2024 Longmont Greenhouse Gas Inventory Report

2024 Emissions Snapshot

Target: Reduce greenhouse gas (GHG) emissions 66% from the 2016 baseline by 2030 (reduce to 402,064 mt CO_2e).

2024 Progress: Emissions were reduced by 15% from the 2016 baseline in 2024. Total emissions were 1,003,936 metric tons of carbon dioxide equivalent (mt CO_2e). The largest contributors to emissions were:

- Commercial buildings: 362,493 (36.1%)
- Residential buildings: 311,039 (31.0%)
- On-road transportation and transit: 205,336 (20.5%)

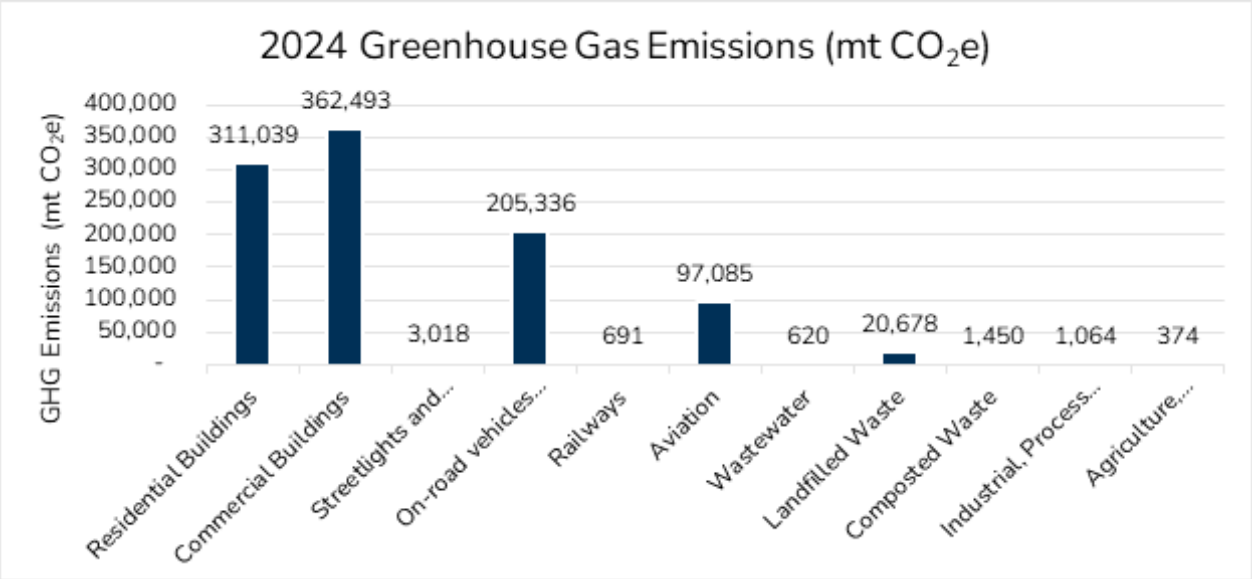

Figure 1: 2024 Longmont GHG inventory by source

Key Takeaways from the 2024 Inventory:

1. Building energy use emissions continue to decrease and have dropped 10% since 2016 primarily due to the transition to 100% renewable powered electricity.
2. Transportation emissions have dropped by 28% due to both reduced vehicle miles traveled and methodology changes.
3. Emissions per capita have decreased by 23%. The 2024 emissions per capita was 9.76 mt CO_2e per capita which is lower than the state (13.9 mt CO_2e emissions per capita according to the U.S. Energy Information Administration).

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Introduction

Sustainability Plan Vision: An engaged community that promotes environmental stewardship, economic vitality, and social equity to create a sustainable and thriving future.

The City of Longmont (Longmont/the City) is committed to achieving the City's sustainability vision and implementing actions to achieve a 66% reduction in greenhouse gas (GHG) emissions by 2030 from a 2016 baseline. GHG emissions are released both by natural and human-caused activities, trapping infrared heat in the earth's atmosphere. Human-caused GHG emissions are a major cause of climate change that can lead to increasing extreme heat days, more severe flooding and wildfires. This can result in significant damages to infrastructure, decreased quality of life and even loss of life – all of which can have economic, social, and environmental impacts to the City. More information on the City's commitment can be read in the 2020 Climate Emergency Resolution.

Actions to address GHG emissions are guided by the Longmont Sustainability Plan (2016, updated in 2018) and Climate Action Recommendations Report (2020). These actions prioritize enhancing quality of life for all communities, supporting affordability and economic growth and minimizing environmental impact. More information on these actions and additional indicators is available on the Longmont Indicators website available in both English and Spanish.

In 2018, Lotus Engineering and Sustainability, LLC (Lotus) developed the City of Longmont's first GHG emissions inventory to establish a baseline year of 2016 for future inventories. Since the first inventory, Longmont has updated the inventory every three years except for one year earlier in 2021 to align with a Boulder County-wide GHG inventory update. 2024 was the first year that City staff gathered data and worked with Kausal, the vendor that built and maintains the Longmont Indicators platform, to adapt Lotus' greenhouse gas inventory into their Kausal Paths platform, otherwise known as the Longmont Scenario Tool. This integration will help streamline future greenhouse gas inventory updates and expand transparency to the community on the City's progress towards climate goals. However, due to this initial integration, the release of the 2024 GHG inventory was delayed until early 2026.

The Longmont Scenario Tool also includes modeling impact into the future. As of end of February 2026, the Longmont Scenario Tool that details the 2024 GHG inventory and impact to current modeling has not yet been published. This update is expected to be published and

accessible by Spring 2026. A larger model update is underway that is expected to be finalized by early 2027.

The following report details the results of the 2024 GHG inventory, including any updates to the methodology and comparison to previous inventories.

Inventory Methodology

Longmont's 2024 GHG emissions inventory is compliant with the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories' (GPC Protocol). The GPC Protocol is a global standard for GHG emission accounting and reporting that was first developed and launched in 2014. Longmont's community-based inventory analyzes GHG emissions from activities within the entire City boundary. A separate municipal operations inventory was developed in 2024 to analyze City facilities and operations only. The municipal operations inventory is not included in this document but is available upon request.

The GPC protocol includes two reporting levels for community-based activities, BASIC and BASIC+:

- BASIC: The BASIC methodology covers stationary energy, in-boundary transportation, and community-generated waste (including wastewater).
- BASIC+: The BASIC+ level includes BASIC emission sources, as well as a more comprehensive coverage of emissions sources such as trans-boundary transportation; electricity transmission and distribution losses; industrial processes and product use (IPPU); and agriculture, forestry, and other land uses (AFOLU).

Longmont completed a BASIC+ inventory, which is consistent with the 2016 baseline. The specific GHGs accounted for in the inventory include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) and sulfur hexafluoride (SF_6). Results combine these four GHGs into metric tons of carbon dioxide equivalents (mt CO_2e).

The inventory categorizes emissions by scopes, sectors and sources as defined by the GPC protocol. The three emissions scopes are dependent on the inventory boundary, which for the 2024 GHG inventory is Longmont city limits plus a small amount of City-owned agriculture outside the city limits. The three scopes are:

1. **Scope 1:** GHG emissions that occur from fuel sources and other processes within the city boundary.
2. **Scope 2:** GHG emissions from electricity that is consumed within the city boundary.

3. **Scope 3:** GHG emissions that occur outside the city boundary but are due to activity within the city boundary. For example, waste that is generated from city community members but landfilled outside the city.

Within each of these scopes, the emissions are divided into sectors that categorize where the emissions come from. These include:

1. **Stationary Energy**, including streetlights and commercial and residential buildings.
2. **Transportation**, including on-road, railways and aviation.
3. **Waste,** including landfilled and composted waste. Avoided emissions from recycling and composting are not included but are detailed in an informational only section later in the report.
4. **Industrial, Process and Product Use (IPPU).**
5. **Agriculture, Forestry, and Land Use (AFOLU).**

Each of these different sectors will have emissions from different sources. Common sources include gasoline, diesel and electricity. A breakdown of scopes and sectors can see in Figure 2 below. Further breakdowns in emission sectors and sources are detailed in the key findings section below.

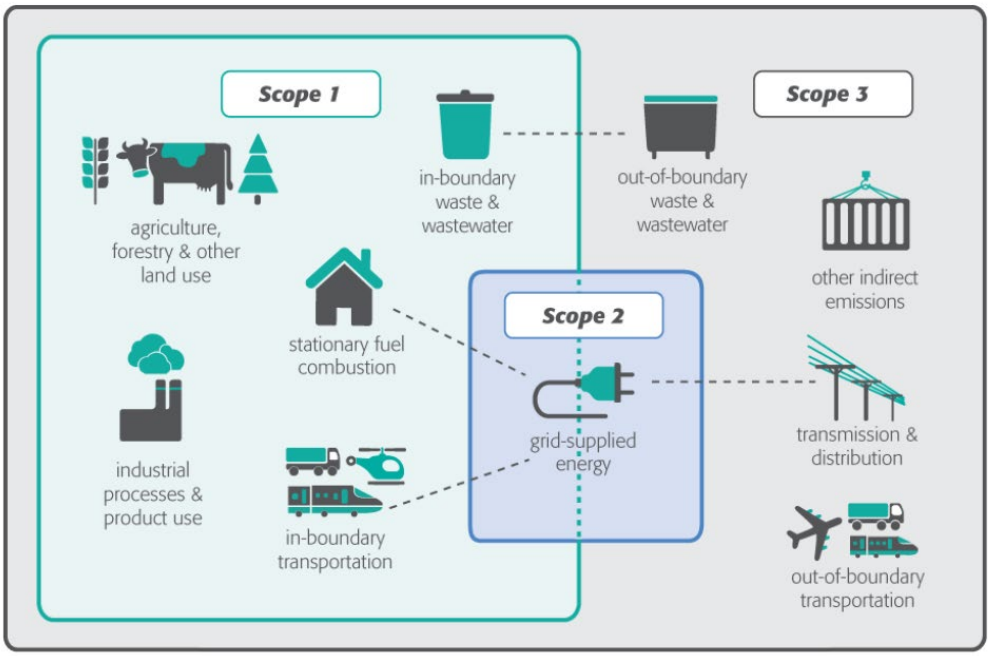

Figure 2: Source and boundaries of city GHG emissions from the Greenhouse Gas Protocol Executive Summary

Key Methodology Changes

For consistency, Longmont works to maintain similar processes across each GHG inventory. As improvements to how emissions are identified, the greenhouse gas inventory methodology is updated to provide the most accurate information. Historically, previous inventories have not been recalculated to account for these updates. However, due to the integration of the inventory into Kausal Paths, more accurate data calculations were added for historical years. This allowed staff to establish a more accurate baseline for 2016 that is aligned with current best practices. Below is a summary of the key methodology changes that went into effect for the 2024 inventory:

- Sulfur hexafluoride (SF_6) is a new greenhouse gas that is included in the 2024 inventory. The primary source of SF_6 in Longmont is from electricity generation and is included in the carbon dioxide equivalent (CO_2e) emission factor, which is used to calculate electricity GHG emissions, provided by Platte River Power Authority (Platte River), the City's power provider. As part of this update, the CO_2e emission factor was used from 2018 through 2024. Platte River only provided a carbon dioxide emission factor for 2016 and 2017 (excluding other sources of GHG emissions). Adding SF_6 slightly increases overall emissions.
- To more accurately report vehicle miles traveled, the City started using data provided by Google's Environmental Insights Explorer (EIE) as recommended by the Local Governments for Sustainability (known as ICLEI). This data was available from 2018 through 2023. Using the 2018 data and change in population, staff backtracked this data to 2016. For 2024, Google EIE is currently updating their methodology and is not releasing 2024 or 2025 data. To estimate 2024, staff used a methodology developed by Lotus for the City and County of Denver and adapted by City of Lakewood City using Federal Highway Administration Traffic Volume Trends for Colorado. This method is more accurate than using changes in population, however, it could not be used to estimate 2016 as data was unavailable. Updating the transportation emission factor has a more significant effect on emissions; for example, this change increased 2021 total emissions by about 4%.

Key Findings from the 2024 GHG Inventory

Total Emissions

Longmont's total GHG emissions in 2024 were 1,003,936 mt CO_2e. As seen in Figure 3, Scope 1 emissions were 41.1% of total, Scope 2 were 45.7% of total and Scope 3 were 13.1% of total. The largest emission sectors are Stationary Energy emissions primarily from residential and commercial buildings, 67.4% of total, followed by transportation, 30.2% of total. See Figure 4 for a full breakdown. The next section will dive further into each of these sectors.

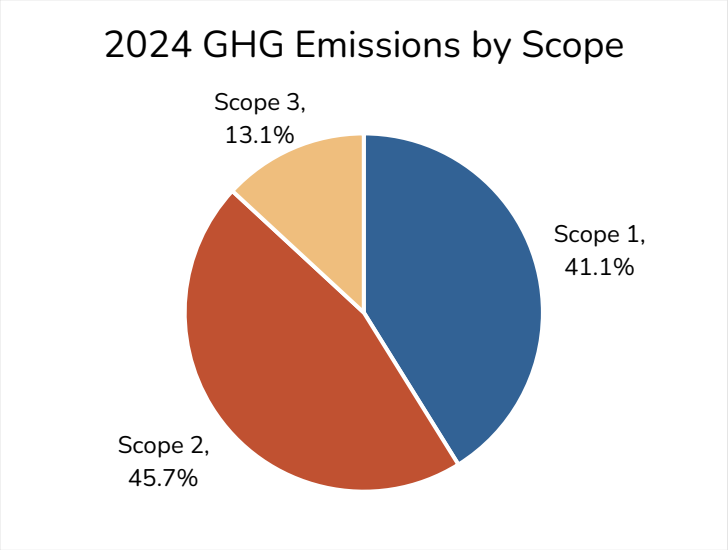

Figure 3: Longmont GHG emissions by scope

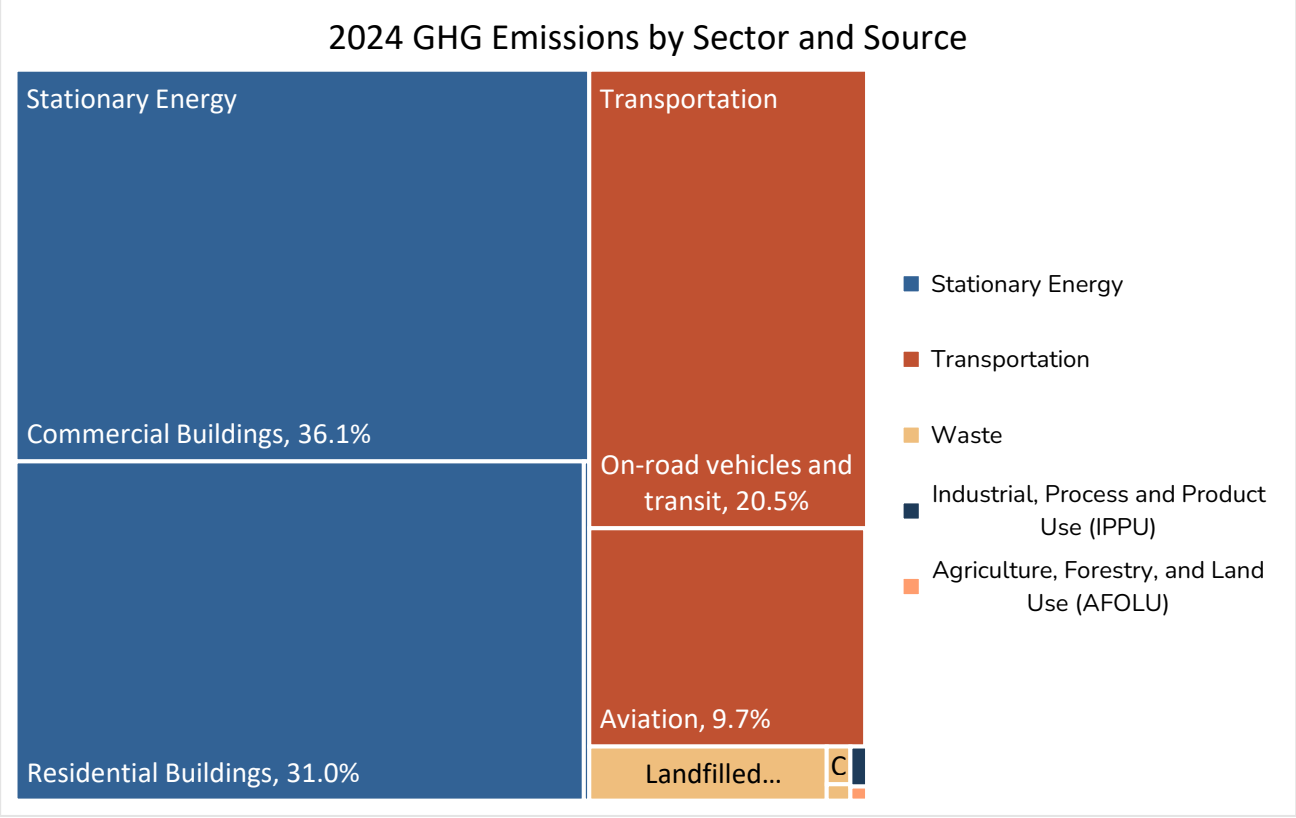

Figure 4: Longmont 2024 GHG emissions by sector and source

Stationary Energy

Stationary energy sources totaled 67.4% percent of total GHG emissions. Here is a further breakdown:

- **By building type:** 36.1% of total GHG emissions are from commercial and industrial buildings (including multifamily buildings with five units or more), 31.0% from residential buildings and 0.3% from streetlights and internal operations.
- **By fuel type:** 46.7% of total GHG emissions are from building electricity and 20.7% are from building natural gas usage.

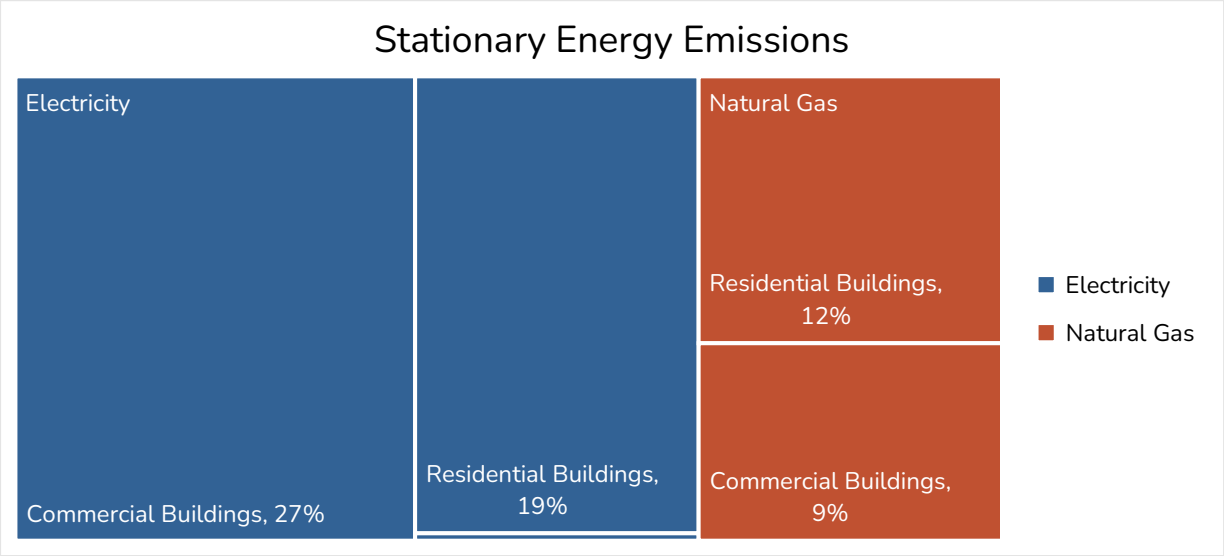

Figure 5: Longmont stationary energy emissions as a percentage of total citywide emissions by fuel source and building type.

Electricity is the largest source of emissions based on fuel type. However, electricity emissions are dependent on how much renewable energy (wind, solar and hydropower) and fossil fuel energy (coal and natural gas) is used to generate the electricity. In 2024, 46.0% of electricity was generated from renewable energy sources, which is about double the amount from the 2016 inventory. This increase has led to a decrease in emissions from electricity by 16.1% while total electricity consumption has increased by 4.8%. Continuing to work towards Longmont's goal of 100% renewable powered electricity by 2030 and opportunities that support this transition, including energy efficiency and distributed energy resources, will further reduce these emissions and is critical to reaching the City's GHG reduction targets.

Natural gas emissions have increased by 7.5% due to a 7.5% increase in consumption, which is influenced by a population, energy efficiency and weather. To decrease natural gas emissions, the City is focusing on efforts to increase energy efficiency and transition appliances and heating, ventilation and air conditioning (HVAC) systems to electric.

Overall, stationary energy emissions have decreased by 10.0% from 2016.

Transportation

Transportation sources totaled 30.2% of total emissions. Here is a further breakdown:

- **By transportation type:** 20.5% of total emissions are from on-road travel including transit, 0.1% from railways and 9.7% from aviation. Figure 6 details how each of these sources contribute to overall transportation emissions.
- **By fuel type:** 15.3% of total emissions are from gasoline, 9.6% from jet fuel, 4.9% from diesel, 0.2% from electricity and 0.2% from a combination of other fuel types including ethanol and compressed natural gas (CNG).

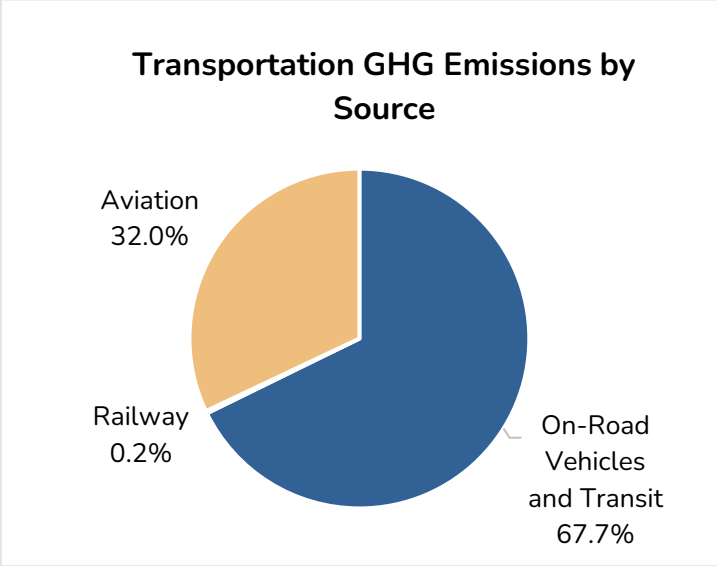

Figure 6: Longmont transportation GHG emissions by source.

On-road transportation includes emissions from gasoline, diesel, all electric, hybrid, ethanol and CNG vehicles such as those used by the City's Waste Services. The CNG vehicles use natural gas generated by the processing of wastewater at the wastewater treatment plant. This reduces the emissions from these vehicles as the natural gas is primarily biogenic instead of being sourced from fossil fuels (see the Biogenic Emissions section on page 11 for further information).

Overall, on-road transportation emissions have decreased by 25% from 2016. This is partially due to an 11% decrease in vehicles traveling on the road. The additional decrease in emissions may be due to multiple factors including an increase in electric vehicles, improving fuel efficiency of vehicles and the changes to the estimation of the types of vehicles on the road.

Implementing programs, like RIDE Longmont in 2024, or infrastructure improvement projects, like the Coffman Street Mobility Improvements, to support an increase in transit, biking, walking and rolling will further help reduce GHG emissions by reducing the number of vehicles on the road. According to the Colorado Energy Office's website EV CO, electric vehicles in Colorado emit less GHG emissions than gasoline or diesel-powered vehicles. Currently, the City offers a rebate to support charging infrastructure and has otherwise relied on federal and state incentives to support the transition to electric vehicles. Federal incentives ended in 2025

which may slow the transition to electric vehicles and negatively impact GHG emission reduction opportunities.

Aviation emissions have decreased by 33% from 2016 and railway emissions have increased by 1,764%. Both changes are due to improvements in the methodology used to calculate these emissions. Railway emissions are only 0.1% of total emissions, so this large change in emissions due to improved data collection does not significantly impact City emissions.

Overall, transportation emissions have decreased by 28% from 2016.

Waste and Wastewater

Waste sources totaled 2.3% of total emissions. Here is a further breakdown:

- **By source type:** 2.1% of the total is from landfilled waste, 0.1% from composted waste and 0.1% from wastewater treatment. Figure 7 details how each of these sources contribute to overall waste emissions.

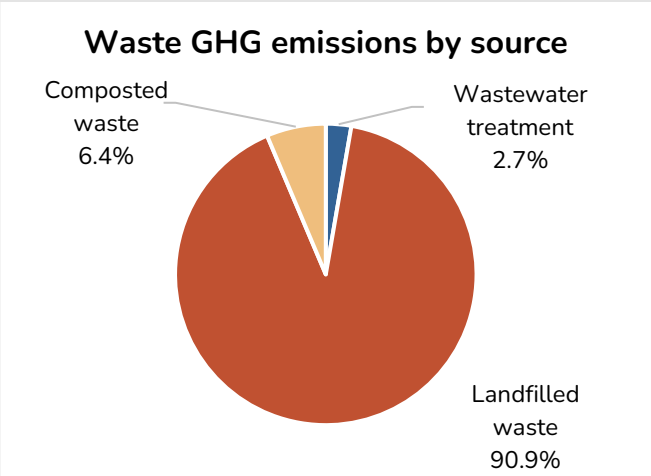

Figure 7: Longmont's waste GHG emissions by source

Landfilled waste emissions have increased by 178% from a 2016 baseline due to an improvement in data collection. In 2016, the City only had access to landfilled residential waste while in 2024 the City tracked data from commercial, residential and construction and demolition. Comparing 2021 to 2024, years that referenced the same data sources, there was a 1.4% decrease in landfilled waste emissions. This is likely due to a 5% increase in waste diversion between those three years from efforts like the Universal Recycling Ordinance that increased commercial and multifamily recycling rates.

Wastewater emissions have increased by 5% from a 2016 baseline, primarily due to an improvement in calculation methodology. Comparing wastewater emissions to 2021, emissions have increased by only 0.02%, staying relatively steady while Longmont's population has increased by approximately 3% in that time.

Overall, waste emissions have increased by 184% from a 2016 baseline primarily due to data accuracy improvements. Waste emissions have decreased by 0.9% from 2021.

Industrial Processes and Procedures

Industrial processes and procedures (IPPU) were 0.11% of total emissions. This sector estimates the use of refrigerants in buildings. Data on refrigerant use is not widely available, so staff followed assumptions developed in previous models by Lotus to estimate R-134a refrigerant usage, the most commonly used refrigerant, based on commercial building square footage.

Overall, IPPU emissions have increased by 17% from 2016, which aligns with growth in commercial building square footage.

Agriculture, Forestry, and Other Land Use

Agriculture, forestry, and other land use (AFOLU) was 0.04% of total emissions. This sector includes emissions from a small number of cows on City-owned property and assumptions based on the use of fertilizer on Longmont farmland. There are opportunities to more accurately report this data in future years to more holistically capture all livestock within city limits.

Overall, AFOLU emissions have decreased by 40% from 2016 due to changes in how the emissions are calculated and a reduction of cows on City-owned property.

Informational-Only Emissions

Avoided Emissions

Avoided emissions refer to GHG emissions that were not released due to actions like recycling instead of landfilling. Avoided emissions are outside the scope of a GHG inventory but can highlight how specific actions can reduce emissions. This section highlights avoided emissions from recycling, composting and renewable energy programs.

- **Waste Reduction:** 105,000 mt CO_2e and 3,070 mt CO_2e were avoided from community recycling and composting, respectively.
- **Renewable Energy Programs:** 9,340 mt CO_2e was avoided from community participation in the commercial and residential power purchase program, as well as rooftop residential and commercial solar. These efforts help increase renewable energy on the electric grid but are not included Platte River's emission factor.

Biogenic Emissions

Biogenic emissions are emissions from CO_2 that result from the combustion of organic materials such as wood or other plants. Biogenic emissions are tracked separately than CO_2

emissions from fossil fuels, such as coal, that were formed from prehistoric plants and animals over millions of years. As per guidance from the GPC Protocol, biogenic emissions are not included in the inventory, as they are from recently created biological processes instead of fossil fuels that would not normally be released without human action.

Biogenic emission sources for Longmont include transportation ethanol and compressed natural gas and wood burned to heat homes. There was 18,549 metric tons of biogenic CO_2 or CO_{2b} from these sources in 2024.

Longmont Equity-Share

Longmont is one of four communities that co-own Platte River Power Authority (Platte River). Platte River generates electricity that is used by the four owner communities and electricity that is sold to other communities. Longmont's GHG inventory only includes electricity that is consumed within city boundaries. Longmont's equity-share emissions refers to Longmont's ownership share of electricity that Platte River sold to other communities and the associated emissions. Longmont's total Equity-Share emissions are 462,403 mt CO_2e. This is not included in the City's inventory as the electricity is being consumed by other communities and is part of those communities' GHG inventories.

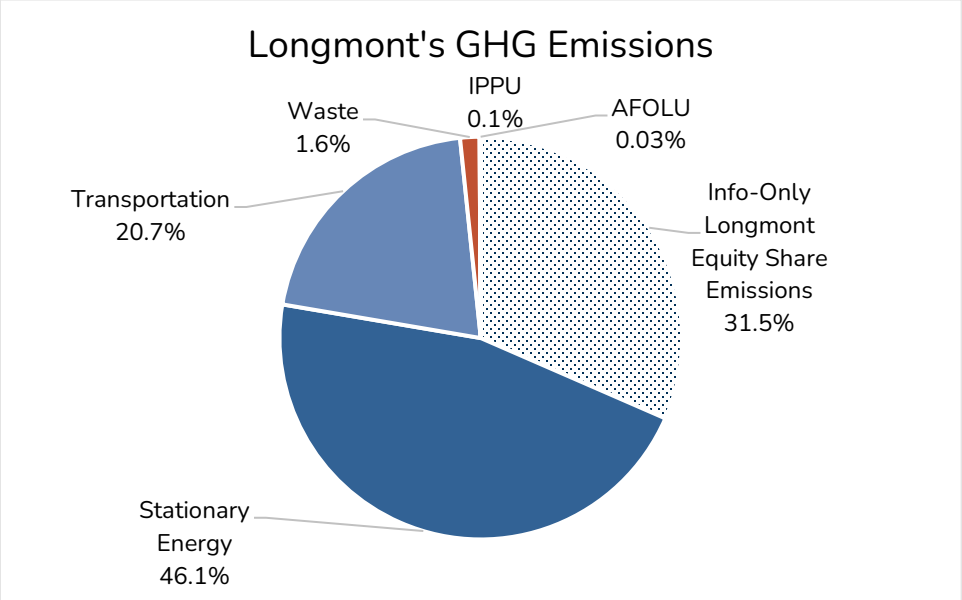

Figure 8: Longmont's 2024 GHG emissions breakdown including the informational only equity share emissions from Longmont's ownership of Platte River

Longmont Emissions Over Time

The 2024 GHG inventory is Longmont's fourth inventory and GHG emissions are generally trending downwards. As seen in Table 1 below, 2021 was the lowest year for total emissions. This is primarily due to lower transportation emissions as a result of a reduction in travel during the COVID pandemic. However, the 2024 had the lowest per capita emissions, highlighting that Longmont's per person GHG emissions are decreasing which is important as the City's population is expected to grow.

Year	Total Emissions (mt CO_2e)	Percent Reduction in Total Emissions (%)	Per Capita Emissions (mt CO_2e/person)	Percent Reduction Per Capita Emissions (%)
2016	1,182,541.88	Baseline year	12.73	Baseline year
2019	1,048,884.31	11%	10.75	16%
2021	978,588.10	17%	9.82	23%
2024	1,003,935.60	15%	9.76	23%

Table 1: Longmont's GHG emission inventories

Looking into the future, the City is currently working on an update to the GHG modeling. Current modeling is based on the City reaching multiple city targets beyond the 100% renewable powered electricity goal, including a transition to 30% zero-emission vehicles by 2030 and expanded building electrification. Currently Platte River projects that they will reach 88% renewable powered electricity by 2030 based on the 2024 Integrated Resource Plan. The City is also behind on the zero-emission vehicle and other targets. To better understand the impact on reaching our GHG emissions reduction target, there is a GHG model update underway that will compare a scenario based on if the City meets its targets and a scenario based on current business as planned, showing the differential. This will help staff further understand where there are gaps in meeting the 2030 GHG reduction target. The initial findings are expected by Spring 2026 and the final update to the Longmont Indicators scenario tool by end of 2026 or early 2027.

Community Comparison

Table 2 compares Longmont's per capita GHG emissions to neighborhood communities and Colorado state.

Community	Year	GHG Per Capita Emissions (mt CO_2e/person)
Longmont	2024	9.8
Boulder	2024	7.3
Erie	2023	12.0
Colorado	2023	13.9

Table 2: Comparison of GHG emissions from Colorado communities

Longmont is ahead of the State of Colorado in achieving emission reductions per capita but is not as low as other communities.

Conclusion

Longmont continues to make progress to reduce GHG emissions through efforts to transition to 100% renewable powered electricity, electrify buildings and vehicles, improve building efficiency and reduce vehicle miles traveled on the road. The impact of this progress on reaching City climate targets is currently being analyzed in a GHG model update that will be completed by late 2026 or early 2027.

Based on available data from the current GHG inventory, the greatest opportunities to achieve the 2030 target is through transitioning the renewable energy supply to 100%, electrifying buildings and vehicles and improving building efficiency. To align with citywide priorities, it is important that this work is completed in a way that is affordable and accessible to the community while maintaining a reliable electric energy supply. One example of how Longmont is taking this holistic model is the Whole Home Health program launched in 2024. This program provides extensive retrofits for income-qualified households to improve the health and safety of their home, increase energy efficiency and provide access to cooling. Programs like this and others, help the City work towards its GHG goals and sustainability vision of an engaged community that promotes environmental stewardship, economic vitality, and social equity to create a sustainable and thriving future for all.