

**2019 TOMPKINS COUNTY
COMMUNITY
GREENHOUSE GAS EMISSIONS
AND ENERGY USE INVENTORY**

February 2021

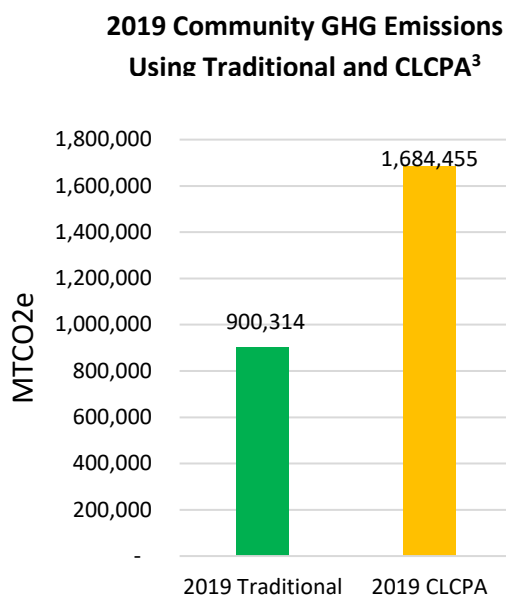
TOMPKINS COUNTY DEPARTMENT OF PLANNING AND SUSTAINABILITY



Executive Summary

This Tompkins County Community Greenhouse Gas Emissions Inventory¹ was developed at a time when greenhouse gas (GHG) accounting methods are poised for changes that have not yet been incorporated into existing protocols and software. As a result, this Inventory tells two distinct stories: Narrative 1 compares the 2019 GHG emissions from community activities using two different methods — the traditional GHG accounting method and the new method anticipated to be adopted in New York State as part of implementing the Climate Leadership and Community Protection Act (CLCPA); Narrative 2 explores the details of the 2019 GHG emissions, calculated with the traditional method, to present a snapshot of GHG emissions in 2019 and a comparison of the 2019 emissions to previous inventories.

Narrative 1 – Comparison of GHG emissions accounting methods



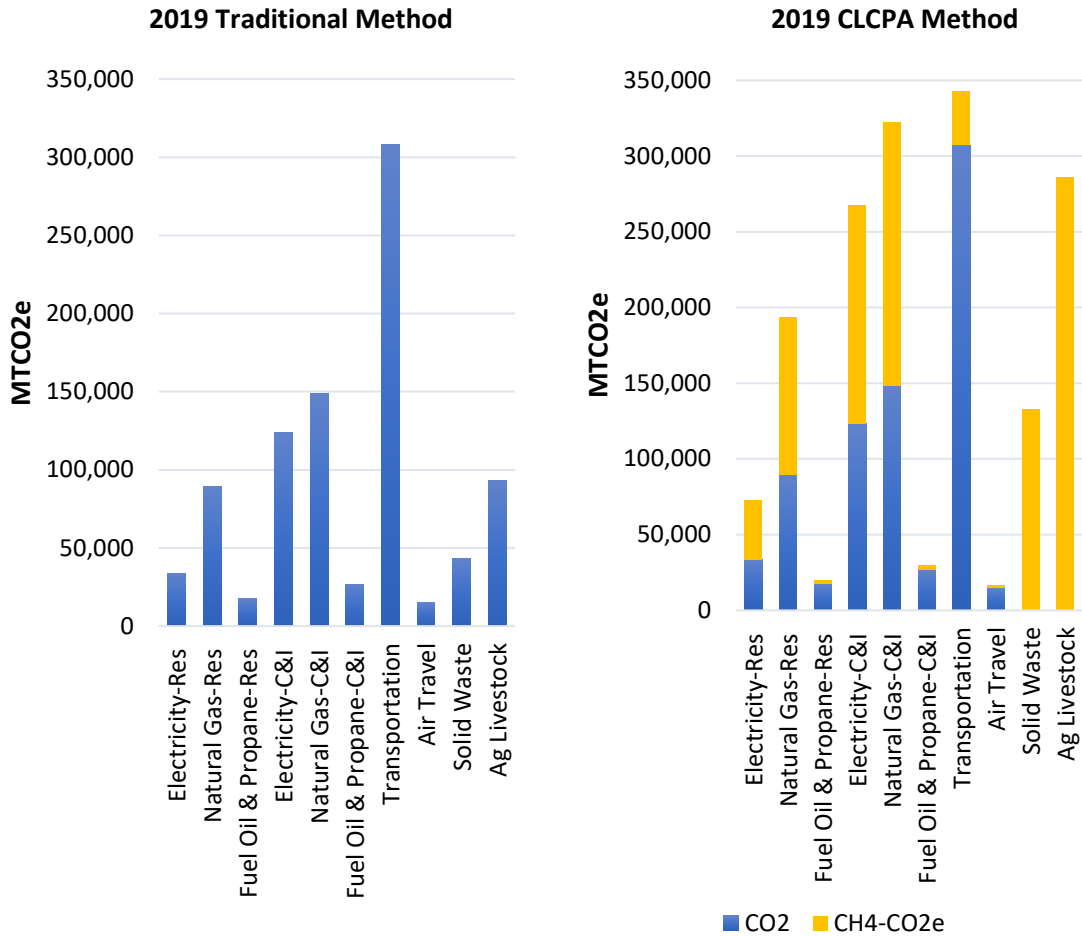
The CLCPA became law in January 2020. In addition to setting goals for reducing GHG emissions, it requires that these emissions be calculated with a 20-year time horizon and account for out-of-state methane leakage associated with natural gas extraction. The traditional accounting method uses a 100-year time horizon and in-state emissions of all greenhouse gases. While New York has not yet issued guidance on how to perform the emissions calculations specified in the CLCPA, the climate scientist advising State officials on these calculations shared the anticipated CLCPA methodology with Tompkins County staff². Using this method, community GHG emissions in the County are 1.9 times higher for 2019 than the total emissions calculated using traditional accounting methods.

The difference between these two accounting methods can be further broken down to show the contribution of methane emissions for each fuel within a sector. The chart below, on the left-hand side, shows the traditional accounting method, and each bar represents all greenhouse gases combined as one emissions number (for each fuel and sector) because the methane contribution is too small to see on this scale with a 100-year global warming potential (GWP). Using the anticipated CLCPA method and separating the carbon dioxide and methane contributions of emissions, the chart below, on the right-hand side, shows that calculating emissions with a shorter time horizon, the 20-year GWP, emphasizes the significance of methane in GHG emissions.

¹ A greenhouse gas (GHG) inventory is a list of emission sources and the associated emissions quantified using standardized methods (US Environmental Protection Agency).

² Robert W. Howarth (2020) Methane emissions from fossil fuels: exploring recent changes in greenhouse-gas reporting requirements for the State of New York, *Journal of Integrative Environmental Sciences*, 17:3, 69-81, DOI: 10.1080/1943815X.2020.1789666.

³ MTCO₂e – a measure of the combined ability of emitted GHGs to trap heat.

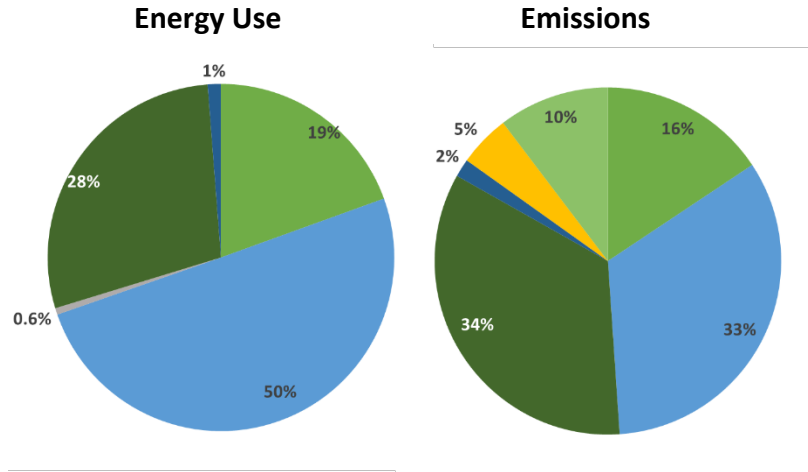


Main takeaways comparing traditional and CLCPA accounting methods

- The GHG emissions using the CLCPA accounting method are almost double what is calculated using the traditional method.
- The CLCPA method emphasizes the near-term contribution of natural gas usage on GHG emissions, pointing to the need to reduce natural gas usage for heating, as well as for electricity generation.
- The CLCPA method emphasizes the near-term impacts of solid waste and agricultural livestock on GHG emissions, pointing to the need to implement techniques to reduce the methane released in those sectors.
- As the electricity grid transitions from fossil fuel sources to renewables, emissions associated with electricity generation will decrease.

Since New York has not yet developed the formal guidance to calculate GHG emissions as required in the CLCPA, this Inventory primarily presents the results using the traditional GHG accounting method, as a way to compare the 2019 information with inventories conducted for 2008 and 2014. *As you read the remainder of this document, please recall the sense of urgency demonstrated by the significantly higher emissions calculations when using the CLCPA accounting method.*

Narrative 2 – Part A: 2019 inventory details using traditional accounting method



Sectors	Energy in MMBtu ⁴	% of Total	Emissions MTCO ₂ e	% of Total
Residential	2,961,816	19%	141,004	16%
Commercial and Industrial	7,626,171	50%	299,401	33%
Groton Electric	92,911	1%	0	0%
Transportation	4,330,588	28%	308,326	34%
Air Travel	186,600	1%	15,160	2%
Solid Waste	0	0%	43,295	5%
Agricultural Livestock	0	0%	93,128	10%
Total	15,198,086		900,314	

Main takeaways for 2019 emissions and energy use using traditional accounting method

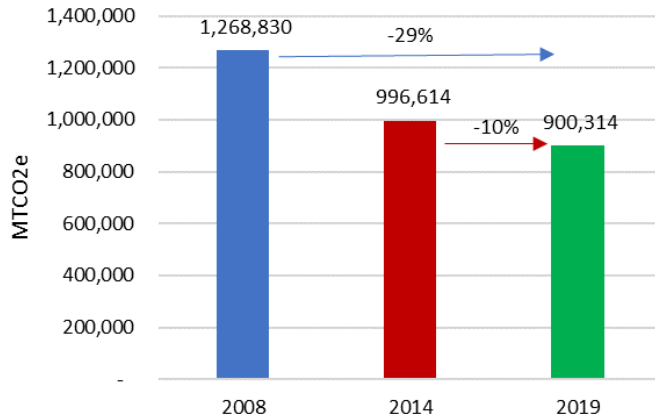
- Total GHG emissions in Tompkins County in 2019 were estimated to be 900,314 metric tons of carbon dioxide equivalent (MTCO₂e).
- The top three sectors for energy consumption and GHG emissions
 - The Commercial and Industrial Sector consumed 50% of all energy and produced 33% of all GHG emissions, making it the highest energy consuming sector.
 - The Transportation Sector consumed 28% of all energy and produced 34% of all emissions, making it the highest emitting sector.
 - The Residential Sector accounted for 19% of energy use and 16% of emissions, making it number three for both consumption and emissions.
- The top three fuels that emitted GHGs
 - Gasoline accounted for 32% of emissions
 - Natural gas accounted for 31% of emissions
 - Electricity (including the grid-mix of fuels to generate it) accounted for 21% of emissions

⁴ MMBtu – a measure of the energy content in fuel; used as a basis for comparing the energy content of various fuels.

These findings emphasize the need to continue to focus on electrifying our heating and cooling systems, expanding the amount of electricity provided from renewable energy sources, reducing the number of miles driven, and transitioning to electric or highly efficient vehicles.

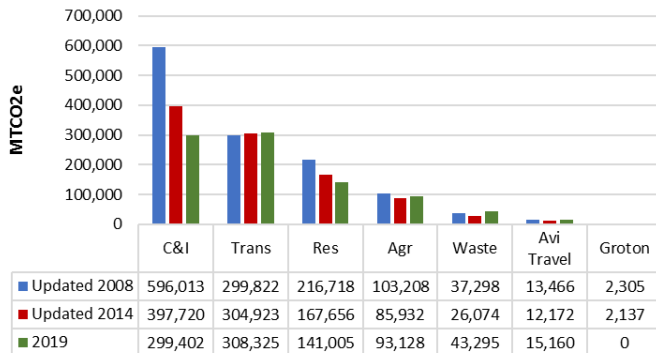
Narrative 2 – Part B: 2008-2019 comparison of emissions and energy use using traditional accounting method

**Community GHG Emissions 2008-2019:
Traditional Methods**

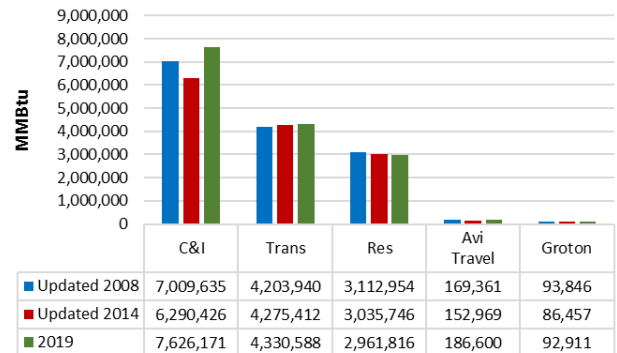


Under the traditional accounting method, Tompkins County reduced GHG emissions from base year 2008 levels by 29% in 2019, with a 10% reduction between 2014 and 2019. These reductions show progress, but the community is still far from achieving net-zero emissions⁵, which is the target set forth in the 2019 Tompkins County Energy Strategy.

Comparison of GHG Emissions



Comparison of Energy Use



Main takeaways for 2008-2019 comparison of emissions and energy use using traditional accounting method

Overall, under the traditional GHG accounting method, community-scale emissions declined between 2008 and 2019.

⁵ The Energy Strategy defined net-zero to mean that GHG emissions are reduced 100%, to zero, although some emissions can be allowed if balanced by negative emissions achieved through actions such as drawing carbon from the air and tree-planting.

- The Commercial and Industrial Sector saw an increase in energy use but also the largest reduction in GHG emissions among all the sectors due to Cornell's 2009 decision to transition its central energy plant from coal to natural gas to produce its heat and electricity.
- The Transportation Sector had an increase in both energy use and emissions. However, it should be noted that it is difficult to see progress in the Transportation Sector at the County level, as the data are highly dependent on regional vehicle types as well as on local modeling to estimate vehicle miles traveled that has not been updated since the 2014 Inventory.
- Residential Sector energy consumption and emissions declined between 2008 and 2019.
- The power supplied to the Village of Groton's municipal electric system (Groton Electric) fully transitioned to emissions-free energy between 2014 and 2019, with 84% coming from hydropower and 16% from nuclear.
- Renewable energy generation increased 1,000% from 2008 to 2019.

As stated in the Tompkins County Energy Strategy (2019), the community needs to work together and take bold actions to continue to reduce emissions and energy consumption. This Inventory is a resource that can inform development of Tompkins County community actions to reduce emissions and transition to renewable energy.