Pitkin County Regional Greenhouse Gas Emissions Summary Report 2019 & 2020

June 2022

Regional Inventory Summary

The Call to Action

Our climate is changing and without significant effort, the effects from climate change will get worse. The Pitkin County Region (the Region), including Unincorporated Pitkin County, the City of Aspen, the Town of Snowmass Village, and the Town of Basalt have demonstrated their commitment to act by taking steps to track emissions and implement climate action policies. Additional and aggressive climate action is needed for the Region to meet its climate goals and preserve today's climate and quality of life.

The boundaries of the Pitkin County Region discussed in this report include all of Pitkin County plus the portion of the Town of Basalt that is in Eagle County. This boundary was selected because it represents the core economic bases driving activity in the region. Until now, a regional inventory of this scale had not been completed. Therefore, this inventory will serve as a base for analyzing future region-wide emissions trends. County-wide emissions for Pitkin County (the County) have also been included through call-out boxes within this report. Pitkin County-specific emissions exclude emissions from the portion of the Town of Basalt within Eagle County and include emissions from all towns strictly within the County boundary.

In 2022, the Pitkin County Region completed a GHG emissions inventory of generated emissions from 2019 and 2020 to understand the County's progress towards achieving its GHG reduction goals. The year 2020 brought COVID-19, which was anticipated to have impacts on the community GHG emissions. Therefore, the County also looked at 2019 emissions to understand emission trends in a non-COVID-19 impacted year.

Key Takeaways

- In 2020, the Region emitted **564,659 metric tons of carbon dioxide equivalent**. This represents nearly a 9% reduction in emissions since 2019.
- The largest share of emissions in 2020 were generated by activities in Unincorporated Pitkin County (36%), followed by the City of Aspen, the Town of Snowmass Village, and the Town of Basalt.
- The Region's emissions in 2020 were primarily generated from electricity and natural gas consumption, gasoline use in on-road vehicles, airplane fuel, and the decomposition of solid waste.

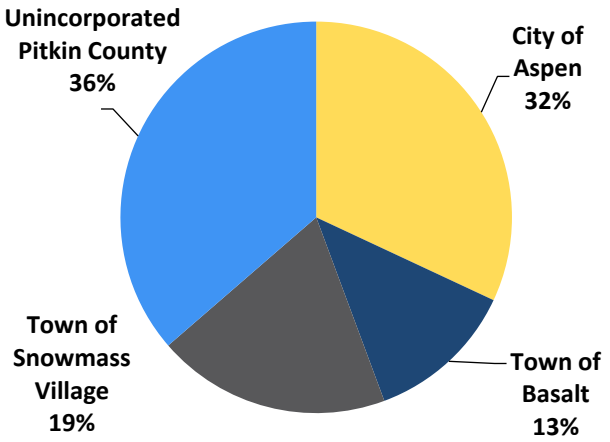


Figure 1: 2020 Regional emissions by community.

- Emissions from the Aspen-Pitkin County airport represent 13% of the total region emissions (70,941 $mtCO_2e$). The airport is included here for consistency with previous inventories.
- Buildings were the greatest source of the region's GHG emissions in 2020, comprising 58% of total GHG emissions in 2020. Residential buildings made up 34% of these emissions, while commercial and industrial buildings contributed 24%. This sector presents significant opportunity for emission reduction efforts.
- Transportation emissions were the second greatest contributor to the region's total emissions, making up 30% of the total. Within the transportation sector, the majority of emissions come from on-road transportation (55%) followed by aviation (42%).
- The waste sector makes up 10% of all regional emissions. On average, residents of the region produce 11.5 pounds of landfilled municipal and construction and demolition waste per resident per day, which is more than double the national average (4.5 pounds).
- Emissions decreased by approximately 9% from 2019 to 2020 for the region, likely due to impacts of the COVID-19 pandemic. This is unique to this region as many

other Colorado towns experienced more significant reductions in emissions, particularly in the commercial & industrial energy and transportation sectors.

Methodology

- 2019 and 2020 GHG emissions inventories used the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC). The inventories account for Scope 1, 2, and 3 emissions.
- Emissions include the primary GHG types and rely on global warming potentials to express the sum of all gases as metric tons of carbon dioxide equivalents ($mtCO_2e$).

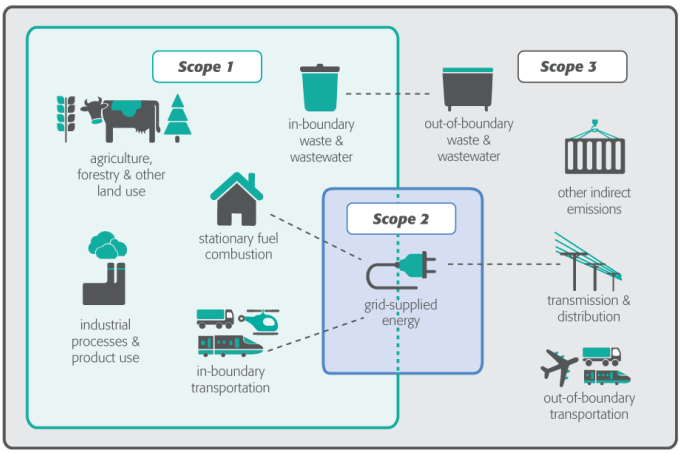


Figure 2. GPC emission sources.

Methodology Changes

- The Pitkin County Solid Waste Center provided total construction and demolition (C&D) waste tonnage for the entire county for all previous inventories. Past inventories (except for the 2014 and 2017 Aspen inventories) attributed C&D waste to individual communities based on the proportion of the population served by the landfill. The 2019 and 2020 inventories used new construction, renovation, and demolition permit data gathered from each city to attribute C&D waste data. The total square footage of construction and demolition from all permits was calculated and the proportion of the square footage attributable to each community was used to split total C&D waste tonnage between each community.
- Previous inventories utilized the results of a 2017 VMT study conducted by Fehr and Peers to estimate on-road transportation emissions. This 2017 VMT study used survey data to generalize travel patterns. Fehr and Peers conducted another VMT study in 2021 to provide updated VMT numbers for the emission inventories. This new study used AirSage data (AirSage data tracks cell phones and their movement). The AirSage data indicated there were more short-length trips occurring than were assumed based on the survey data used in 2017. More trips of shorter length and less trips of longer length led to lower total VMT estimates overall

and the significant decrease in on-road transportation emissions for the Pitkin County Regional and Pitkin County.

2020 Emissions Summary

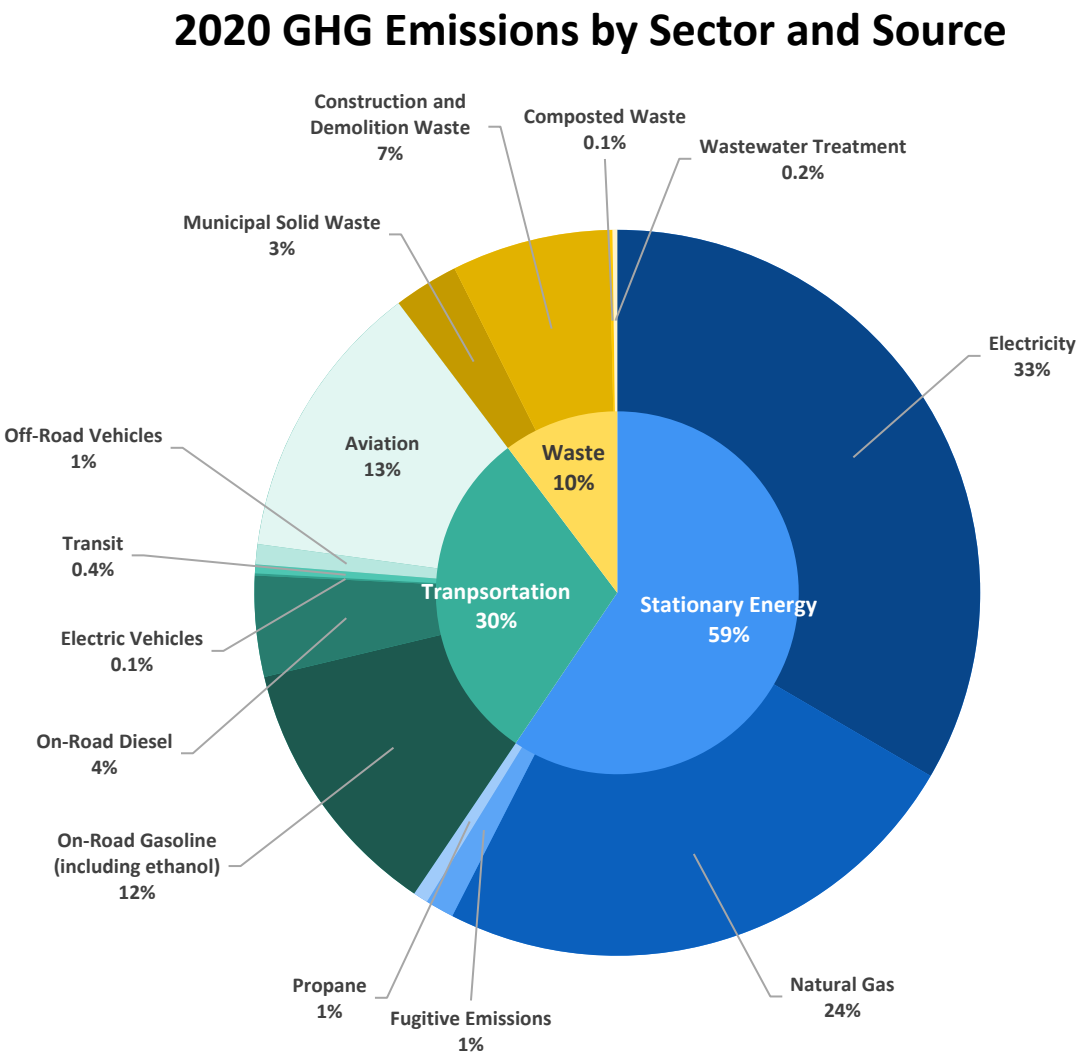


Figure 3. Pitkin County Region 2020 GHG Emissions by Sector and Source.

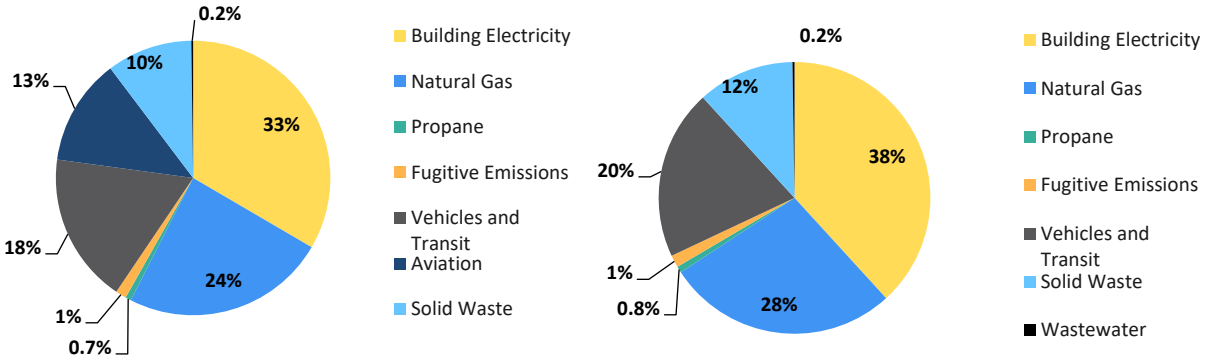


Figure 4: Pitkin County Region's 2020 GHG Emissions with (left) and without (right) Aviation (mt CO2e).

2019 Emissions Summary

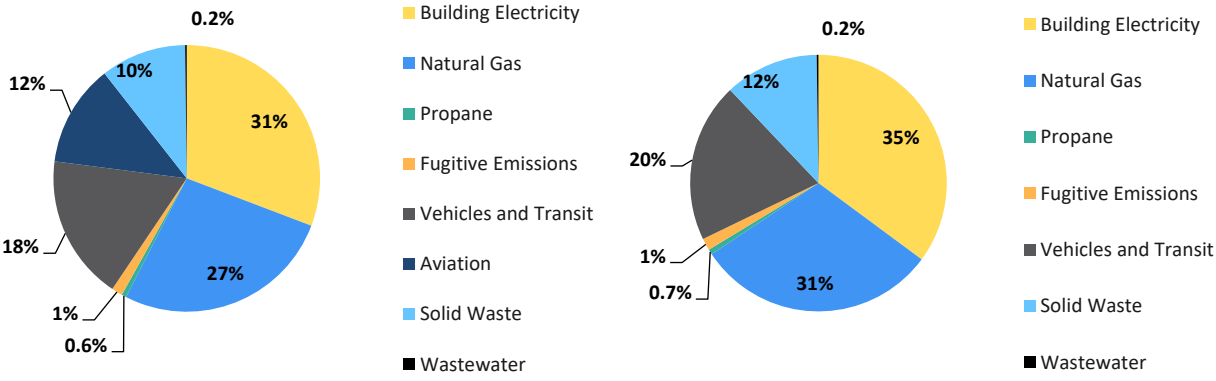


Figure 5: Pitkin County Region's 2019 GHG Emissions with (left) and without (right) Aviation (mt CO2e).

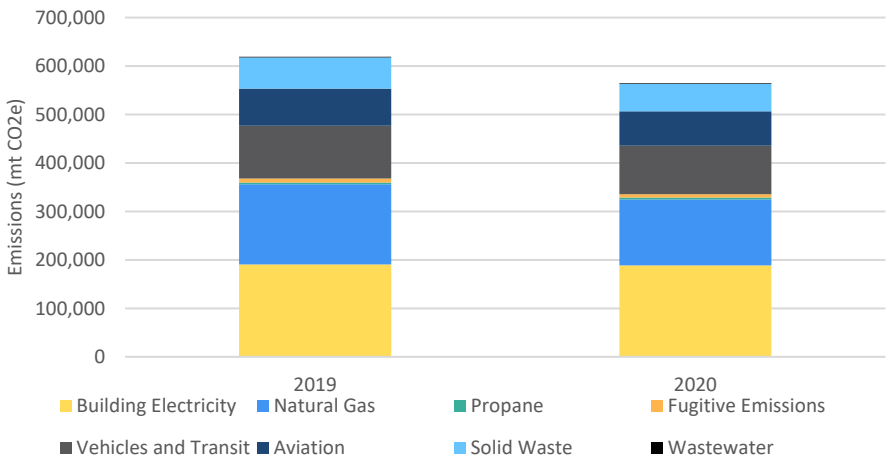


Figure 6. The Pitkin County Region's 2019 (left) and 2020 (right) GHG Emissions with Aviation (mt CO2e).

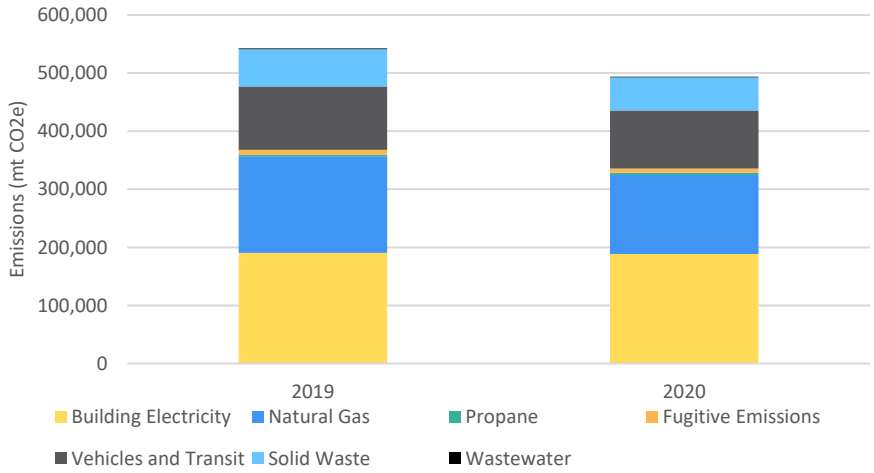


Figure 7. The Pitkin County Region's 2019 (left) and 2020 (right) GHG Emissions without Aviation (mt CO2e).

COVID-19 IMPACTS

Due to the COVID-19 pandemic, 2020 was not a typical year. To understand how the pandemic affected emissions, the Region compared the findings from 2019 and 2020 inventories.

- Between 2019 and 2020, the Region saw a decrease in emissions of almost 9%. This reduction was likely attributed to the temporary suspension of services and travel.
- This is unique to this region as many other Colorado towns experienced more significant reductions in emissions, particularly in the commercial & industrial energy and transportation sectors.
- Emission reductions were seen across all sectors: buildings, transportation, and waste. Changes in emissions generated from buildings were also a result of a cleaner electric grid.

Overview of Key Findings for Pitkin County

- 2019 total GHG emissions in the County were 560,929 metric tons of carbon dioxide equivalent (mt CO_2e); in 2020 this decreased by nearly 9% to 512,423 mt CO_2e.
- Approximately 90% of the Region's GHG emissions were generated within Pitkin County in 2020.
- Emissions from the building sector account for over half of all Pitkin County emissions (61% in 2019 and 61% in 2020). Thus, this sector presents significant opportunity for emission reduction efforts.
- Transportation emissions, including aviation, represented 29% of total emissions in 2020. In 2020 and 2019, 50% of transportation emissions were from on-road diesel and gasoline vehicles, while 45% came from the airport. The significant share of emissions that comes from on-road gasoline and diesel vehicles, combined in consideration with the very small proportion that comes from transit and EV use, indicates that Pitkin County may be able to realize significant reductions in transportation sector emissions by supporting greater use of transit services and greater adoption of EVs.
- The total tonnage of residential and commercial waste landfilled increased slightly from 2019 to 2020, while total construction & demolition waste landfilled decreased slightly during the same time. The total tonnage composted remained relatively stable between the two years and the recycling rate dropped from 2019 to 2020 by ~2,000 tons.

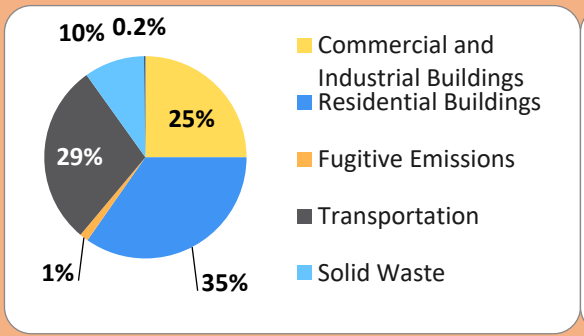


Figure 1A: 2019 Pitkin County emissions by sector

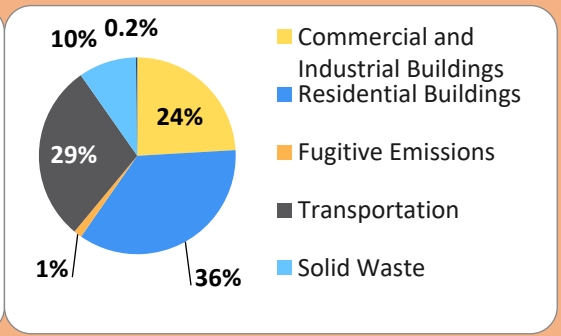


Figure 2A: 2020 Pitkin County emissions by sector

Sector Emissions Overview & Opportunities

Buildings

- In 2019 and 2020, Buildings are the largest emitting sector in the Region, accounting for over half of all regional emissions.
- In 2020, natural gas emissions equaled 54% of total building emissions and electricity emissions equaled 43% of total building emissions.
- Currently, HCE sources 44% of their power supply from clean energy resources (mainly renewables including solar, wind, biomass, and hydro), and Aspen Electric sources 99% of their power supply from renewable resources.

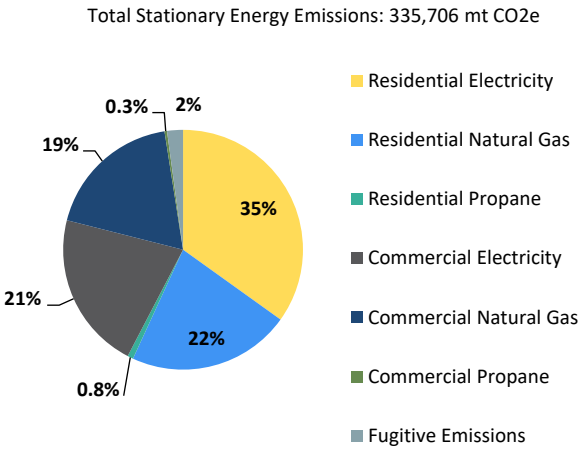


Figure 8: The Region's 2020 Stationary Energy

Opportunities to Reduce Emissions

There are two primary pathways to reduce emissions from buildings:

1. Decrease the amount of energy used through energy efficiency strategies.
2. Employ building electrification using clean and renewable electricity to power buildings.

- Adopt the latest building code for new buildings. Today, much of the region follows the 2015 International Energy Conservation Code, but more aggressive codes are available and will yield significant savings for newly built buildings. The Region and the County can go further and adopt aggressive amendments to the IECC, working towards net-zero buildings by 2030.
- Advance building beneficial electrification.[1] Since electricity emissions are expected to decrease due to a progressively greener grid, electrification of natural gas systems in existing buildings could be a highly impactful action that the Region can take to reduce building emissions.
- Continue investing in energy efficiency for existing buildings to drive down costs and energy use and support future electrification efforts.

[1] Building electrification is the process of converting fossil-fuel powered appliances to appliances powered by electricity, where electricity is sourced from a progressively cleaner grid.

TRANSPORTATION

- The transportation sector, including aviation, made up 30% of overall emissions in 2019 and 31% in 2020. Total emissions from transportation decreased by 8% between 2019 and 2020.
- In 2020, aviation emissions made up 42% of total transportation emissions and gasoline-powered vehicle emissions were 39% of total transportation emissions.
- In 2020, 1% of on-road vehicles were all-electric vehicles (EV), and 0.3% of on-road vehicles were plug-in hybrid electric vehicles.

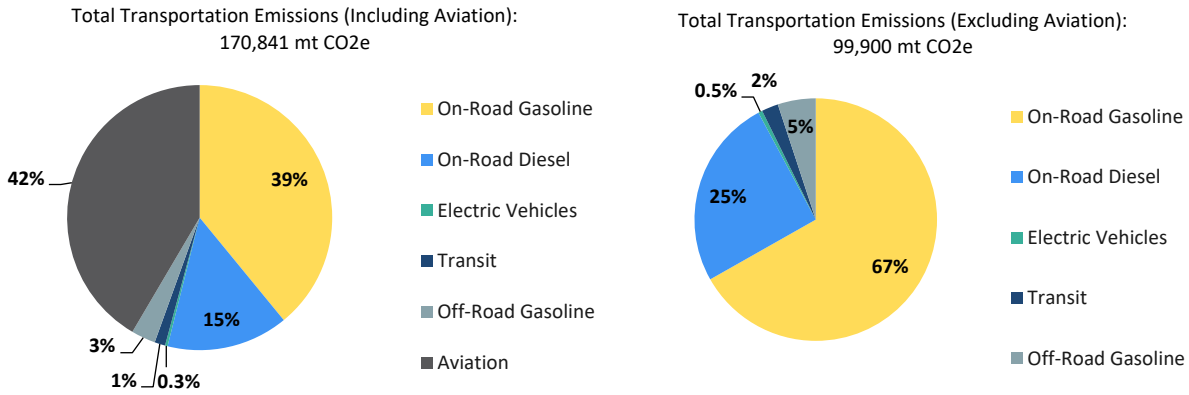


Figure 9. The Region's 2020 Transportation Emissions with and without Aviation.

Opportunities to Reduce Emissions

- Support adoption of electric vehicles through incentives, EV-charging infrastructure, and adoption of EVs for fleet.
- Develop a business program to encourage smart commuting for employees to reduce overall vehicle miles traveled.
- Work with RFTA and regional partners to identify and invest in solutions that advance multi-modal transportation options.
- Investigate opportunities to reduce emissions from airline travel through low-emitting fuels.

There are two primary pathways to reduce emissions from on-road transportation:

1. Reduce the overall vehicle miles traveled through expansion of multi-modal transportation options.
2. Electrify transportation using clean and renewable electricity to power vehicles.

Waste

- The waste sector is the third largest emitting sector in the Region.
- Waste emissions are overwhelmingly generated from the decomposition of landfill waste generated by the community.
- Landfilled waste includes municipal solid waste and construction and demolition waste.

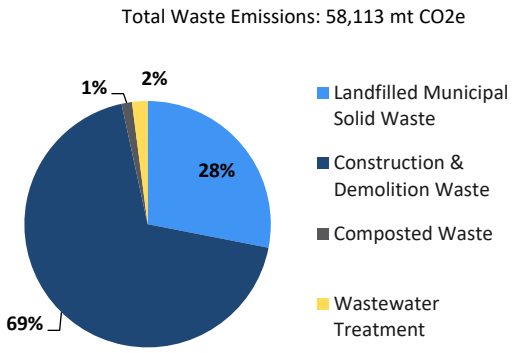


Figure 10: The Region's 2020 Waste Emissions.

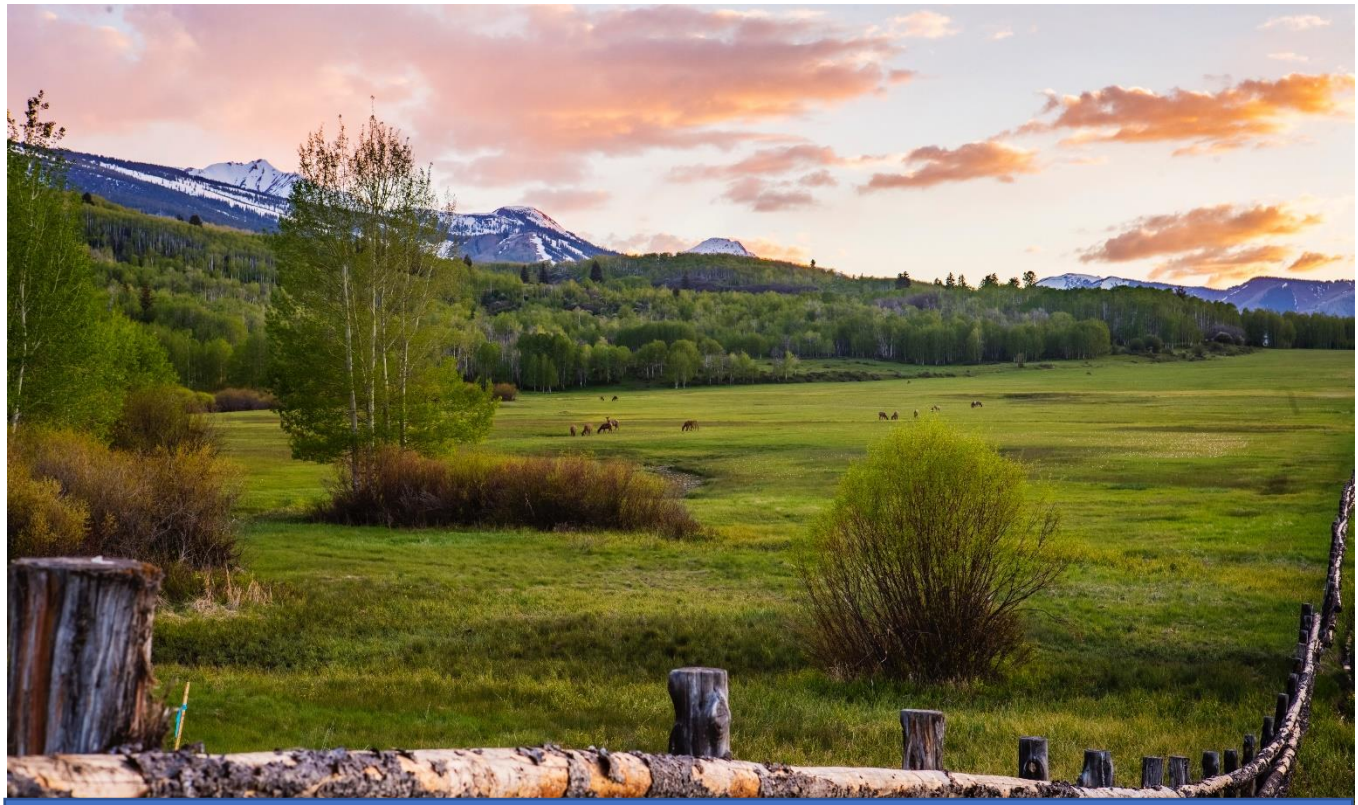
- On average, 11.5 pounds of waste are produced per capita each day in the Region. This is over twice the US average of 4.5 pounds per capita per day. The large amount of waste is largely driven by the influx of tourists into the community on a regular basis.

Opportunities to Reduce Emissions

- Improve the diversion of construction and demolition waste and debris.
- Increase waste diversion opportunities for community members and businesses including recycling, composting, yard waste diversion, and other hard-to-recycle materials. Specifically target organic waste through composting to reduce methane emissions from the decomposition of these materials in the landfill.
- Improve education on, and access to, waste diversion opportunities for out-of-town visitors.

There are two primary pathways to reduce emissions from waste.

1. Reduce overall waste generated and sent to the landfill.
2. Divert waste materials from entering the landfill. Organic waste is one of the largest contributors to waste GHG emissions.



The Pitkin County Region Inventories

Achieving significant reductions in GHG emissions is a big lift, and the Pitkin County Region recognizes that this challenge requires aggressive action. The 2019 and 2020 regional inventories are the first to evaluate GHG emissions at the regional scale for the Roaring Fork Valley. Previous emissions excluded the portion of the Town of Basalt that falls within Eagle County, however, this has now been included in the regional inventory and report. Therefore, this inventory will provide a baseline for analyzing future region-wide emissions trends and understanding how the various communities within the region contribute to emissions and impact emissions reductions.

Appendix- Table of All Emissions by Scope, Source, and Sector for Pitkin County Region and Pitkin County

Pitkin County Region

Scope	2019		2020	
	Emissions	Percent of Total	Emissions	Percent of Total
Scope 1	426,554	69%	375,355	66%
Scope 2	191,183	31%	189,304	34%
Scope 3	0	0%	0	0%
Total Emissions	**618,998**		**564,659**	

Sector	2019		2020	
	Emissions	Percent of Total	Emissions	Percent of Total
Commercial and Industrial Buildings	153,004	25%	134,999	24%
Residential Buildings	206,641	33%	193,515	34%
Fugitive Emissions	8,220	1%	7,193	1%
Transportation	185,636	30%	170,841	30%
Solid Waste	64,283	10%	56,932	10%
Wastewater Treatment	1,213	0.2%	1,180	0.2%
Total Emissions	**618,998**		**564,659**	

Sector	Source	2019		2020	
		Emissions	Percent of Total	Emissions	Percent of Total
Stationary Energy	Electricity	190,543	31%	188,700	33%
	Natural Gas (including fugitive emissions)	171,335	28%	140,789	25%
	Oil and Gas Wells	2,455	0.4%	2,455	0.4%
	Propane	3,533	0.4%	3,762	0.5%
Transportation	On-Road Transportation and Transit	103,497	17%	94,234	17%
	EVs and Electric Buses	641	0.1%	605	0.1%
	Off-Road Vehicles	4,857	0.8%	5,061	0.9%
	Aviation	76,641	12%	70,941	13%
Waste	Solid Waste	64,283	10%	56,932	10%
	Wastewater	1,213	0.2%	1,180	0.2%
Total Emissions		**618,998**		**564,659**	

Pitkin County

Scope	2019		2020	
	Emissions	Percent of Total	Emissions	Percent of Total
Scope 1	383,265	68%	336,431	66%
Scope 2	117,648	32%	175,977	34%
Scope 3	17	0.003%	15	0.003%
Total Emissions	**560,929**		**512,423**	

Sector	2019		2020	
	Emissions	Percent of Total	Emissions	Percent of Total
Commercial and Industrial Buildings	140,226	25%	123,380	24%
Residential Buildings	194,692	35%	182,407	36%
Fugitive Emissions	7,834	1%	6,871	1%
Transportation	162,736	29%	149,914	29%
Solid Waste	54,287	10%	48,721	10%
Wastewater Treatment	1,154	0.2%	1,131	0.2%
Total Emissions	**560,929**		**512,423**	

Sector	Source	2019		2020	
		Emissions	Percent of Total	Emissions	Percent of Total
Stationary Energy	Electricity	177,183	32%	175,450	34%
	Natural Gas (including fugitive emissions)	159,837	28%	131,217	26%
	Oil and Gas Wells	2,455	0.4%	2,455	0.5%
	Propane	3,277	0.6%	3,536	1%
Transportation	On-Road Transportation and Transit	83,833	15%	76,217	15%
	EVs and Electric Buses	465	0.1%	528	0.1%
	Off-Road Vehicles	4,857	1%	5,061	1%
	Aviation	73,581	13%	68,109	13%
Waste	Solid Waste	54,287	10%	48,721	10%
	Wastewater	1,154	0.2%	1,131	0.2%
Total Emissions		**560,929**		**512,423**	