

# New Paltz Greenhouse Gas Inventory for Local Government Operations

Climate Smart Communities Task Force

February, 2019

# What are Climate Smart Communities?

- ▶ A network of New York communities engaged in reducing greenhouse gas (GHG) emissions and improving climate resilience. The program provides guidance to local governments on best practices for mitigating and adapting to climate change.
- ▶ Communities can take action to minimize the risks of climate change and reduce its long-term costs:
  - ▶ Reduce GHG Emissions
  - ▶ Adapt to a Changing Climate
  - ▶ Save Taxpayers Money
- ▶ The Climate Smart Communities program is jointly sponsored by the following six New York State agencies: DEC, NYSERDA, DPS, DoS, DoT, and DoH.

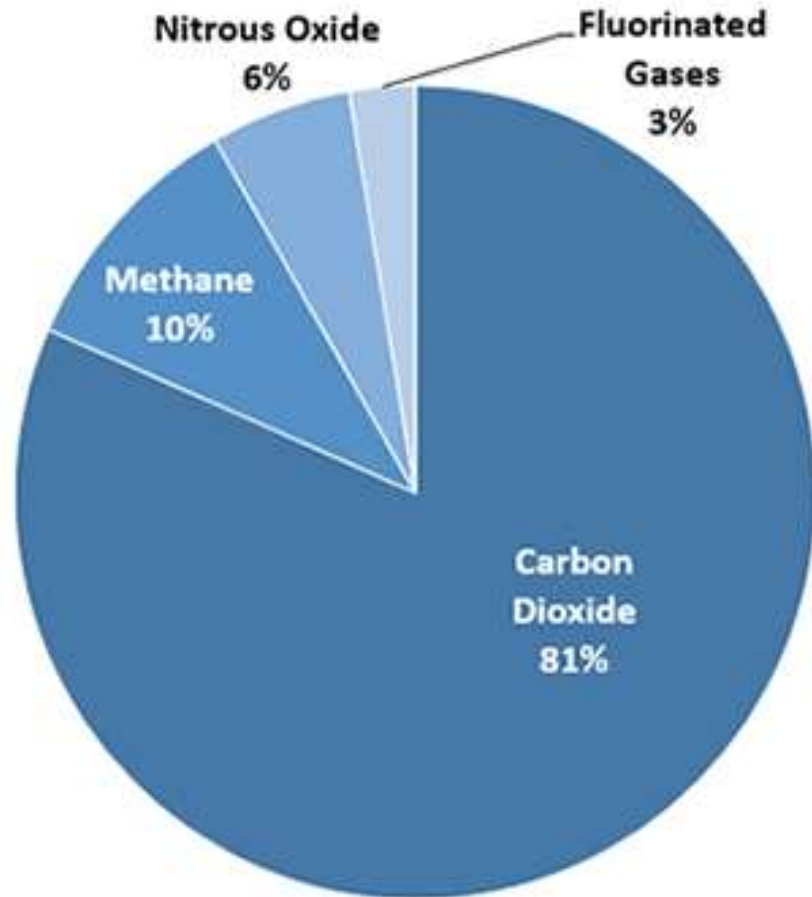
# Town of New Paltz is a Climate Smart Community!

- ▶ In 2010 the Town of New Paltz pledged to
  - ▶ Build a climate-smart community.
  - ▶ Inventory emissions, set goals, and plan for climate action.
  - ▶ Decrease energy use.
  - ▶ Shift to clean, renewable energy.
  - ▶ Use climate-smart materials management.
  - ▶ Implement climate-smart land use.
  - ▶ Enhance community resilience to climate change.
  - ▶ Support a green innovation economy.
  - ▶ Inform and inspire the public.
  - ▶ Engage in an evolving process of climate action
- ▶ 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

# What are Greenhouse Gases (GHG)?

- ▶ GHG 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.
- ▶ GHG can remain in the atmosphere for different amounts of time, ranging from a few years to thousands of years.
- ▶ The most common types are:
  - ▶ Carbon dioxide (CO<sub>2</sub>) - enters the atmosphere through burning of fossil fuels, solid waste, & wood products; 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.

# U.S. Greenhouse Gas Emissions in 2016



U.S. Environmental Protection Agency (2018). Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2016

# How do we measure the impact of Greenhouse Gases

- ▶ For each GHG, the EPA has calculated a Global Warming Potential (GWP) to reflect how long it remains in the atmosphere, on average, and how strongly it absorbs energy.
- ▶ The GWP allows comparisons of the global warming impacts of different gases.
  - ▶ It is a measure of how much energy the emission of 1 ton of a gas will absorb over a given period of time relative to the emission 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. The time period usually used for GWPs is 100 years.
  - ▶ 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.

# How do the Greenhouses Gases compare in GWP

- ▶ Carbon Dioxide ( $\text{CO}_2$ ): GWP = 1 as it is the gas being used as the reference. Emitted  $\text{CO}_2$  will last thousands of years in the atmosphere.
- ▶ Methane ( $\text{CH}_4$ ): estimated GWP = 28-36 over 100 years. Emitted  $\text{CH}_4$  lasts about a decade but absorbs much more energy than  $\text{CO}_2$ ; the shorter lifetime/higher energy absorption is reflected in the GWP. The  $\text{CH}_4$  GWP also accounts for some indirect effects since  $\text{CH}_4$  is a precursor to ozone, itself a GHG.
- ▶ Nitrous Oxide ( $\text{N}_2\text{O}$ ): estimated GWP = 265-298 over 100-years. Emitted  $\text{N}_2\text{O}$  will last for more than 100 years in the atmosphere.
- ▶ Fluorinated Gases: Chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), hydrochlorofluorocarbons (HCFCs), perfluorocarbons (PFCs), and sulfur hexafluoride ( $\text{SF}_6$ ) are sometimes called high-GWP gases because for a given amount of mass they trap substantially more heat than  $\text{CO}_2$ . The GWPs for these gases can be in the thousands or tens of thousands; they can last in the atmosphere from weeks to thousand of years.

# New Paltz Greenhouse Gas Inventory for Local Government Operations

- ▶ Local Government Operations: any facility or use that the Town has financial or operational control over
- ▶ The inventory was built on actual usage of
  - ▶ Direct emissions sources = propane, fuel oil, gasoline, & diesel; no natural gas was used by Town government operations
  - ▶ Indirect emission sources = electricity
  - ▶ No emissions of fluorinated gases were calculated since we have no significant local government sources
- ▶ All Greenhouse Gas emissions were converted to CO<sub>2</sub> equivalents and reported in tons. For this report CH<sub>4</sub> = 28 CO<sub>2</sub>eq and N<sub>2</sub>O = 298 CO<sub>2</sub>eq.
- ▶ The inventory shows usage, costs, and emissions by facility and energy types to allow analysis and comparisons.



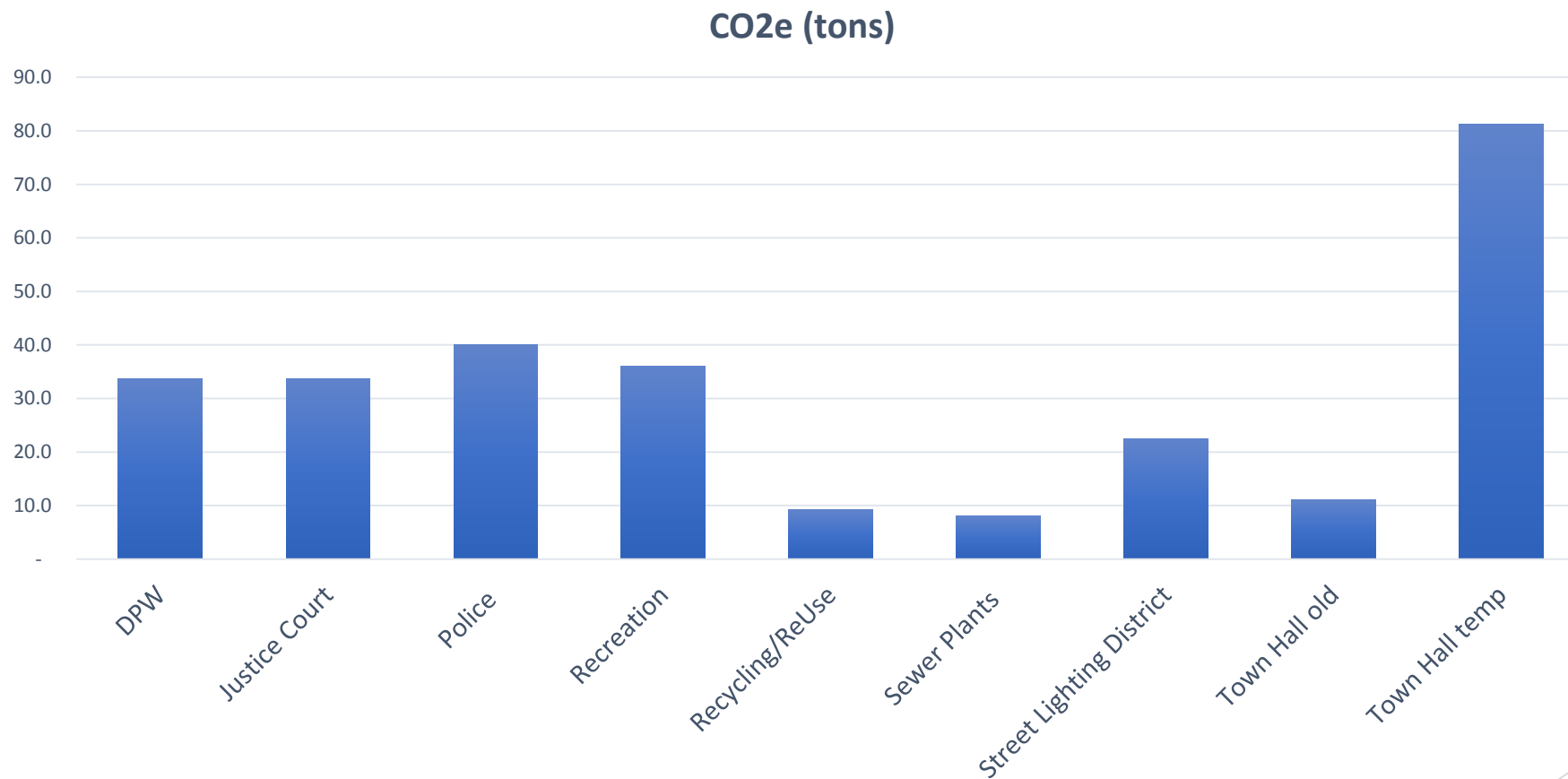
# HUDSON VALLEY REGIONAL COUNCIL: “Climate Action Planning Institute”



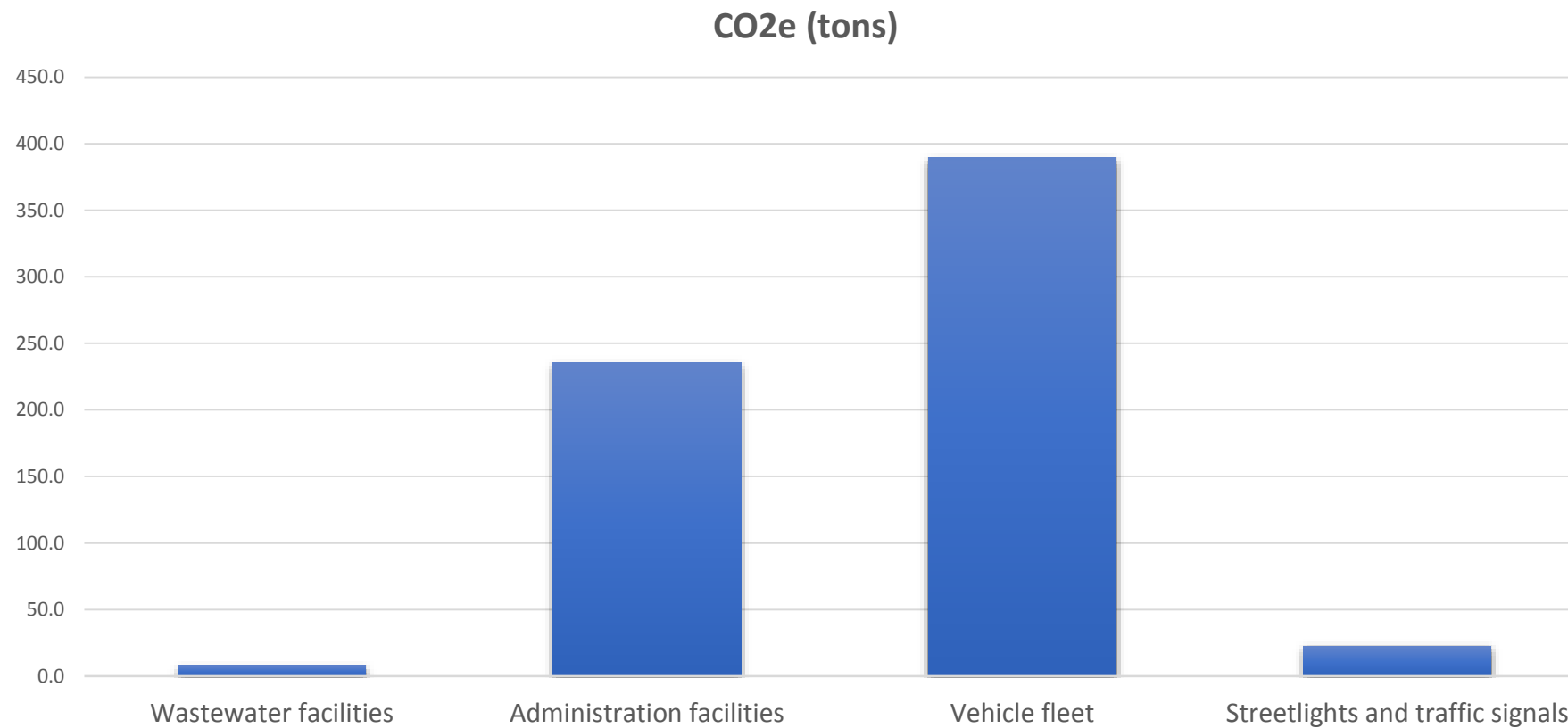
Climate Smart New Paltz



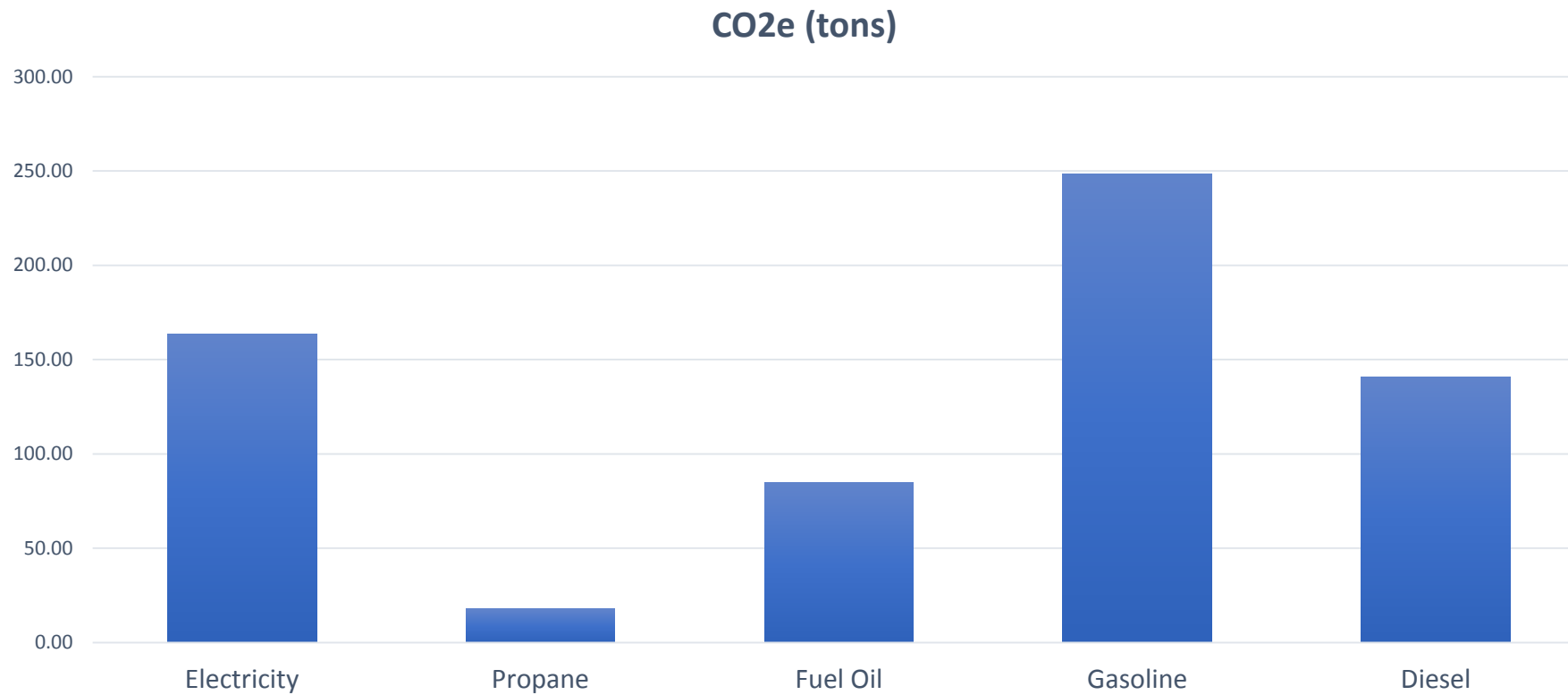
# GHG Emissions by Facility for Electricity, Propane, & Fuel Oil



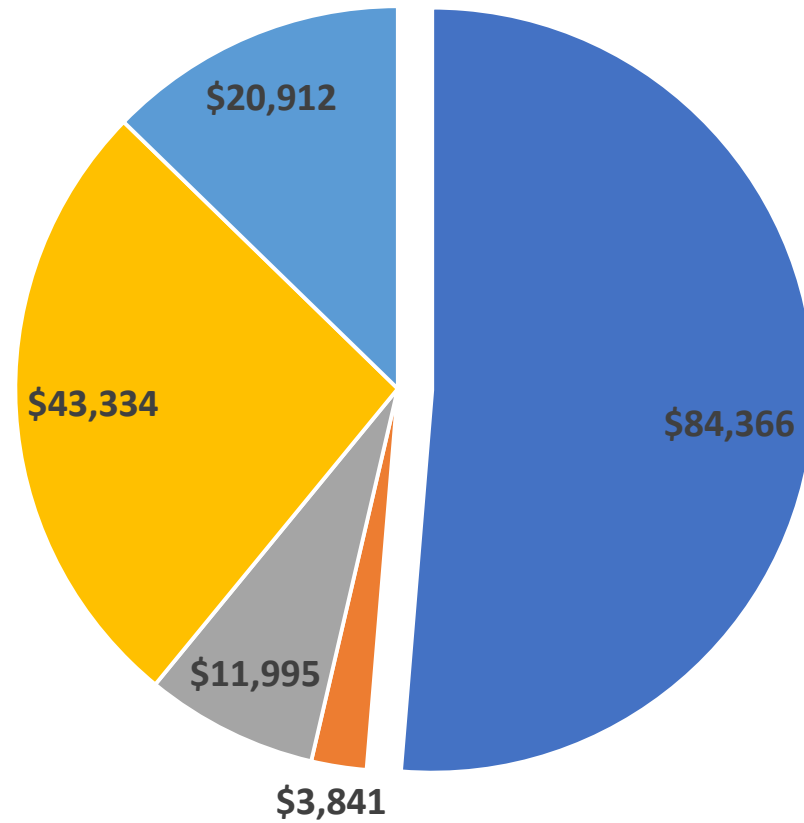
# Total GHG Emissions by Function for All Energy Sources



# GHG Emissions by Energy Type



# Average Energy Costs by Fuel Type



■ Electricity ■ Propane ■ Fuel Oil ■ Gasoline ■ Diesel

# Annual Trends in GHG Emissions (tons CO2e)

Function	2013	2014	2016	2017
All Municipal Operations	580.44	638.03	645.51	665.53
Administration Facilities	139.78	178.75	243.15	227.65
Vehicle Fleet	411.36	428.05	371.20	407.85
Streetlights & Signals	21.73	22.99	23.08	21.99
Wastewater Facilities	7.58	8.24	8.09	8.44

Fuel Type	2013	2014	2016	2017
Electricity	113.92	112.47	161.01	165.98
Propane	15.61	23.28	18.21	17.48
Fuel Oil	39.56	74.23	95.09	74.22
Gasoline	252.27	261.45	237.78	259.32
Diesel	159.09	166.60	133.42	148.53

# Key Findings

- Total average Town GHG emissions = **655.5 tons** of CO<sub>2</sub>e/year for the baseline years 2016 - 2017.
- The total GHG emissions for all municipal functions show an upward trend year after year.
- For 2016-2017, % of the total Town GHG emissions were:
  - vehicle fleet (Police Department & DPW) = 59%
  - administration facilities (buildings, recreation facilities, Recycle/Reuse Center) = 36%
  - streetlights/signals = 3%
- For 2016-2017, Police Department use of gasoline = 150 tons of CO<sub>2</sub>e/year; Police Building energy use = 40.1 tons CO<sub>2</sub>e/year.
- For 2016-2017, the DPW use of gasoline + diesel = 232 tons CO<sub>2</sub>e/year; DPW buildings energy use = 33.6 tons CO<sub>2</sub>e/year.
- A large change in GHG emissions occurred when the Town Hall was moved from the old building to the temporary trailer units: 35,527 KWh (=11.1 tons CO<sub>2</sub>e/year) to 161,820 KWh (=81.3 tons CO<sub>2</sub>e/year).
- Another notable change occurred at the Justice Court, where electricity usage went from an average for 2013-2014 of 1,957 KWh (= 0.6 tons CO<sub>2</sub>e/year) to an average for 2016-2017 of 30,604 KWh (= 9.5 tons CO<sub>2</sub>e/year).

# Next Steps

## ▶ **CSC Task Force subteam & Town Finance Officer**

- Collect and enter 2018 energy data
- Plan for collection of Scope 3 data such as solid waste sent out, fugitive emissions, employee commuting, etc.

## ▶ **Town Board**

- Accept the final 2019 Town of New Paltz GHG Inventory report & post it on the Town website
- Create a Climate Action Plan
  - 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
  - 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



# Thank you!