



Village of Kinderhook Community Greenhouse Gas Inventory Data from Capital District 2010 Regional GHG Inventory Report Compiled November 22, 2022

BACKGROUND

The Village of Kinderhook Board approved a Resolution on May 11, 2016 to become a Climate Smart Community (CSC), including creation of a Climate Smart Task Force to undertake this effort on June 8, 2016. An action item in the CSC Certification process is *PE2 Action: Community GHG Inventory*.

This Community GHG Inventory Report summarizes the GHG emissions from the Village of Kinderhook's transportation fuels, waste, energy usage in buildings, and other sources within a given geographic boundary. Developing this GHG Inventory is the first step towards tangible climate action, the development of a Community Climate Action Plan (CAP) and enabling the Village of Kinderhook to identify realistic goals and community reduction of greenhouse gases.

DATA GATHERING AND METHODOLOGY

For this report, Village of Kinderhook is utilizing baseline data from 2010 as reported in the [Capital District 2010 Regional Greenhouse Gas Inventory](#)¹. This inventory, completed by Climate Action Associates LLC, a sub-consultant to the Capital District Regional Planning Commission for the New York State Energy Research and Development Authority (NYSERDA), reports on community-level emissions of various sectors in metric tons of carbon dioxide equivalent (MTCO_{2e}). This data is meant to provide a baseline which can be used to measure future progress in reducing the broader community's collective emissions. In order for the inventory report to be valid for submission it must be completed within 5 years of submission; this inventory report was completed November 22, 2022. The inventory includes Scope 1, Scope 2 and Scope 3 GHG emissions for the community, as defined below.

- **Scope 1:** Direct GHG emissions that physically occur within the regional or community boundary such as those emitted by burning natural gas or fuel oil in homes and businesses.
- **Scope 2:** Indirect GHG emissions from purchased electricity.
- **Scope 3:** Indirect GHG emissions attributed to region or community activities that cause emissions whether the emissions physically occur in-boundary or not.

Baseline Year

The inventory process requires the selection of a baseline year. The year chosen for this regional inventory was 2010.

Quantification Methods

Greenhouse gas emissions in this inventory are quantified using calculation-based methodologies. Calculation-based methodologies calculate emissions using activity data and emissions factors. To calculate emissions accordingly, the basic equation is used:

$$Activity\ Data \times Emissions\ Factor_{(Fuel, GHG)} = GHG\ Emissions_{(Fuel, GHG)}$$

Activity data refer to the relevant measurement of energy use or other greenhouse gas generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled.

Emissions Factors

Each GHG has an emission factor unique to each fuel. The electricity emission factor is based on the EPA eGRID (2012) subregion, which in this case is **NYUP (Upstate)**. The propane, heating oil/diesel, and gasoline emissions factors are taken from the EIA database on carbon dioxide emissions coefficients. Non-CO2 GHGs are converted to an equivalent amount CO2 using a global warming potential (GWP) unique to each gas as defined in the Intergovernmental Panel on Climate Change(IPCC) Second Assessment Report. All GHG emissions in this report are reported in units of Metric Tons Carbon Dioxide Equivalent (MTCDE) which is the convention for reporting regional GHG inventories. One MTCDE is equal to 1000 kgs of CO2.

Data

Data for each category for the community, provided from the [Capital District 2010 Regional Greenhouse Gas Inventory, Appendix B](#) was as follows:

Table B 1. Municipal Roll-Up GHG Inventories (MTCDE)

		County	Roll Up GHG Emissions By Sector (MTCDE)							Totals
			Res	Com	Industry	Process	Transport	Waste	Ag	
Kinderhook	Village	Columbia	5,078	1,622	0	468	3,615	371	0	11,155

Table B 2. Utility-Supplied Energy Consumption Data for 2010 by Municipality

		County	Electricity(MWh)				Natural Gas (Therms)			
			Total	Res.	Com.	Indust.	Total	Res.	Com.	Indust.
Kinderhook	Village	Columbia	5,921	4,399	1,523	0	0	0	0	0

Table B 3. Vehicle-miles-traveled and Fuel Consumption (gallons) by Municipality

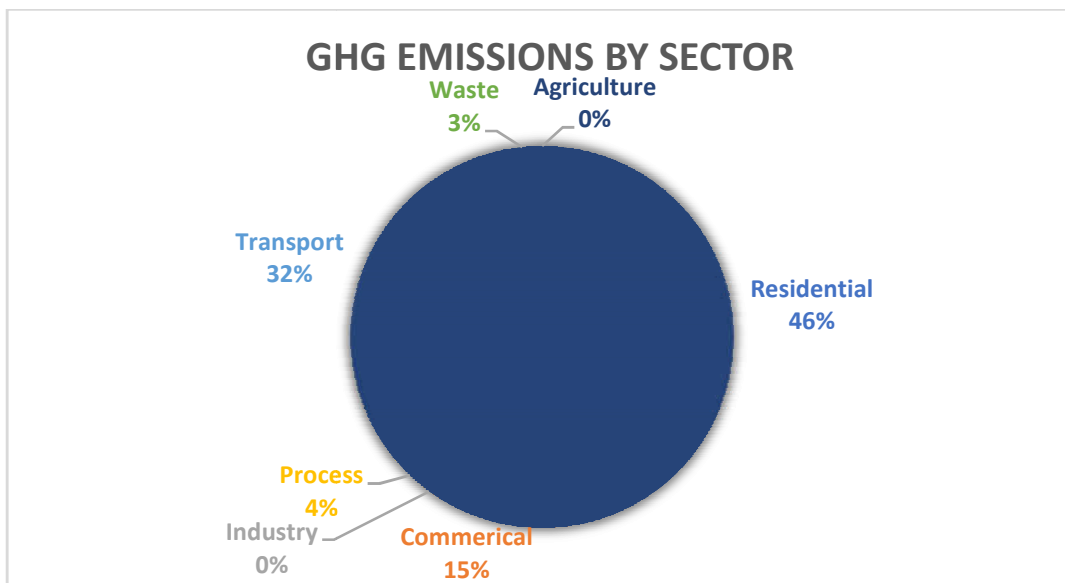
		County	Vehicle Miles Traveled and Fuel Consumption (gallons)			
			VMT	Gasoline	Ethanol	Diesel
Kinderhook	Village	Columbia	6,831,765	265,203	29,467	43,618

Table B 4. Household GHG emissions and Energy Cost of Living

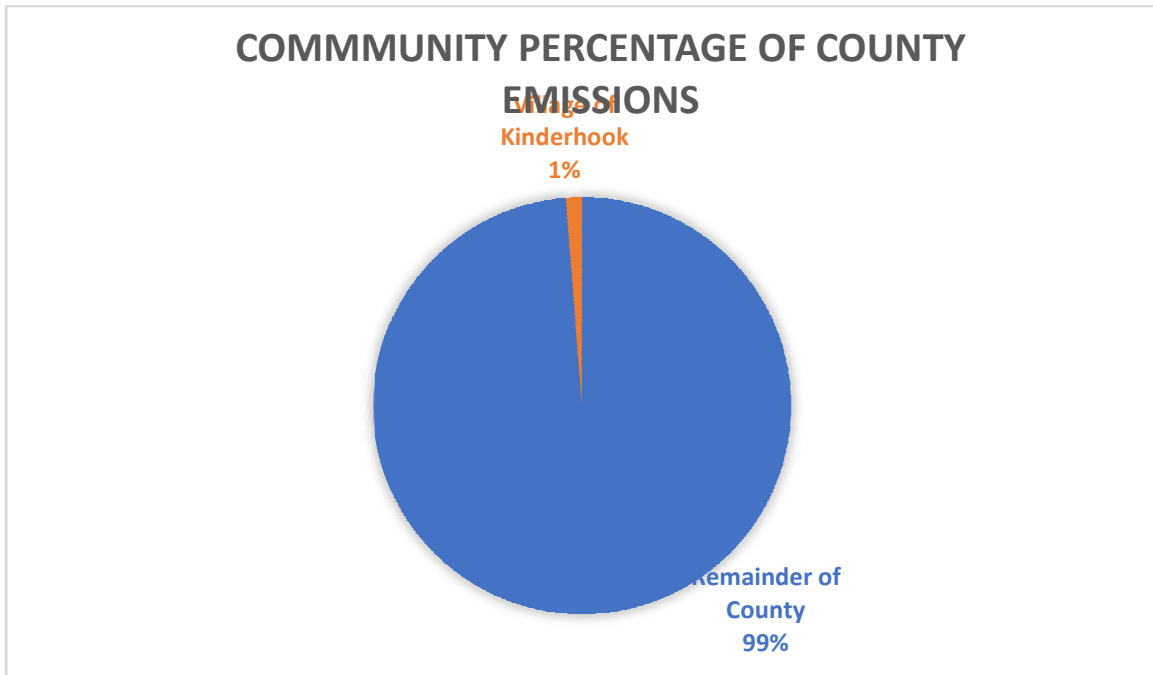
		County	Per-Household GHG Footprint(MTCDE)			Energy Cost of Living (ECOL)		
			Energy	Transport	HHTotal	ECOL(\$)	Income(\$)	%income
Kinderhook	Village	Columbia	9.2	9.1	18.3	7,465	84,974	9%

KEY FINDINGS

In 2010, the Village of Kinderhook emitted 11,155 Metric Tons Carbon Dioxide Equivalent (MTCDE) greenhouse gas (GHG) emissions. Residential energy use accounts for 46%, followed by energy consumption in the transportation (32%), commercial (15%), and process (4%) or fugitive emissions, defined in the figures as the sum of industrial process, product use, and transmission/distribution loss emissions sectors. Waste is 3%, and both agriculture and industry are 0% with no discernible emissions.



These emissions for Village of Kinderhook account for 1% of Columbia County, which emitted 887,247 Metric Tons Carbon Dioxide Equivalent (MTCDE).



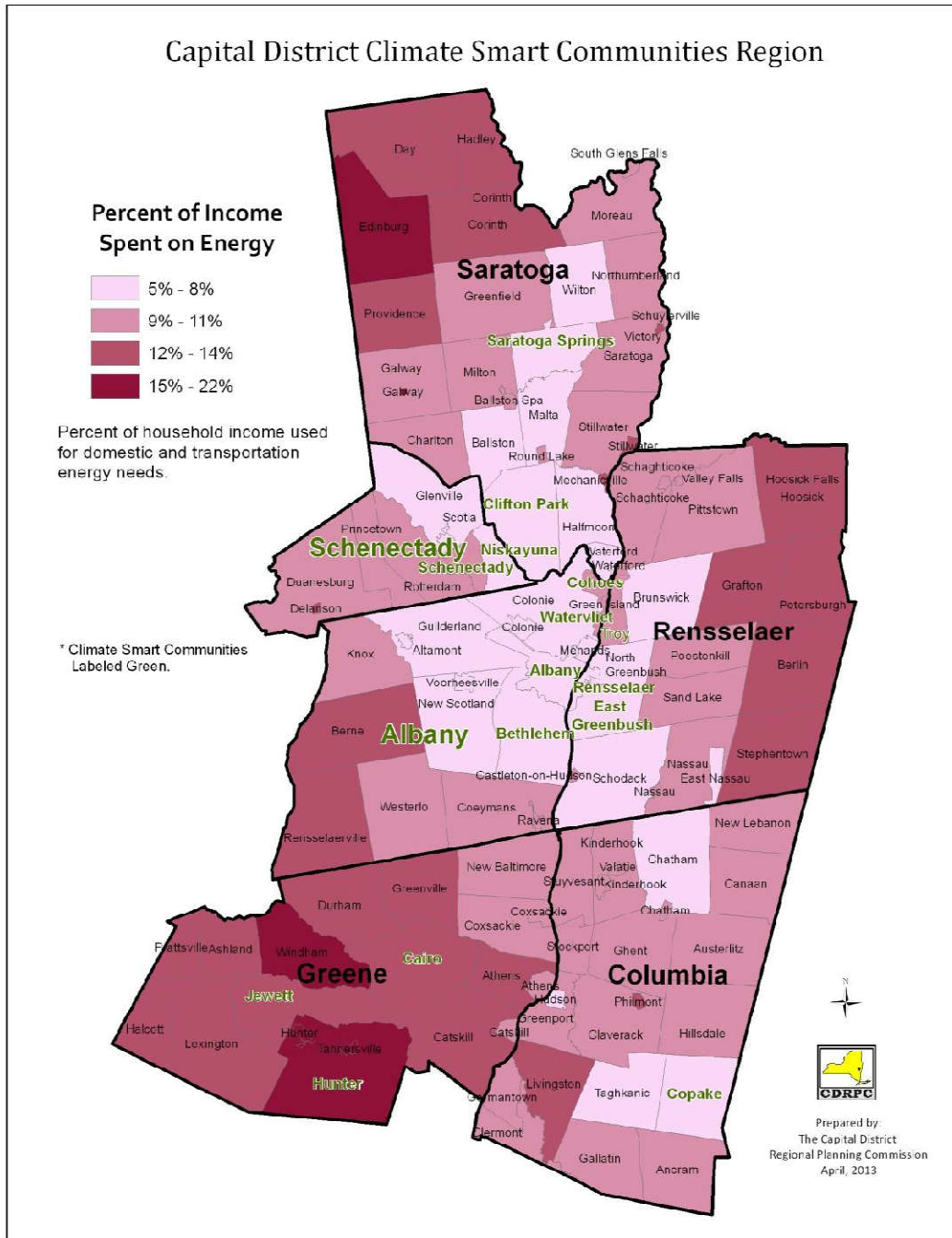
Village of Kinderhook’s per-capita emissions were 9.2 MTCDE / person, based on the 2010 Census for the village, 1,211. This is compared to 14.1 MTCDE / person for Columbia County and 14.7 MTCDE / person for the entire Capital Region.



9.2 MTCDE / person

Energy cost of living as a percentage of income is 9%. This is at the median to lower end of percentages in the Capital Region, as displayed on the map below.

Capital District Climate Smart Communities Region



ACCOMPLISHMENTS AND FURTHER OPPORTUNITIES TO REDUCE GREENHOUSE GASES

Developing a GHG emissions baseline enables the Village of Kinderhook to set goals and targets for future reduction of GHG emissions.

The Village of Kinderhook has been proactive in reducing GHG emissions and energy costs for residents and businesses. They completed a community solar campaign in 2021, signing up

residents and educating the public about renewable energy. The village is also undertaking a clean heating and cooling campaign to educate residents about heat pumps and electrification in 2023.

The majority of Village of Kinderhook GHG emissions come from residential and transportation. Further conversion to electric vehicles and moving these emissions to “Scope 2” will allow the Village of Kinderhook to offset GHGs with renewable energy. This could include a public education campaign on electric vehicles and additional EV charging stations in the village. Additionally, the clean heating and cooling campaign should help residents think about heat pumps and energy improvements to further lower GHGs in residences.

Community Climate Action Planning is a next step for the Village of Kinderhook to identify reduction targets and strategies/funding to achieve these targets.

ⁱ NYSERDA, CDRPC, & Climate Action Associates. (2013, May 20). *Capital district 2010 regional GHG inventory - government of New York*. Capital District 2010 Regional GHG Inventory. Retrieved November 18, 2022, from https://climatesmart.ny.gov/fileadmin/csc/documents/GHG_Inventories/capdistghginven.pdf