation of it requires local efforts that all communities have a burden and responsibility to pursue.

Appendix A: Community Wide Methodology

Residential

- Electric and NG usage data both come from the Central Hudson DB
  https://utilityregistry.org/app/#/
  Conversion from MWh to KWh is desirable for familiar units.

- Fossil Fuel usage comes from Federal data and filtered on New York State
  https://www.eia.gov/state/data.php?sid=NY

- Use population data for Village to allocate a portion of the Fossil Fuels (Oil and Propane) usage based on demographics
  https://docs.google.com/spreadsheets/d/1JD-7dg9WHRUqa63Qy8b5Nelax_FAwW3DYEP53kv9osU/edit?usp=sharing

- Convert from MMBTU to Gals for familiar units
  https://www.enspireenergy.com/energy-conversion-calculator/

Commercial

- Same methodology except filter on “Sesctor” to obtain Commercial

Transportation

- Obtain NYS data from https://www.dot.ny.gov/highway-data-services and filter for Ulster County VMT.

- Since the data only goes down to the County Level by Road Type, use % of Road Type in New Paltz Village and Town to allocate the Ulster County VMT.
  https://docs.google.com/spreadsheets/d/1VxRqoBuFK2S2D1NvrYabYEkDmvJAOMVh/edit?usp=sharing&ouid=109573853466449850117&rtpof=true&sd=true

Solid Waste

- Data provided by Town of New Paltz Recycling and Refuse Annual Report.

Water and Wastewater

- The village is treated as 100% on municipal provided waste treatment, no septic

AFLOU

- Village ordinance prohibits livestock in the Village

Process and Fugitive Emissions

- Use the latest Ulster County GHG Inventory report for Fugitive Emissions and allocate 1% for Village of New Paltz

Appendix B: Government Operations Methodology

Update to 2017 GHG Reported Emissions

The emission factor used for 2017 by ICLEI was a calculated factor based on an average of 2016 and 2018 eGRID emission factors. No eGRID emission factors were published for 2017. Also, emissions in the 2017 inventory were calculated as zero for electricity. For this reason, 2017 usage data was used to recalculate the GHG emissions for that year causing the numbers to be revised upward.

- Total GHG emissions from all energy sources for local government operations in the Village of New Paltz were initially reported as 391.5 metric tons (MT) of CO2e for 2017.
- The total GHG emissions number was revised upward from 391 MT CO2e to 463 MT CO2e for 2017 using ICLEI software that had different emission factors than those available at the time of the initial GHG report (the raw data did not change). See **Appendix D**.

Appendix C: Community Wide GHG Emission Details

Residential

	CO2e MT				Fossil Fuel and Electric Usage			
	2017.00	2023.00	Change	Usage Unit	2017.00	2023.00	Change
	ICLEI	ICLEI					
Village							
Fuel Oil	821	3142	282.70%	Fuel Oil (Gals)	79299	303536	282.77%
Propane	187	918	390.91%	Propane (Gals)	32,915	161,504	390.67%
Natural Gas	203	632	211.33%	NG (CCu Ft)	36728	114650	212.16%
Electric	1054	1146	8.73%	Electric (MWh)	7849	10,541	34.30%
Total	2265	5838	157.75%				

Commercial

	CO2e MT				Fossil Fuel and Electric Usage		
Village							
Fuel Oil	None	1478		Fuel Oil (Gals)	None	142758	
Natural Gas	542	9467	1646.68%	Propane (Gals)	111157	1941217	1646.38%
Propane	None	386		NG (CCu Ft)	None	60,040	
Electric	908	1402	54.41%	Electric (MWh)	6764	12,786	89.03%
Total	1450	12733	778.14%				

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Transportation

	CO2e MT						Fossil Fuel VMT (excludes EV VMT)			
	2017	2017 Updated	2023	Change			2017 (West)	2017 (Updated)	2023	Change
	ICLEI	ICLEI	ICLEI				West Method	Londa Method	Londa Method	
Village										
Gas	6940	3455	3185	-54.11%						
Diesel	1836	873	805	-56.15%						
Total	8776	4328	3990	-54.54%		Total Miles	20,061,239	8,952,725	8,252,617	-58.86%

Solid Waste

	CO2e MT							
	2017	2023	Change		Usage Unit	2017	2023	Change
	ICLEI	ICLEI						
Village								
Solid Waste	142.8	99			Tons	144.9	100	
Branches and Food Waste	0				Tons	2148		-100.00%
Collection/Transportation	9	10			Miles	304	304	
Total	151.8	109	-28.19%					

Greenhouse Gas (GHG) Inventory Report for 2023

Water and Wastewater

Village is 100% on waste treatment facility and that is reported in Village Government Operations

AFLOU (Agriculture)

By ordinance no livestock is permitted in the Village.

Process and Fugitive Emissions

	CO2e MT							
	2017	**2023**	**Change**		Usage Unit	**2017**	**2023**	**Change**
	ICLEI	ICLEI						
Village								
NG Leaks	34	53.37	56.97%		MMBTU			
Ozone Depleting Sources	620	964.42	55.55%		Metric Tons			
Total	654	1017.79						

Appendix D: Government Operations GHG Emission Details

Village Master Facilities List

ICLEI GHG Reporting Sector	Village Site	Energy Source Units
Buildings and Facilities	Village Hall (Fuel Oil tank 2)	Gal
	Village Hall	kWh
	DPW Garage (Fuel Oil tank 1)	Gal
	Village EV Charging Station	kWh
	DPW (Hugenot St). Pole Barn	kWh
	Fire Station substation / New Fire Station	kWh
Water & Wastewater Treatment	Waste Water Treatment Plant - Hugenot St.	kWh
	Waste Water Treatment Plant - Hugenot St. Fuel Oil tank 4	Gal
	Sewer Pump Station - Henry Ct. (aka Hugenot St.)	kWh
	Sewer Pump Station - Hasbrouck Ave	kWh
	Sewer Pump Station - Orchard Ln	kWh
	Sewer Pump Station - Route 32	kWh
	Sewer Pump Station - HWD	kWh
	Water Treatment Plant - Mtn. Rest	kWh
	Water Treatment Plant - Mtn. Rest Fuel Oil tank 3	Gal
	Aqueduct Water Pump Station - Mtn. Rest	kWh
	Water Tower Telemetry - Bruce/Rita	kWh
Street Lights & Traffic Signals	Village Hall Lighting	kWh
	Hasbrouck Park Lighting	kWh
Vehicle Fleet	Gasoline - DPW/Firehouse	Gal
	Diesel - DPW	Gal

Greenhouse Gas (GHG) Inventory Report for 2023

Buildings and Facilities

Village Site	Energy Source Units	2017 Usage	2023 Usage	% Change	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	$CO_2(e)$ Metric Tons 2017 (Village Report)	$CO_2(e)$ Metric Tons 2017 (ICLEI)	$CO_2(e)$ Metric Tons 2023 (ICLEI)	% Change
Village Hall (Fuel Oil) tank 2	Gal	3298	2300	-30%	$6,084.33	$7,201.83	18%	?	34	24	-30%
Village Hall (with to without fire station)	kWh	67360	55520	-18%	$6,332.97	$6,160.50	-3%	?	9	6	-33%
DPW Garage (Fuel Oil) tank 1	Gal	2557	1889	-26%	$4,902.57	$5,933.95	21%	?	26	19	-25%
Village EV Charge Station	kWh	0	0	0%	$0	$0	0%	?	0	0	0%
DPW (Hugenot St). Pole Barn	kWh	14898	1552	-90%	$1,412.76	$172.21	-88%	?	2	0	-92%
Fire Station Substation / New Fire Station	kWh	2083	97080	4561%	$530.53	$11,233.73	2017%	?	0	11	3700%
Total (KWh)		84341	154152	83%	$8,276.26	$17,566.44	112%	?	11	17	49%
Total (Gal)		5855	4189	-28%	$10,986.90	$13,135.78	20%	?	60	43	-28%
Total (Buildings and Facilities)					$19,263.16	$30,702.22	59%	65.83	71	60	-16%

Water and Wastewater

Village Site	Energy Source Units	2017 Usage	2023 Usage	% Change	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	CO2(e) Metric Tons 2017 (Village Report)	CO2(e) Metric Tons 2017 (ICLEI)	CO2(e) Metric Tons 2023 (ICLEI)	% Change
Waste Water Treatment Plant - Hugenot St.	kWh	299160	266840	-11%	$9,319.21	$29,608.57	218%	?	37.3	29.2	22%
Waste Water Treatment Plant - Hugenot St. (Fuel Oil) tank 4	Gal	8760	6851	-22%	$15,170.94	$20,682.43	36%	?	89.3	70.4	21%
Sewer Pump Station - Henry Ct. (also Hugenot St.)	kWh	1558	1622	4%	$502.31	$179.98	-64%	?	0.2	0.2	5%
Sewer Pump Station - Hasbrouck Ave	kWh	65	183	182%	$426.96	$20.31	-95%	?	0.0	0.0	-100%
Sewer Pump Station - Orchard Ln	kWh	232	686	196%	$424.85	$76.12	-82%	?	0.0	0.1	-167%
Sewer Pump Station - Route 32	kWh	12768	22996	80%	$1,123.31	$2,551.64	127%	?	1.6	2.5	-58%
Sewer Pump Station - HWD	kWh	40249	42037	4%	$3,660.56	$4,664.43	27%	?	5.0	4.6	8%
Water Treatment Plant - Mtn. Rest	kWh	134000	323520	141%	$17,177.10	$35,897.78	109%	?	16.7	35.5	-112%
Water Treatment Plant - Mtn. Rest (Fuel Oil) tank 3	Gal	4980	7930	59%	$8,913.91	$23,693.68	166%	?	50.8	81.5	-60%
Aqueduct Water Pump Station - Mtn. Rest	kWh	231680	137160	-41%	$18,208.04	$15,219.27	-16%	?	28.9	15.0	48%
Water Tower Telemetry - Bruce/Rita	kWh	1764	1867	6%	$515.08	$207.16	-60%	?	0.2	0.2	9%
Total (KWh)		721476	796911	10%	$51,357.42	$88,425.26	72%	?	97.0	87.4	10%
Total (Gal)		13741	14781	8%	$24,084.85	$44,376.11	84%	?	140.0	151.9	-8%
Total (Water & Wastewater Treatment)		735217	811692	10%	$75,442.27	$132,801.37	76%	154.48	237.0	239.2	-1%

Streetlights and Traffic Signals

Village Site	Energy Source Units	2017 Usage	2023 Usage	% Change	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	$CO_2(e)$ Metric Tons 2017 (Village Report)	$CO_2(e)$ Metric Tons 2017 (ICLEI)	$CO_2(e)$ Metric Tons 2023 (ICLEI)	% Change
Village Hall Lighting	kWh	22	2368	10664%	$425.31	$262.75	-38%	?	0	0	0%
Hasbrouck Park Lighting	kWh	151312	3698	-98%	$61,676.47	$410.33	-99%	?	43	0	-99%
Total (Street Lights & Traffic Signals)		151334	6066	-96%	$62,101.78	$673.08	-99%	47.29	43	1	-98%

Vehicle Fleets

Village Site	Energy Source Units	2017 Usage	2023 Usage	% Change	2017 Cost	2023 Cost (Electric calculated from NYPA rate)	% Change	$CO_2(e)$ Metric Tons 2017 (Village Report)	$CO_2(e)$ Metric Tons 2017 (ICLEI)	$CO_2(e)$ Metric Tons 2023 (ICLEI)	% Change
Gasoline (DPW & Firehouse)	Gal	6463	5855	-9%	$12,103.05	$17,608.73	45%	64	58	51	-11%
Diesel (DPW)	Gal	5134	3148	-39%	$9,837.58	$10,123.81	3%	60	54	32	-40%
Total (Vehicle Fleet)		11597	9003	-22%	$21,940.63	$27,732.54	26%	124	112	84	-25%

Appendix E: Factors, Sources & Calculations

Factors and Sources

EPA – eGRID 2023 subregion - NYUP region = 241.7 lbs CO2e/MWh

EPA – eGRID 2016 & 2018 (averaged for 2017) subregion – NYUP region = 274.9 lbs CO2e/MWh.

The electric grid CO2e emission factor (EF) in lbs/MWh for 2016 (EF=295.9) and 2018 (EF=253.9) were averaged for 2017 (EF=274.9 lbs. CO2e/MWh). Published figures for 2017 were not available.

Calculations

Electricity usage [MT CO2e] = [#kWh] x [1 MWh/1000 kWh] x [emission factor lbs. CO2e/MWh] x [1 MT CO2e/2204.6 lbs. CO2e]

Fuel Oil emissions [MT CO2e] = [#gal] x [(10.21/1000) MT CO2e/gal]

Gasoline emissions [MT CO2e] = [#gal] x [(8.887/1000) MT CO2e/gal]

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