Lanark County: Greenhouse Gas Emissions Progress Report

2019 and 2023 Corporate and Community Sectors

Revision Date: December 2024

LANARK COUNTY

ICLEI Local Governments for Sustainability

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Contents

Introduction

Tracking greenhouse gas (GHG) emissions is crucial for mitigating climate change and understanding progress towards local and global sustainability goals. By tracking GHG emissions, organizations and governments can make informed decisions, identify target areas to reduce GHG emissions, and contribute to a more sustainable future.

A GHG emissions inventory summarizes energy use and related emissions for the buildings, transportation, waste, and agriculture/forestry/land use sectors. GHG emissions are expressed in tons of carbon dioxide equivalent emissions (tCO_2e), which are calculated for methane (CH_4), carbon dioxide (CO_2), and nitrous oxide (N_2O). Lanark County's GHG emissions inventory follows the Partners for Climate Protection (PCP) tool, which offers a consistent and robust accounting methodology that compares emissions across different sectors.

Lanark County has completed two corporate and community GHG emissions inventories: one inventory for 2019 and one inventory for 2023.

The Lanark County corporate inventory tracks emissions from the following sectors*:

- Buildings
- Fleet
- Streetlights
- Solid waste

*Note: Since Lanark County does not operate water or wastewater treatment facilities, emissions from this sector are not included in the corporate inventory.

The Lanark County community inventory tracks emissions from the following sectors:

- Stationary energy (i.e., residential; commercial and institutional; manufacturing, industries, and construction; agriculture, fishing and forestry activities; and non-specified sources).
- Transportation (i.e., on-road transportation)
- Waste (i.e., solid waste and wastewater)
- AFOLU (i.e., agriculture, forestry, and other land use)

The following report compares the total 2019 and 2023 corporate and community greenhouse gas emissions by sector.

Corporate Emissions

The corporate greenhouse gas emissions inventory includes data from corporate buildings, streetlights, fleets, and waste. For corporate buildings, data was gathered from electricity and natural gas providers: HydroOne, Ottawa River Power Corporation (ORPC), and Enbridge.

Streetlight data was collected from electricity providers: HydroOne and ORPC.

Fleet data was collected from internal fuel consumption records (i.e., gasoline and diesel) for all corporate-owned vehicles (Public Works and Lanark County Housing Corporation).

Waste data was gathered from county staff.

2019 Corporate Emissions Overview

In 2019, a total of 2,194.85 tCO2e were emitted from Lanark County corporate operations (Table 1, Figure 1). Corporate buildings were the largest source of corporate greenhouse gas emissions, representing nearly 73% of emissions (Table 1, Figure 1). Corporate fleet was the second largest source of greenhouse gas emissions, followed by waste and streetlights (Table 1, Figure 1). Natural gas was the energy source responsible for the largest proportion of GHG emissions, representing 68% of emissions, followed by diesel, electricity, gasoline, and propane (Table 2, Figure 2).

Table 1 – Lanark County's corporate GHG emissions by sector in 2019.

Sector	**Emissions (tCO2e)**	**Energy (GJ)**
Building	1606.55	50557
Streetlights	1.12	132
Fleet	477.88	6752
Waste	109.30	N/A
Total	**2194.85**	**57441**

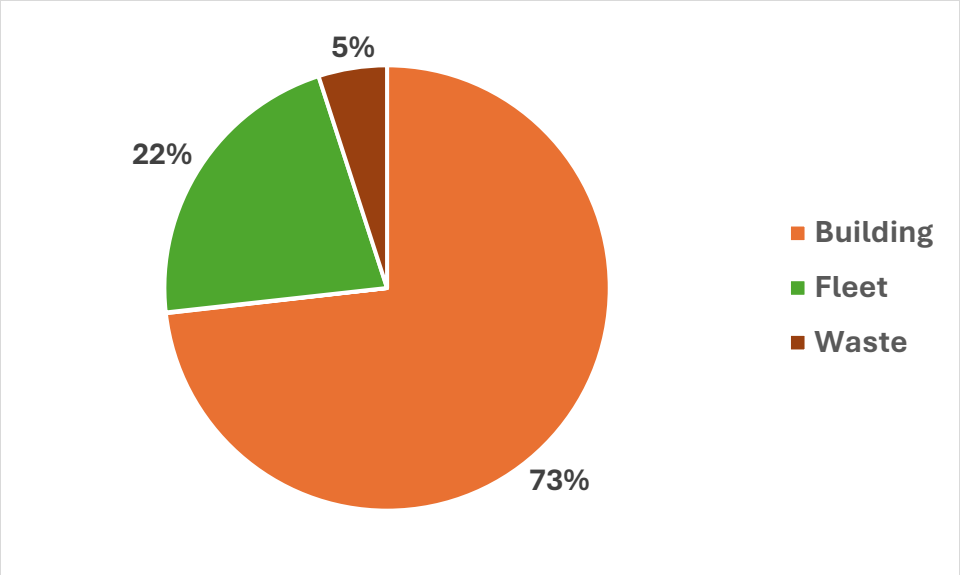

Figure 1 – Pie chart of Lanark County's corporate GHG emissions by sector in 2019.

Table 2 – Lanark County's corporate GHG emissions by source in 2019.

Source	**Emissions (tCO2e)**	**Energy (GJ)**
Electricity	185.82	21952
Natural gas	1413.80	28605
Diesel	446.51	6278
Propane	8.05	132
Gasoline	31.37	474
Total	**2085.55**	**57441**

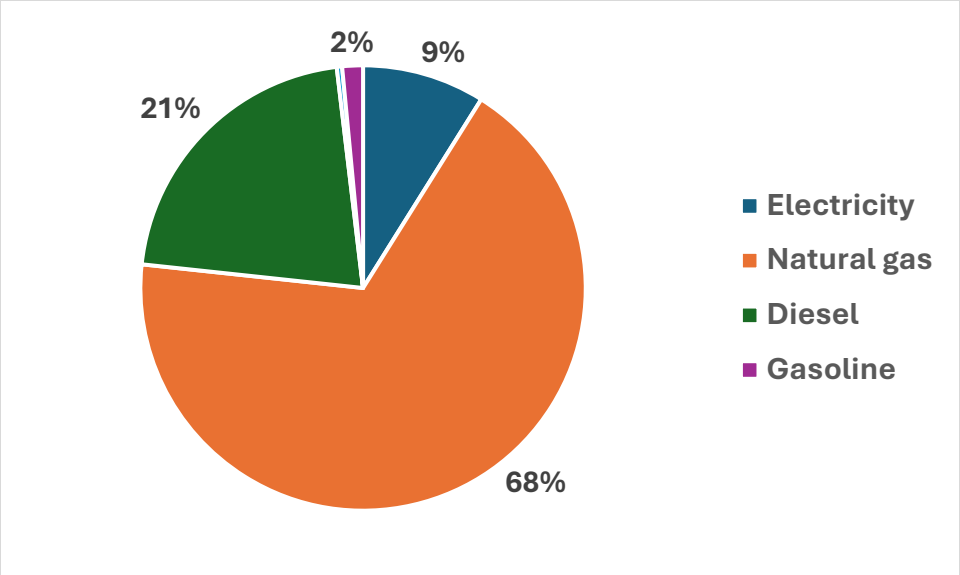

Figure 2 – Pie chart of Lanark County's corporate GHG emissions by source in 2019.

2023 Corporate Emissions Overview

In 2023, a total of 1,785.02 tCO2e were emitted from Lanark County corporate operations (Table 3, Figure 3). Corporate buildings were the largest source of corporate greenhouse gas emissions, representing 69% of emissions (Table 3, Figure 3). Corporate fleet was the second largest source of greenhouse gas emissions, followed by waste and streetlights (Table 3, Figure 3). Natural gas was the energy source responsible for the largest proportion of GHG emissions, representing 58% of emissions, followed by diesel, electricity, gasoline, and propane (Table 4, Figure 4).

Table 3 – Lanark County's corporate GHG emissions by sector in 2023.

Sector	**Emissions (tCO2e)**	**Energy (GJ)**
Building	1219.60	41884
Streetlights	0.99	125
Fleet	451.93	6384
Waste	112.50	N/A
Total	**1785.02**	**48393**

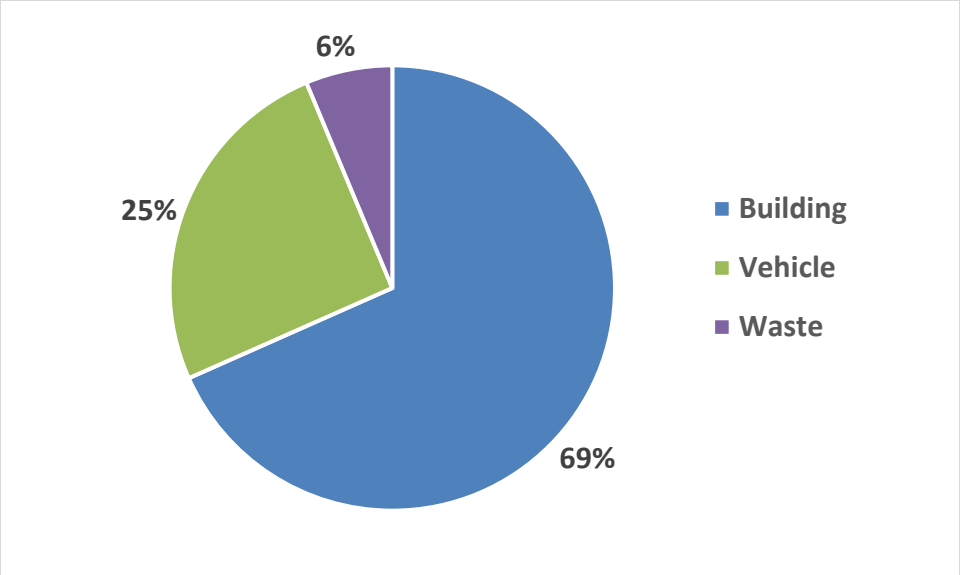

Figure 3 – Pie chart of Lanark County's corporate GHG emissions by sector in 2023.

Table 4 – Lanark County's corporate GHG emissions by source in 2023.

Source	**Emissions (tCO2e)**	**Energy (GJ)**
Electricity	166.64	21071
Natural gas	1047.55	20833
Diesel	424.69	5973
Propane	6.40	105
Gasoline	27.24	411
Total	**1672.52**	**48393**

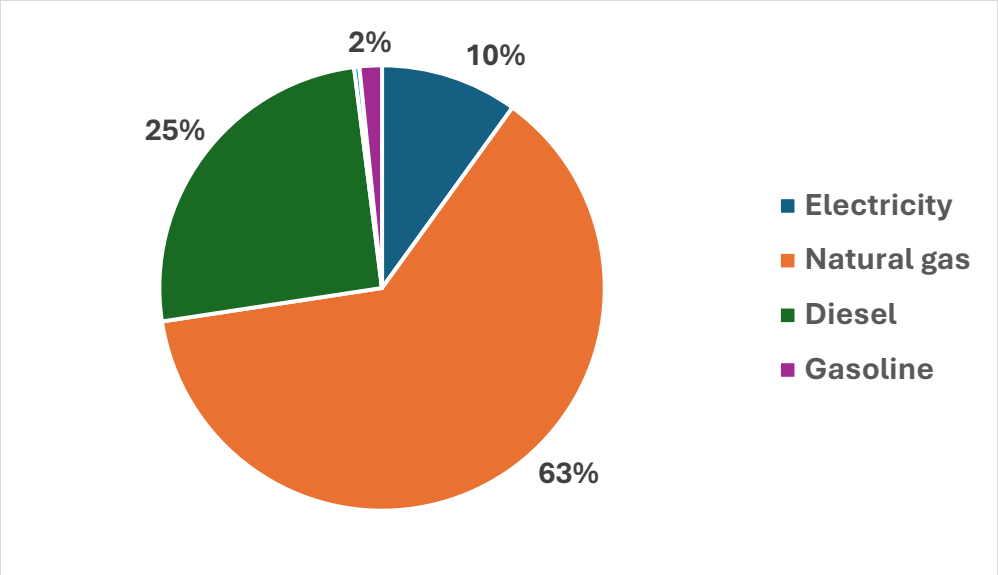

Figure 4 – Pie chart of Lanark County's corporate GHG emissions by source in 2023.

Comparison of 2019 and 2023 Corporate Emissions Overview

Since 2019, GHG emissions have decreased in all sectors except waste, which has increased by 3% (Table 5, Figure 5). Total corporate emissions have decreased by approximately 19% from 2019 to 2023. The sector with the largest decrease in emissions is building (-24%), followed by streetlights (-11%) and fleet (-5%) (Table 5, Figure 5).

Table 5 – Lanark County's corporate GHG emissions by sector in 2019 and 2023.

Sector	Emissions (tCO2e) 2019	Emissions (tCO2e) 2023	% increase (+) or decrease (-)
Building	1606.55	1219.60	-24%
Streetlights	1.12	0.99	-11%
Fleet	477.88	451.93	-5%
Waste	109.30	112.50	3%
Total	**2194.85**	**1785.02**	**-19%**

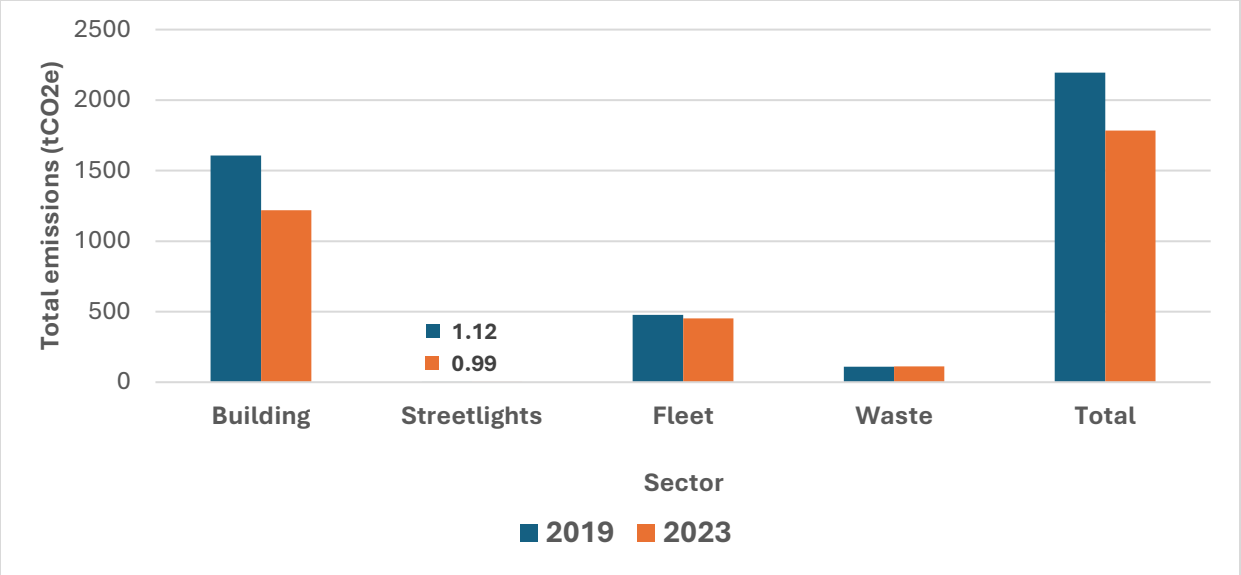

Figure 5 – Lanark County's corporate GHG emissions by sector in 2019 and 2023.

Emissions by Sector

Building Sector Emissions for 2019 and 2023

Between 2019 and 2023, building GHG emissions decreased by 24% (Table 5, Figure 5). The Lanark County Housing Corporation (LCHC) Carleton Place office data wasn't included in 2023 as this office was closed before 2023. The data is similar for Union Hall, Office Trailer, and Almonte Depot in 2019 and 2023. There has been a decrease in emissions for Administration, Lanark Lodge, and LCHC all units (Table 6, Figure 6).

Table 6 – Corporate building greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**	**Gross Floor Area of Buildings (sq. ft.) 2019**	**Gross Floor Area of Buildings (sq. ft.) 2023**
Administration	64.79	59.81	29436	29436
Union Hall	9.15	7.23	2825	2825
Office Trailer	0.79	0.52	160	160
Almonte Depot	0.89	0.72	4805	4805
Lanark Lodge	495.08	246.76	126420	126420
LCHC all units	1011.79	904.56	404310	436532
LCHC CP office	24.06	N/A	166	N/A
Total	**1606.55**	**1219.6**	**568122**	**600178**

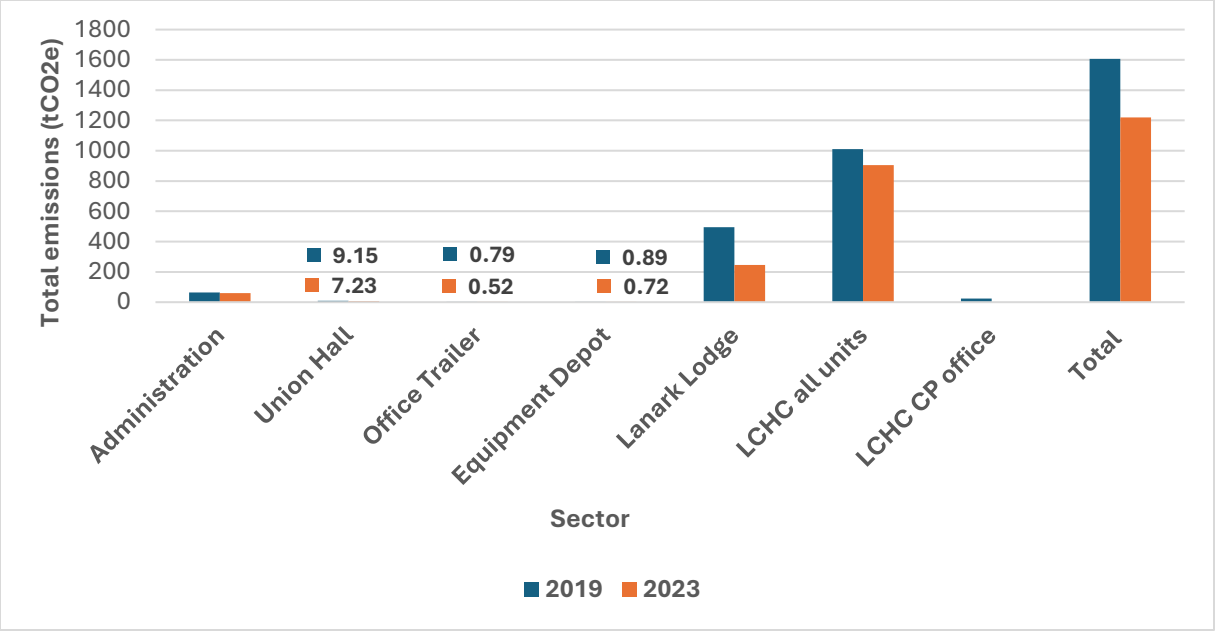

Figure 6 – Corporate building greenhouse gas emissions (tCO2e) in 2019 and 2023.

Streetlight Sector Emissions for 2019 and 2023

Since 2019, streetlight GHG emissions have decreased by 11% (Table 5, Figure 5, Table 7, Figure 7).

Table 7 – Corporate streetlights greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Streetlights	**1.12**	**0.99**

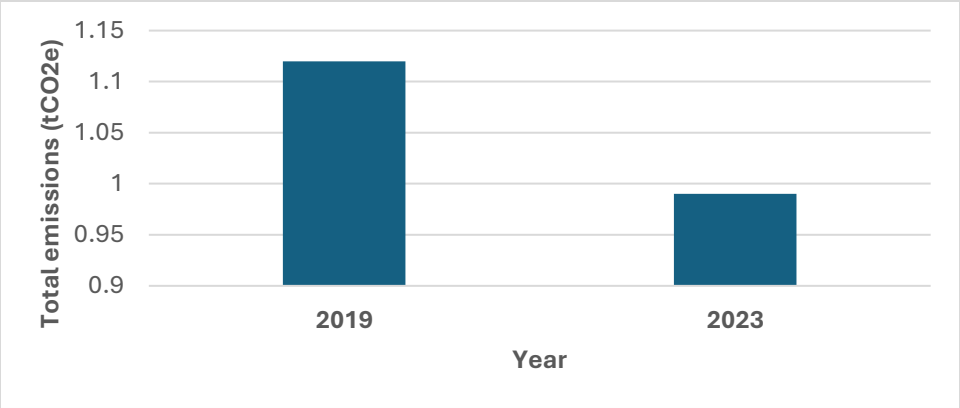

Figure 7 - Corporate streetlights greenhouse gas emissions (tCO2e) in 2019 and 2023.

Fleet Sector Emissions for 2019 and 2023

Since 2019, total corporate fleet GHG emissions have decreased by approximately 5% (Table 5, Figure 5). Further, there has been a decrease in emissions in on-road transportation and the LCHC fleet (Table 8, Figure 8). Fleet emissions for on-road transportation have decreased since the County purchased an electric truck in 2023.

Table 8 - Corporate fleet greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Off Road Vehicles	52.12	52.92
On Road Vehicles	394.39	371.77
LCHC fleet	31.37	27.24
Total	**477.88**	**451.93**

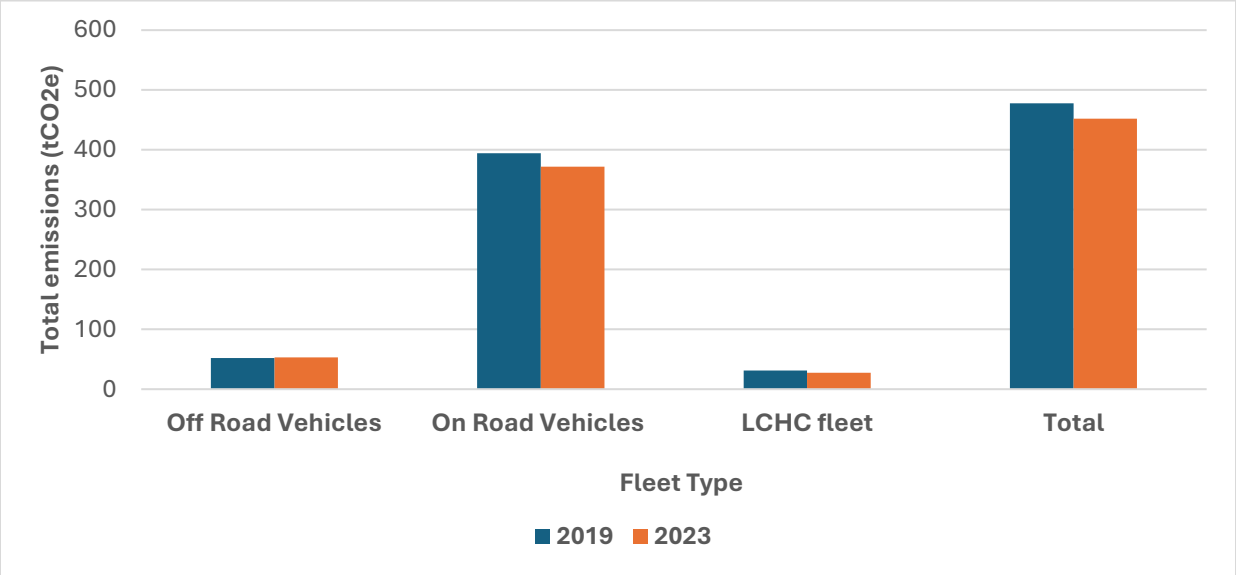

Figure 8 - Corporate fleet greenhouse emissions (tCO2e) in 2019 and 2023.

Waste Sector Emissions for 2019 and 2023

Since 2019, waste GHG emissions have increased by 3% (Table 5, Figure 5). Additionally, the emissions have increased for both Lanark Lodge and Administration buildings. However, emissions have been decreased for Union Hall and Public Works Garage. In 2023, data from the LCHC offices was reported under the “LCHC All Units” category. The waste disposal site in Almonte was discontinued between 2019 and 2023 (Table 9, Figure 9).

Table 9 – Corporate waste greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Lanark Lodge	39.96	47.70
Administration	17.10	21.60
Union Hall	15.12	12.60
LCHC offices	4.00	N/A
Public Works Garage	7.56	6.30
Almonte Depot	7.56	N/A
LCHC all Units waste	18.00	24.30
Total	**109.30**	**112.50**

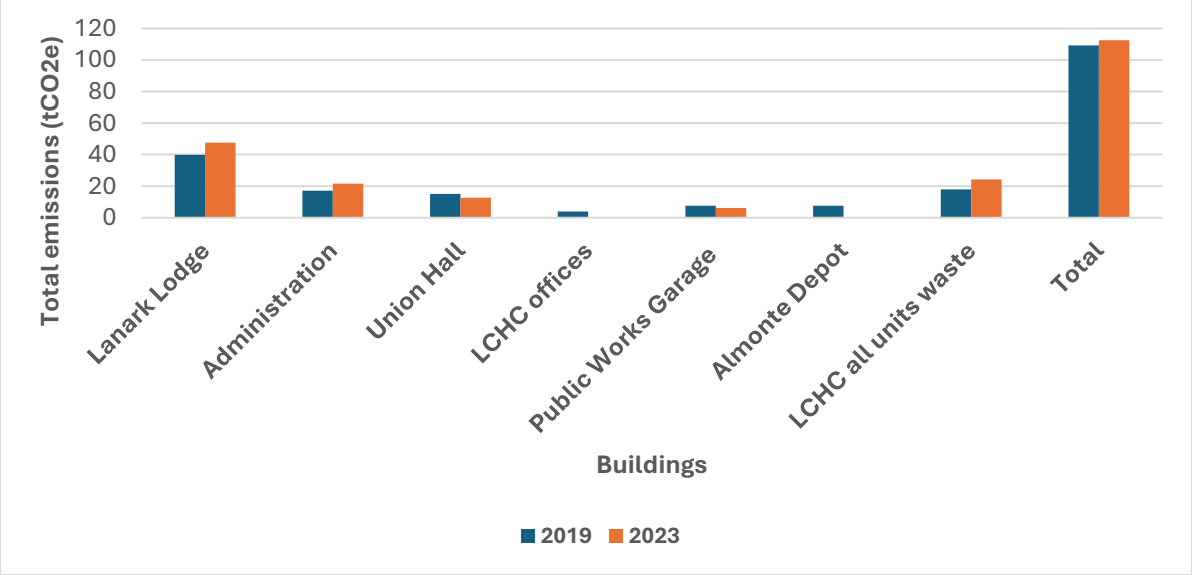

Figure 9 – Corporate waste greenhouse gas emissions (tCO2e) in 2019 and 2023.

Community Emissions

The community emissions include data from the following sectors: stationary energy (i.e., residential; commercial, and institutional; manufacturing, industries, and construction; agriculture, fishing, and forestry activities; and non-specified sources), transportation (i.e., on-road transportation), waste (i.e., solid waste and wastewater), and AFOLU (agriculture, forestry, and other land use).

For stationary energy, data was collected from Enbridge, HydroOne, and Ottawa River Power Corporation (ORPC). For residential homes heated by propane and heating oil, the data was calculated using the Canada Energy Regulator Conversion tables. Lanark County's inventory doesn't include data for energy industries, fugitive emissions of coal, and fugitive emissions of oil, and natural gas in the community stationary energy sector.

For transportation, the data was collected using fuel sales data from Kalibrate. Kalibrate provides fuel sales data for urban municipalities (Carleton Place, Smiths Falls, and Perth). For the remainder of the municipalities in Lanark County, a formula was used to estimate the overall fuel consumption. For the transportation sector, data wasn't included for off-road transportation, railways, waterborne navigation, and aviation.

Waste data was gathered from all nine local municipalities from the Financial Information Return (FIR) data for solid waste and disposal. Further, for wastewater, a population method was used to calculate the wastewater usage in the PCP tool. Data isn't included for the biological treatment of waste, incineration, and open burning.

For the AFOLU sector, the data was calculated from the total area of managed county forests multiplied by a carbon sequestration factor from Greenscale Inc. (1.55 tons carbon/hectare/year). Additionally, livestock emissions were calculated from the livestock data from the Agriculture Census (number of beef, dairy cows, and sheep) and multiplied by livestock emission factors from the 2021 National Inventory Report. Data isn't included for IPPU (industrial process and product use).

2019 Community Emissions Overview

In 2019, a total of 589759.97 tCO2e were emitted from the Lanark County community emissions (Table 10, Figure 10). On-road transportation was the largest source of community greenhouse gas emissions, representing nearly 57% of the emissions (Table 10, Figure 10). Residential was the second largest source of greenhouse gas emissions, followed by AFOLU. Gasoline was the energy source responsible for the largest proportion of GHG emissions, followed by natural gas and fuel oil (Table 11, Figure 11).

Table 10 – Lanark County's community GHG emissions by sector in 2019.

Sector	Emissions (tCO2e)	Energy (GJ)
Agriculture, fishing, and forestry activities	72.16	8792
Agriculture, forestry, and other land use	45038.00	N/A
Commercial and institutional	37390.58	1153669
Solid waste	22089.42	N/A
Manufacturing industries and construction	7627.50	484405
Non-specified sources	25732.52	531846
Residential	115684.75	3066445
On-road transportation	336103.80	5074688
Wastewater and sewage	21.24	N/A
Total	**589759.97**	**10319845**

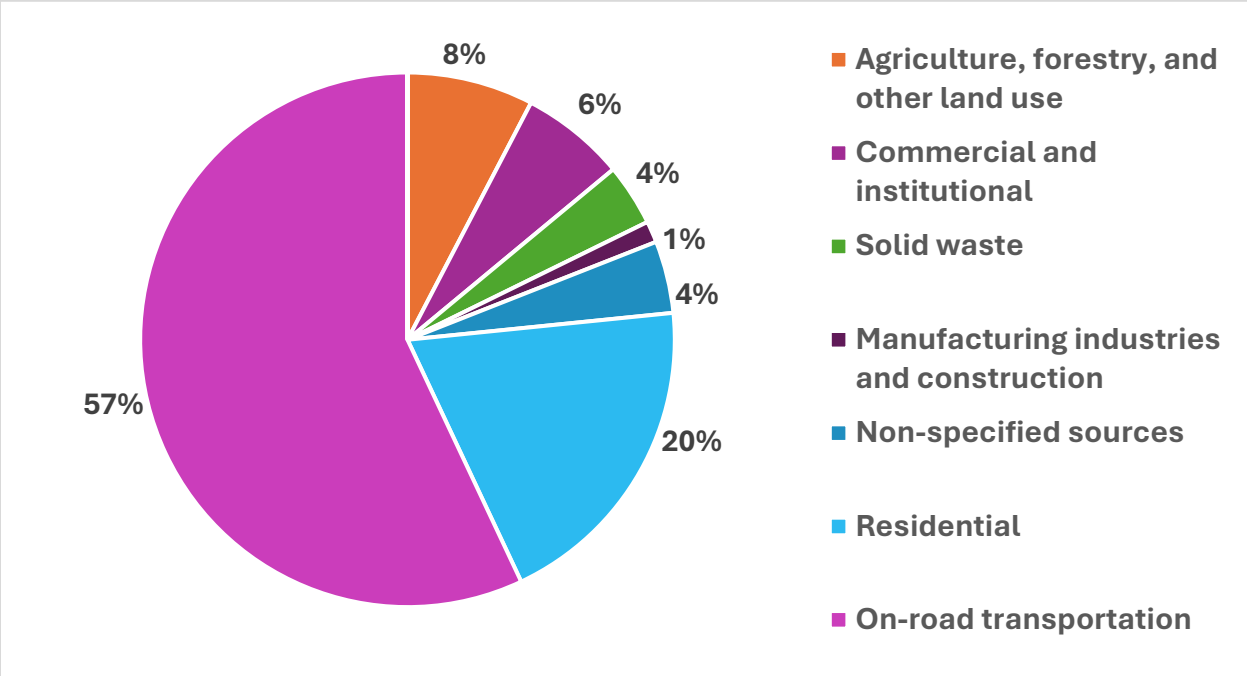

Figure 10 – Pie chart of Lanark County's community GHG emissions by sector in 2019.

Table 11 – Lanark County's community GHG emissions by source in 2019.

Source	Emissions (tCO2e)	Energy (GJ)
Natural gas	128545.80	2600891
Diesel	1394.35	19431
Fuel oil	24108.83	338432
Gasoline	334709.45	5055257
Total	**488758.43**	**8014011**

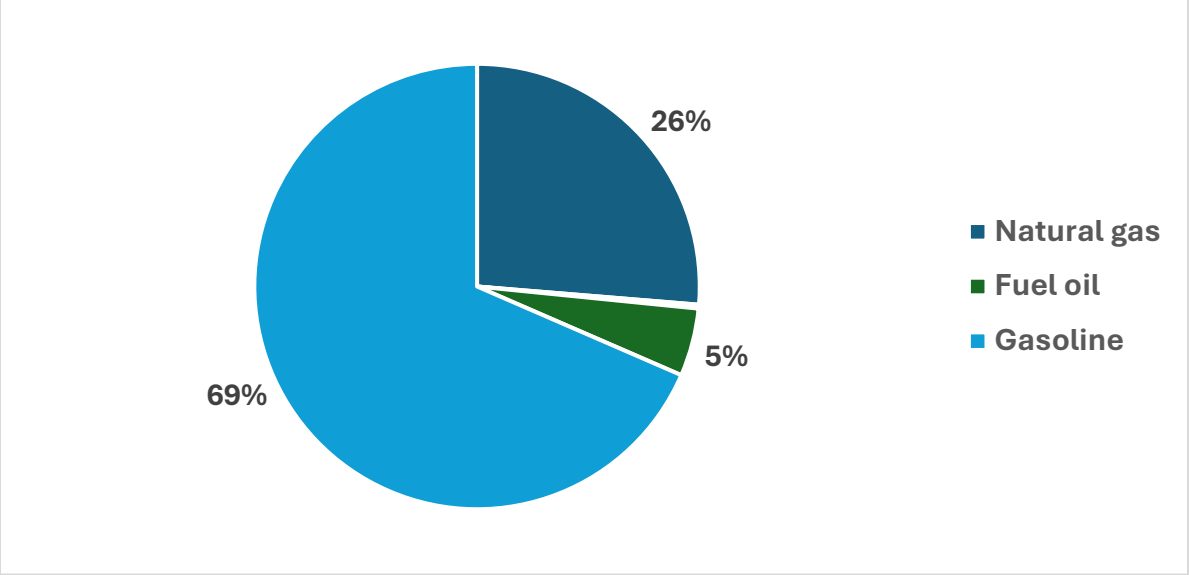

Figure 11 – Pie chart for Lanark County's community GHG emissions by sector in 2019.

2023 Community Emissions Overview

In 2023, a total of 576754.40 tCO2e were emitted from the Lanark County community emissions (Table 12, Figure 12). On-road transportation was the largest source of community greenhouse gas emissions, representing nearly 59% of the emissions (Table 12,

Figure 12). Residential was the second largest source of greenhouse gas emissions, followed by AFOLU. Gasoline was the energy source responsible for the largest proportion of GHG emissions, followed by natural gas and fuel oil (Table 13, Figure 13).

Table 12 - Lanark County's community GHG emissions by sector in 2023.

Sector	**Emissions (tCO2e)**	**Energy (GJ)**
Agriculture, fishing, and forestry activities	55.65	7036
Agriculture, forestry, and other land use	45038.00	N/A
Commercial and institutional	38537.96	1237868
Solid waste	23325.30	N/A
Manufacturing industries and construction	6284.52	491454
Non-specified sources	18564.60	16350
Residential	106800.45	1954995
On-road transportation	338124.76	5105200
Wastewater and sewage	23.20	N/A
Total	**576754.40**	**8812903**

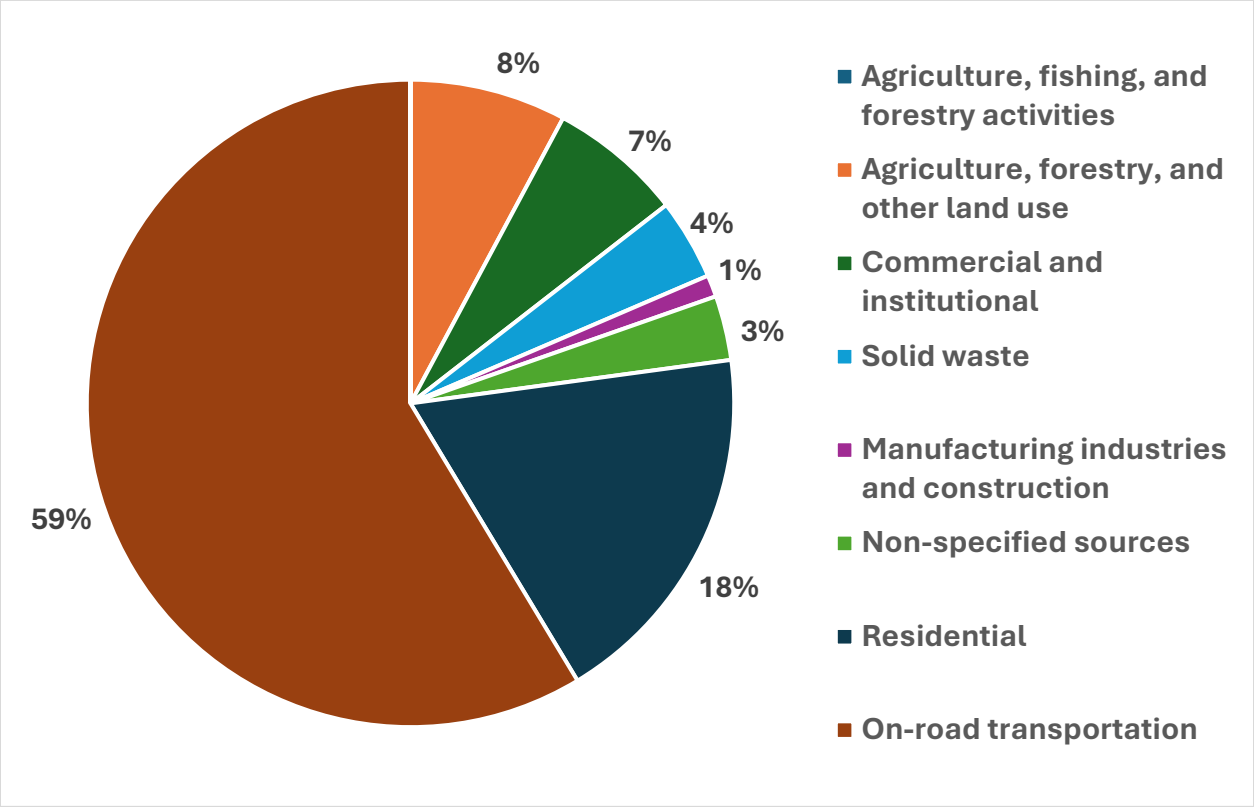

Figure 12 – Pie chart of Lanark County's community GHG emissions by sector in 2023.

Table 13 - Lanark County's community GHG emissions by source in 2023.

Source	Emissions (tCO2e)	Energy (GJ)
Gasoline	336715.05	5085549
Diesel	1409.71	19651
Propane	16907.59	276466
Electricity	18653.86	2358514
Natural gas	110624.41	735014
Fuel oil	24057.32	337709
Total	**508367.94**	**8812903**

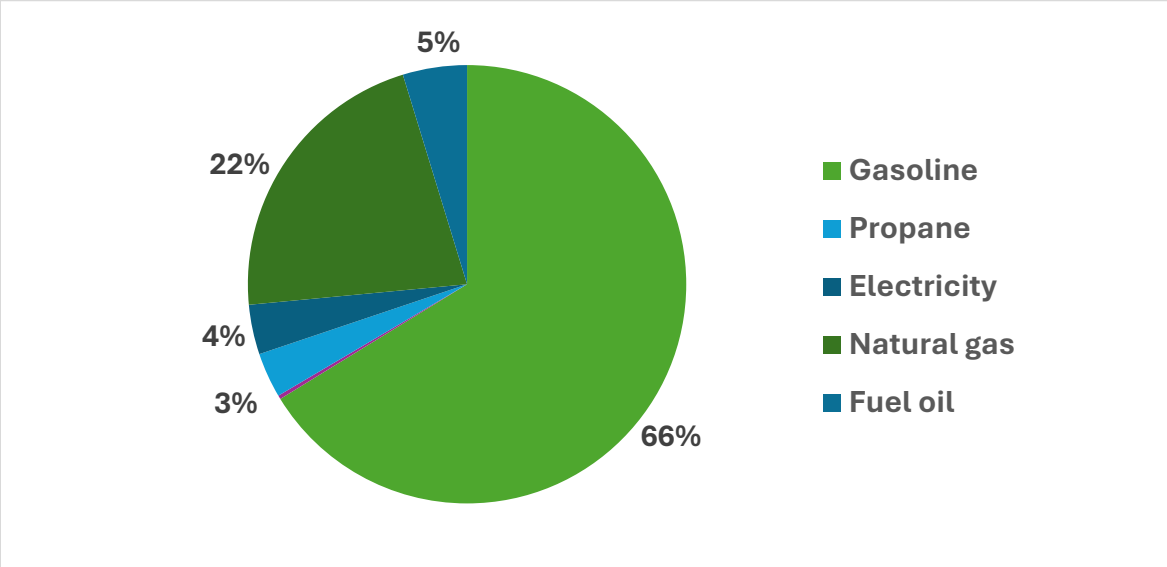

Figure 13 – Pie chart for Lanark County's community GHG emissions by source in 2023.

Comparison of 2019 and 2023 Community Inventory Overview

Since 2019, total community GHG emissions have decreased in agriculture, fishing and forestry activities, manufacturing industries and construction, non-specified sources, and residential whereas GHG emissions have increased in commercial and institutional, solid waste, on-road transportation, and wastewater and sewage. AFOLU GHG emissions are the same for 2019 and 2023 (Table 14, Figure 14). Total community emissions have decreased by approximately 2% from 2019 to 2023. The sectors with the largest decrease

in emissions are non-specified sources (-27%), followed by agriculture, fishing, and forestry activities (-22%), manufacturing industries, and construction (-17%) (Table 14, Figure 14).

Table 14 – Lanark County's community GHG emissions by sector in 2019 and 2023.

Sector	**Emissions (tCO2e) 2019**	**Emissions (tCO2e) 2023**	**% increase (+)/decrease (-)**
Agriculture, fishing, and forestry activities	72.16	55.65	-22%
Agriculture, forestry, and other land use	45038.00	45038.00	0
Commercial and institutional	37390.58	38537.96	3%
Solid waste	22089.42	23325.30	5%
Manufacturing industries and construction	7627.50	6284.52	-17%
Non-specified sources	25732.52	18564.60	-27%
Residential	115684.75	106800.45	-7%
On-road transportation	336103.80	338124.76	0.6%
Wastewater and sewage	21.24	23.20	9%
Total	**589759.97**	**576754.40**	**-2%**

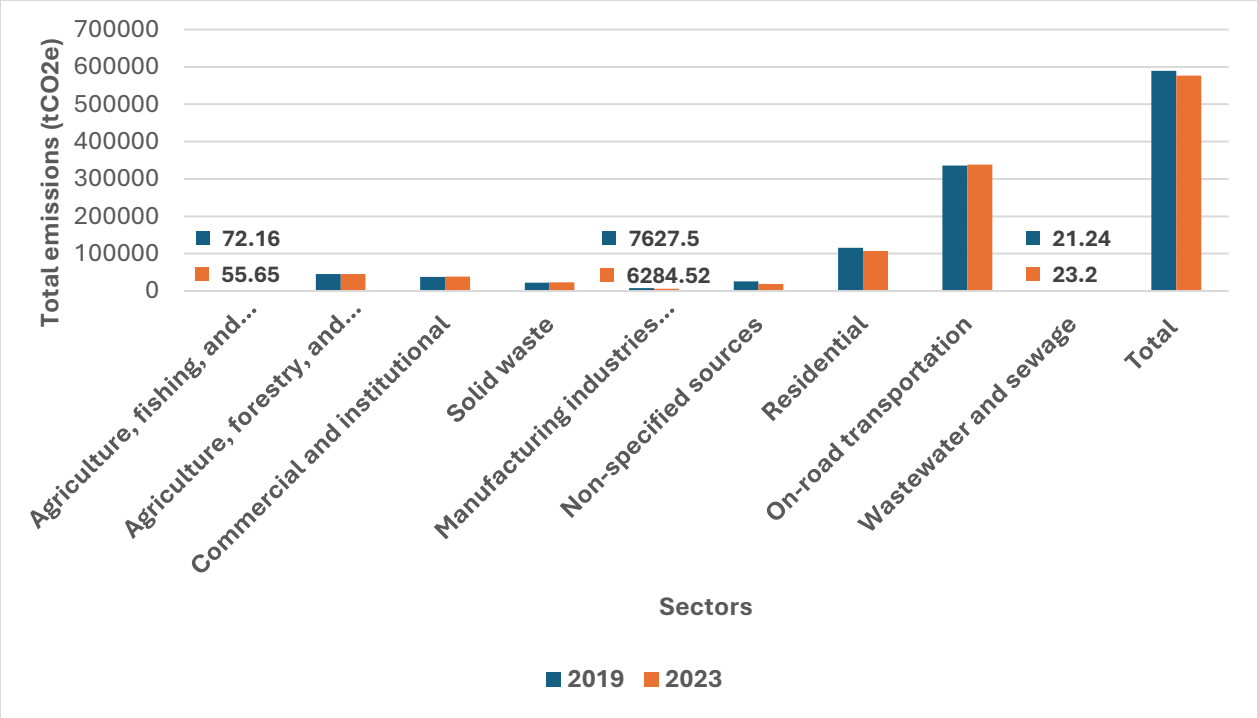

Figure 14 - Lanark County's community GHG emissions by sector in 2019 and 2023.

Emissions by Sector

Stationary Energy Sector Emissions for 2019 and 2023

Residential Sector Emissions for 2019 and 2023

Since 2019, total residential community GHG emissions have decreased by approximately 7% (Table 14, Figure 14, Table 15, Figure 15). Further, GHG emissions have decreased for Lanark County Residential but have increased for Almonte, ORPC (Table 15, Figure 15).

Note: The ORPC provides electricity services for the Almonte area, while the rest of Lanark County is serviced by HydroOne. Enbridge provides natural gas services. Further, data for propane and fuel oil was calculated using the Canadian Energy Regulator Conversion tables.

Table 15 – Community residential greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Lanark County Residential Total	114634.59	105618.15
Almonte Electricity - Ottawa River Power Corp.	1050.16	1182.30
Total	**115684.75**	**106800.45**

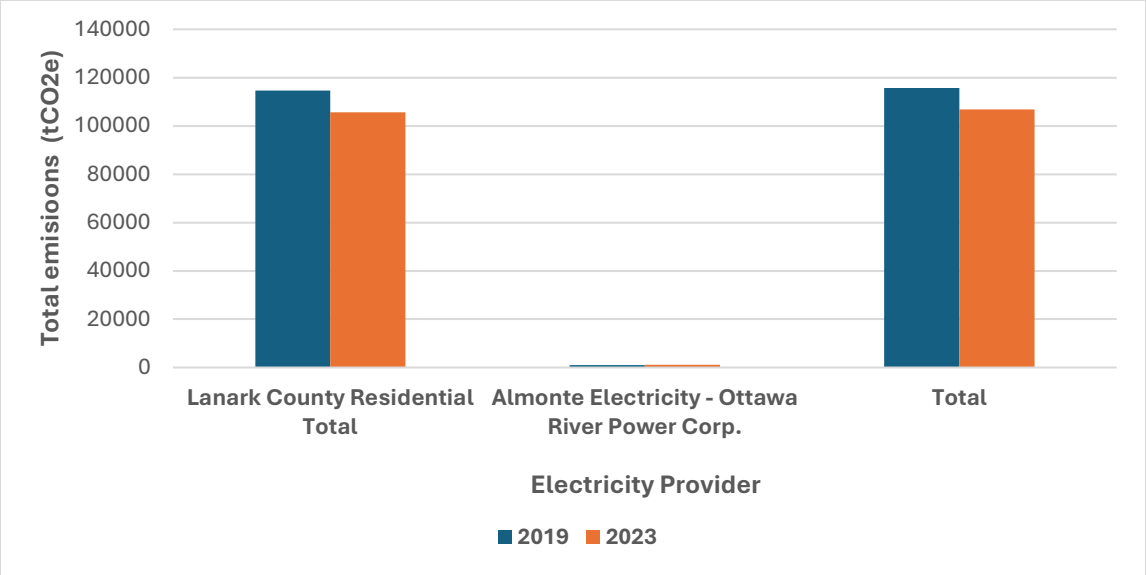

Figure 15 - Community residential greenhouse gas emissions (tCO2e) in 2019 and 2023.

Commercial and Institutional Sector Emissions for 2019 and 2023

Since 2019, total commercial and institutional community GHG emissions have increased by approximately 3% (Table 14, Figure 14, Table 16, Figure 16). The data was provided by HydroOne and Enbridge.

Table 16 – Community commercial and institutional greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	Total GHG emissions (tCO2e) 2019	Total GHG emissions (tCO2e) 2023
Lanark County Commercial Total	**37390.58**	**38537.96**

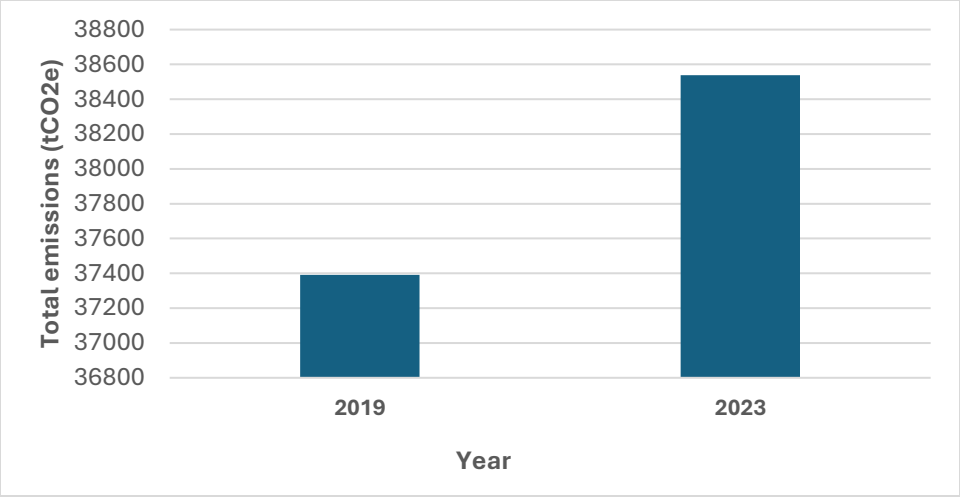

Figure 16 - Community commercial and institutional greenhouse gas emissions (tCO2e) in 2019 and 2023.

Manufacturing, Industries, and Construction Sector Emissions for 2019 and 2023

Since 2019, total manufacturing, industries, and construction community GHG emissions have decreased by approximately 17% (Table 14, Figure 14, Table 17, Figure 17). The data was provided by HydroOne and Enbridge.

Table 17 - Community manufacturing, industries, and construction greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Lanark County Industrial Total	**7627.50**	**6284.52**

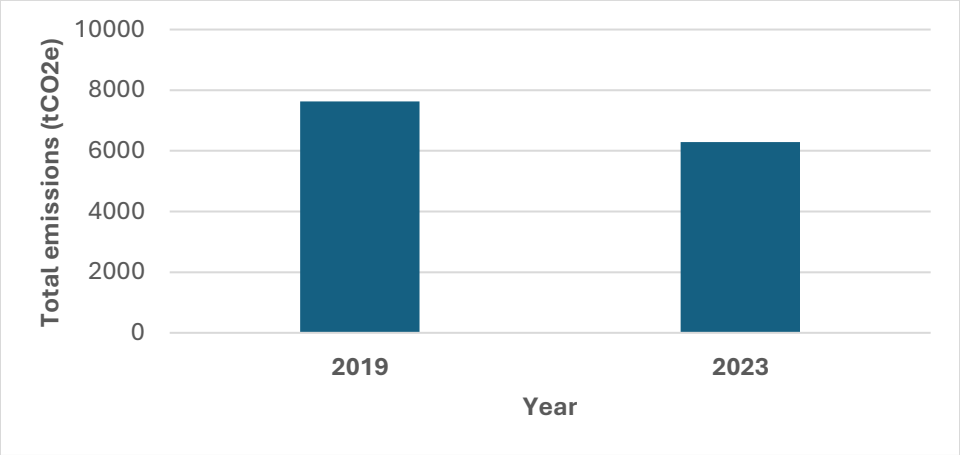

Figure 17 - Community manufacturing, industries, and construction greenhouse gas emissions (tCO2e) in 2019 and 2023.

Agricultural, Fishing, and Forestry Activities Sector Emissions for 2019 and 2023

Since 2019, total agricultural, fishing, and forestry activities community GHG emissions have decreased by approximately 22% (Table 14, Figure 14, Table 18, Figure 18). The data was provided by HydroOne and Enbridge.

Table 18 – Community agricultural, fishing, and forestry activities greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	Total GHG emissions (tCO2e) 2019	Total GHG emissions (tCO2e) 2023
Agricultural (Entire County) Total	**72.16**	**55.65**

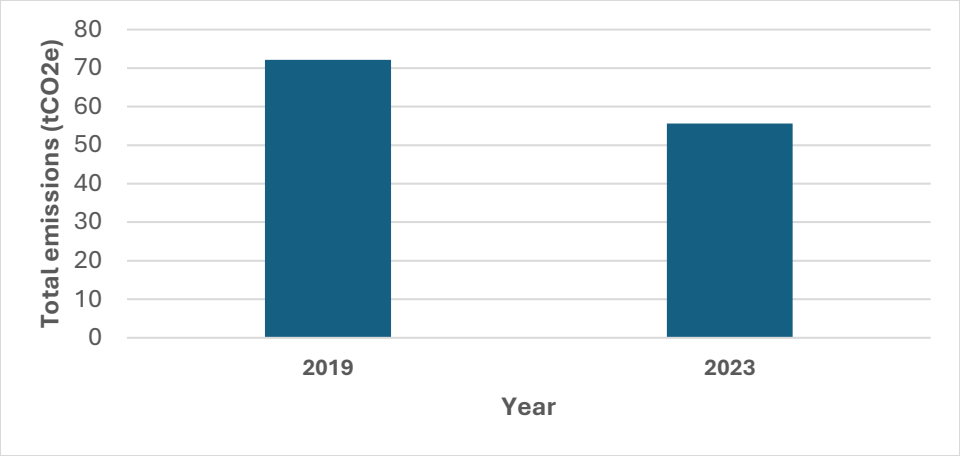

Figure 18 - Community agricultural, fishing, and forestry activities greenhouse gas emissions (tCO2e) in 2019 and 2023.

Non-specified sources Sector Emissions for 2019 and 2023

Stationary data for non-specified sources include data for incorrect postal codes, streetlighting, sentinel lighting, unmetered scattered load, and distributed generation.

Since 2019, total non-specified community GHG emissions have decreased by approximately 17% (Table 14, Figure 14, Table 19, Figure 19). The data was provided by HydroOne and Enbridge.

Table 19 – Community non-specified sources greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Other Customer Consumption Total	**25732.52**	**18564.60**

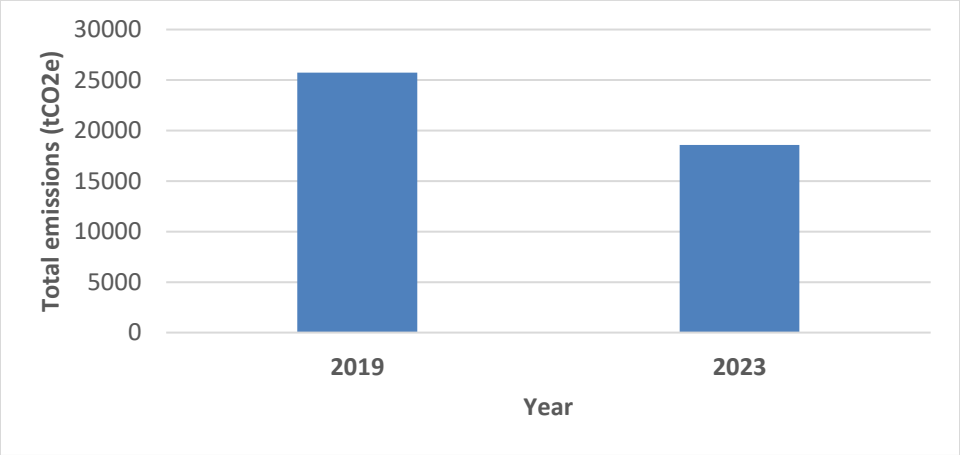

Figure 19 - Community non-specified sources greenhouse gas emissions (tCO2e) in 2019 and 2023.

Transportation Sector Emissions for 2019 and 2023

Since 2019, transportation community GHG emissions have increased by approximately 0.6% (Table 14, Figure 14, Table 20, Figure 20). Kalibrate provided fuel sales data, that was used to generate the total emissions in the PCP tool.

Table 20 – Community transportation greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	Total GHG emissions (tCO2e) 2019	Total GHG emissions (tCO2e) 2023
Fuel sales Total	**336103.80**	**338124.76**

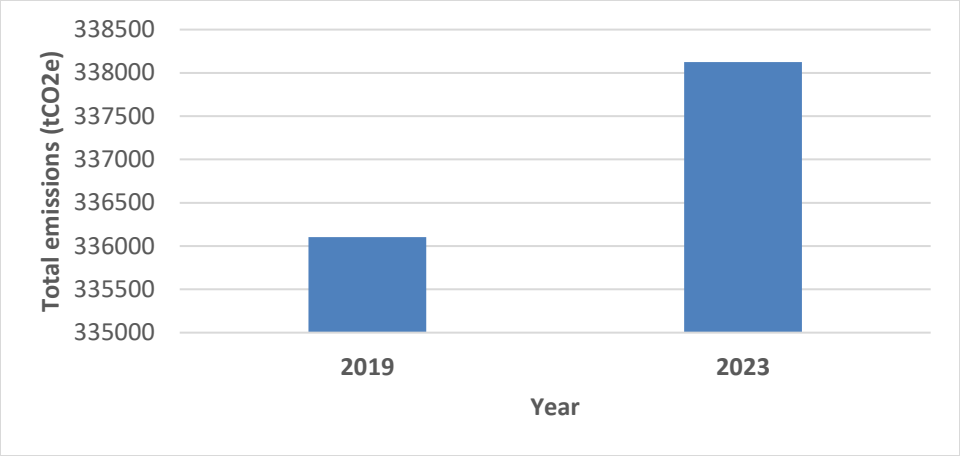

Figure 20 – Community transportation greenhouse gas emissions (tCO2e) in 2019 and 2023.

Waste Sector Emissions for 2019 and 2023

The local municipalities provided the total data on solid waste through FIR. The wastewater data was calculated using the population method in the PCP tool.

Since 2019, solid waste community GHG emissions have increased by approximately 5%, and wastewater community GHG emissions have increased by 9% (Table 14, Figure 14, Table 21, Figure 21, Table 22, Figure 22).

Solid Waste Sector Emissions for 2019 and 2023

Table 21 – Community solid waste greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Perth	1960.20	1448.55
Carleton Place	4461.48	4040.55
Smiths Falls	1149.30	3763.80
Montague	1446.66	1212.30
Mississippi Mills	4565.16	1922.40
Beckwith	3700.08	3179.25
Drummond/North Elmsley	2091.42	3854.25
Lanark Highlands	421.20	1834.65
Tay Valley	2293.92	2069.55
Total	**22089.42**	**23325.30**

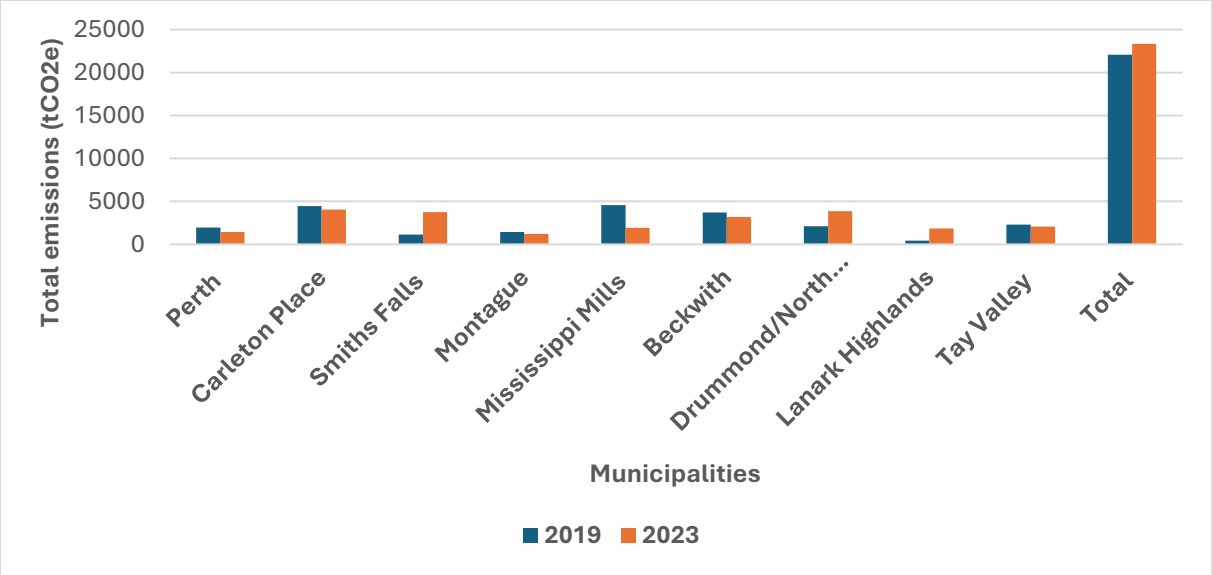

Figure 21 – Community solid waste greenhouse gas emissions (tCO2e) in 2019 and 2023.

Wastewater Sector Emissions for 2019 and 2023

Table 22 - Community wastewater greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Perth	0.53	0.58
Smiths Falls	0.78	0.83
Carleton Place	0.95	1.12
Mississippi Mills	1.17	1.31
Beckwith Township	4.52	5.34
Drummond/North Elmsley	4.55	4.79
Lanark Highlands	3.16	3.40
Montague	2.23	2.32
Tay Valley	3.35	3.51
Total	**21.24**	**23.20**

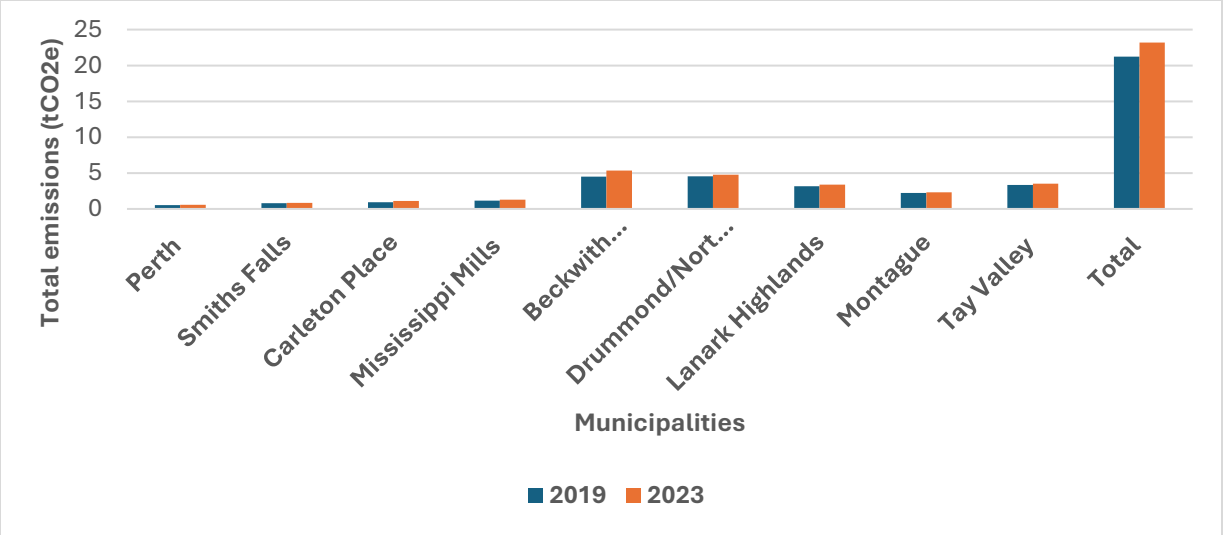

Figure 22 - Community wastewater greenhouse gas emissions (tCO2e) in 2019 and 2023.

AFOLU Sector Emissions for 2019 and 2023

Agriculture, forestry, and other land use (AFOLU) emissions have remained the same in 2023 because the total managed forested area by the county has not changed (Table 14, Figure 14, Table 23, Figure 23).

Table 23 – Community AFOLU greenhouse gas emissions (tCO2e) in 2019 and 2023.

Description	**Total GHG emissions (tCO2e) 2019**	**Total GHG emissions (tCO2e) 2023**
Managed Forest Carbon Sequestration	0	0
Livestock Emissions	**45038.00**	**45038.00**

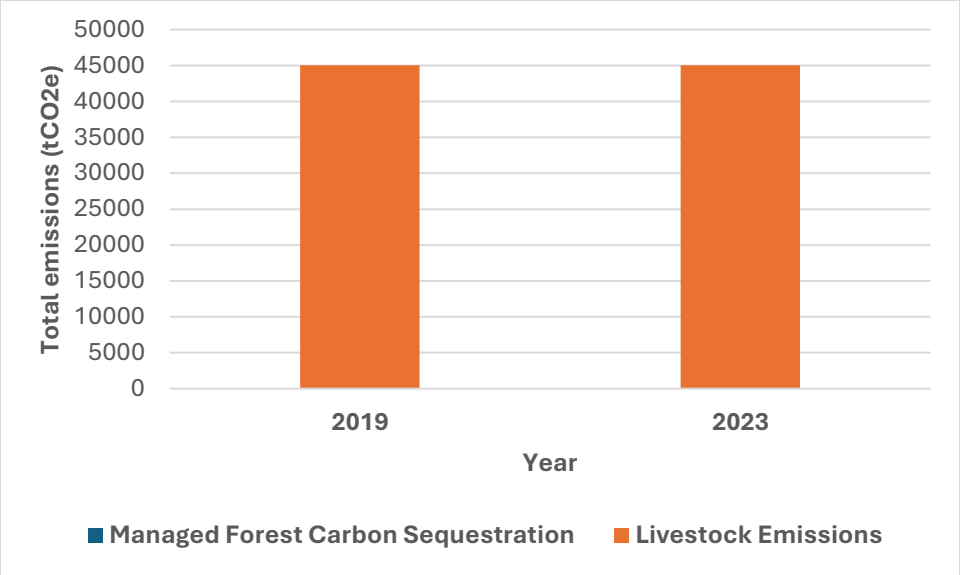

Figure 23 - Community AFLOU greenhouse gas emissions (tCO2e) in 2019 and 2023.

Key Findings

This GHG emissions inventory provides a comprehensive review of Lanark County's GHG emissions for 2019 and 2023. The key findings include:

- There has been a 19% decrease in corporate emissions since 2019. Total corporate emissions for the year 2019 are 2194.85 tCO2e, and total corporate emissions for the year 2023 are 1785.02 tCO2e.
- In 2019 and 2023 corporate emissions, natural gas was the primary contributor to emissions with buildings and fleets contributing the most.
- There has been a 2% decrease in community emissions since 2019. Total community emissions for the year 2019 are 589759.97 tCO2e, and total community emissions for the year 2023 are 576754.40 tCO2e.
- In 2019 and 2023 community emissions, gasoline was the primary contributor to the emissions with the on-road transportation and residential sector contributing the most.

Recommendations for Future Action

- Continue biannual greenhouse gas emissions reporting and tracking.
- Develop and implement sector-specific emissions reduction plans.

- Engage stakeholders in climate action efforts through education and outreach programs.
- Explore opportunities for renewable energy and energy efficiency investments