December 2025

2024

Community Greenhouse Gas Inventory

The Corporation of the County of Huron | Climate & Energy

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Units & Abbreviations

CO_2e	Carbon dioxide equivalent
GHG	Greenhouse gas
GJ	Gigajoule
kWh	Kilowatt hour
L	Litres
m^3	Metres cubed
PCP	Partners for Climate Protection
t	Tonne

Glossary

Carbon dioxide equivalent (CO_2e): A unit of measure that allows the comparison of emissions from different types of greenhouse gases.

Greenhouse gas: Any gas emitted from a source (natural and/or anthropogenic) that absorbs heat in the atmosphere.

Energy source: Refers to the various types of energy and fuel used within the County's corporate facilities and fleet. This includes electricity, natural gas, propane, gasoline, and diesel.

Sector: Refers to the various areas in a community that create greenhouse gas emissions. This includes buildings, agriculture, solid waste, and transportation.

1. Introduction

In July 2019, the County of Huron joined the Partners for Climate Protection (PCP) program. This program, jointly established by the Federation of Canadian Municipalities and ICLEI – Local Governments for Sustainability, encourages municipalities to take action against climate change, and more specifically, the reduction of greenhouse gas (GHG) emissions. The PCP program is comprised of a 5-milestone framework that works to reduce corporate and/or community GHG emissions through the development of an emissions inventory, reduction targets, and an action plan.

As part of the commitment to the PCP program, the County of Huron developed a corporate GHG emissions inventory in 2017/2018 and re-inventoried emissions in 2024. To build on the corporate emissions inventory, the County was interested in conducting a preliminary community GHG emissions inventory for 2024. Understanding community emissions is integral to designing and implementing climate mitigation and adaptation efforts for community members.

2. Methods

The compiled inventory encompasses the best available data for community GHG emissions from the building sector (residential, commercial, and industrial), on-road transportation, agriculture and other land uses, and solid waste. The emissions associated with each area of the inventory were calculated using the PCP Milestone Tool. This online database assists municipalities in creating GHG inventories, as it provides a simple, accurate, and consistent methodology for determining emissions.

The GHG emissions associated with the community building sector were calculated using 2024 aggregated data obtained from local utility providers for electricity, propane, natural gas, and oil for residential, commercial, and industrial buildings within Huron County.

The emissions from on-road transportation were calculated using 2023 data from Google's Environmental Insights Explorer project. This tool uses mobility data obtained from smartphones equipped with GPS to estimate travel distance and GHG emissions for Huron County. The data delineated emissions from inbound, outbound, and in-boundary trips, which is helpful to understand how many on-road transportation emissions are from travel in Huron County. There are some limitations to this data, as it is from 2023, and not everyone has a smartphone or has their location services enabled on their smartphone while driving. However, this method has been shown to be comparable to other transportation emission calculations, and it is the best available data for Huron County at this time.

The agricultural emissions included enteric fermentation methane emissions from livestock, including sheep, pigs, cattle, and other livestock. In addition, land inputs, such as manure, fertilizer, and herbicides, were used to understand the nitrous oxide emissions from nitrogen application to agricultural land. This data was all obtained from the 2021 Statistics Canada census, which is the best available data at the regional level in Huron County.

The solid waste emissions are 2024 aggregated data for residential and commercial waste in Huron County. These values are underrepresented as not all waste data could be gathered by staff.

3. Community Inventory

3.1 Inventory Summary

The following section provides an overview of Huron County's 2024 community GHG emissions. The emissions are presented as annual totals and compared by sector (i.e., solid waste, commercial, residential, agriculture, industrial, and on-road transportation), as well as the total energy consumed by sector. The information summarized in this section is further outlined in Appendix 1.

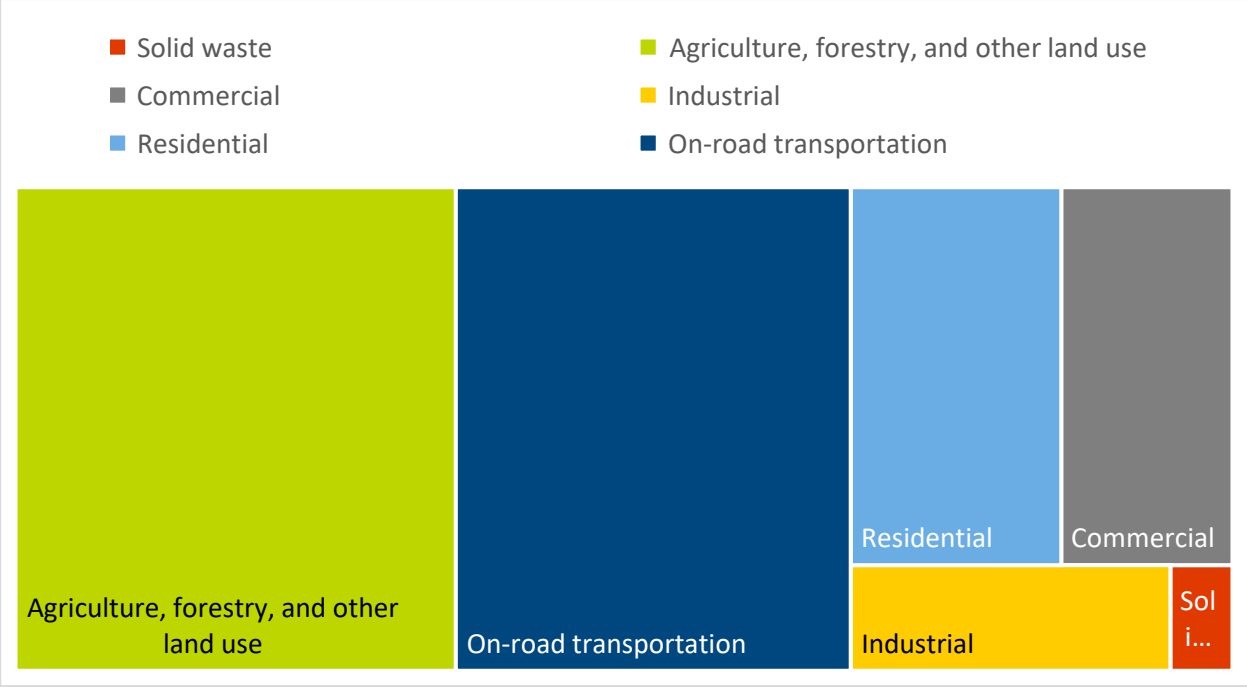


Figure 1. 2024 community greenhouse gas emissions (tCO_2e) by sector.

In comparing Huron County's GHG emissions by sector (Figure 1), total emissions were approximately 756,000 tCO2e in 2024. Based on the available data, agriculture and other land

use, and on-road transportation account for the largest proportions of annual emissions, representing approximately 36% and 32%, respectively.

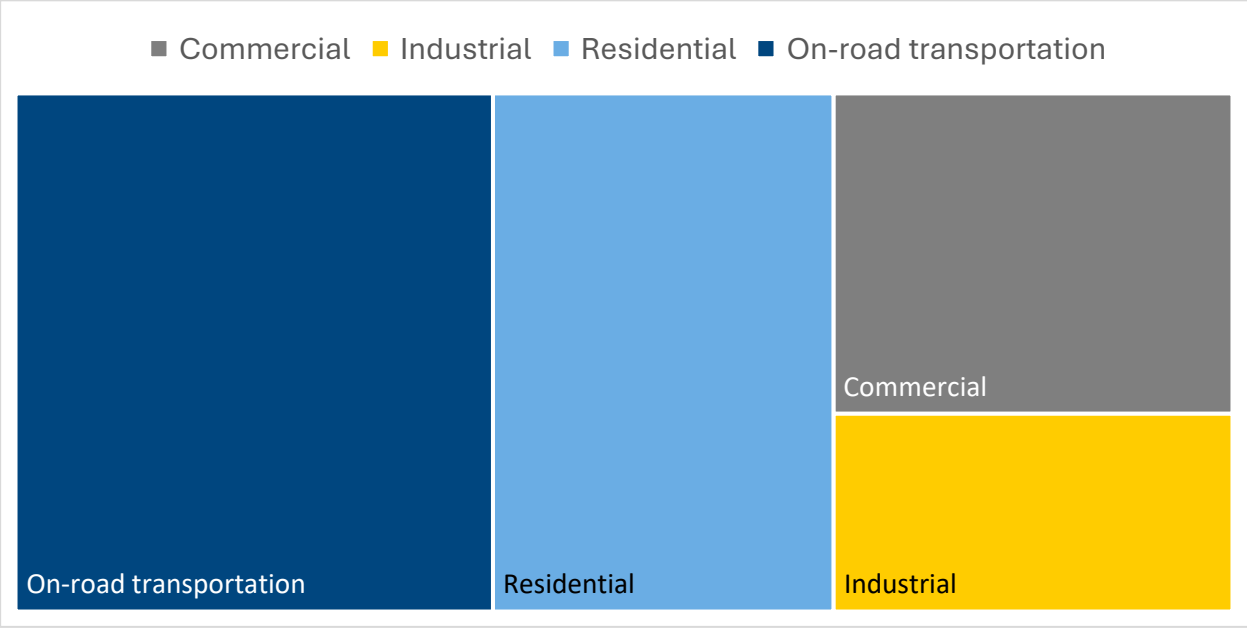


Figure 2. 2024 community energy use (GJ) by sector.

For energy use, the community used 9,353,659 gigajoules of energy between residential, commercial, industrial, and on-road transportation. On-road transportation was the largest contributor to community energy use with 3,668,710 gigajoules. With a population of over 61,000, 91% of residents commute with their personal vehicle regularly, leading to high energy use from on-road transportation. The remaining energy use from the community's building sector accounts for 60% of the total energy use, with residential being the highest building sector at 28%.

When comparing energy use and GHG emissions by source (Figure 3), natural gas and on-road transportation fuels dominate both energy use and emissions. Natural gas accounts for 41% of total energy use and 37% of emissions, while on-road transportation represents 39% of energy use but contributes a larger proportion of emissions at 52%. This may reflect the higher carbon intensity of transportation fuels compared to natural gas. By contrast, electricity makes up 16% of total energy use but only 6% of emissions due to Ontario's relatively low-carbon grid. Smaller sources, such as propane and fuel oil, together represent less than 5% of community energy use and emissions. This could indicate that households are less reliant on these fuel sources as their main method for heating.

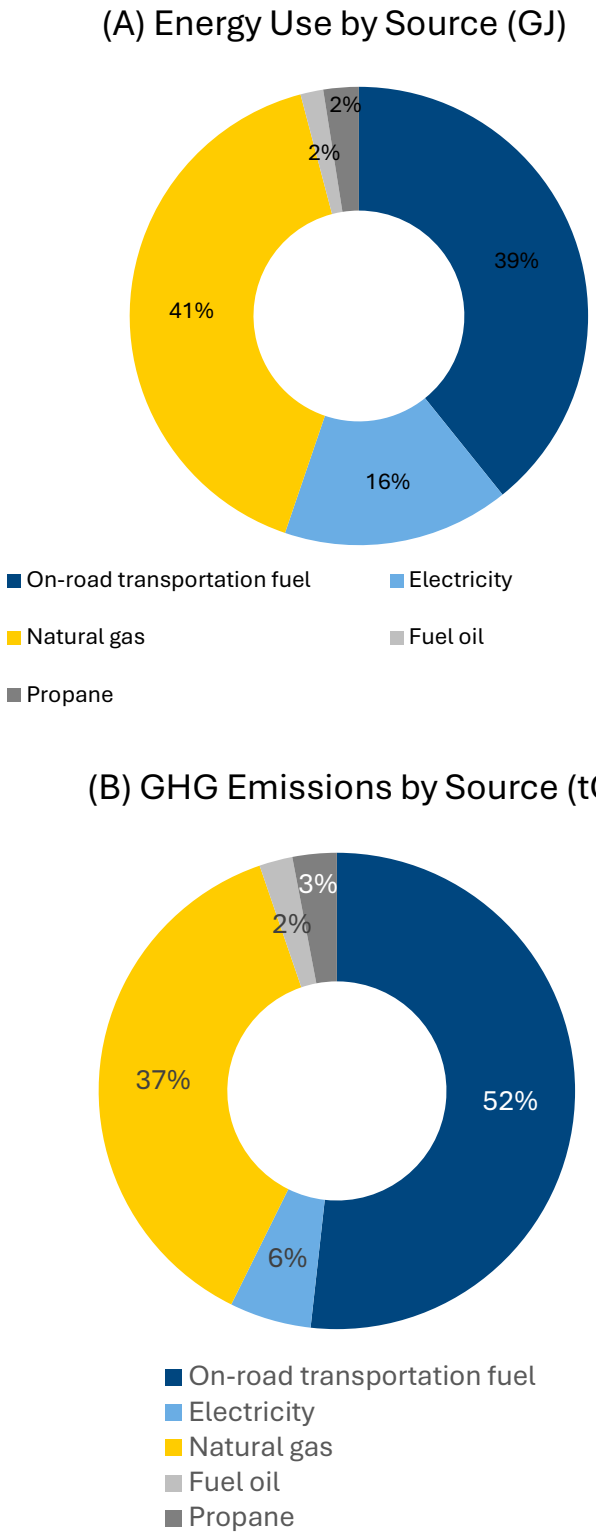


Figure 3. Total 2024 energy use (A) and GHG emissions (B) by source.

3.2 Agriculture

Agriculture is a dominant industry in Huron County and supports provincial and national production. Based on the best available data from 2021, livestock and land use are the two main agricultural emission sources that staff could obtain for Huron County.

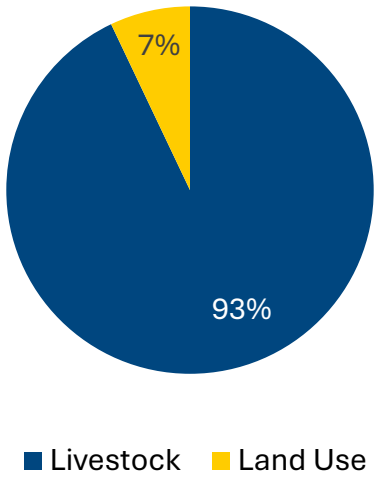


Figure 4. 2021 total greenhouse gas emissions (tCO_2e) from agriculture.

In Huron County, livestock accounts for 93% of agricultural emissions, which includes methane emissions from cattle, pigs, sheep, and other livestock. Cattle account for 226,641 tonnes of annual emissions based on the number of cattle reported in the 2021 census. While there are more pigs than cattle in Huron County, the emission factor for cattle is higher, leading to higher emissions (Figure 5). In addition to the listed livestock, chicken production does occur in Huron County, although there is currently no confirmed emission factor for chicken to determine relevant GHG emissions.

The emissions from land use are minimal and related to the nitrous oxide from fertilizer, fungicides, insecticides, and other additives to agricultural land for production. While additions to the land, such as fertilizers, can lead to emissions, agricultural land also sequesters carbon dioxide in the soil, crops, and woodlots that are associated with agricultural land.

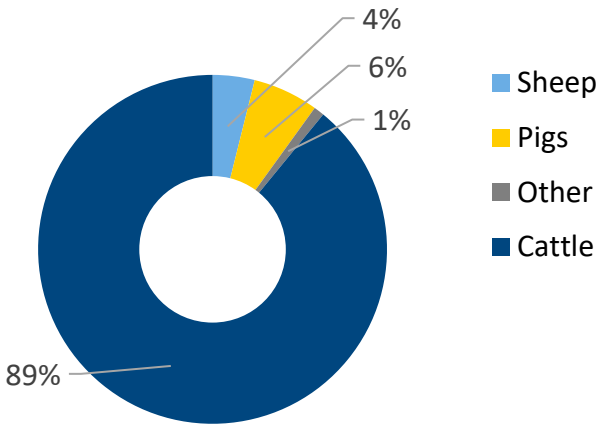


Figure 5. 2021 total greenhouse gas emissions (tCO_2e) from enteric fermentation based on 2021 Huron County livestock counts.

3.3 Buildings

The building sector is a large contributor to GHG emissions and energy use in Huron County. The building sector comprises residential, commercial, and industrial properties and their energy use. Commercial and industrial buildings produced 59% of total energy from the building sector, with 3,066,765 gigajoules of energy use in 2024 (Figure 6A). The distribution of greenhouse gas emissions is similar to energy use, with commercial and industrial creating more emissions than residential buildings (Figure 6B).

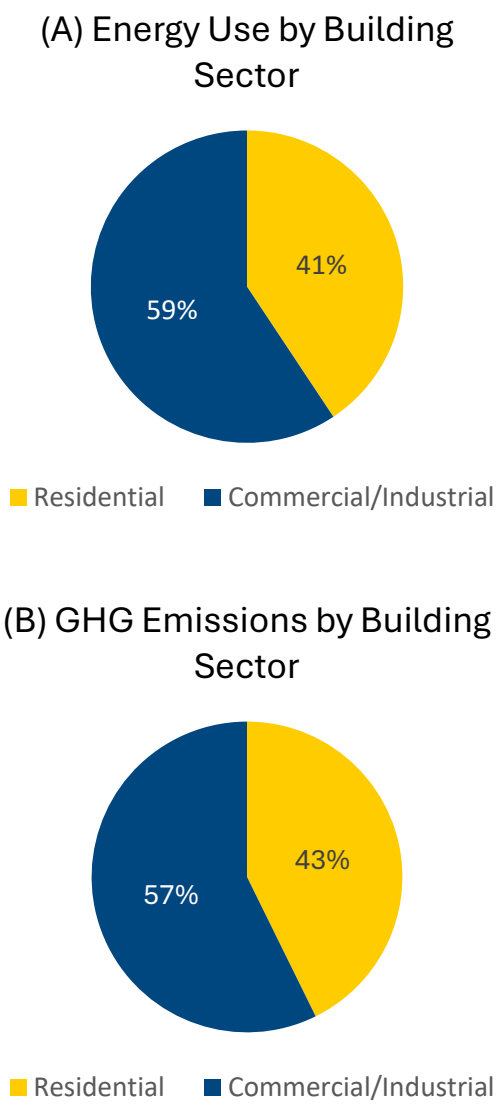
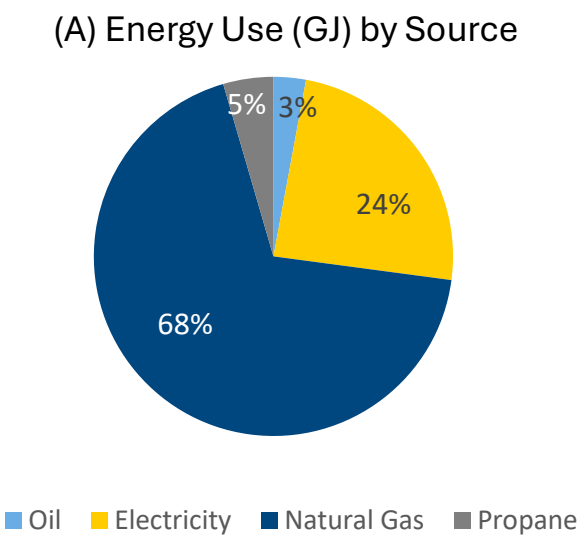


Figure 6. 2024 energy use (A) and greenhouse gas emissions (B) by building sector in the community.

For buildings, it is important to consider the source of the energy and the associated GHG emissions to design practical and needed energy efficiency solutions for a community. In Huron County, natural gas is the most commonly used energy source for the building sector and therefore, contributes 82% of the GHG emissions (Figure 7). Electricity is just over a third of the total energy used in the County, however, it is only responsible for 7% of GHG emissions. Based on available data, oil and propane are less prevalent in the commercial and industrial sectors, which corresponds with their smaller contributions to energy use and GHG emissions from the building sector.



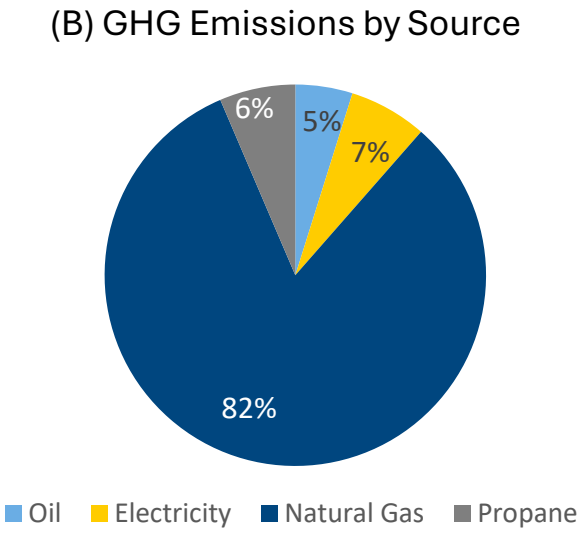


Figure 7. 2024 energy use (A) and greenhouse gas emissions (B) by source for the entire building sector.

In Huron County, residential buildings account for 43% of GHG emissions from the building sector (Figure 6). In residential buildings, natural gas has the largest energy use, at 1,463,503 gigajoules (70%), followed by electricity (20%), fuel oil (7%), and propane (3%) (Figure 8). To be expected, natural gas also contributes to the highest GHG emissions from residential buildings, with 78% of emissions (Figure 7B). With the high emission factor for fuel oil, it surpasses the GHG emissions of electricity at 11%.

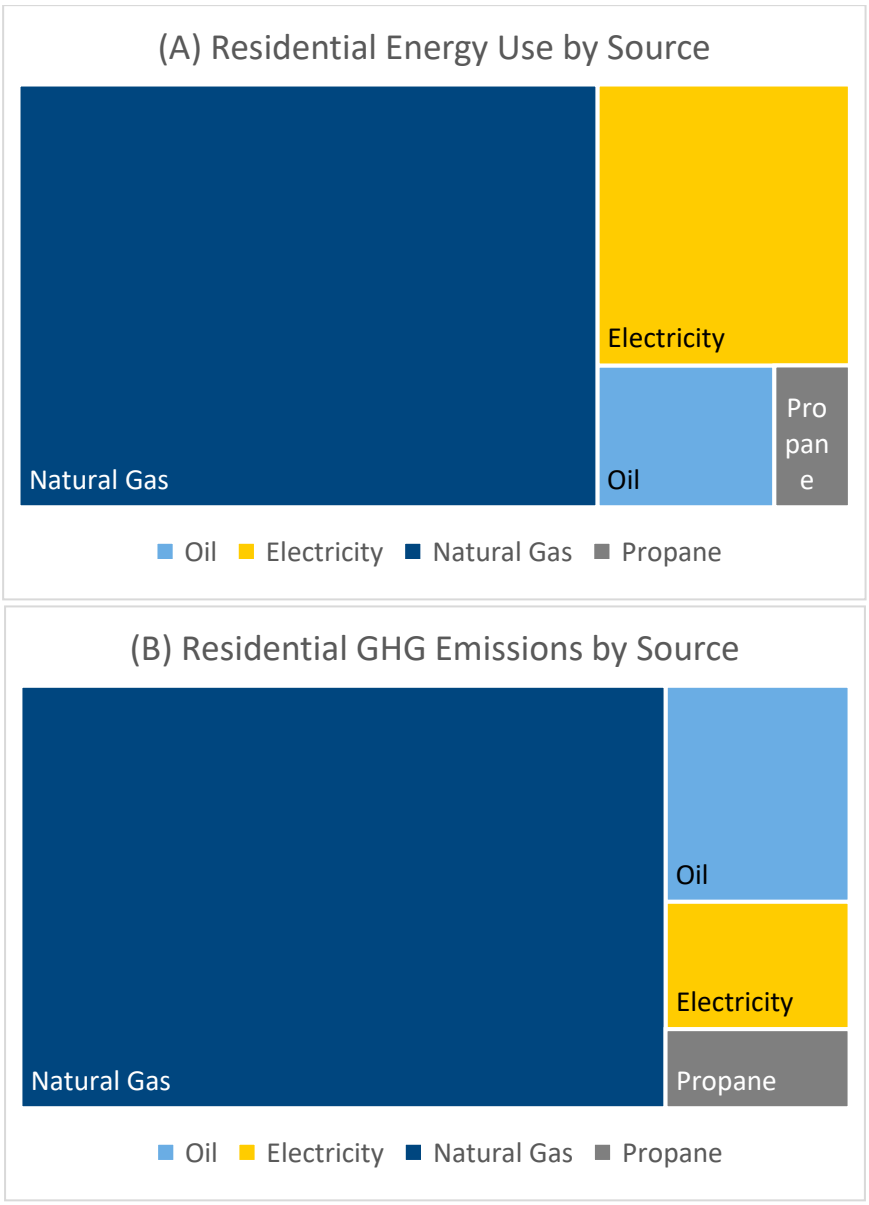


Figure 8. 2024 residential energy use (A) and greenhouse gas emissions (B) by source.

These values are based on the best available data. They represent the known consumption data for the residential sector, as the County was unable to obtain 2024 consumption data for all utility providers in Huron County.

3.4 Transportation

The on-road transportation sector is the second largest GHG emission source in Huron County, emitting over 301,000 tonnes of carbon dioxide equivalent emissions in 2023. These emissions are based on a combined total of 732,000,000 kilometers traveled in 2023. The on-road transportation data is divided into three travel bounds:

- **In-Boundary**: The entire recorded trip occurred within the jurisdictional boundaries of Huron County
- **Inbound**: Trips entering the jurisdictional boundaries of Huron County
- **Outbound**: Trips leaving the jurisdictional boundaries of Huron County

While some of the trips taken may not begin or end in Huron County, this information helps quantify the emissions released within our boundaries for those who commute or travel into or out of Huron County. While emissions are more equally distributed between the travel bounds, there were 39 times more in-boundary trips in 2023 compared to inbound or outbound (Figure 9).

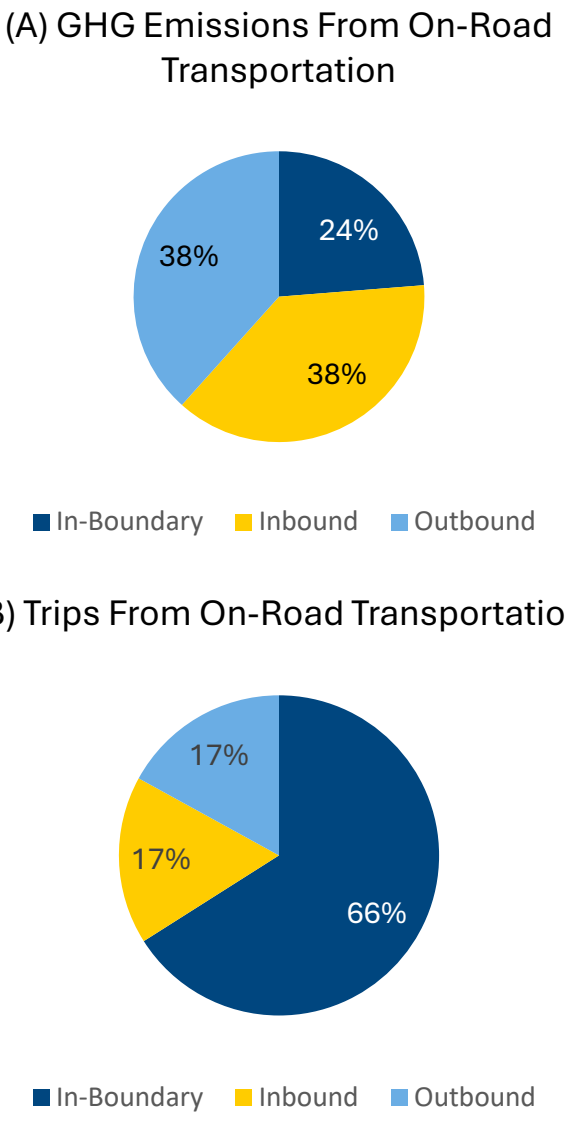


Figure 9. 2023 greenhouse gas emissions (A) and trips taken (B) by on-road vehicles based on their travel bounds.

Despite the high volume of in-boundary trips (Figure 9), the distance travelled per trip was greater for inbound and outbound travel, which is to be expected with the high volume of tourists that come to Huron County, daily commutes, and residents travelling to areas outside of Huron County (Figure 10).

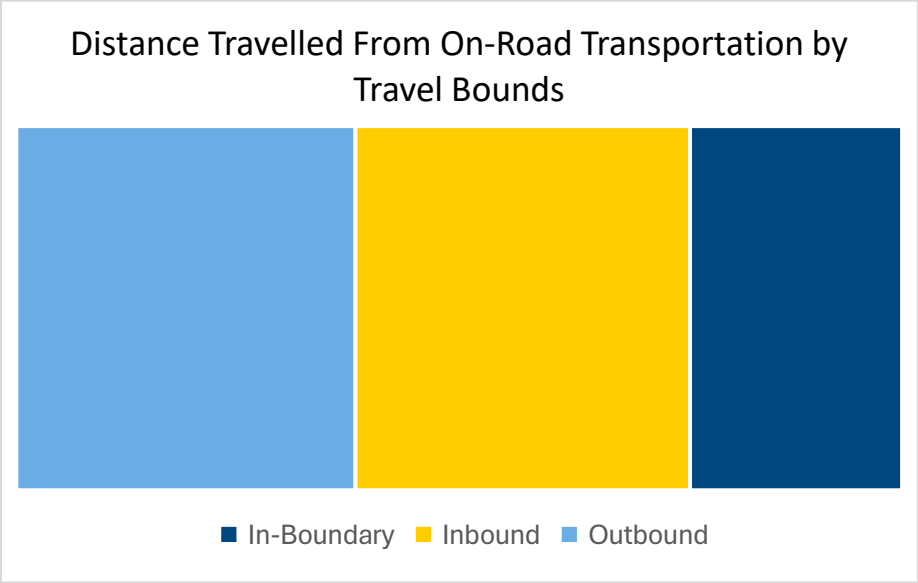


Figure 10. 2023 distance travelled by on-road vehicles based on travel bounds.

For active transportation, it was found that in 2023, individuals walked a total of 3,482,184 km over the course of 3,387,544 trips. This accounted for over 7% of total trips taken but was only 0.48% of total kilometers travelled.

3.5 Solid Waste

In Huron County, GHG emissions from solid waste are a small portion of the overall community emissions at 1% (Figure 1). Based on the available data, the community created a minimum of 5,604 tonnes of waste from the commercial and residential sectors in 2024, leading to 8,473 tonnes of carbon dioxide equivalent emissions (Figure 11). In addition to the generated waste, a minimum of 5,383 tonnes of recycling was collected from the commercial and residential sectors in 2024, which demonstrates that diversion is occurring in the waste sector.

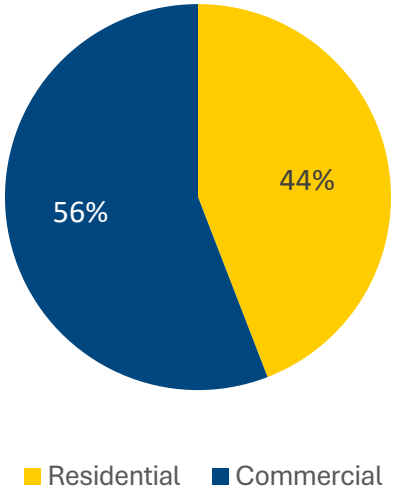


Figure 11. 2024 greenhouse gas emissions by sector in the community.

These values are underrepresented for the community, as the County was unable to access data from all local waste collection companies.

4. Moving Forward

In summary, Huron County's estimated community emissions for 2024 were 756,849 tonnes of carbon dioxide equivalent. These emissions demonstrate the cumulative impact from solid waste; agriculture, forestry, and other land uses; commercial, industrial, and residential building sectors; and on-road transportation.

Nationally, Canada emitted 694,000,000 tonnes of carbon dioxide equivalents (tCO2e) in 2023 (ECCC, 2025), which the Canadian Climate Institute (2025) estimates to be similar in 2024. With over 41 million residents, each Canadian is estimated to emit 16.8 tonnes of carbon dioxide equivalents (tCO2e) in 2024. Based on the estimated greenhouse gas emissions for Huron County, each resident emits 12.5 tCO2e a year, which is below the national average

While this inventory is an estimate based on the best available data, it provides a baseline for the community to understand where GHG emissions are being created. This inventory will allow the County to continue to monitor community emissions moving forward, and it will help advance goals and strategies to reduce emissions through the new community climate action strategy.

5. Appendices

Appendix 1: Inventory Results - Summary

Table 1. Summary of greenhouse gas emissions and energy by sector for 2024.

Sector	2024 Emissions (tCO_2e)	2024 Energy (GJ)
Solid Waste	8,473	N/A
Agriculture, Forestry, and other land uses	273,809	N/A
Commercial	83,264	1,896,353
Industrial	43,470	1,170,412
Residential	102,182	2,618,184
On Road Transportation	245,650	3,668,710
Total	756,849	9,353,659

Table 2. Summary of greenhouse gas emissions and energy by source.

Sector	2024 Emissions (tCO_2e)	2024 Energy (GJ)
On Road Transportation Fuel	246,650	3,668,710
Electricity	26,331	1,497,042
Natural Gas	177,630	3,804,103
Fuel Oil	10,719	150,475
Propane	14,237	233,329
Total	474,566	9,353,659

Appendix 2: Inventory Results – Agriculture, Forestry and Other Land Uses

Table 1. Summary of greenhouse gas emissions for agriculture, forestry, and other land uses from 2021 federal census.

Sector	2021 Emissions (tCO_2e)
Livestock	254,464
Land Use	19,345
Total	273,809

Table 2. Total greenhouse gas emissions from enteric fermentation from 2021 federal census.

Sector	2021 Emissions (tCO_2e)
Sheep	9,903
Pigs	15,451
Other	2,483
Cattle	226,640

Appendix 3: Inventory Results – Building Sector

Table 1. Summary of greenhouse gas emissions and energy from all energy sources used in residential, commercial and industrial sectors for 2024.

Sector	Source	2024 Emissions (tCO_2e)	2024 Energy (GJ)
Residential	Fuel Oil	10,708	150,328
	Electricity	6,328	424,568
	Natural Gas	73,549	1,463,503
	Propane	3,910	64,087
	Total	94,496	2,102,486
Commercial	Fuel Oil	11	147
	Electricity	1,827	392,113
	Natural Gas	71,101	1,334,851
	Propane	10,326	169,242
	Total	83,265	1,896,353
Industrial	Electricity	6,472	434,211
	Natural Gas	36,998	736,201
	Total	43,470	1,170,412
Total		221,230	5,169,251

Appendix 4: Inventory Results – Transportation

Table 1. Total greenhouse gas emissions, number of trips taken and distance travelled for all three travel bounds.

Sector	2023 Emissions (tCO_2e)	Trips (#)	Distance (km)
In-Boundary	71,634	31,261,289	283,016,498
Inbound	114,359	8,045,963	446,255,894
Outbound	115,761	8,053,924	451,729,116
Total	301,754	47,361,176	1,181,001,508

Appendix 5: Inventory Results – Solid Waste

Table 1. Summary of waste collected and the associated greenhouse gas emissions for 2024.

Sector	Collected (Tonnes)	2024 Emissions (tCO_2e)
Residential	2,473	3,739
Commercial	3,131	4,734
Total	5,604	8,473