VILLAGE OF MONTOUR FALLS

COMMUNITY GREENHOUSE GAS EMISSIONS BASELINE INVENTORY (2018)

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1 INTRODUCTION

1.1 WHAT IS A COMMUNITY GREENHOUSE GAS INVENTORY?

A community greenhouse gas (GHG) inventory is an accounting, analysis, and report of the GHG emissions resulting from transportation fuels, waste, energy usage in buildings, and other sources within a given geographic boundary. (NYSDEC)

A community GHG inventory provides a baseline year that benchmarks the entire Village's energy use and greenhouse gas emissions, which allows the Village to track and prioritize the potential GHG impact of policy recommendations and strategies for the Village's sustainable growth and development. The baseline year for this community inventory is 2018, which is the same reporting period for the Local Government Operations Greenhouse Gas Inventory and Local Government Fleet Inventory produced by the Cornell Cooperative Extension in 2019.

The data that are typically collected are typically divided into three scopes, as summarized in **Figure 1**. **Scope 1** includes the community's direct emissions, including on-site fossil fuel combustion and fuel consumption for stationary combustion sources such as buildings and mobile combustion sources such as vehicles. **Scope 2** includes the community's indirect emissions, including those that result from the generation of electricity, heat, or steam at off-site utility energy generation plants or other sources. **Scope 3** includes the community's other indirect emissions that also occur within the community boundary, including from water, wastewater, urban forestry, waste disposal, agriculture, and other activities specific to the community. Scope 3 for this 2018 baseline includes water, wastewater, and urban forestry. It is recommended that the Village pursues a Scope 3 addendum that inventories municipal solid waste and more detailed land use to identify additional strategies to reduce landfill waste and related GHG emissions.

1.2 WHY DID THE VILLAGE UNDERTAKE THIS COMMUNITY GHG INVENTORY?

The Village undertook this Community GHG Inventory to gather baseline data which will allow the Village Sustainability Committee and the community to create a plan to reduce community GHG emissions, leading to a more climate resilient community, and to identify community energy expense reduction strategies.

Government operations typically account for less than three percent of a community's emissions. It is therefore important to understand how the industries, businesses, schools, homes, and vehicles in the entire community are contributing to climate change. (NYSDEC)

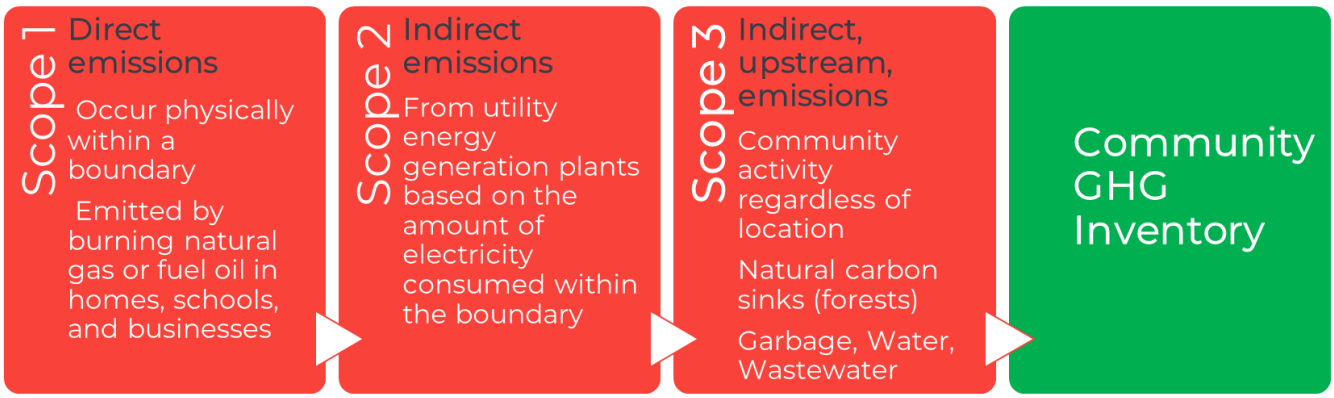

Figure 1 - Standard Greenhouse Gas Inventory Scopes

1.3 WHAT METHODS WERE USED TO CREATE THE COMMUNITY GHG INVENTORY?

At the recommendation of the NYSDEC Office of Climate Change, the Village used the United States Environmental Protection Agency (US EPA) Local Greenhouse Gas Inventory Tool (LGHGI). This free, interactive spreadsheet tool calculates GHG emissions for most sectors, including residential, commercial, transportation, and waste and water management. The tool is comprised of two modules: one for community-wide inventories, the other for inventories of local government operations only. The 2018 Local Government Operations Inventory (see *Village of Montour Falls, New York: Greenhouse Gas Emissions Inventory: A comparison of 2013 and 2018*) utilized a different but comparable data protocol – the Local Government Operations Protocol. The tool is pre-programmed with default emission factors and system assumptions needed to calculate emissions.The LGHGI is scalable to accommodate different levels of activity data to meet the needs and constraints of different local governments and their communities.

The LGHGI workbook is easy to use and update, making this method highly replicable with a minimum level of effort necessary to obtain accurate and verifiable data. The Climate Leadership and Community Protection Act has directed the Department of Environmental Conservation (NYSDEC) to issue an annual report on statewide greenhouse gas emissions, pursuant to Section 75-0105 of the Environmental Conservation Law (ECL). As of March 2021 NYSDEC is preparing the first annual report to be issued in 2021 and will seek public input on the format of the report, the organization of information to be included in the report, as well as the methodology and analysis used to determine annual statewide greenhouse gas emission levels. The method chosen by NYSDEC will likely inform the methods and assumptions used for future GHG inventories for local government operations and communities.

As shown in **Figure 2**, the Local Greenhouse Gas Inventory Tool is a Microsoft Excel workbook in which all data relevant to the greenhouse gas inventory are entered, analyzed, and displayed in a series of output tables and graphs. Users should read the *Introduction* and *Read Me* workbook tabs before attempting to input new data. Although the workbook is easy to use, the overall quality of the analysis and resulting usefulness as both a planning and progress tracking tool are dependent on the quality of the input data, which sometimes require assumptions based on the judgments of environmental subject matter experts.

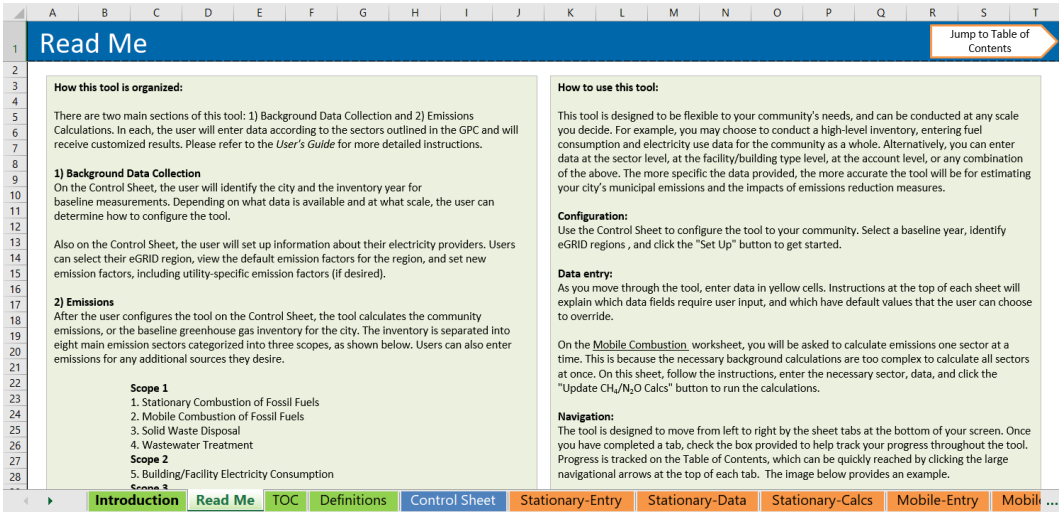

Figure 2 - US EPA Local Greenhouse Gas Inventory Tool Read Me Tab

Data Input and Output Overview

Each scope is completed by entering data, reviewing the calculations to ascertain if any values need to be customized, and verifying that the output data tables and graphs match the output values. The tab names are summarized in **Figure 3**. Each data input tab is the LGHGI Excel workbook is labeled "[Scope]-Entry". As seen in **Figure 4**, relevant electricity data are entered into the *Electricity-Entry* tab.

Figure 3 – Scope Tab Titles

Control Sheet
Stationary -Entry
Stationary - Data
Stationary - Calcs
Mobile - Entry
Mobile - Data
Mobile - Summary
Mobile - Detail Calcs
Solid Waste - Control
Solid Waste - Entry
Wastewater - Control
Wastewater - Entry
Wastewater - Calcs
Electricity - Entry
Electricity - Data
Electricity - Calcs
Water
Ag. & Land Management
Urban Forestry
Waste Production
Additional Emission Sources
Summary - Emissions

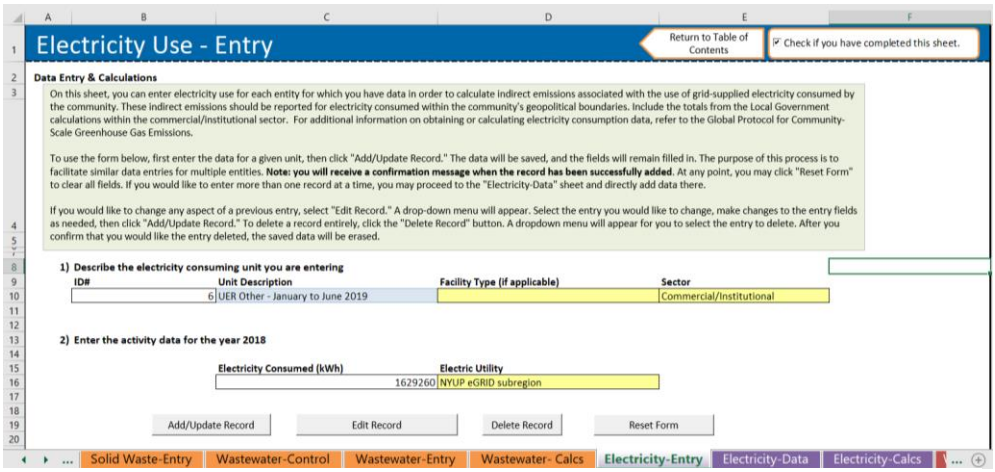

Figure 4 – Example Data Input Page – Scope 2 Electricity-Entry Tab

As seen in Figure 5, the input data are then displayed in the *Electricity-Data* tab, where their accuracy can be easily verified.

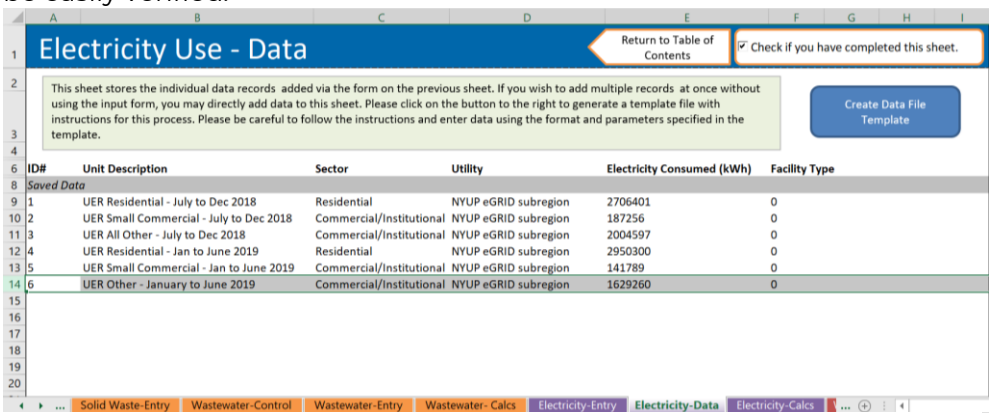

Figure 5 – Example Data Page – Scope 2 Electricity-Data Tab

As seen in **Figure 6**, the output data are then displayed in the *Electricity-Calculations* tab. The greenhouse gas emissions summary tables and graphs display GHG by sector: residential, commercial/institutional, industrial and, if relevant, energy generation and reported in Metric tons of carbon dioxide equivalent abbreviated as MT CO2e. The unit "CO2e" represents an amount of a GHG whose atmospheric impact has been standardized to that of one unit mass of carbon dioxide (CO2), based on the global warming potential (GWP) of the gas. Tool formulas convert standard metrics for electricity, renewable energy, fuel use, chemical use, water use, and materials management into MTCO2e. Wherever data are available based on regional and local inputs, GHG emissions may be broken down into specific gases such as carbon dioxide, methane, and nitrous oxide. Calculation assumptions based on community characteristic selections such as utility territory and inputs are displayed in summary tables next to all formulas.

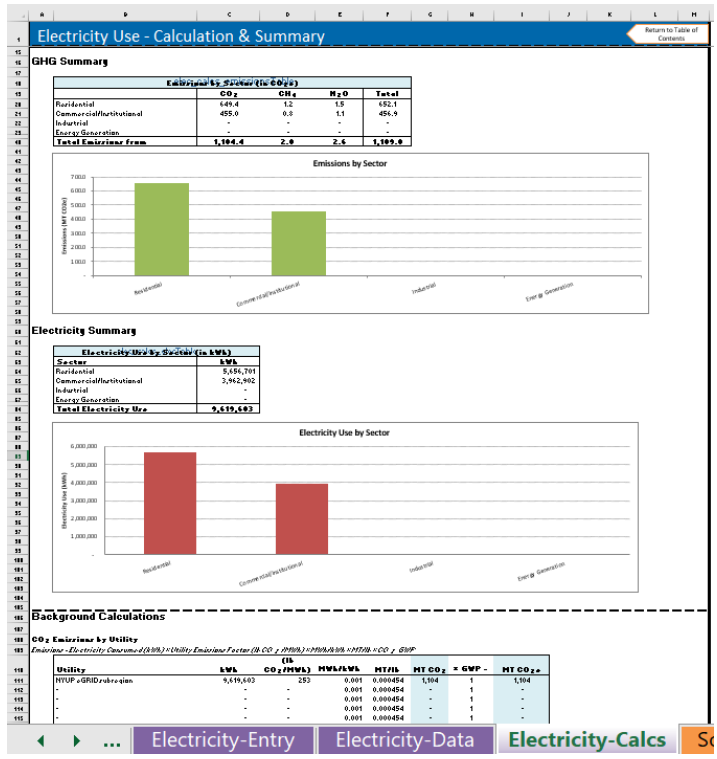

Figure 6 – Example Data Page – Scope 2 Electricity-Calcs Tab

1.4 2018 DATA SUMMARY

The total estimated 2018 greenhouse gas emissions for Montour Falls is displayed in **Table 1**. This analysis included estimates of carbon dioxide, methane, and nitrous oxide. Emissions associated with hydroflourocarbons, perfluorcarbons, and sulphur hexafluoride are associated with commercial refrigeration were out of scope for this Community GHG Inventory. Direct emissions refer to the emissions generated on-site (as opposed to electricity delivered through a grid system), such as from the combustion of fossil fuels. Fossil fuels are any fuel derived from the pre-historic burial of organic matter. Examples include natural gas (methane or CH4) and petroleum products (gasoline, diesel, kerosene, propane, and others). Combustion of petroleum products releases greenhouse gases into the atmosphere. Indirect remissions refer to emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling. These emissions can be allocated in an inventory to an entity, but are generated offsite. An example is electricity that is not generated directly at a facility. A facility uses electricity on-site, but the fuels used to generate the electricity are combusted off-site, perhaps at a regional power plant. If the generation source is at a different site that is also operated by the city, it is not an indirect emission source.

Table 1 - Total Community Emissions

Total Montour Falls Emissions (MT CO2e)								
	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total MT CO_2e	Percent of Total
Direct Emissions	7,781	35.5	158	-	-	-	7,975	88%
Indirect Emissions	1,104	2.0	2.6	-	-	-	1,109	12%
Total Gross Emissions	8,911	37.5	161	-	-	-	**9,109**	100%
Negative Emissions (Trees)	(1,862)	(0.05)	(0.06)	-	-	-	(1,862)	-20%
Total Net Emissions	7,023	37.5	161	-	-	-	**7,222**	80%

The data in **Table 1** show that approximately 88% of all emissions are direct emissions and approximately 12% are indirect emissions. This shows that the community has a significant opportunity and control over potential strategies to reduce direct or on-site emissions. Additionally, a tree cover estimate taken from the *2019 Village of Montour Falls Natural Resources Inventory* showed the significant value of conserving trees, which are valuable in this context because they sequester or trap carbon. Through the process of photosynthesis, trees remove CO2 from the atmosphere and store it as cellulose, lignin, and other compounds. A medium growth coniferous or deciduous tree, planted in an urban setting and allowed to grow for 10 years, sequesters 23.2 and 38.0 lbs of carbon, respectively (US EPA).

Table 2 displays a more detailed summary of community emissions by source. Stationary combustion refers to the on-site combustion of fuels to produce electricity, heat, or motive power using equipment in a fixed location. Mobile combustion refers to the combustion of fuels to power a moving vehicle, such as gasoline or diesel fuel in a car or truck. 31% of emissions come from stationary combustion and 56% of emissions come from mobile combustion. This shows that the community has a significant opportunity to reduce emissions associated with vehicles by undertaking strategies such as converting to hybrid or electric vehicles, choosing to bicycle or walk to local destinations, and planning trips to reduce overall vehicle miles traveled. Planning strategies such as installing LED streetlights and making roadways, sidewalks, and trails even safer and more inviting for residents can significantly reduce vehicle emissions.

Table 2 - Detailed Total Community Emissions By Source

Emissions by Source (MT CO_2e)								
Source	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total	Percent of Total
Stationary Combustion	2,848.04	0.27	0.01	-	-	-	2,848.31	31%
Mobile Combustion	4,932.92	19.33	158.34	-	-	-	5,110.58	56%
Solid Waste	-	-	-	-	-	-	-	0%
Wastewater Treatment	-	15.87	-	-	-	-	15.87	0%
Electricity	1,104.42	1.96	2.60	-	-	-	1,108.99	12%
Water	25.50	0.05	0.06	-	-	-	25.61	0%
Ag & Land Management	-	-	-				-	0%
Urban Forestry	(1,887.83)	-	-				(1,887.83)	-21%
Waste Production	-	-	-				-	0%
Total (Gross Emissions)	8,910.89	37.47	161.00	-	-	-	**9,109.36**	100%
Total (Net Emissions)	7,023.06	37.47	161.00				7,221.53	

Table 3 - Community Emissions By Scope

Total Montour Falls Emissions (MT CO2e)								
	CO_2	CH_4	N_2O	HFCs	PFCs	SF_6	Total MT CO_2e	Percent of Total
Scope 1	7,780.96	35.47	158.34	-	-	-	7,974.77	88%
Scope 2	1,104.42	1.96	2.60	-	-	-	1,108.99	12%
Scope 3	(1,862.33)	0.05	0.06	-	-	-	(1,862.22)	-20%
Total Gross Emissions	8,910.89	37.47	161.00	-	-	-	**9,109.36**	79%
Total Net Emissions	7,023.06	37.47	161.00	-	-	-	**7,221.53**	79%

As summarized in **Figure 4**, another way to display community emissions is by scope. Scope 1 refers to all direct GHG emissions. Indirect GHG emissions from the consumption of purchased electricity, heat, or steam. Other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, outsourced activities, etc. The Scope 3 emissions included in this Community GHG Inventory are wastewater treatment and urban forestry. Future inventories using this tool could also take into account a more specific look at waste generation by type and agricultural and land management.

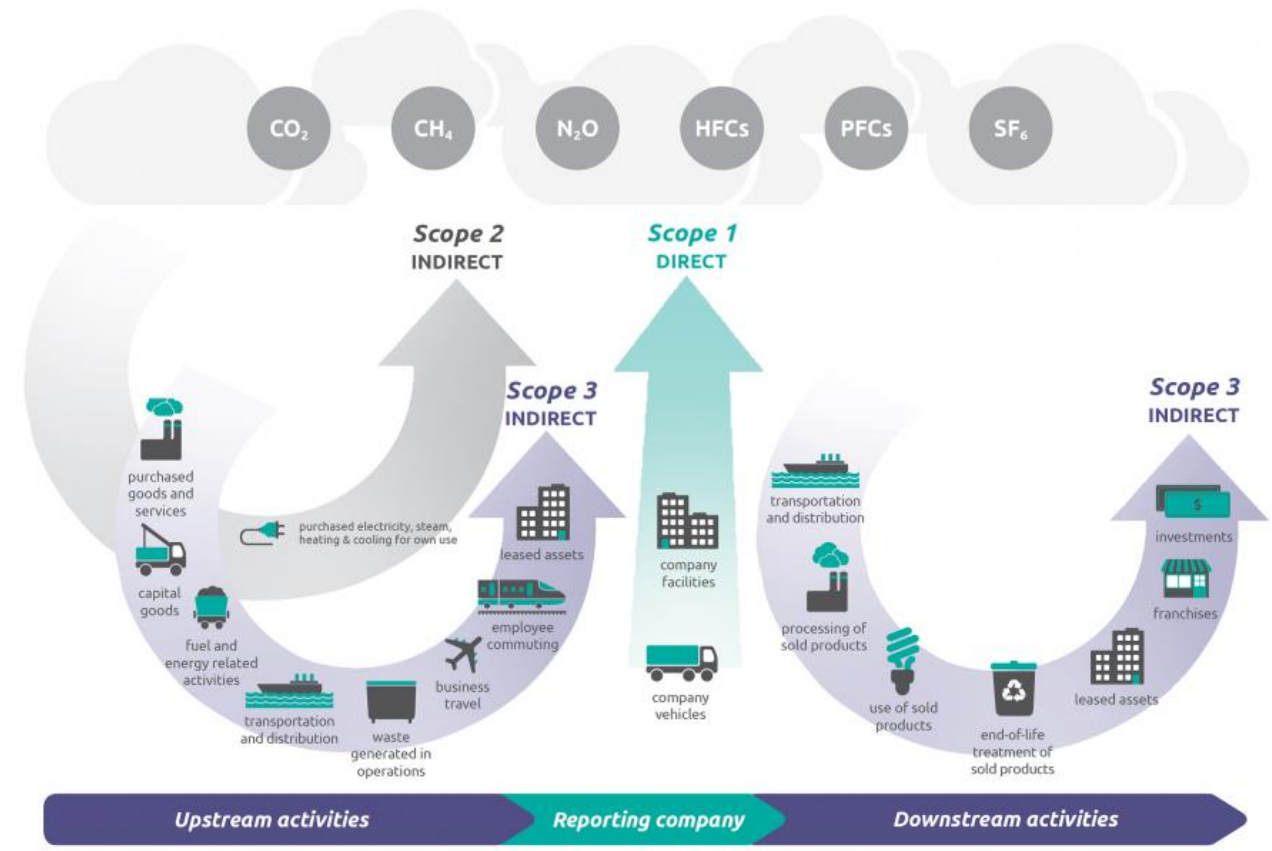

Figure 4 - Overview of Greenhouse Gas Emissions Organized by Scope (US EPA)

Another useful way of categorizing greenhouse gas emissions is by sector. As seen in Table 4, approximately 54% of gross emissions is residential and 46% is commercial. This shows that all community actors and stakeholders have an opportunity to contribute to emissions reduction.

Table 4 - Gross Community Emissions By Sector. Note: Due to Utility Energy Registry (UER) reporting limitations on electricity account type categorization, Commercial and Industrial Emissions cannot be.

Gross Emissions by Sector		
Sector	**Total Total (MT CO_2e)**	**Percent of Total**
Residential	4,879.36	54%
Commercial/Institutional	4,230.01	46%
Industrial	-	0%
Energy Generation	-	0%
Total	**9,109.36**	**100%**

2 KEY RECOMMENDATIONS

The policy recommendations associated with the findings for the 2018 baseline year can be divided into five focus areas:

1. Energy Efficiency
2. Renewable Energy Generation Procurement & Electrification of Heating/Cooling
3. Electric Vehicle Procurement
4. Transportation Planning and Education
5. Land conservation and Tree Planting

Energy Efficiency Recommendations

New buildings:

- Implement NYStretch Energy Code to improve development standards

Existing buildings:

- Encourage Schuyler County Legislature to pass PACE financing (CEC HIA) in order to unlock access financing for cost-effective energy efficiency commercial building improvements
- Use CEC coordinator resources and approved FlexTech providers to conduct energy audits and building studies (significant incentives subsidizing up to 95% of total costs)
- Facilitate school district connections to NYPA K-12 Services to implement benchmarking and reduce school energy costs
- Assist low-to-moderate income (LMI) households with reducing energy costs by accessing Weatherization Assistance Program (WAP) and EmPower New York

Renewable Energy Generation Procurement & Electrification of Heating/Cooling

- Work with NYPA and NYSERDA to procure electricity from renewable sources
    - 100% Renewable Energy for Municipalities CEC HIA
    - NYPA Municipal Services consultation
        - Alternative to a CCA
- Clean Heating & Cooling – educate businesses and residents about how to electrify heating and cooling loads and reduce dependence on natural gas
    - Use CCE Schuyler resources and rebates/vouchers from NYSERDA qualified installers

Electric Vehicle Procurement and Education

- Increase the number of EVs
- Work with CEC coordinator to undertake a sponsored electric vehicle education campaign (HIA)
- Report on the number of annual EV registrations
- Encourage the use of rideshare and carpooling tools

Table 5 - 2021 Electric Vehicle Registrations for Schuyler County and Montour Falls

Electric Vehicle Registration Data (Updated Monthly from NYSERDA)				
Community	PHEV/EREV	BEV	Total EVs	Percentage of EV Registrations in Schuyler County
Montour Falls	5	1	6	15%
Schuyler County	25	16	41	

Transportation Planning

- Integrate GHG reduction into Complete Streets initiatives
- Continue to improve roadway safety: residents safely enjoy picturesque vistas
    - Local events downtown and access to core needs: groceries, library, pharmacy
        - Reduces vehicle miles and encourages walking
    - Continue to maintain and promote EV charger network
- Increase access to on-demand rides and public transit
    - Coordinate with Schuyler County transit and mobility access services
- Encourage expansion of Gadabout services
    - Educate vendors to consider using the New York Truck Voucher Incentive Program (NYTVIP)
- Encourage conversion of Schuyler school district busses to EV

Land Conservation and Tree Planting

- Create a Community Climate Action Plan which includes a tree planting program
- Draft a list of Climate Smart Communities actions related to land conservation for Silver-certification planning

2.1 ALIGNMENT WITH KEY NEW YORK STATE PROGRAMS

Next steps include aligning goals and objectives identified by the Community GHG Inventory outcomes with key New York State programs which offer funding and financing, technical support, and guidance on federal, utility, or other incentives for actions which reduce greenhouse gas emissions.

NYSDEC

- Pursue Silver-Level Certification

- Consider applying for 2021 CFA certification and/or implementation grants

NYSERDA

- Schedule CEC coordinator meeting for CEC Leadership Round and express reducing transportation emissions as a priority
- Pursue Clean Energy Communities designation high-impact actions
- Clean Fleets and NYTVIP
- Electric Vehicle Community Campaign
- Encourage adoption of Open C-PACE (at County level)
- NYStretch
- Connect to FlexTech Consultants for building studies and energy audits

EFC Stormwater Street Trees/Urban Forestry Program

- Urban Forestry Programs are comprehensive plans that map out existing trees and plant new trees to manage and maintain the urban canopy

Empower New York, WAP & HEAP

- Connect to Economic Opportunity Program, Inc. of Chemung and Schuyler (NYSERDA approved contractor)
- Educate residents about energy efficiency for LMI households (WAP & HEAP eligibility through NYS HCR) via vendor rebates for energy audits, solar, and efficient appliances