

Eagle County Energy Inventory



EAGLE COUNTY

2023 data on energy use, costs and emissions

KEY FINDINGS

Eagle County's **greenhouse gas emissions** in 2023 totaled 1.432 million metric tons of carbon dioxide equivalent (CO₂e) – an increase of 6% from the 2014 baseline. That said, for the first time since 2017, GHG emissions have nearly leveled out, showing only a .12% increase over 2022. The majority of emissions come from buildings and ground transportation. So, while supporting reductions in all areas that emit greenhouse gases are important, focusing on these sectors will generate the greatest impacts.

Looking at the built environment, **electricity emissions** show a 35% decrease since 2014. Holy Cross Energy (HCE) and Xcel Energy have been making strides toward cleaner electricity grids and have supported this reduction. In 2015, HCE had a 28.5% renewable grid. As of 2023, HCE reports a 50% renewable grid with a much higher projected percentage in 2024.

Natural gas emissions increased by 17.5% compared to 2014. There is plenty of room for improvement through the adoption of updated building codes as well as funding or incentive programs to encourage weatherization and electrification of homes, businesses, and government buildings.

Eagle County's **transportation emissions** are 10% higher compared to 2018 (the earliest year for which there are comparable data). However, transportation emissions declined by 2.4% from emissions in 2022. The County's

per-capita transportation emissions continue to stand at roughly double the state average. This is largely due to population growth and lengthening commutes. The most effective tactics to reverse this trend will be to increase public transit ridership, electric vehicle adoption, and improvements to EV charging infrastructure. EVs now account for 1.8% of vehicle registrations in the County, slightly more than the statewide proportion.

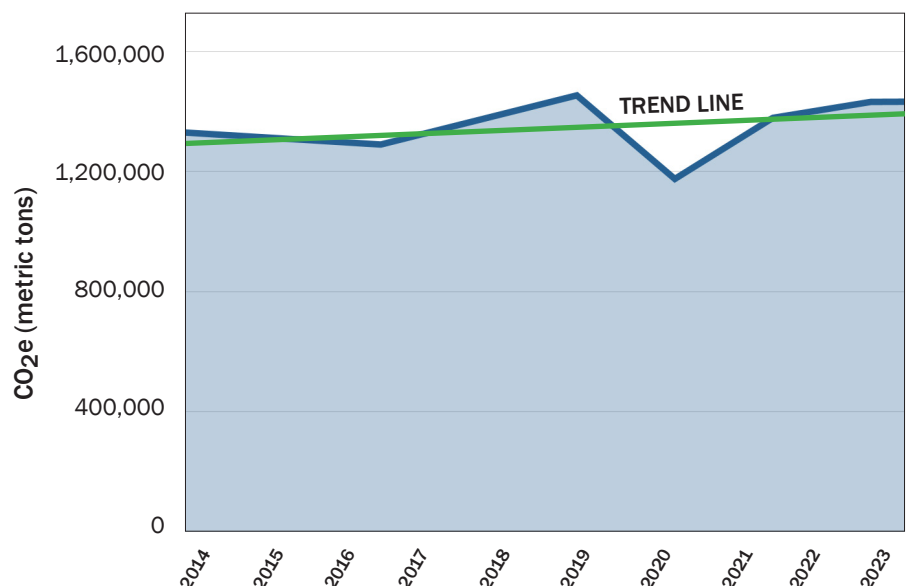
Solid waste emissions have decreased by nearly 2% compared to 2014. However, there was no significant change from 2022 due to an increase in landfilled waste and a decrease in diverted waste. Efforts to achieve further reductions can be highly visible, although it should be noted that waste makes up only 6% of the County's emissions.

New this year, the 2023 inventory includes an analysis performed by Walking Mountains which quantifies the estimated emissions and removals from the **Agriculture, Forestry and Other Land Use (AFOLU) sector**. The analysis for this emerging topic estimated that from 2019 to 2021 (the most recent data set), the AFOLU sector removed an estimated annual net total of 202,000 MT CO₂e from the atmosphere. This data provides some insight into the impact of the AFOLU sector on total emissions for the County and the value of protecting and conserving natural assets.

Section 1: Overview of Emissions

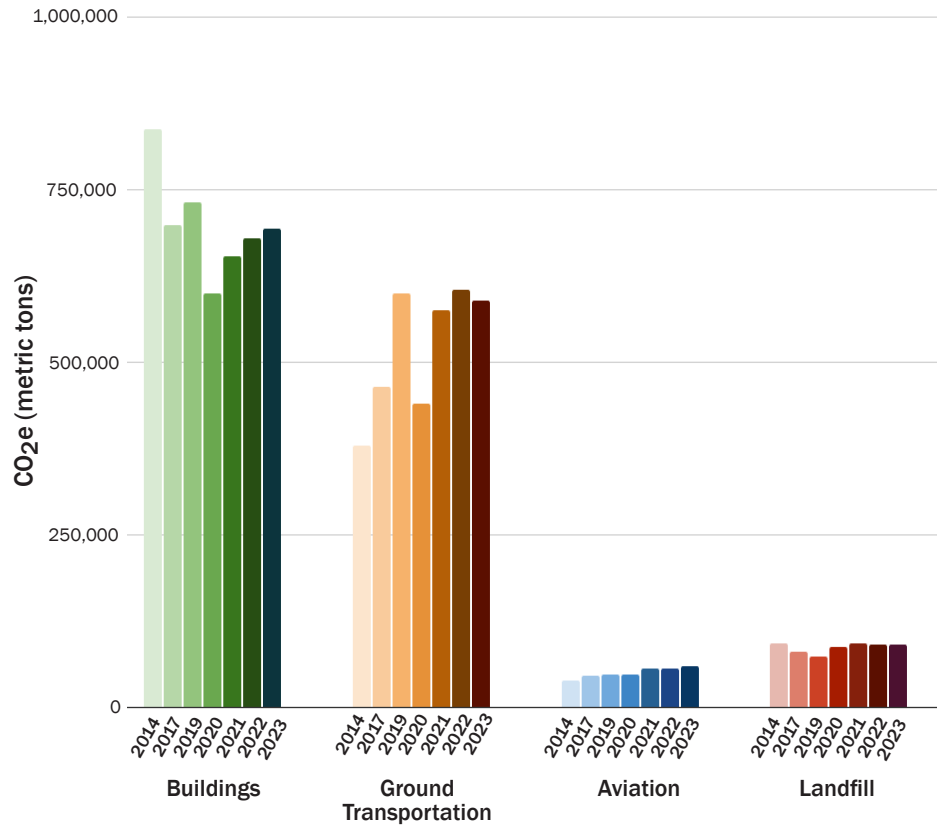
1. Total Emissions, 2014-2023

Eagle County set goals of reducing emissions 25% by 2025 and 50% by 2030, compared to 2014 levels. As of 2023, emissions have maintained a 6% increase over 2014. Based on the trend so far, it is highly unlikely that the 2025 goal will be met. For the first time since the 2014 baseline year, emissions remained essentially flat, increasing a negligible 0.12%.



2. Change in Emissions by Sector, 2014-2023

The built environment has seen a significant emissions decrease of 17% since 2014. Building energy use has been steadily increasing over the last four years, presumably due to population growth and development, but this has been more than offset by an increasingly clean electricity grid. Transportation saw its first decrease in emissions since 2019, showing a 2.4% decrease over 2022. Since 2014, however, transportation emissions have risen 55% due to a steady increase in vehicle miles traveled and increased accuracy in transportation reporting.

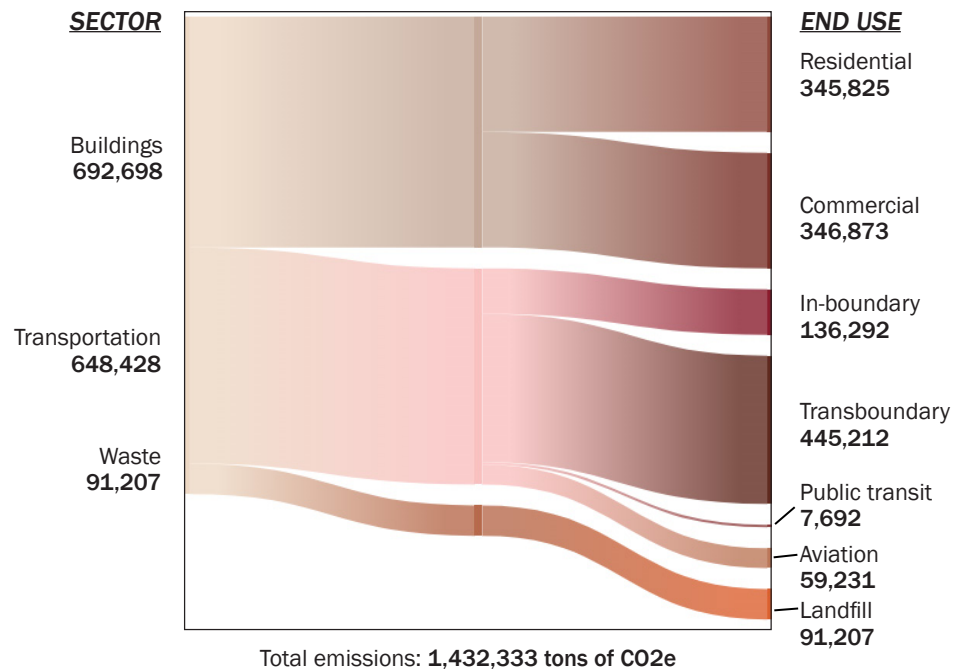


NOTE

Eagle Valley Transportation Authority's decision to make many of its routes fare-free in 2024 will likely cause a shift to public transit from other forms of ground transportation, with a potentially positive effect on emissions.

3. Total Emissions by End Use, 2023

This visualization breaks down the major emissions-producing sectors by end-use. Notably, commercial buildings account for slightly more emissions than residential buildings. The largest share of transportation emissions results from “transboundary” travel, presumably due to daily commuters and tourists traveling to and from Eagle County. (This is discussed in more detail in Section 4.) Public transit is shown to be a very small contributor to emissions as compared to other forms of ground transportation.



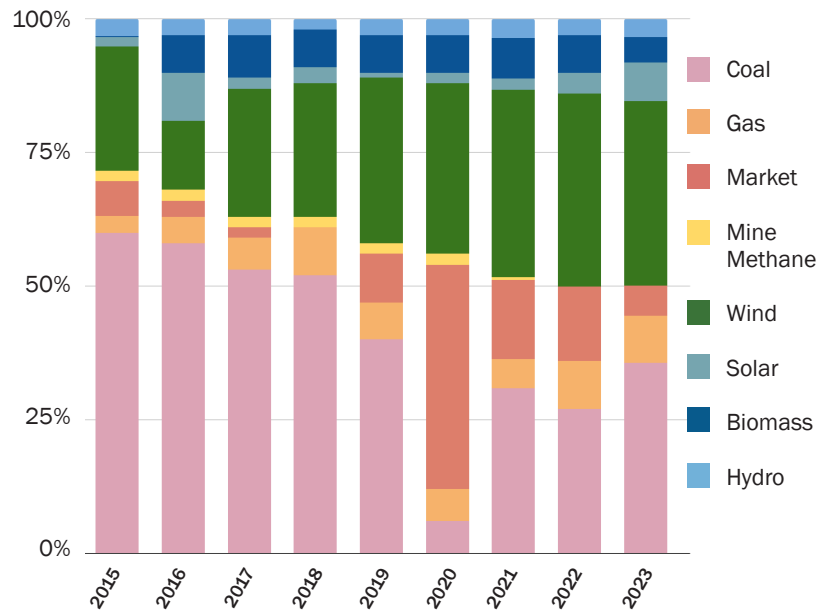
Section 2: Utility Energy

4. Holy Cross Energy Electricity by Sources, 2015-2023

Holy Cross Energy (HCE) provides 99% of the electricity consumed by Eagle County residents and therefore has the greatest impact on emissions for the building sector. As of 2023, the utility has upped its share of renewable energy to 50% and is expected to increase it significantly in the coming years.

HCE owns 2.7 MW of solar capacity and holds power purchase agreements for several small renewable sources located in or near its service territory, including 8 hydroelectric generators, 16 commercial solar arrays, and a 12 MW biomass plant. For the remaining grid power, HCE has long-term power supply commitments through contracts with Public Service Company of Colorado (a subsidiary of Xcel Energy), owns an 8% share in Unit 3 at the Comanche Generating

Station located in Pueblo, and purchases hydropower from the Western Area Power Administration. “Market” energy is procured to offset any overages and the generation sources cannot be identified with a high level of certainty.

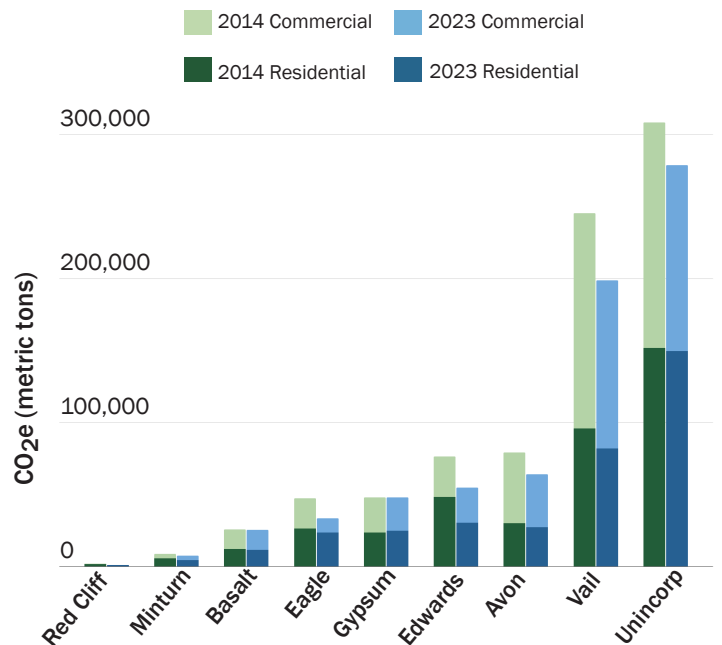


Section 3: Emissions from Buildings

5. Built Environment Emissions by Community, 2014 vs. 2023

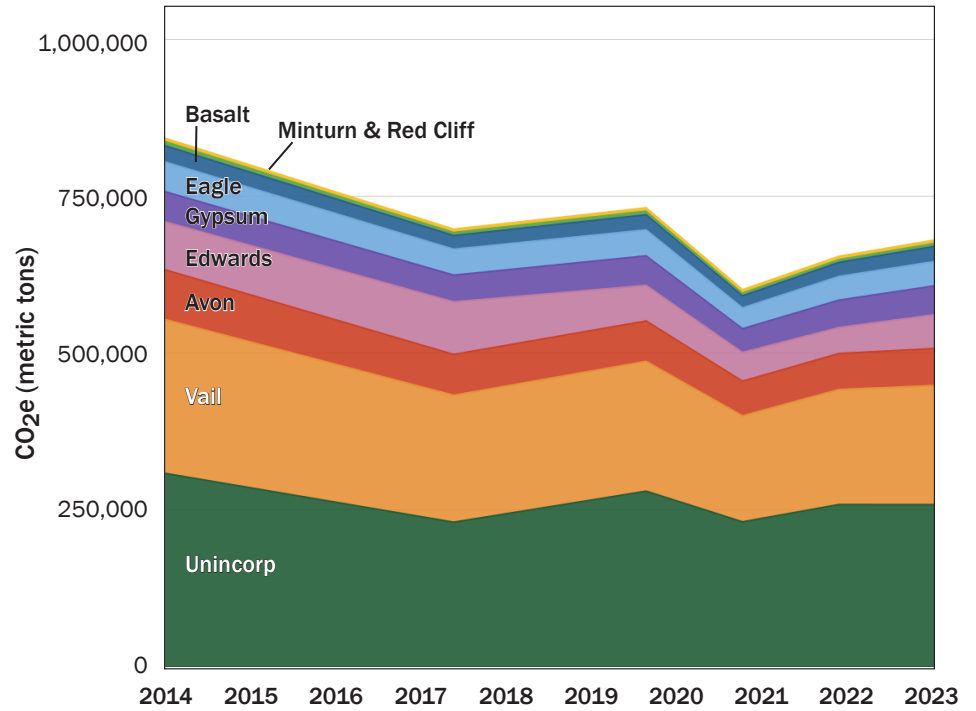
Since 2014, each major community in Eagle County has decreased its building emissions or at least held them level. As highlighted in Chart 5, the most significant reductions have been in commercial buildings, although in nearly all situations residential emissions have reduced as well. Commercial buildings are those so designated by the utilities, and include hotels, multifamily complexes with a single meter, recreational facilities (e.g., lifts and snowmaking equipment), government buildings, schools, retail, industrial and manufacturing facilities.

While Edwards is unincorporated, its emissions are separately trackable by analyzing data for the 81632 zip code area. That is not the case for all other unincorporated parts of the County, including the communities of Eagle-Vail, El Jebel, McCoy, Bond and Burns, which are aggregated in the “Unincorp” category. Together, these areas have more population and housing units than any of the county’s individual municipalities. The unincorporated category shows an extra increase in commercial emissions for 2023 because Black Hills Energy combined its Eagle commercial data with the unincorporated totals to comply with the 15/15 customer privacy rule (explained below).



6. Buildings Emissions by Community, 2014-2023

Looking at the trend since 2014, we can see that emissions were artificially low in 2020 due to the pandemic, and while all communities have seen a rebound over the last four years, almost all are still below 2019 levels. The decrease and slowed growth in emissions is largely due to Holy Cross Energy’s decarbonization of its grid.

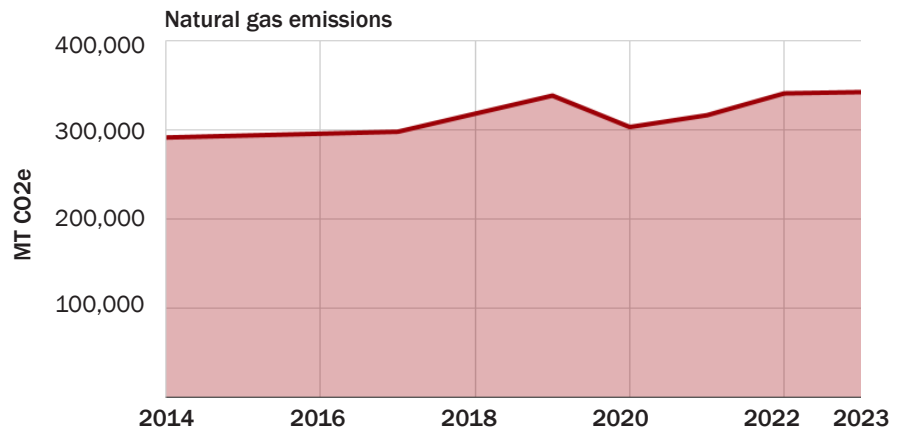
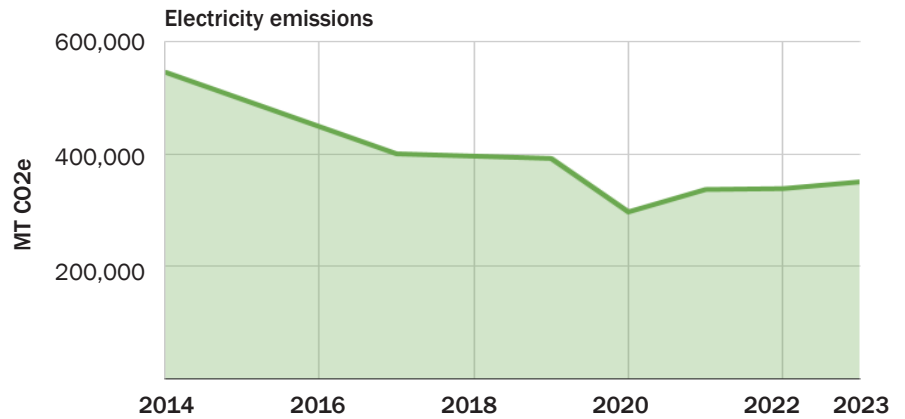


NOTE

Continuing to focus on decarbonizing energy, improving weatherization and implementing energy management programs will significantly reduce building emissions.

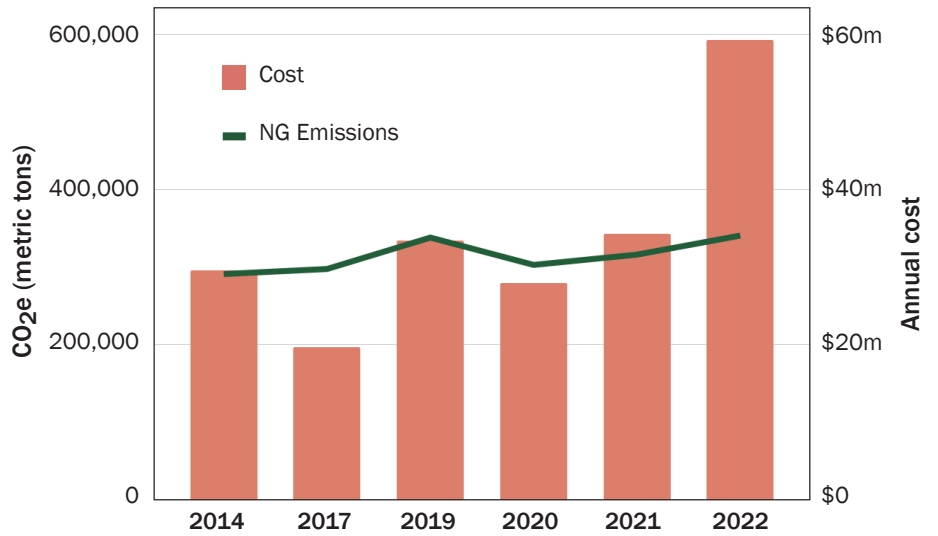
7. Building Emissions by Fuel over Time, 2014-2023

Since 2014, the County has seen significant growth in its building stock. Despite the growth, changes in electric supply have resulted in cleaner electricity and thus reduced emissions. On the other hand, natural gas emissions have continued to rise with the growth. Continuing to focus on decarbonizing energy use in commercial and residential buildings can significantly mitigate the impacts of the built environment on emissions. Within both sectors, improving weatherization and implementing energy management programs will help adapt buildings, and the grid, to the rising electric demand that will result from electrification.



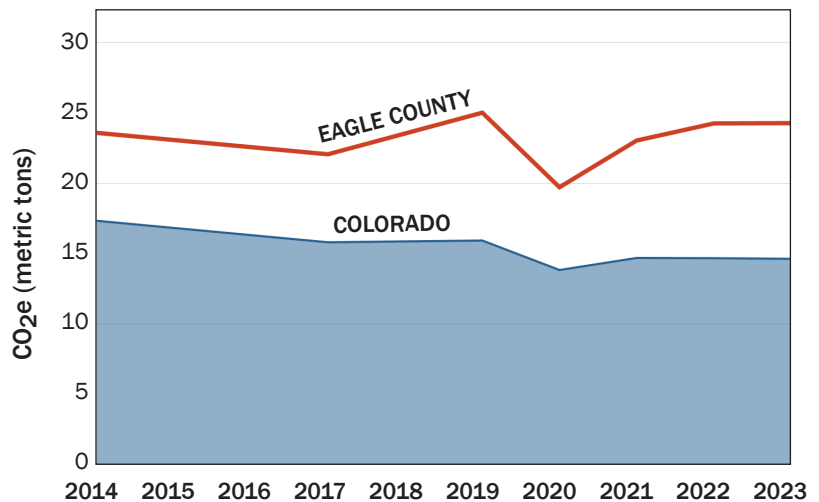
8. Building Natural Gas Emissions and Expenditures, 2014-22

One significant aspect of natural gas has been its rising cost. Eagle County experienced a 101% increase in the cost of natural gas since 2014, 73% of it in 2022. Due to changes in policy by Black Hills Energy, aggregated costs are no longer provided, and are only provided directly to customers. Therefore, the above analysis cannot be updated for 2023. While the rising costs are not directly related to emissions, past data is a valuable reference for future planning efforts.



9. Emissions per Capita, 2014-2023

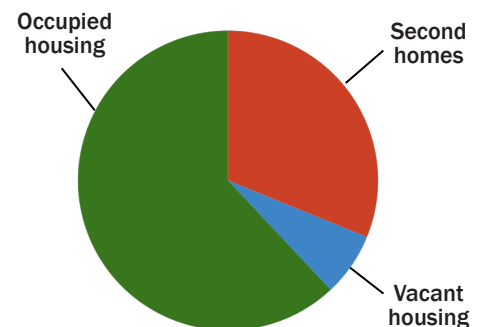
Eagle County’s per-capita greenhouse gas emissions significantly exceed the Colorado average. Contributing factors are transportation, as commuting emissions are over double the state average; second homes, which make up an estimated one-third of all housing stock; and lodging, which contributes emissions from visitors who are not counted in the permanent population. Understanding that Eagle County’s emissions include resort visitors and year-round tourism, measuring per-capita emissions may not be relevant as a comparison to other communities, but is included to show changes over time relative to the state.



10. Housing Occupancy in Eagle County

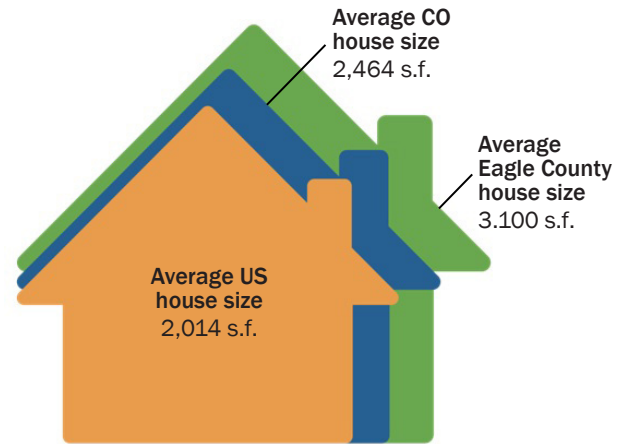
The following data was analyzed for the 2022 inventory to understand the impacts that the County’s demographic makeup has on emissions. It is again included in this inventory to help visualize the impact that occupancy behaviors and average home size have on the County’s emissions.

The West Vail Master Plan analysis performed by Economic & Planning Systems, Inc., in 2020 found that roughly one-third of the County’s housing stock is second homes. Second homes inflate per-capita emissions because their owners are not counted as part of the County’s permanent population. Per-capita emissions are further increased by the County’s average household size of just 2.0 people (compared to the state average of 2.6), which causes housing emissions to be divided by a smaller number of people.



11. Average House Size: Eagle County vs. Colorado vs. U.S.

The average Eagle County home is 3,100 square feet, 26% larger than the average Colorado home and 54% larger than the average American home. A 2023 study performed by Pitkin County highlights the dramatic increase in emissions in relation to the square footage of a home. According to this study, the average home in Colorado produces 10.5 lbs CO₂e/sq ft, or 26,000 lbs/CO₂e/year, whereas the average Eagle County home produces 30% more emissions at 12 lbs CO₂e/sq ft, or 18.5 tons CO₂e/year.



NOTE

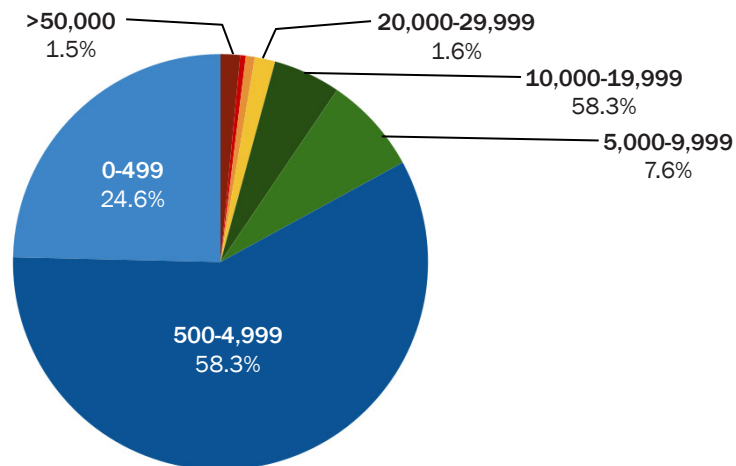
As buildings become more efficient and use less energy, the emissions attributed to the building sector will also likely decrease.

12. Commercial Buildings in Eagle County

Following the enactment of Colorado’s “Energy Performance for Buildings” statute (HB21-1286) in 2023, owners of commercial, multifamily and public buildings 50,000 sq. ft. or larger are required to annually benchmark their whole-building energy use and meet set building performance targets. Of the 4,404 commercial buildings in Eagle County, 67 are subject to this requirement. This requirement affects hospitals, lodging, multifamily housing, schools, and large retail buildings. Benchmarking tracks energy use, which is then used to estimate emissions. As mentioned above, emissions increase exponentially as the square footage of a building increases, so reductions in the largest buildings will show the most noticeable results.

| Building Square Footage | # of Buildings |
|-----------------------------------|----------------|
| >50,000 | 67 |
| 40,000-49,999 | 19 |
| 30,000-29,999 | 31 |
| 20,000-29,000 | 70 |
| 10,000-19,000 | 231 |
| 5,000-9,999 | 333 |
| 500-4,999 | 2,568 |
| 0-499 | 1,085 |
| Total Commercial Buildings | 4,404 |

13. Total Commercial Buildings by Square Footage



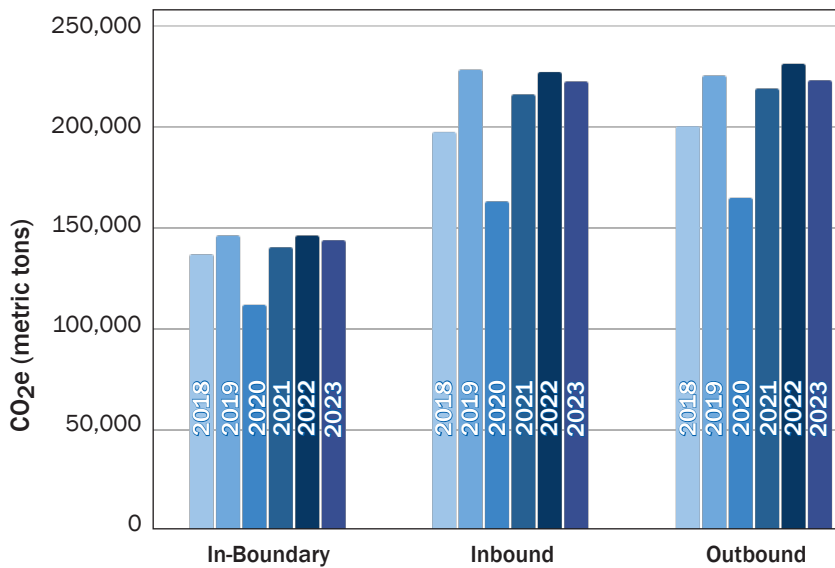
Section 4: Transportation Energy Use and Emissions

14. Transportation Emissions by Trip Type, 2018-2023

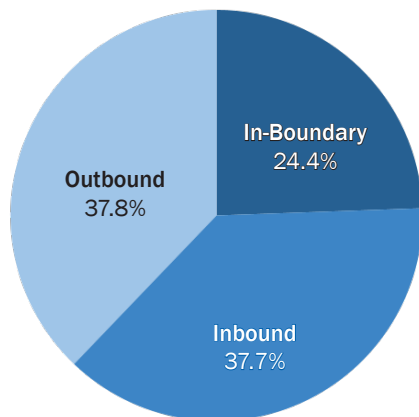
Transportation emissions declined by nearly 2% from 2022 to 2023. However, the longer-term trend shows an increase of 10% since 2018.

Transportation data for 2018-2023 was collected using Google’s Environmental Insights Explorer, which uses location services on individuals’ electronic devices to estimate vehicle miles traveled and emissions in three categories: in-boundary (trips that start and end within Eagle County), inbound (trips into the county from elsewhere) and outbound (vice versa). This data became available in 2018 and is more accurate than the pre-2018 data set (which was derived indirectly from CDOT trip data).

Efforts to reduce transportation emissions will need to focus on increasing public transit ridership, electric vehicle adoption and EV charging infrastructure. The greatest portion of transportation emissions results from transboundary travel, much of which can be attributed to commuter trips and tourism. Addressing these sources might be attempted through tourism fees that support infrastructure upgrades or rebates, and in supporting mode share for commuters.



15. Transportation Emissions by Trip Type, 2023

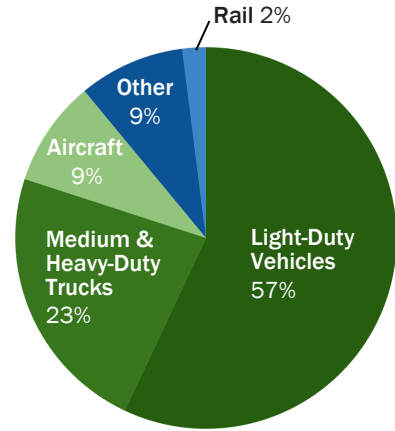


NOTE

Efforts to reduce emissions will need to focus on increasing public transit ridership, electric vehicle adoption and electric vehicle charging infrastructure while decreasing transboundary travel.

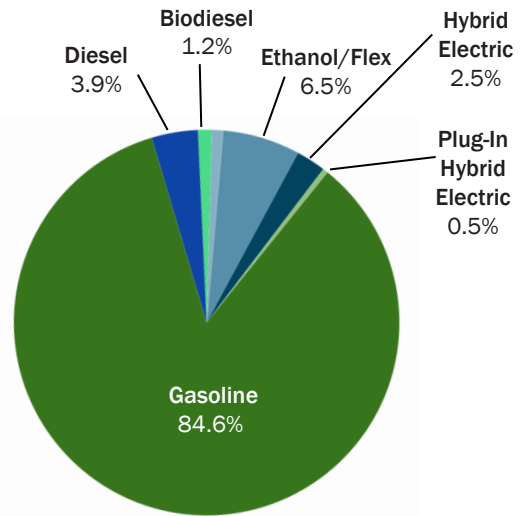
16. U.S. Transportation Sector Emissions by Source

While a breakdown of transportation emissions by category is not available at the county level, the relative proportions for Eagle County are believed to be consistent with national figures compiled by the EPA. Notably, light-duty vehicles (including passenger cars and light-duty trucks) are the largest category. These, combined with medium- and heavy-duty trucks, account for 80% of transportation emissions nationally. The data set was last updated in 2022.



17. Types of Vehicles Registered in Colorado

The State of Colorado published a data set from 2022 that breaks down the types of vehicles registered in the State. These percentages contribute to how transportation emissions are calculated in Eagle County.



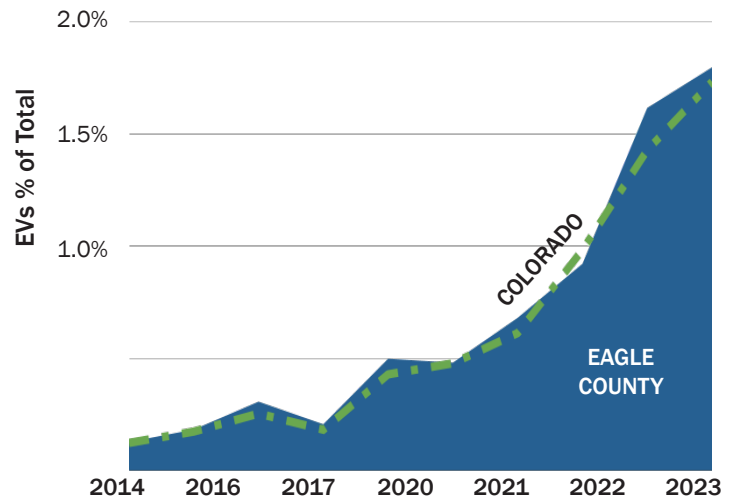
NOTE

State and federal incentives are expected to increase the rate of EV adoption in the next few years.

18. EVs Registered Annually, 2014-2023, Eagle County vs. Colorado

Electric vehicles (EVs) represented 1.8% of all registered vehicles in Eagle County in 2023 – comparable to the state figure of 1.7%. This data includes both plug-in hybrid vehicles and battery-electric vehicles. Similarly, the County’s EV adoption rate has tracked very closely with the state’s since 2014.

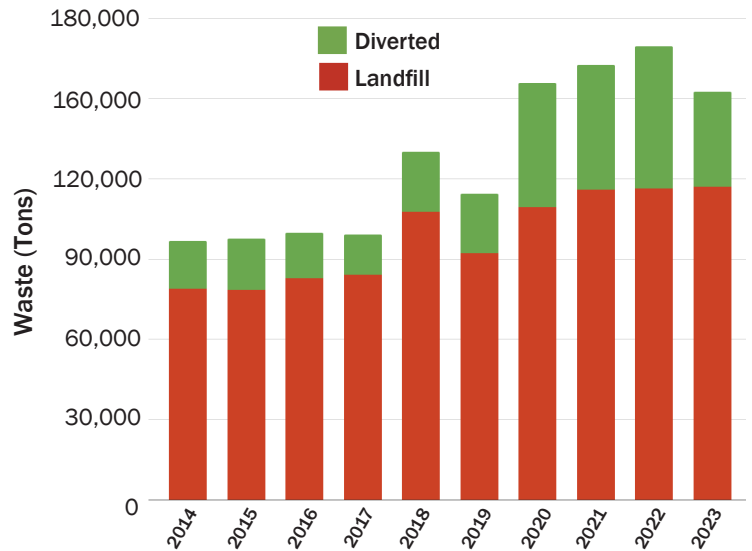
Incentives for residents and organizations can be employed to achieve the 2% annual increase in EV adoption as detailed in the Eagle County Electric Vehicle Infrastructure Plan. With the addition of state and federal incentives, the rate of adoption could be much higher over the next couple of years. Maintaining the adoption rates after state incentives have waned will be the challenge as 2030 nears.



Section 5: Solid Waste Emissions

19. Aggregated Eagle County Solid Waste by Category, 2014-2023

The Eagle County Landfill received 117,000 tons of disposed waste in 2023, and emitted 91,207 tons of CO₂e. The diversion rate in 2023 was 23%, which compares favorably to the statewide average of 16%, but is 7% lower than the previous year. Methane produced from organic material decomposing in the landfill is the primary source of solid waste emissions.



NOTE

Efforts should continue to focus on reducing organic waste (landscaping and food waste) and on increasing the diversion of other recyclables.

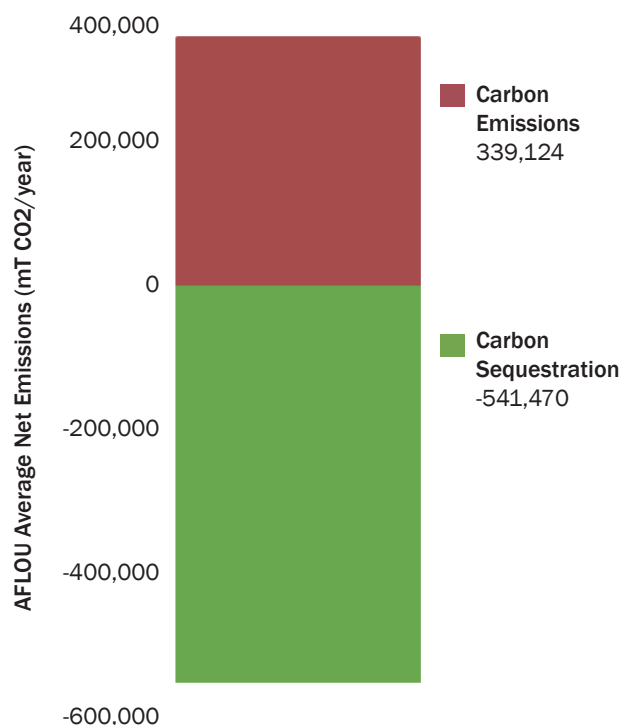
Section 6: Natural Climate Solutions

This 2023 inventory includes data from an analysis performed by Walking Mountains and the Climate Action Collaborative for Eagle County Communities, which quantifies the estimated emissions and removals from the Agriculture, Forestry and Other Land Use (AFOLU) sector.

The analysis estimated that during the period 2019-2021 the sector emitted 339,000 MT CO₂e, which came primarily from disturbances such as fire, timber harvesting and development. During the same time period, the AFOLU sector removed an estimated 541,500 MT CO₂e through carbon sequestration. Carbon sequestration occurs when healthy forests and landscapes are maintained and undisturbed for long periods of time, and from reforestation of disturbed sites. The results show an estimated net total of 202,000 MT CO₂e removed from the atmosphere through carbon sequestration.

This data provides some insight into the impact of the AFOLU sector on total emissions for the County. While the net carbon sequestration performed by the County’s natural systems can’t be used as a kind of credit to offset human-caused emissions – it is, rather, a baseline condition that must be at least maintained – the figure shows that our natural lands play an important role in supporting the health of Eagle County’s residents and natural systems. Strategies to maintain this health include encouraging regenerative farming practices such as no-till and cover crops, thinning dry brush and timber to reduce wildfire fuels, reusing existing developed land over disturbing green spaces for new development, and planning for density in growth rather than sprawl.

20. Eagle County Net Emissions Considering AFOLU Sequestration, 2019-2021



Acknowledgments and Sources

Data collection and analysis by Christina Matzl. Editing and layout by Diane Ernst and Dave Reed.

Special thanks to Eagle County Commissioners Jeanne McQueeney, Kathy Chandler-Henry and Matt Scherr for their continued leadership on the role local governments can take to address climate change and for commissioning this emissions inventory to be used by the Climate Action Collaborative to measure progress toward its goals.

ENERGY INVENTORY PROTOCOL

The Eagle County Emissions Inventory quantifies total energy use, costs and carbon emissions by sector and by fuel and utility source, using 2014 as the baseline year, utilizing an improved transportation metric in 2018, and adding new data from 2023.

The inventory's purpose is to understand how and where energy is used and emissions are generated. With this information, each energy-using sector can identify opportunities to increase efficiency, reduce emissions and reduce costs.

15 / 15 RULE

Per the Colorado Department of Regulatory Agencies, the 15/15 Rule is a privacy standard enacted to ensure customer anonymity when energy data is released to third parties. The rule requires that aggregated data include a minimum of 15 customers with no one customer's load exceeding 15 percent of the group's energy consumption. If this minimum cannot be met, the data will be removed from the information provided.

In Eagle County, there were a total of 26 customers removed from the Xcel Energy data set. Black Hills

AFOLU

The AFOLU analysis was completed using ICLEI's Land Emissions and Removals Navigator (LEARN) tool and reviewed by Erin Glen and Angela Scafidi from World Resources Institute. Imagery used to generate this data came from the U.S. Geological Survey's National Land Cover Database.

The following individuals provided data, insight, support and expertise for this report: John Gitchell and Kate Kirkman, Eagle County; Mike Steiner and Christina Conley, Holy Cross Energy; Mike Beyer, Yampa Valley Electricity Authority; Heather Baldwin, Black Hills Energy; Gina McCrackin, Will Barror and Amelia Kovacs, Walking Mountains.

This inventory complies with the U.S. Community Protocol for Accounting and Reporting of GHG Emissions (USCP). At least five emission-generating activities must be included for an inventory to be USCP compliant. This inventory surveys five activities: residential energy, commercial energy, vehicles, aviation and the landfill. Note that the AFOLU data is not included in the primary emissions calculations but as a supplemental piece of information in the report.

Energy initially removed 375 commercial accounts from the data set which included 66 unincorporated commercial customers in addition to the Town of Eagle's 309 commercial and government customers. The willingness of utility companies to share data is paramount in maintaining accurate emissions accounting. Though not as robust as previous data sets from BHE, CLEER was able to incorporate limited data regarding Town of Eagle's commercial buildings into the commercial unincorporated totals for this year's report.

SOURCES

[Section 1.1](#)

Holy Cross Energy, Xcel Energy, Black Hills Energy, Yampa Valley Electric Association, Eagle County Airport, Colorado Department of Transportation, Google Environmental Insights Explorer, and the 2023 Eagle County Diversion Report (Walking Mountains).

[Section 1.2](#)

Colorado 2021 data from [Colorado 2021 Greenhouse Gas Inventory Update With Historical Emissions from 2005 to 2021 and Projections to 2050](#), released September 2021, [U.S. Energy Information Administration](#), [EPA](#), [EPA Annexes to the Inventory of U.S. GHG Emissions and Sinks](#).

[Section 1.3](#)

Holy Cross Energy, Xcel Energy, Black Hills Energy, Yampa Valley Electric Association, Eagle County Airport, Colorado Department of Transportation, Google Environmental Insights Explorer and 2023 Eagle County Diversion Report.

[Section 2.4](#)

[Holy Cross Energy Power Supply Report](#). 2023 emissions data, direct from Holy Cross Staff

[Sections 3.5 - 3.13](#)

Holy Cross Energy, Xcel Energy, Black Hills Energy and Yampa Valley Electric Association.

Eagle County Assessor, [West Vail Master Plan](#), [Pitkin County 2023 GHG Analysis report](#), [Rocky Mountain Institute](#).

[Sections 4.14 - 4.15](#)

[Google Environmental Insights Explorer](#).

[Section 4.16](#)

[U.S. Environmental Protection Agency: Fast Facts on Transportation Greenhouse Gas Emissions, Active Fuels Data Center](#), Vehicles registered in 2022.

[Sections 4.17 - 4.18](#)

[Eagle County, U.S. Environmental Protection Agency: Green Vehicle Guide, Electric Vehicle Myths, U.S. Department of Transportation, Atlas Public Policy, CODOT](#).

[Section 5.19](#)

2023 Eagle County Diversion Report, Walking Mountains Science Center.

[Section 6.20](#)

2016-2021 analysis of Eagle County AFOLU emissions and reductions analysis provided by Walking Mountains and the Climate Action Collaborative

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