

Town of Roseboom Climate Smart Actions

The Town of Roseboom was certified by NYSERDA as a Clean Energy Community in 2019 and has received a \$5000 grant from them to use toward future energy reduction projects. Now, we are working with the Department of Environmental Conservation to be certified as a Climate Smart Community. This requires 120 points to achieve the Bronze level. This will give us access to even more grant money for energy saving projects. We are almost there! We submitted an application this past July, but did not quite make it. There were a few “Actions” that did not meet all their specifications. We will try again on the January 7, 2022 re-submission date. These CSC Actions not only reduce our energy consumption and emissions, but save us money as well!

So far, this is what we have done:

We have re-appointed a Climate Smart Community (CSC) Coordinator for a 4 year term: Environmental Committee Chairperson, Allegra Schecter, in 2021.

We have re-appointed a CSC Task Force in 2021, comprised of Town Supervisor Patti Gustafson, Town Board members Curtis Vandewerker and Charlie Diamond, Highway Superintendent Dan Gage and local business persons Mary Jo Cronin and Bob Schecter, for a 4 year term.

We are part of the Regional Climate Program, Clean Energy Communities, where we completed 4 High Impact Actions for Certification: a Unified Solar Permit (2016), LED Street lighting (2018), Benchmarking Building Energy Usage (2018) and Energy Code Enforcement Training (2019)

We completed Exterior Lighting Upgrades, converting all our outdoor security lights to LED (2016).

We completed Interior Lighting Upgrades by converting all fluorescent to LED lighting (2021)

We insulated above the ceiling in the Town Garage (2018) and new garage door weather-stripping (2021).

We have a Green Power Procurement Plan with NEXAMP for 10% solar credit on our National Grid bills for both our streetlights and the Town Barn signed in 2019.

We have used our Town Comprehensive Plan with Sustainability Elements to guide our Town’s environmental direction and to create a Natural Resource Inventory in 2019.

We have adopted the Natural Resource Inventory as a local law in 2021. This will guide the future development of our Town and protect our scenic views and natural resources.

We have adopted the Otsego County Hazard Mitigation Plan in 2021, after attending all the pre-requisite workshops.

We have planted trees in a Riparian Buffer, to protect the stream bank adjacent to the Town Garage from runoff from our sand and salt in 2021.

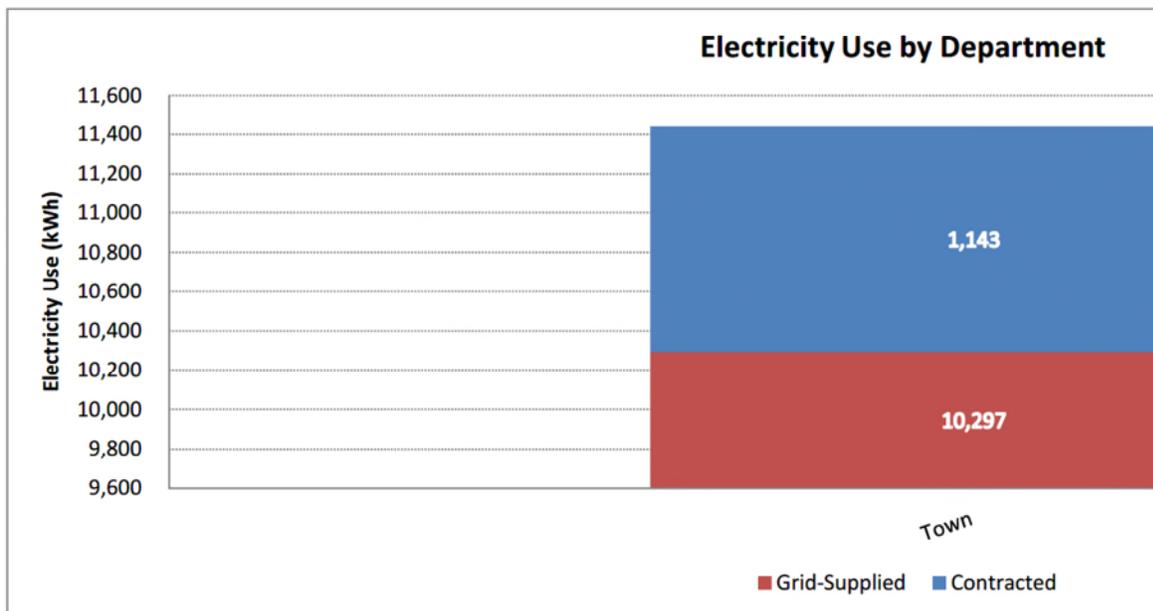
In preparation for increasing rainfall events due to climate change, we are continually enlarging replacement culverts over certain stream crossings where there has been flooding in the past.

We are in the process of achieving a Community Choice Aggregation (CCA) Plan for ALL Roseboom residents to receive a 10% solar credit on their National Grid Electric bill in 2022.

We have also completed a local government **Green House Gas (GHG) Inventory** which tracks the Town’s energy usage and produced CO2 and other emissions. Climate Smart Communities are committed to reducing GHG emissions, which include Carbon Dioxide (CO2), Methane (CH4) and Nitrous Oxide (N2O). These gasses build-up in the atmosphere and contribute to global warming and climate change. By taking a Municipal Inventory, we can see where changes can be made to lower our emissions. Even though our government GHG footprint is relatively small, every little bit we can do locally to minimize these emissions helps the planet. The following graphs and tables track the Lighting, Heating , Heavy Equipment Operations and even the Highway Employees Commute for the year 2020.

The Electricity Summary shows the electricity used through National Grid and the 10% solar credit with NEXAMP we contracted for both our Street Lights and the Town Barn.

Electricity Use by Department (in kWh)				
Department	Grid-Supplied kWh	Contracted kWh	Total kWh	Market-Based kWh
Town	10,297	1,143	11,440	9,154
Total Electricity Use	10,297	1,143	11,440	9,154



As you can see, from the next chart, the solar NEXAMP produces virtually zero CO2 emissions.
CO₂ Emissions by Contractual Instrument

Emissions = Electricity Consumed (kWh) × Emissions Factor (lb CO₂/MWh) × MWh/kWh × MT/lb × CO₂ GWP

Contractual Instrument/Utility	kWh	EF (lb			MT CO ₂
		CO ₂ /MWh)	MWh/kWh	MT/lb	
NEXAMP solar	1,143	-	0.001	0.000454	-
NEXAMP	-	-	0.001	0.000454	-
NEXAMP	-	-	0.001	0.000454	-
NEXAMP solar	1,143	-	0.001	0.000454	-
NEXAMP solar	1,143	-	0.001	0.000454	-
NEXAMP solar	1,143	-	0.001	0.000454	-

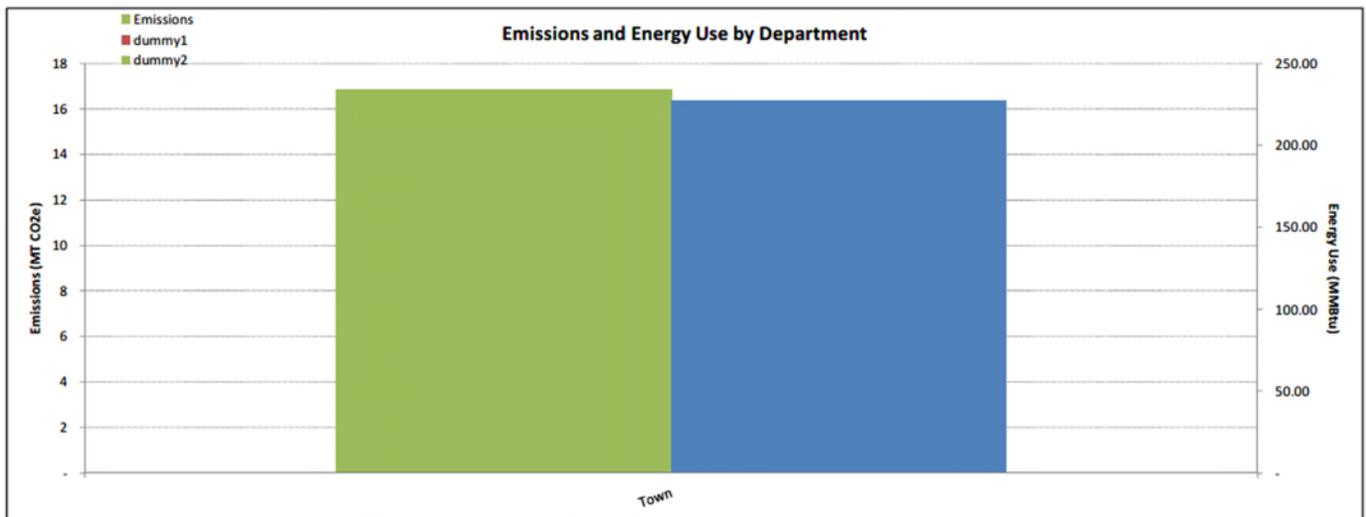
The Stationary Summary calculates the energy used to heat the Town Barn in 2020, and the emissions created by the diesel burning furnace. This amount would vary from year to year depending on the weather. Installing automatic garage door-openers (2015), insulating the garage ceiling (2017) and putting new weather-stripping around the garage doors (2021) saves us money and reduces emissions, but we are hoping to replace the old boiler completely. If we install a more efficient ground source heat pump, using our earned Clean Energy Communities grant money and Covid ARPA funds, it will eliminate our local CO2 emissions by using electricity.

Department Summary

Emissions by Department (MT CO ₂ e)				
Department	CO ₂	CH ₄	N ₂ O	Total
Town	17	0	0	17
Total Stationary Combustion Emissions	17	0	0	17

Fuel and Energy (MMBtu) Use by Department				
Department	mcf	gal	tons	Energy Use
Town	-	1,649	-	228
Total Stationary Combustion Energy Use	-	1,649	-	228

Check to display: Emissions Energy Use



Fuel Summary

Emissions by Fuel Type (MT CO ₂ e)				
Fuel Type	CO ₂	CH ₄	N ₂ O	TOTAL
Natural Gas	-	-	-	-
Diesel	17	0	0	17
Gasoline	-	-	-	-
LPG	-	-	-	-
Propane	-	-	-	-
Butane	-	-	-	-
Residual Fuel Oil No. 5	-	-	-	-
Residual Fuel Oil No. 6	-	-	-	-
Jet Fuel	-	-	-	-
Bituminous Coal	-	-	-	-
Digester Gas	-	-	-	-
Total Emissions from Stationary Fuel Combustion	17	0	0	17

Fuel and Energy Use by Type		
Fuel Type	Fuel Used	Energy Use (MMBtu)
Natural Gas	0 mcf	-
Diesel	1,649 gal	227.56
Gasoline	0 gal	-
LPG	0 gal	-
Propane	0 gal	-
Butane	0 gal	-
Residual Fuel Oil No. 5	0 gal	-
Residual Fuel Oil No. 6	0 gal	-
Jet Fuel	0 gal	-
Bituminous Coal	0 tons	-
Digester Gas	0 mcf	-
Total Stationary Fuel Consumed		227.56

	Fuel Use	Unit	kg CO ₂ /unit	MT/kg	MT CO ₂	× GWP =	MT CO ₂ e
Natural Gas	0	mcf	54.50	0.001	0.00	1	-
Diesel	1649	gal	10.21	0.001	16.84	1	16.84
Gasoline	0	gal	8.78	0.001	0.00	1	-
LPG	0	gal	5.79	0.001	0.00	1	-
Propane	0	gal	5.59	0.001	0.00	1	-
Butane	0	gal	6.58	0.001	0.00	1	-
Residual Fuel Oil No. 5	0	gal	10.21	0.001	0.00	1	-
Residual Fuel Oil No. 6	0	gal	11.27	0.001	0.00	1	-
Jet Fuel	0	gal	9.75	0.001	0.00	1	-
Bituminous Coal	0	tons	2328.46	0.001	0.00	1	-
Digester Gas	0	mcf	43.79	0.001	0.00	1	-

CH₄ Emissions by Fuel Type

CH₄ Emissions = Fuel use × CH₄ Emission Factor (kg CH₄/unit of fuel) × MT/kg; CO₂ equivalent emissions = MT CH₄ × Global Warming Potential of CH₄

	Fuel Use	Unit	kg CH ₄ /unit	MT/kg	MT CH ₄	× GWP =	MT CO ₂ e
Natural Gas	0	mcf	0.00514	0.001	0.00	25	-
Diesel	1649	gal	0.00150	0.001	0.00	25	0.06
Gasoline	0	gal	0.00140	0.001	0.00	25	-
LPG	0	gal	0.00100	0.001	0.00	25	-
Propane	0	gal	0.00100	0.001	0.00	25	-
Butane	0	gal	0.00110	0.001	0.00	25	-
Residual Fuel Oil No. 5	0	gal	0.00150	0.001	0.00	25	-
Residual Fuel Oil No. 6	0	gal	0.00170	0.001	0.00	25	-
Jet Fuel	0	gal	0.00149	0.001	0.00	25	-
Bituminous Coal	0	tons	0.27423	0.001	0.00	25	-
Digester Gas	0	mcf	0.00269	0.001	0.00	25	-

N₂O Emissions by Fuel Type

N₂O Emissions = Fuel use × N₂O Emission Factor (kg N₂O/unit of fuel) × MT/kg; CO₂ equivalent emissions = MT N₂O × Global Warming Potential of N₂O

	Fuel Use	Unit	kg N ₂ O/unit	MT/kg	MT N ₂ O	× GWP =	MT CO ₂ e
Natural Gas	0	mcf	0.00010	0.001	0.00	298	-
Diesel	1649	gal	0.00010	0.001	0.00	298	0.05
Gasoline	0	gal	0.00010	0.001	0.00	298	-
LPG	0	gal	0.00010	0.001	0.00	298	-
Propane	0	gal	0.00010	0.001	0.00	298	-
Butane	0	gal	0.00010	0.001	0.00	298	-
Residual Fuel Oil No. 5	0	gal	0.00010	0.001	0.00	298	-
Residual Fuel Oil No. 6	0	gal	0.00010	0.001	0.00	298	-
Jet Fuel	0	gal	0.00008	0.001	0.00	298	-
Bituminous Coal	0	tons	0.03989	0.001	0.00	298	-
Digester Gas	0	mcf	0.00053	0.001	0.00	298	-

The Mobile Summary tracks the diesel used in 2020, by the Town's 6 heavy duty trucks, plows, sanders, and equipment. This is a fluctuating number, as it depends on how much ice and snow we get in any given year, and how many times the trucks need to go out to keep the roads clear.

Fuel Use by Department and Fuel Type

This table summarizes fuel consumption by department. These are the activity data used to calculate CO₂ emissions.

	Gasoline	Diesel	Biodiesel (B5)	Biodiesel (B20)
Units	Gallons	Gallons	Gallons	Gallons
Town	-	10,062	-	-
Total	-	10,062	-	-

Energy Use by Department and Fuel Type

This table summarizes energy use by department (MMBtu).

	Gasoline	Diesel	Biodiesel (B5)	Biodiesel (B20)
Town	-	1,390	-	-
Total	-	1,390	-	-

Gross CO₂ Emissions

CO₂ Emissions (MT) = Fuel use × kg CO₂/unit of fuel × MT/kg

	Gasoline	Diesel	Biodiesel (B5)	Biodiesel (B20)
EF: kg CO ₂ /gal (or g.g.e.)	8.78	10.21	10.17	10.06
Town	-	103	-	-
Total	-	103	-	-

The Employee Commute Emissions Summary tracks the 4 Town Highway Employees average daily commute from home for the year 2020. You will see it our greatest source of GHG emissions. It depends on how far away the employees live, and how they get to work.

Please enter the average one-way commute length for city employees. Default commute distance is 12.6 miles (<http://www.fhwa.dot.gov/policy/2010cpr/execsum.htm>).

This commute distance may be longer or shorter than the average commute for your city's employees.

Average One-Way Commute Length (miles)	7.0	12.6
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Please enter the number of days each city employee works per year. This number will be multiplied by lay work week, two weeks (10 days) of vacation, and 10 federal holidays.

Workdays per year	220	240
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Employee Commute Emissions Summary

Emissions by Department (MT CO ₂ e)	
	CO ₂
Town	5.01
Total	1,382.17

Background Calculations

Employees by Department and Mode

Number of Employees who use mode = # of employees × percentage of employees who use each mode

	Single Occupancy		
	Vehicle	Carpool	Motorcycle
Town	4	0	0.0
Total	1104	0	0

Daily CO₂ Emissions by Department and Mode

$CO_2 \text{ Emissions/Day} = \text{Employees traveling} \times \text{Trip Distance/day} \div \text{People/Mode} \div \text{miles per gallon} \times \text{MT} \times \text{gal/mile} \times \text{kg CO}_2/\text{gal} \times \text{MT/kg} = \text{MT CO}_2/\text{day}$

	Single Occupancy		
	Vehicle	Carpool	Motorcycle
CO ₂ Emission Factor (kg/gal)	8.78	8.78	8.78
mpg	21.6	21.6	43.4
People/Mode	1	2	1

Town	0.02	-	-
Total	6.28	0.00	0.00

Annual CO₂ Emissions by Department and Mode

$\text{Annual CO}_2 \text{ Emissions (MT)} = \text{MT CO}_2/\text{commute day} \times \text{commute days/yr}$

	Single Occupancy		
	Vehicle	Carpool	Motorcycle
Town	5.01	-	-
Total	1,382.17	0.00	0.00

Emissions by Source (MT CO ₂ e)								
Source	CO ₂	CH ₄	N ₂ O	HFCs	PFCs	SF ₆	Total	Percent of Total
Stationary Combustion	16.84	0.00	0.00	-	-	-	16.84	1%
Mobile Combustion	102.73	0.03	0.34	-	-	-	103.11	7%
Solid Waste	-	-	-	-	-	-	-	0%
Wastewater Treatment	-	-	-	-	-	-	-	0%
Electricity - Location Based	-	-	-	-	-	-	-	0%
<i>Electricity - Market Based (for informational purposes only)</i>	-	-	-	-	-	-	-	
Employee Commute	1,382.17	-	-	-	-	-	1,382.17	92%
Water	-	-	-	-	-	-	-	0%
Ag & Land Management	-	-	-	-	-	-	-	0%
Urban Forestry	-	-	-	-	-	-	-	0%
Waste Generation	-	-	-	-	-	-	-	0%
Total (Gross Emissions)	1,501.74	0.03	0.34	-	-	-	1,502.11	100%
Total (Net Emissions)	1,501.74	0.03	0.34	-	-	-	1,502.11	100%

