

Larimer County 2022 Government Operations Greenhouse Gas Emissions Inventory Results

Overview

As a part of the Climate Smart and Future Ready Initiative, Larimer County embarked on an update to its local government operations greenhouse gas (GHG) emissions inventory. Larimer County contracted Lotus Engineering & Sustainability, LLC to estimate emissions from the County's buildings, fleet and equipment, employee commuting, business travel, waste, and several sources of consumption for calendar year 2022. The following memo gives an overview of the results from the 2022 GHG inventory.

2022 Results with the Larimer County Landfill

In 2022, Larimer County's total emissions with the landfill and including consumption-based sources were 115,106 mt CO₂e. Without including consumption-based sources, the total emissions are slightly lower at 102,992 mt CO₂e.

These emissions are divided by sector: waste, stationary energy, fleet & equipment, employee commuting, business travel, refrigerants, and consumption-based (Figure 1). Emissions from waste accounted for 73% of Larimer County's operational GHG emissions (84,175 mt CO₂e). Consumption-based

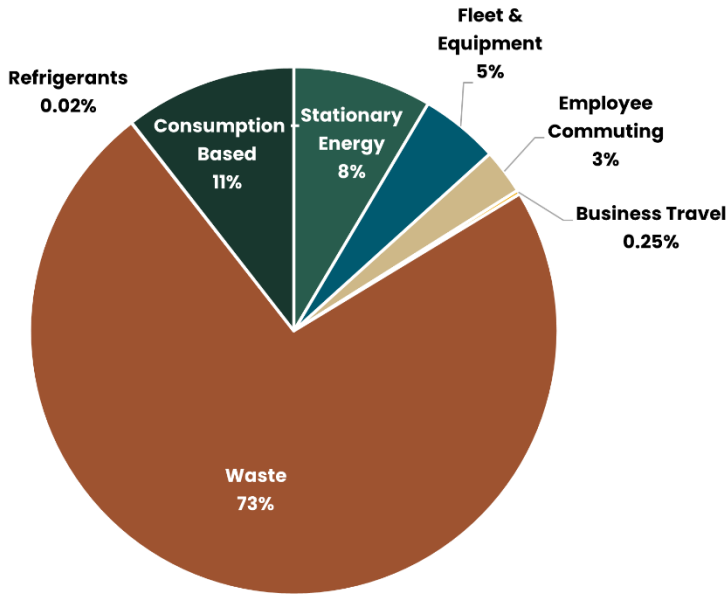


Figure 1. Larimer County greenhouse gas emissions by sector in 2022 including the Larimer County landfill.

sources (such as asphalt and cement, computers and hardware, food, etc.) accounted for 11% of emissions (12,114 mt CO₂e); stationary energy (i.e., building energy use), 8% of emissions (9,779 mt CO₂e); fleet & equipment fuel use at 5% of emissions (5,538 mt CO₂e); employee

commuting at 3% of emissions (3,182 mt CO₂e); business travel at 0.3% of emissions (293 mt CO₂e); and refrigerants, 0.02% of emissions (25 mt CO₂e). It should be noted that landfill emissions are calculated based on a combination of quantity of waste disposed, composition of waste disposed, and operations and maintenance of the landfill. The County has control over the operations and maintenance of the landfill but will require help from entities and partners outside of the County to reduce the quantity and alter the makeup of the waste.

2022 Results without Larimer County Landfill

According to the Local Government Operations Protocol (LGOP), which was the guidance used to create Larimer County's operational inventory, the County must report all emissions associated with activities over which it has operational control. For Larimer County, this includes the County landfill, which is owned and operated by the County. However, it can be helpful to also look at emissions sectors and sources outside of the landfill to better analyze the areas where Larimer County has greater opportunity to take action to reduce emissions.

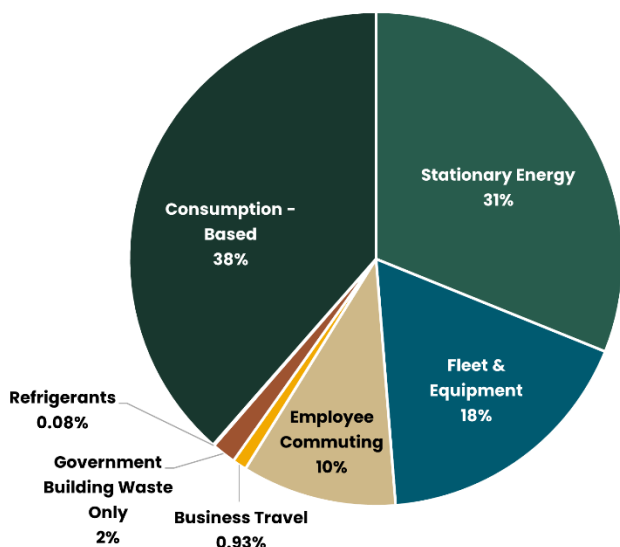


Figure 2. Larimer County greenhouse gas emissions by sector in 2022 without the Larimer County landfill.

emissions (9,779 mt CO₂e). Fleet & equipment fuel use accounted for 18% of emissions (5,538 mt CO₂e); employee commuting at 10% of emissions (3,182 mt CO₂e); waste, 2% of emissions (498 mt CO₂e); business travel at 1% of emissions (293 mt CO₂e); and refrigerants, .08% of emissions (25 mt CO₂e).

In 2022, Larimer County's total emissions without the landfill and including consumption-based sources were 31,430 mt CO₂e. Without including consumption-based sources, the total emissions are lower at 19,315 mt CO₂e.

These emissions are divided by sector: waste from County operations, stationary energy, fleet & equipment; employee commuting; business travel; refrigerants; and consumption-based (Figure 2). When not including the landfill, emissions from consumption-based sources were the largest sector at 38% of all emissions (12,114 mt CO₂e). Stationary energy accounted for 31% of Larimer County's operational GHG

GHG Emissions by Source with Landfill

In 2022, the top three sources of emissions (taking into account the landfill) were landfill waste, asphalt and cement, and facility electricity (Figure 3). Landfill waste accounted for 73% of

emissions (83,677 mt CO₂e); asphalt and cement, 7% of emissions (7,683 mt CO₂e); and facility electricity, 5% of emissions (5,818 mt CO₂e).

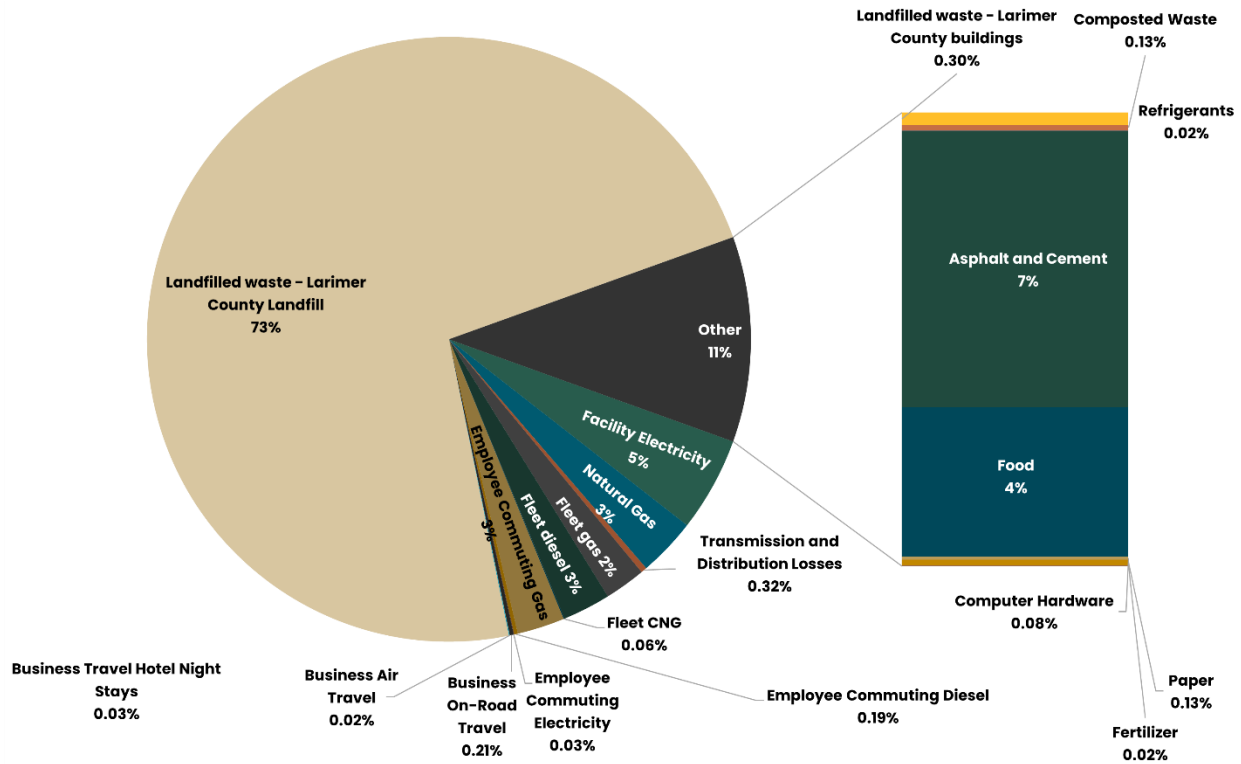


Figure 3. Larimer County greenhouse gas emissions by source in 2022 including the Larimer County landfill.

GHG Emissions by Source without Landfill

In 2022, the top three sources of emissions (not taking into account the landfill) were asphalt and cement, facility electricity, and food (Figure 4). Asphalt and cement accounted for 25% of emissions (7,683 mt CO₂e); facility electricity, 19% of emissions (5,818 mt CO₂e); and food, 13% of emissions (4,160 mt CO₂e).

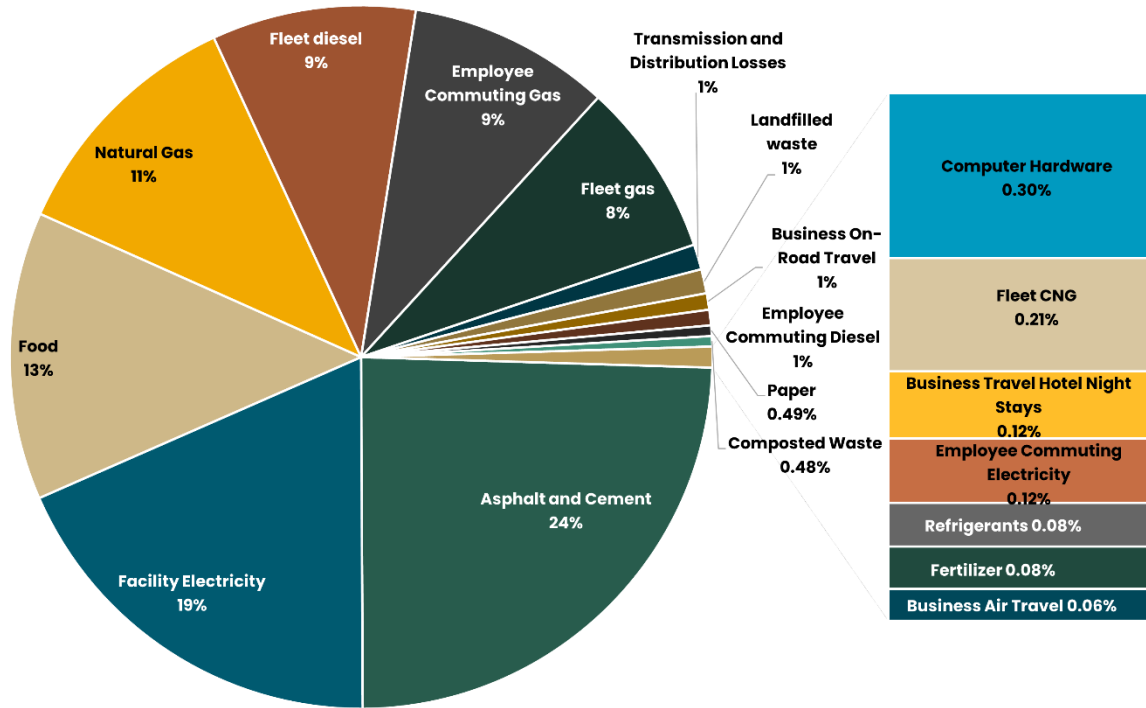


Figure 4. Larimer County greenhouse gas emissions by source in 2022 without the Larimer County landfill.

Benchmarking

The counties referenced for benchmarking were Santa Fe County, NM; Pierce County, WA; and Jefferson County, WA. The main difference between these and Larimer County are (1) Santa Fe County and Jefferson County do not include consumption-based sources; (2) Santa Fe County’s 2005 inventory includes the landfill while the 2018 inventory doesn’t; and (3) Pierce County didn’t include landfill emissions in its inventory. There are no comparable county inventories in Colorado available for benchmarking; Larimer County is serving as a pioneer in this space. The County recognizes that there will be many comparable communities in Colorado and across the country for the community-wide GHG inventory results.

The following tables lay out information on emissions per employee (Table 1) and breaks down emissions information between these counties (Table 2).

Table 1. Benchmarking emissions for Larimer County with other counties by emissions per FTE.

Emissions per Employee				
County	Inventory Year	Emissions (mt CO _{2e})	# of Employees	Emissions per FTE
Larimer, CO (w. landfill)	2010	92,315	1,958	47.1
Larimer, CO (w. landfill)	2022	115,106	1,983	58.0
Larimer, CO (w/o landfill)	2022	31,340	1,983	15.8
Santa Fe, NM (w. landfill)	2005	426,707	1,000	426.7
Santa Fe, NM (w/o landfill)	2018	11,600	1,000	11.6
Pierce, WA	2019	26,851	2,966	9.1
Jefferson, WA	2018	2,361	274	8.6

Table 2. Comparing emissions profiles between Larimer County and other comparable counties, without landfill emissions.

Emissions Breakdown				
Sector	County			
	Larimer, CO (2022)	Pierce, WA (2019)	Santa Fe, NM (2018)	Jefferson, WA (2018)
Stationary Energy	31.3%	26%	54.7%	54.6%
Fleet & Equipment	28.2%	55%	22.5%	45.4%
Waste	1.6%	8%	0.02% (solid)	N/A
Consumption-based	38.8%	11%	N/A	N/A
Water & Wastewater Treatment	N/A	N/A	20.3%	N/A

Year-over-Year Comparison

In 2010, Larimer County's estimated government operations emissions were 92,315 mt CO₂e. Emissions sources included in 2010 include building electricity, natural gas, and propane use; fleet & equipment fuel use; waste deposited at the County landfill; refrigerants; and County-financed travel. When comparing those sources to comparable sources in the 2022 inventory, emissions increased by 7% overall. Most sources actually saw decreases in emissions with the exception of waste deposited at the Larimer County Landfill, which saw a 24% increase in emissions. The largest decreases in emissions came from refrigerants (-91%) and building electricity (-59%).

Table 3. Emissions comparison between the 2010 and 2022 Larimer County government operations inventories.

Source	2010 Emissions (mt CO ₂ e)	2022 Emissions (mt CO ₂ e)	% Change
Natural gas & propane	3,860	3,596	-7%
Building electricity	14,280	5,818	-59%
Fleet & equipment	6,075	5,538	-9%
Refrigerants	266	25	-91%
Landfilled waste	67,326	83,677	24%
Business travel	509	293	-42%
Comparable emissions total (mt CO₂e)	92,316	98,948	7%