Eagle County Energy Inventory

2022 data on energy use, costs and emissions

EAGLE COUNTY

KEY FINDINGS

Eagle County's **greenhouse gas emissions** in 2022 totaled 1.43 million metric tons of carbon dioxide equivalent (CO2e) – an increase of 6% over emissions in the baseline year 2014. While much of that increase is due to population growth and tourism, the fact is that emissions are continuing to grow across all sectors; the County is not progressing toward its goal of a 50% reduction in emissions by 2030, and is in fact falling further behind. In the absence of more dramatic initiatives, the County will find it increasingly difficult to achieve that goal.

Looking at the building sector, **natural gas** usage increased by 17% compared to 2014, despite a considerable increase in the cost of gas during the same period. Natural gas now accounts for more emissions than electricity does, and the gap will only widen as the grid becomes greener. On the bright side, there is much room for improvement through the adoption of updated building codes and funding of incentive programs to encourage weatherization and electrification of homes, businesses and government buildings. Another factor contributing to emissions is the relatively large size of homes in the County, which again represents an opportunity for improvement.

The **electricity** picture is more positive. Consumption has increased by only 6% since 2014, while – thanks to a rapid increase in renewables supplied to the grid by Holy Cross Energy – emissions have decreased by a remarkable 38%. The latter trend looks to continue, as Holy Cross has set a goal of 100% carbon-free electricity by 2030. Note, however, that electricity demand is expected to increase as buildings are electrified and as a growing number of electric vehicles plug in.

Eagle County's **transportation** emissions increased by 13% between 2018 and 2022, and its per-capita transportation emissions now 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 EV charging infrastructure. EVs now account for 1.6% of vehicle registrations in the County, about the same proportion as is seen statewide.

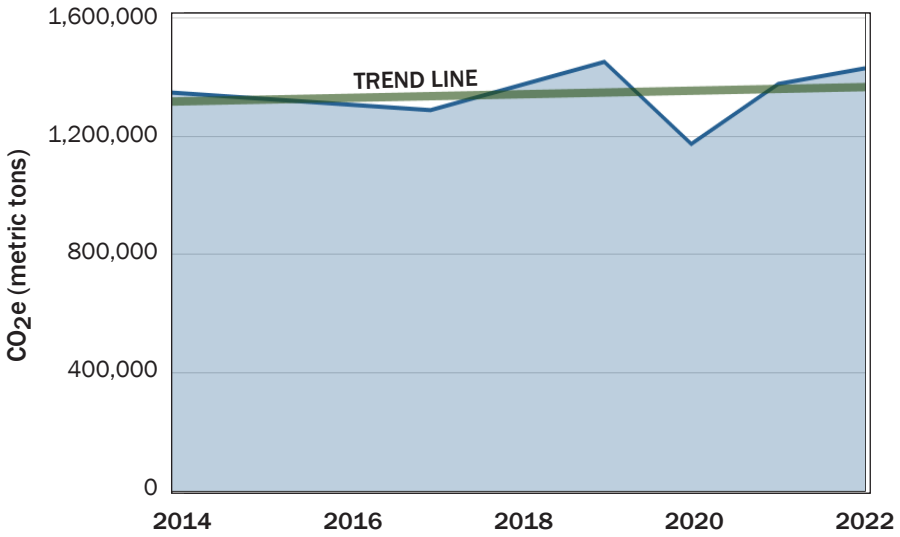
Solid waste emissions decreased 2.6% compared to 2014. Efforts to achieve further reductions can be highly visible, although it should be noted that waste makes up only 6% of the County's emissions.

Section 1: Overview of Emissions

1. Total Emissions, 2014-2022

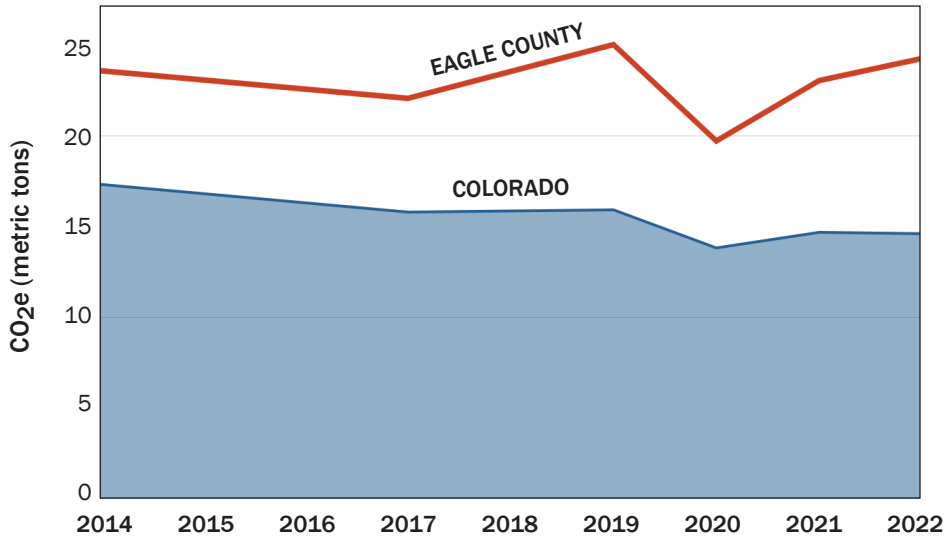
Eagl Eagle County set goals of reducing emissions 25% by 2025 and 50% by 2030, compared to 2014 levels. As of 2022, emissions had actually *increased* by 6% since the 2014 baseline year. Based on the trend so far, it is looking highly unlikely that the 2025 goal will be met.

As for the 2030 goal, it is worth noting that more than half of the 2014-2030 period has already passed. Given negative progress in the first half, the County will have to make major course corrections to cut emissions 50% in the next seven years.



2. Emissions per Capita, 2014-2022

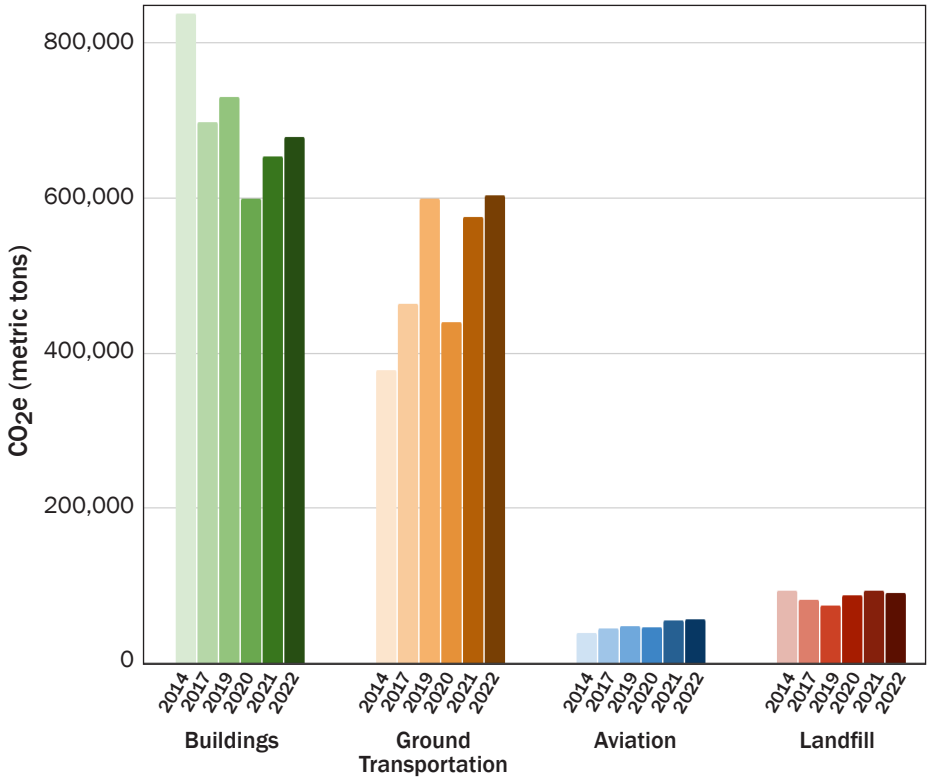
On a per-capita basis, greenhouse gas emissions are higher in Eagle County than in Colorado, and the gap is widening. Contributing factors are transportation, given that commute distances are double the national average; second homes, which make up an estimated one-third of all housing stock; and lodging, 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.



3. Change in Emissions by Sector, 2014-2022

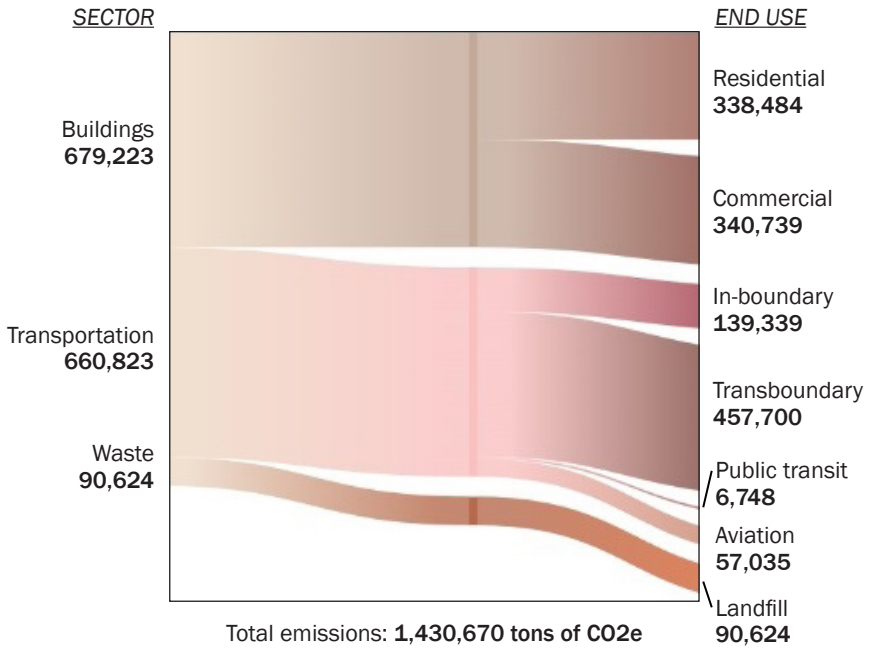
Despite a modest rebound since the pandemic, the building sector has seen a significant (19%) decrease since 2014. Electricity use actually increased 6% during the period - due, presumably, to population increase, EV charging and building electrification - but the growing proportion of renewable energy has more than compensated.

Transportation has trended in the opposite direction, increasing 60% since 2014 due to a steady increase in vehicle miles traveled and increased accuracy in transportation reporting.



4. Emissions by End Use, 2022

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 - that is, daily commuters and tourists entering and leaving Eagle County. (This is discussed in more detail in Section 5.) Public transit is shown to be a very small contributor to emissions.

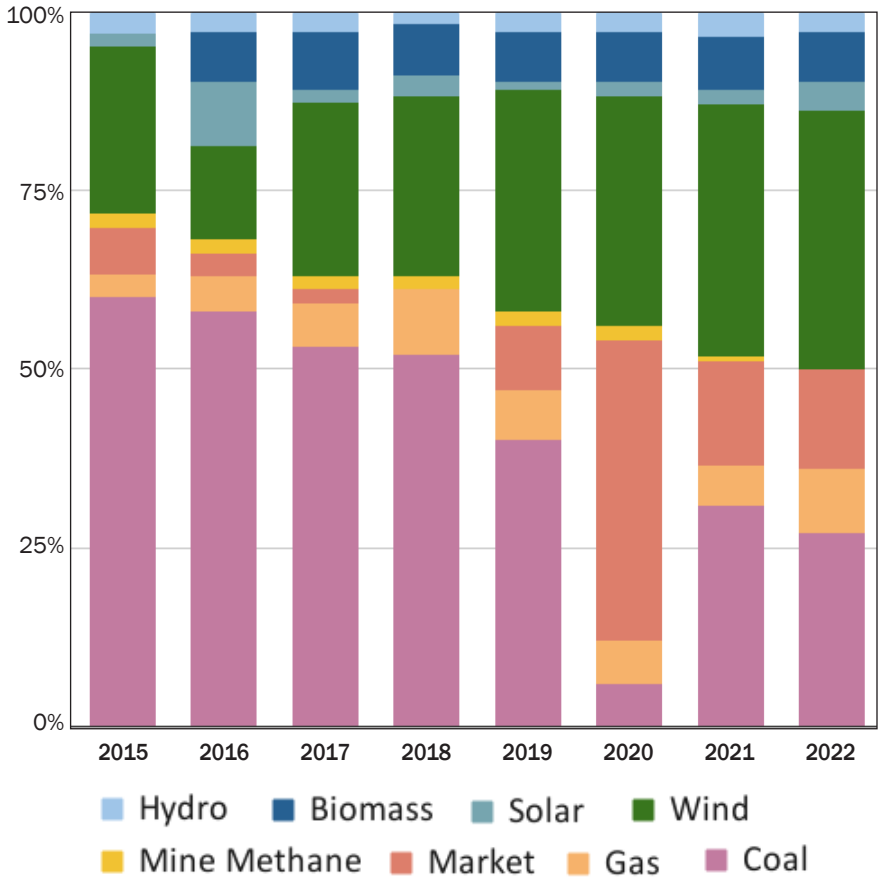


Section 2: Utility Energy

5. Holy Cross Energy's Fuel Mix, 2015-22

Holy Cross Energy provides 99% of the electricity consumed by residents in Eagle County.

As of 2022, the utility has increased its share of renewable energy to 50%. Holy Cross 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, Holy Cross 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 in Pueblo, and purchases hydropower from the Western Area Power Administration. "Market" energy is procured to offset any overages and the sources cannot be identified with a high level of certainty, but is assumed to be fossil fuels.



Section 3: Emissions from Buildings

The emissions tracked in this section include only those attributable to energy use in buildings. Transportation and waste emissions are not reported at the community level at this time.

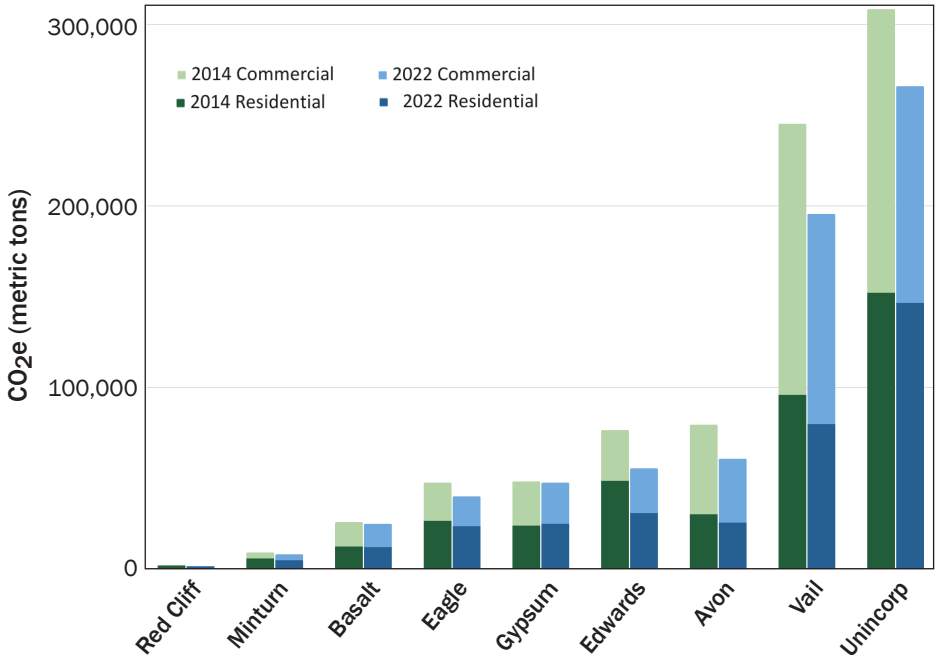
6. Buildings Emissions by Community, 2014 vs. 2022

Notes:

Edwards: Data for Edwards, an unincorporated community, includes the entire 81632 zip code.

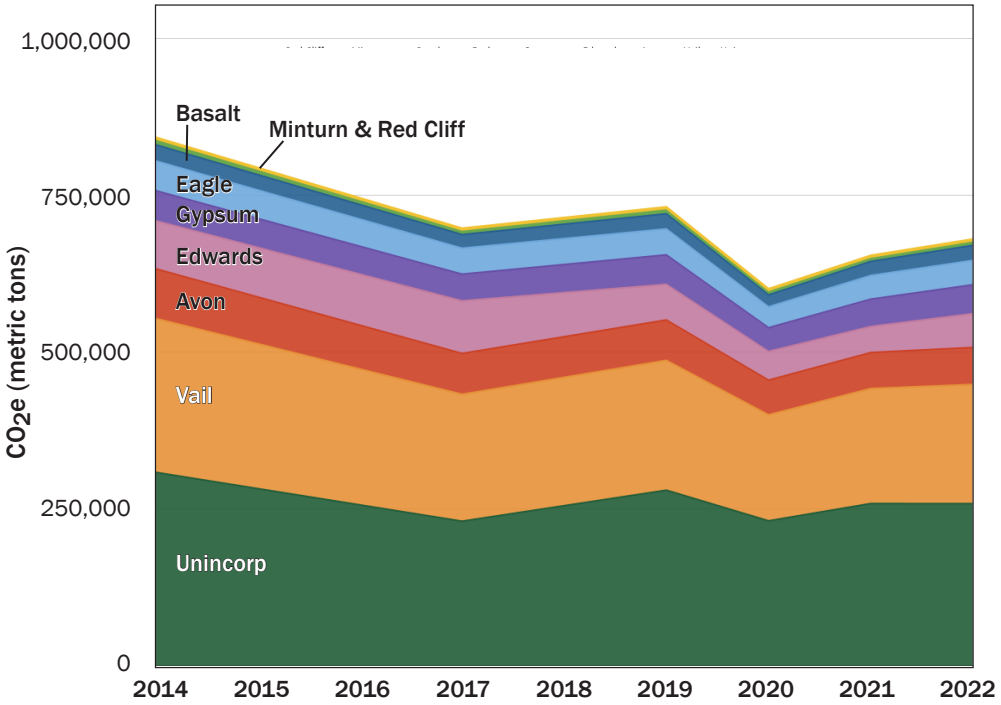
Unincorp: All of unincorporated Eagle County other than the 81632 zip code. This includes the unincorporated communities of Eagle-Vail, El Jebel, McCoy, Bond and Burns. It has more population and housing units than any of the county's individual municipalities.

Commercial: A broad utility designation for properties such as hotels, multi-family complexes with a single meter, recreational facilities (lifts and snow-making equipment), government buildings, schools, retail, industrial and manufacturing facilities.



7. Buildings Emissions by Community, 2014-2022

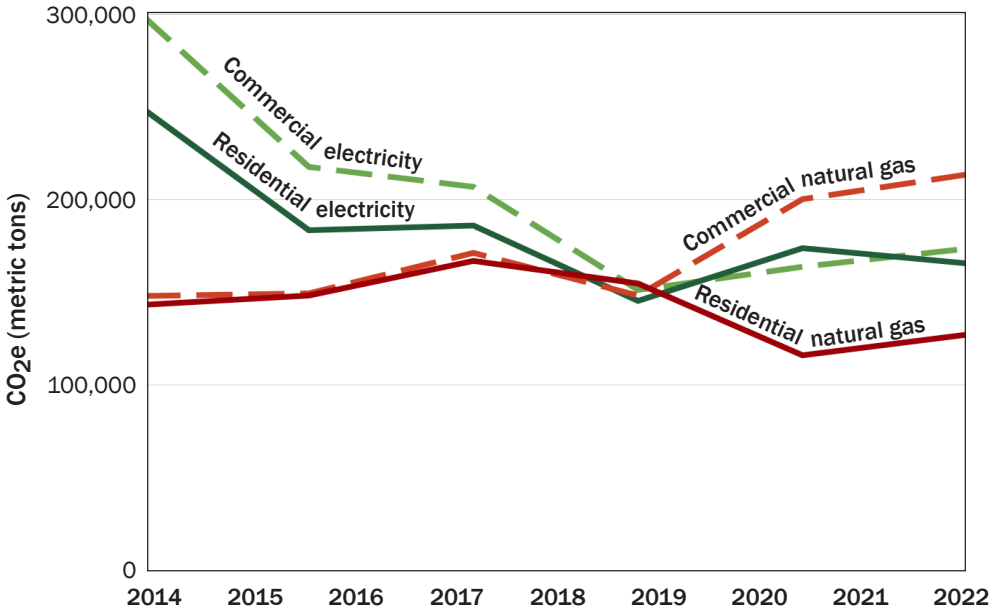
Most of Eagle County's communities, as well as its unincorporated areas, are showing a downward trend in emissions since 2014. Emissions in 2020 were artificially low due to the pandemic, and all communities have seen a rebound in 2022, but are still below 2019 levels. The decrease in emissions is largely due to the decarbonization of the grid by Holy Cross Energy.



8. Emissions by Fuel and Building Type

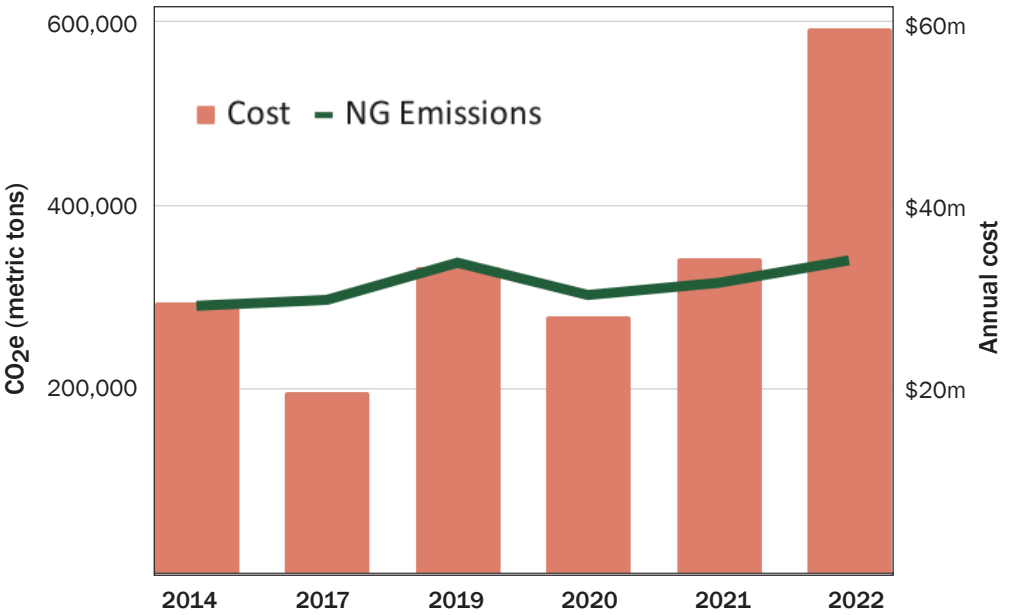
As the electricity grid becomes cleaner, the proportion of emissions attributable to natural gas increases. While the commercial and residential sectors share a near-even split of emissions from electricity, the commercial sector comprises 57% of natural gas emissions.

With the commercial sector now consuming the majority of building fuels, a focus on decarbonizing energy use in commercial buildings will greatly improve the impacts of the built environment. Within both sectors, improving weatherization and looking into energy management programs will help adapt buildings, and the grid, to the rising electric demand that will result from electrification.



9. Natural Gas Emissions and Expenditures, 2014-22

One significant aspect of natural gas that has been observed is its rising cost. Eagle County experienced a 101% increase in costs associated with natural gas since 2014, 73% of it in 2022. This is in sharp contrast with the historic average annual increase of 2.5%. While not directly related to emissions, this finding is an eye-opening detail that will affect the residents as the County moves toward greater energy efficiency and reduces emissions.

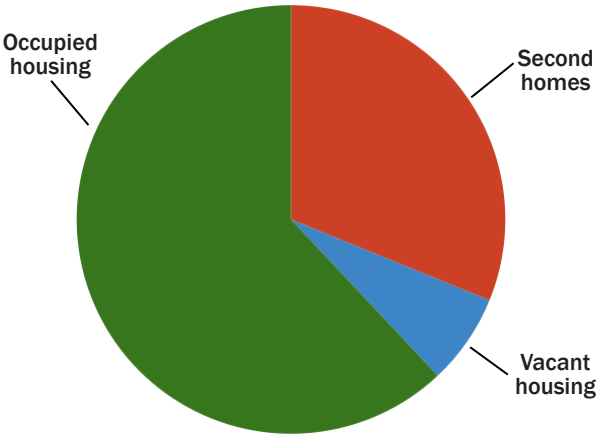


Section 4: Effects of Housing Demographics on Emissions

For the 2022 inventory, it was requested that housing in Eagle County be analyzed in an effort to understand the impacts that the County's demographic makeup has on emissions. The following analysis draws on data from the 2020 West Vail Master Plan, Eagle County Assessor records and a relevant study done by Pitkin County.

10. Housing Occupancy in Eagle County

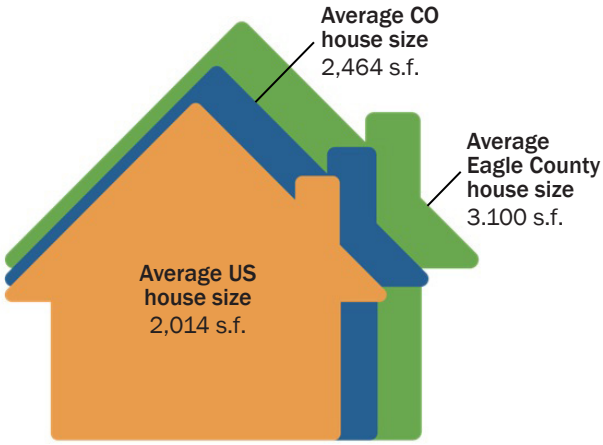
The West Vail Master Plan analysis performed by Economic & Planning Systems, Inc., found that second homes comprise roughly a third of the County's housing stock. Second homes inflate per-capita emissions because their owners are not counted as part of the County's permanent population. Per-capita emissions 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. US

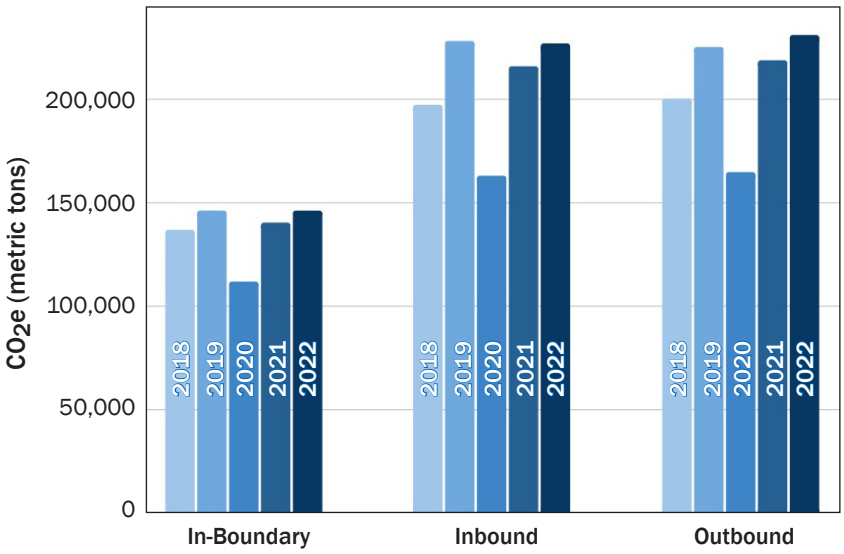
The average Eagle County home is 3,100 square feet, making it 26% larger than the Colorado average. Moreover, according to a 2023 study performed by Pitkin County, that average Eagle County home produces 14% more emissions per square foot than the state average, meaning that its total emissions are 44% greater. In absolute terms, the average Eagle County home produces 37,000 lbs. of CO2e per year.

The most impactful ways to reduce these emissions are to improve weatherization and transition buildings to all-electric.

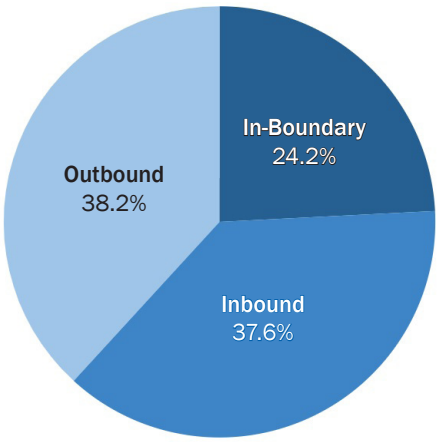


Section 5: Transportation Energy Use and Emissions

12. Transportation Emissions by Trip Type, 2018-2022



13. Transportation Emissions by Trip Type, 2022



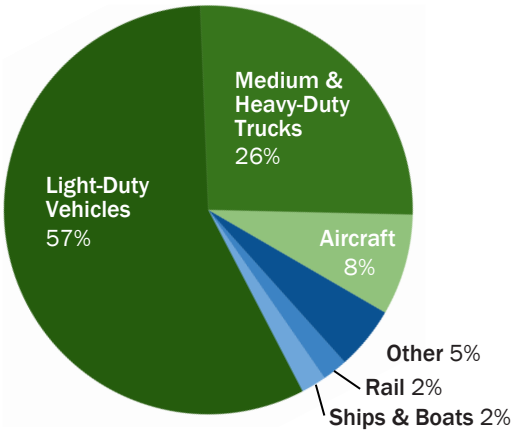
Transportation emissions have increased by 13% since 2018. Per capita, Eagle County residents account for 10 metric tons of CO2 emissions annually, which is roughly double the state average.

Transportation data for 2018-2022 was collected using Google's Environmental Insights Explorer, which uses location services on individuals' electronic devices to estimate transportation vehicle miles 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 superior to 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 are the result of the higher transboundary emissions, much of which can be attributed to commuter percentages and tourism. Addressing these sources might be attempted through tourism fees that support infrastructure upgrades or rebates, and in supporting mode share for commuters.

14. U.S. Transportation Sector Emissions, 2022

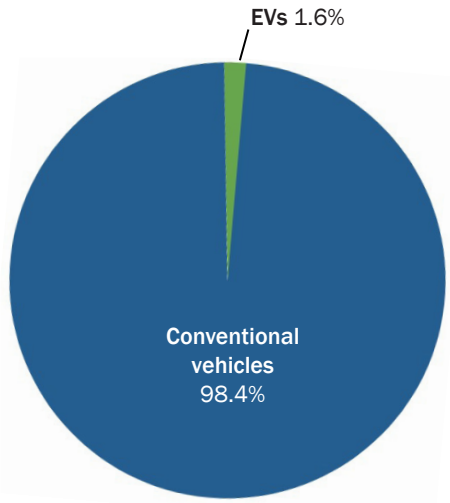
While a breakdown of transportation emissions by category is not available at the county level, the relative proportions for Eagle County are believed to be consistent with national figures compiled by the EPA. Notably, light-duty vehicles (including passenger cars and light-duty trucks) are the largest category. These, combined with medium- and heavy-duty trucks, account for 83% of transportation emissions nationally.



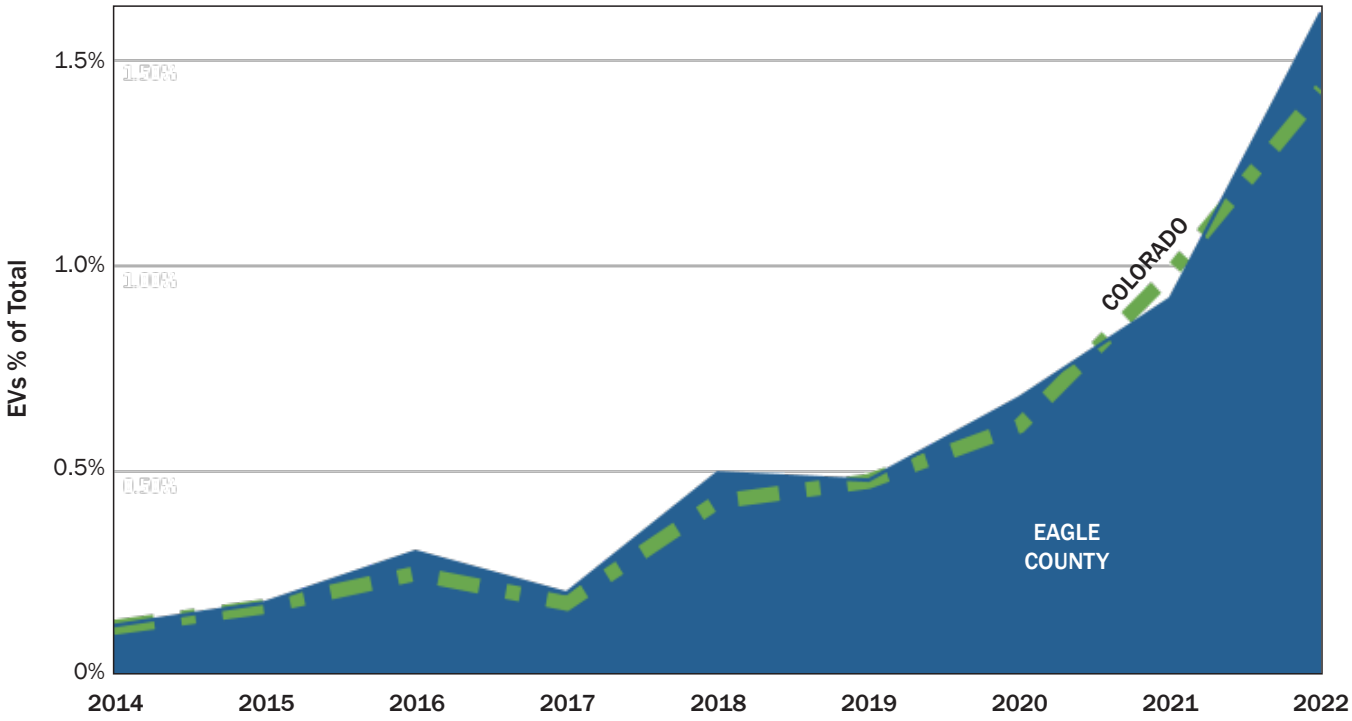
15. Total Registered Vehicles on the Road in Eagle County, 2022

Electric vehicles represent 1.6% of all registered vehicles in Eagle County - comparable to the state figure of 1.4%. These data include 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.



16. Annual EV registration, Eagle County vs. Colorado, 2014-22

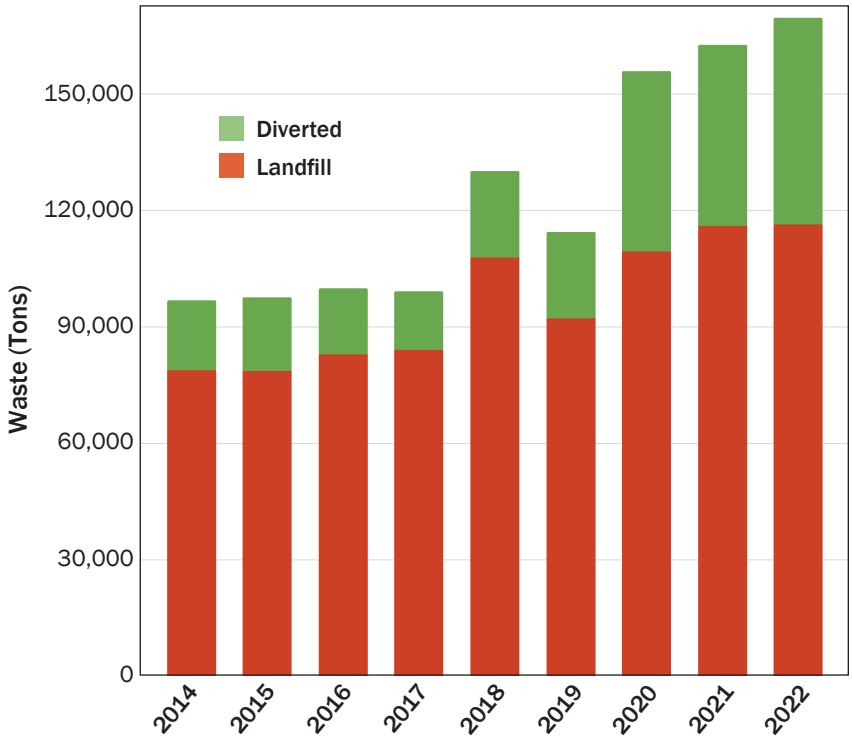


Section 6: Solid Waste Emissions

17. Aggregated Eagle County Solid Waste by Category, 2014-2022

The Eagle County Landfill received 116,276 tons of disposed waste in 2022, resulting in an estimated 90,624 tons of CO2e emissions. The diversion rate has increased in recent years, but not enough to offset the additional waste being disposed. Methane produced from organic material decomposing in the landfill is the primary source of solid waste emissions.

Efforts should continue to focus on reducing organic waste, including landscaping and food waste, and other recyclables. The diversion rate in 2022 was 31%, which compares favorably to the statewide average of 16%, but there is more room for improvement.



Acknowledgments and Sources

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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.

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 Science Center.

ENERGY INVENTORY PROTOCOL

The Eagle County Energy Inventory quantifies total energy use, costs, and carbon emissions by sector and by fuel and utility source, using 2014 as the baseline year and adding new data from 2022.

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

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.

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 2022 Eagle County Diversion Report (Walking Mountains Science Center).

Section 1.2

Colorado 2021 data from Colorado 2021 Greenhouse Gas Inventory Up-date With Historical Emissions from 2005 to 2021 and Projections to 2050, released September 2021 (https://drive.google.com/file/d/1SFtUongwCdZvZEEKC_VEorHky267x_np/view), Census.gov (https://www.census.gov/quickfacts/fact/table/eaglecountycolorado,CO,US/PST045222), U.S. Energy Information Administration (https://www.eia.gov/environment/emissions/state/), EPA (https://cfpub.epa.gov/ghgdata/inventoryexplorer/#allsectors/allsectors/allgas/econsect/current), EPA, Annexes to the Inventory of U.S. GHG Emissions and Sinks (https://www.epa.gov/system/files/documents/2022-04/us-ghg-inventory-2022-annexes.pdf).

Sections 1.3 - 1.4

Holy Cross Energy, Xcel Energy, Black Hills Energy, Yampa Valley Electric Association, Eagle County Airport, Colorado Department of Transportation, Google Environmental Insights Explorer and 2022 Eagle County Diversion Report.

Section 2.5

Holy Cross Energy Power Supply Report (https://www.holycross.com/greenhouse-gas-emissions/).

Sections 3.6 - 3.9

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

Sections 4.10 - 4.11

Eagle County Assessor, West Vail Master Plan (https://www.engagevail.com/5696/widgets/18833/documents/31391), Pitkin County 2023 GHG Analysis report (https://www.documentcloud.org/documents/23810137-ghg-analysis-report-pitco-2023-01-25-revision), Rocky Mountain Institute (https://rmi.org/all-electric-new-homes-a-win-for-the-climate-and-the-economy/),

Sections 5.12 - 5.13

Google Environmental Insights Explorer (https://insights.sustainability.google/). World Tourism Organization and International Transport Forum (2019), Transport-related CO2 Emissions of the Tourism Sector – Modelling Results, UNWTO, Madrid, DOI (https://doi.org/10.18111/9789284416660).

Section 5.14

U.S. Environmental Protection Agency: Fast Facts on Transportation Greenhouse Gas Emissions (https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions).

Sections 5.15 - 5.16

Eagle County (https://www.eaglecounty.us/community/about_us.php#collapse411b7), U.S. Environmental Protection Agency: Green Vehicle Guide, Electric Vehicle Myths (https://www.epa.gov/greenvehicles/electric-vehicle-myths), U.S. Department of Transportation (https://www.fhwa.dot.gov/policyinformation/statistics.cfm), Atlas Public Policy (https://atlaspolicy.com/evaluateco/), CODOT (https://www.codot.gov/programs/environmental/greenhousegas).

Section 6.17

2021 Eagle County Diversion Report, Walking Mountains Science Center.

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