2019 TOMPKINS COUNTY GOVERNMENT OPERATIONS

GREENHOUSE GAS EMISSIONS AND ENERGY USE INVENTORY

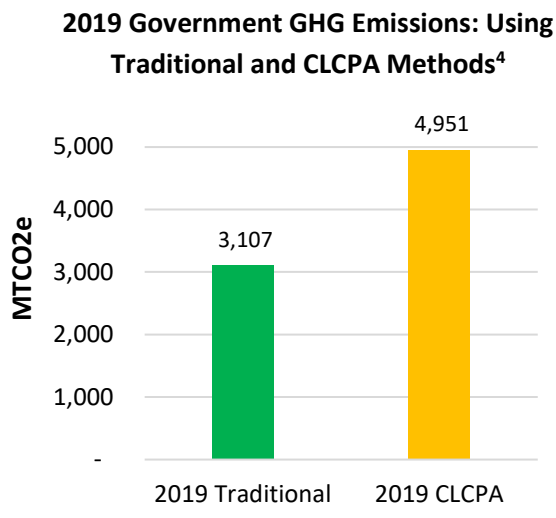
February 2021

TOMPKINS COUNTY DEPARTMENT OF PLANNING AND SUSTAINABILITY

Executive Summary

This Tompkins County Government Operations Greenhouse Gas Emissions Inventory[1] 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 County government operations[2] 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 staff[3]. Using the CLCPA method, the government operations GHG emissions are 1.6 times higher for 2019 than the total emissions calculated using the traditional accounting method.

The difference between these two accounting methods can be broken down to show the contribution of methane emissions from Buildings & Facilities and Vehicles & Equipment. The chart, on the left-hand side below, uses the traditional accounting method, and each bar represents all greenhouse gases combined as one emissions number 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, on the right-hand side below, shows that calculating emissions with a shorter time horizon, the 20-year GWP, emphasizes the significance of methane in GHG emissions.

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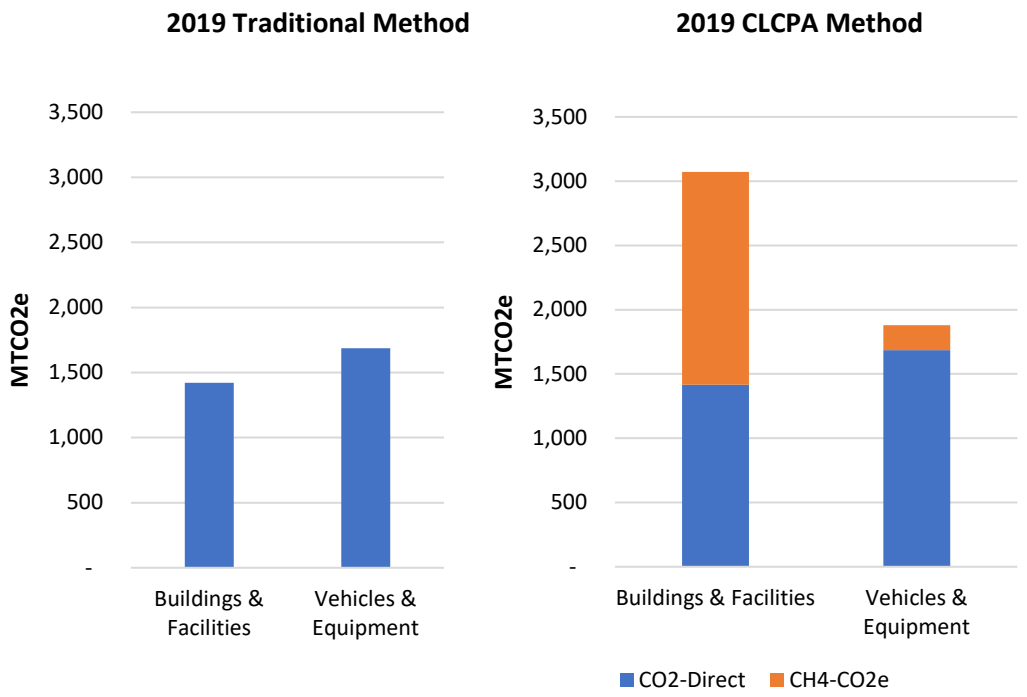
[1] A greenhouse gas inventory is a list of emission sources and the associated emissions quantified using standardized methods (US EPA).

[2] The County government operations include two overarching sectors: (1) Buildings & Facilities, which includes electricity and thermal heating for all County buildings and facilities; and (2) Vehicles & Equipment, which includes both on- and off-road vehicles and equipment powered by predominantly gasoline and diesel.

[3] 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.

[4] MTCO2e – a measure of the combined ability of emitted GHGs to trap heat.



Main takeaways comparing traditional and CLCPA accounting methods

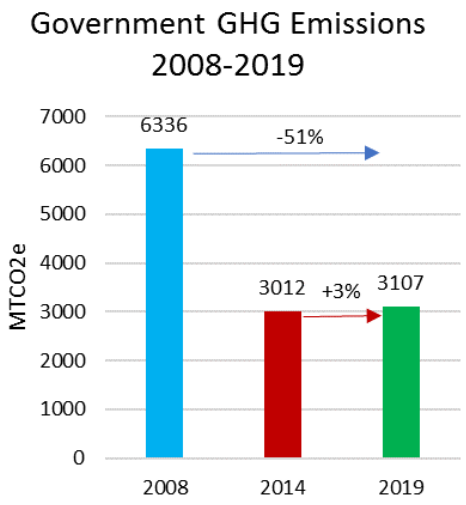
- The GHG emissions using the CLCPA accounting method are 1.6 times the emissions calculated using the traditional method.
- The CLCPA method emphasizes that methane associated with the natural gas used to heat County buildings has a significant impact on climate change.

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

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

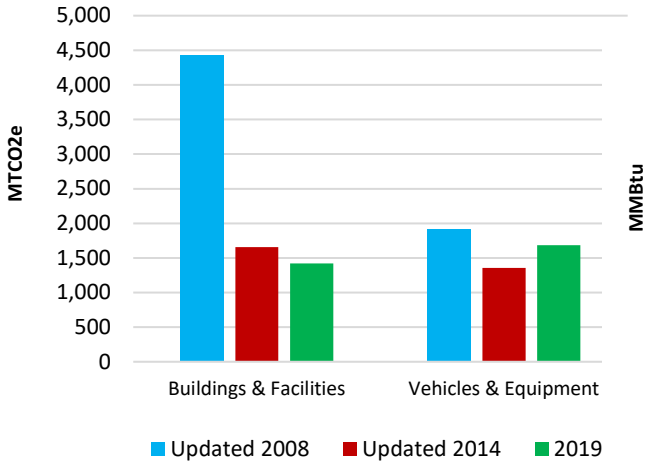
- The total 2019 County government GHG emissions were approximately 3,107 metric tons of carbon dioxide equivalent ($MTCO_2e$) with 54% of emissions from County vehicles and equipment fueled by gasoline, biodiesel, diesel, and ethanol fuels and 46% of emissions from natural gas consumption in County facilities.
- The total electricity consumed by County government operations in 2019 was 6,787,385 kilowatt hours. All the emissions associated with electricity consumption were offset by the County's purchase of Renewable Energy Certificates, which include electricity produced at a micro-hydro facility in Waterloo, NY, and by the County's wind energy supplier.
- The total amount of natural gas consumed for County government operations in 2019 was 266,724 therms.
- In 2019, the Vehicles & Equipment Sector consumed 181,606 gallons of fuel (gasoline, diesel and biodiesel), which equates to 23,779 million British thermal units (MMBtu) of energy needed to fuel the vehicles and off-road equipment, such as mowers and forklifts.

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

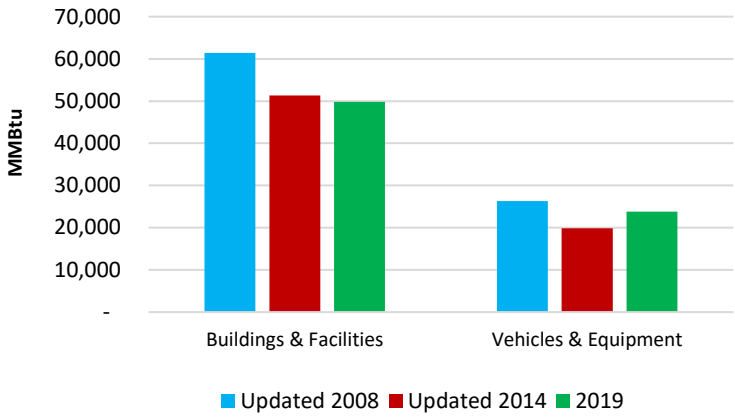


Under the traditional accounting method, Tompkins County reduced the GHG emissions from its government operations by 51% or 3,229 $MTCO_2e$ between the baseline year 2008 and 2019. However, between 2014 and 2019, GHG emissions increased by 3%. The 2019 Tompkins County Energy Strategy calls on the County government, as well as the community, to achieve net-zero emissions[5] as soon as possible. Although the progress since 2008 is encouraging news and reflects the positive results of the County's concerted efforts to reduce its emissions, these advances are tempered by the reality that achieving net-zero emissions will require significant changes to the County's buildings and fleet.

Emissions 2008-2019



Energy Use 2008-2019



[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.

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

- Buildings & Facilities emissions decreased by 68% from 2008 to 2019 with a 14% decrease between 2014 to 2019.
- Vehicles & Equipment emissions decreased 12% from 2008 to 2019 but increased by 25% between 2014-2019.
- Buildings & Facilities energy use decreased by 19% from 2008 to 2019 and had a 3% increase between 2014 to 2019.
- Vehicles & Equipment energy use decreased 10% from 2008 to 2019 but increased by 20% between 2014-2019.

Recent increases in vehicle emissions can be attributed to switching to higher emitting B5 biodiesel as a mechanical necessity for the near term, along with other factors (ex. weather impacts on snow plowing needs, regulatory requirements impacting vehicle use, frequency of service calls covering distant corners of the County). However, conversion of the gasoline-based passenger fleet to electric vehicles (EVs) can yield much progress while electric alternatives to diesel vehicles are under development.

Although weather variations impact energy use and emissions at County facilities, the electrification of buildings currently using natural gas, along with additional energy efficiency improvements, would provide the greatest potential for additional GHG emissions reductions in County buildings and facilities.

The results of this Inventory will inform the County's next steps in reducing GHG emissions from government operations. This Inventory indicates that the greatest potential for GHG emissions reductions in County government operations are to be found in vehicle fleet fuel use and natural gas use in facilities.

Past inventories informed the County's investments to reduce its GHG emissions – examples include the inclusion of a geothermal system to transition the Ithaca Tompkins International Airport Terminal from natural gas as part of its expansion, and acquisition of 23 plug-in EVs in recent years. The information contained in this Inventory, together with investments through the County's Capital Program and other leveraged resources, will help make real the next steps towards achieving net-zero GHG emissions from County government operations.