

AGENDA

INFORMATION UPDATE

February 22, 2022

5:00 PM,



I. INFORMATION UPDATE

- I.A. Parks and Open Space Naming Policy
- I.B. Greenhouse Gas Emissions Inventory



INFORMATION MEMORANDUM

TO: Mayor and City Council

FROM: Matt Kuhn, Parks and Open Space Director

THROUGH: Austin Weiss, Parks and Recreation Director
Diane Foster, Assistant City Manager

MEMO DATE: February 15, 2022

MEETING DATE: February 22, 2022

RE: Parks and Open Space Naming Policy

REQUEST OF COUNCIL: This memo provides a summary of a proposed Parks and Open Space Naming Policy. Should City Council wish to discuss this item in a work session prior to staff providing a resolution for City Council consent, City Council should notify the City Manager.

SUMMARY AND BACKGROUND: The Parks and Open Space Department seeks City Council direction regarding the proposed Parks and Open Space Naming Policy. Currently, a formal and adopted naming policy does not exist for these City of Aspen properties.

The Parks and Open Space staff developed the proposed naming policy in 2009. At that time, the proposed policy was discussed at a work session with the former City Council. We have reviewed the recording from that meeting, and the Council at the time was supportive of the proposed policy. Subsequently, we have found that staff in 2009 prepared a resolution for Council consent, however it does not appear that the policy was formally adopted through resolution.

The following Parks and Open Space Naming policy is exactly as proposed in 2009. This framework provides a linear series of criteria that should be used to vet new park and open space names. It provides clear guidance for preference to names after geographic or common names, and provides some guidance for requests to name parks or open spaces after a person. Ultimately, the proposed policy defers to City Council to approve naming or re-naming parks.

Recently, a citizen has petitioned staff and the Open Space and Trails Board to rename Tot Lot park after an individual currently living in the neighborhood adjacent to the park. It was this question that has brought discussion and research around the proposed policy. The citizen request has, to date, not been brought to City Council. It should be noted that it is not staff's intention to thwart that request by adopting this policy. Rather, we hope to

provide Council and staff with a better understanding of process for future petitions and consideration.

Proposed naming policy:

City of Aspen Parks and Open Space Department Naming Policy

When naming or renaming various properties managed by the City of Aspen Parks and Open Space Department, the naming priorities will be as ranked and stated below:

- 1. Geographic or common usage identification*
- 2. Place or event of historical or cultural significance*
- 3. Natural or geological features*
- 4. A deceased individual/family that has made a significant land contribution to the City of Aspen, when naming has been stipulated as a condition of the donation.*
- 5. A person who has played a large part in protecting a particular parcel of land for public benefit or who has made a significant contribution to the community and has been deceased at least five (5) years.*

Name changes to parks, trails, and open space are generally discouraged, unless the present name causes confusion due to locations of properties with similar names. Renaming creates expense and confusion given the necessity for changing and updating signs, maps, brochures, website information, contact information, police and fire department personnel, and any other venue of information dissemination.

Any citizen or City staff member may submit to the City of Aspen Parks and Open Space Department a written recommendation for the naming or renaming of a property. The City of Aspen Parks and Open Space Department will then assess the appropriateness of the recommendation based upon the above ranking policy and will present the request and recommendations to the City of Aspen City Council for its review and potential approval.

FINANCIAL IMPACTS: There are relatively few direct financial impacts for adopting a naming policy. Indirect impacts include costs associated with changing names where signs, maps, brochures, websites, and other resources need to be revised upon name changes.

ENVIRONMENTAL IMPACTS: None.

ALTERNATIVES: City Council could direct staff to change the proposed policy, or to amend or delete certain conditions.

RECOMMENDATIONS: Staff recommends bringing the proposed Parks and Open Space Naming Policy to City Council as a Resolution in a forthcoming regular meeting.

CITY MANAGER COMMENTS:



INFORMATION ONLY MEMORANDUM

TO: Mayor and City Council
FROM: Tim Karfs, Sustainability Programs Administrator
THROUGH: Ashley Perl, Climate Action Manager
MEMO DATE: February 18, 2022
MEETING DATE: February 22, 2022
RE: Greenhouse Gas Emissions Inventory

PURPOSE: The purpose of this memo is to provide City Council with the findings from the 2020 Community Greenhouse Gas (GHG) Emissions Inventory. This data provides the foundation for City Council's carbon reduction goal and will inform Aspen's continued progress in all areas of environmental sustainability including energy use, waste reduction, transportation, and renewable energy.

SUMMARY AND BACKGROUND:

The key takeaway from the data is that although Aspen has achieved some documented reductions in greenhouse gas emissions, significant work is still required if Aspen wishes to contribute positively in the fight to lessen the impacts from a changing climate. Business as usual calculations show that Aspen will not meet its targets unless it decisively ramps up its decarbonization efforts.

Greenhouse Gas Inventory Basics: GHG inventories are used by municipalities, organizations, private businesses, and countries across the world to track and measure the emissions associated with particular actions or entire communities. They are used to inform climate action planning efforts and to provide an estimate of a community's carbon footprint for a given time. Aspen adheres to the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC) which is a globally accepted process for cities to measure and track GHG emissions.

Some might imagine that GHG emissions can be measured using a real time air measurement tool, but in reality, GHG emissions are calculated by taking data from utilities and other sources and calculating how much energy was used over the course of a year and then applying emissions factors to each type of energy. This calculation yields total greenhouse gas emissions per sector per year. Sectors of GHG emissions can vary and in Aspen the sectors are historically divided into commercial buildings, residential buildings, on-road transportation, airport operations, and waste processing.

Aspen's History: Aspen conducted its first GHG inventory in 2005 with data from 2004, and continued to produce inventories for the years 2007, 2014, 2017, and now 2020. Using the 2004 inventory as a baseline, Aspen set ambitious GHG reduction goals in

2007 that aimed to reduce emissions 30% by the year 2020 and 80% by the year 2050. The 2017 inventory showed that the Aspen community had reduced emissions 21% compared to the 2004 baseline.

DISCUSSION:

Changes to Methodology: The most recent inventory used updated assumptions and as a result has a more robust methodology than previous inventories. Specific changes to the methodology are noted below.

- **Two Years of Data.** In past years, staff collected data from a singular year. However, this time around, data was collected from both 2019 and 2020 to understand the impacts of COVID-19 and broader trends before and during the pandemic.
- **Smaller Geographic Area.** All of Aspen's past inventories collected data from a geographic region that was similar to the Urban Growth Boundary and included parts of Red Mountain as well as some on-mountain activities. However, in 2020 other governments in the region, including Pitkin County, Basalt and Snowmass joined in partnership with the City of Aspen to conduct a region-wide inventory. According to global reporting protocols, Aspen's GHG boundary became about 20% smaller (more reflective of the City's municipal boundaries) so as to not double count areas where other governments were claiming responsibility for the emissions. While this aligns with best practices and will benefit decision makers moving forward, it also has the effect of making previous years' inventories not comparable to the 2020 inventory. However, the 2017 inventory was adjusted, or backcasted, to allow for comparability between 2017 and 2020.

Changes to City of Aspen GHG Reduction Goals: In 2021, City Council set three priority goals for a two-year period and one of these goals is to reduce greenhouse gas emissions to the amount that is scientifically necessary to prevent the most catastrophic effects of climate change. One of the first actions City Council took to make progress on this goal was to adopt science-based GHG reduction targets, which replaced the former 30% by 2020 and 80% by 2050 goals with new goals to reduce emissions 63% by 2030 and 100% by 2050.

These goals accurately represent the speed and scale of carbon reduction that Aspen must achieve to responsibly do its part in preventing catastrophic global warming. It should be noted that Aspen's new science-based targets use a baseline year of 2017 instead of 2004, as in the past. This is a best practice that puts Aspen in alignment with other global cities in their path to reach zero carbon. The downside to using this approach is that Aspen's progress is no longer measured against a 2004 baseline and is instead measured against a more ambitious but universal 2017 baseline.

The progress that has been made in carbon reduction between 2004 and 2017 is significant, documented and has positioned the community well to reach future goals. Aspen has been a leader in carbon reduction for over twenty years and staff is confident in the community's ability to rise to the challenge of dramatically reducing carbon even further.

Progress Over Time: By comparing the back-casted 2017 inventory with the comparable geographic boundary used in 2020, this data shows that Aspen achieved a 23% reduction in community wide emissions from 2017 to 2020. Many of these reductions are attributed to closures and reduced activity associated with COVID-19. Despite this, these reductions remain significant and show that the Aspen community has the technical ability to dramatically reduce emissions.

Figure 1: Aspen's forecasted emissions and reduction goals.

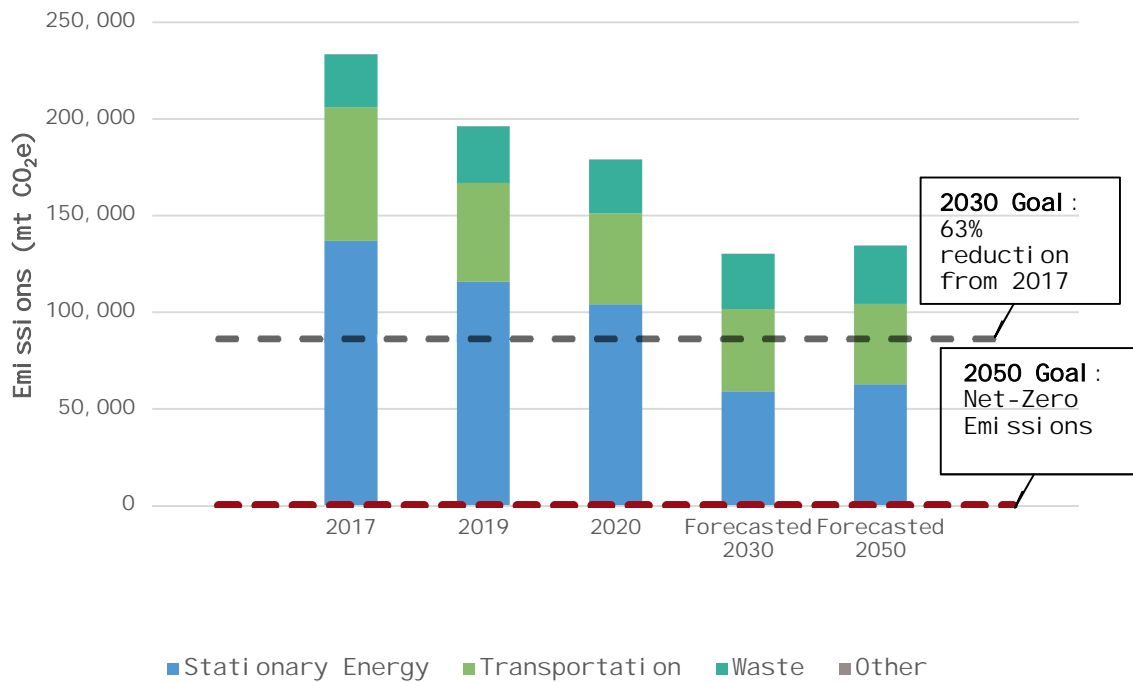
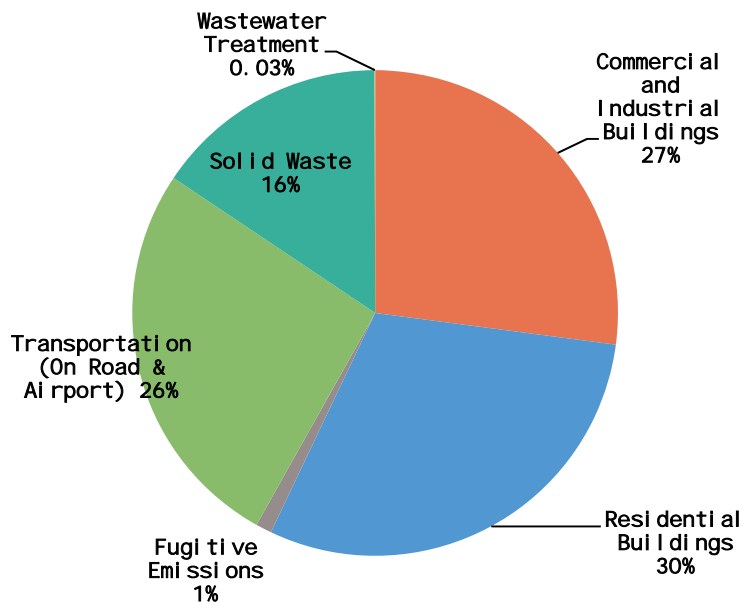


Figure 2: Aspen's 2020 emissions by sector.



Key Findings: The following trends demonstrate that Aspen is both securing incremental wins and will need to do more to reduce emissions:

- **Commercial and residential buildings:** Emissions from the building sector contribute to the largest portion (57%) of Aspen's total emissions. These emissions primarily come from the use of natural gas and electricity consumption in those buildings, which is in line with national trends. At the same time, the building sector achieved the most significant reductions out of all sectors which is a direct result of cleaner electricity being procured by local utilities. Aspen Electric has provided customers with 100% renewable energy since 2015 and Holy Cross Energy's commitment to 100% carbon free electricity by 2030 ("100x30") has resulted in a rapid adoption of renewables.
- **Waste:** Emissions from the disposal and processing of waste are the third largest source of community emissions comprising 16% of the total share, with construction and demolition waste representing the vast majority. On average, 17.3 pounds of waste is produced per capita each day in Aspen. This is nearly four times the US average. It is notoriously difficult to attribute waste that enters a landfill to a specific community and as a result the waste generated by Aspen's visitors is assigned to residents.
- **Transportation:** Emissions from Aspen's airport represent 15% of the total community emissions. The airport has been included for consistency with previous inventories. However, it should be noted that local officials have limited authority to reduce emissions at the airport from a policy perspective. Transportation related emissions have decreased since 2017, now representing 11% of the total. This reduction is primarily due to a change in methodology which now uses more accurate data to measure vehicle movement.
- **COVID-19 impacts:** Aspen's total emissions were impacted by the COVID-19 pandemic by approximately 9%. This is noteworthy as many other global cities have reported more significant reductions in their emissions due to COVID-19 disruptions. This shows that Aspen's overall 23% reductions since 2017 is partly due to climate action programming and the addition of renewable energy to the regional grid and partly due to covid closures.

Conclusion and Next Steps: The 2020 community GHG inventory and accompanying memo represents the completion of a key milestone for City Council's carbon reduction goal and provides staff the necessary baseline data for completing a technical update to the Climate Action Plan. The Climate Action Plan was first created in 2007 and went through an in-depth update in 2017. Much of the content remains relevant today and the forthcoming technical update will adjust the priority actions to align with a pathway to achieve Aspen's science-based targets.

Additionally, this memo, accompanying GHG inventory report, and refinement to the emissions inventory methodology and boundary are valuable to City Council to inform this year's priority climate actions. Equipped with the key findings from the 2020 GHG inventory report, City Council and staff have a useful reference point to act and achieve

deeper GHG reductions. Bold action is necessary to get Aspen over the line to do its part to reduce emissions by 63% by 2030 and reach net-zero by 2050.

ENVIRONMENTAL IMPACTS: There is no direct environmental benefit from conducting a GHG inventory. However, this inventory will serve as the basis for Aspen's climate planning efforts moving forward and acts as a valuable tool for reducing GHG emissions across the community.

ATTACHMENTS:

Attachment A – 2020 Aspen Community Greenhouse Gas Emissions Inventory

A photograph of a forest scene. In the foreground, there are dark green evergreen branches. In the background, several tall, thin, white-barked trees (likely aspens) stand vertically. The foliage of these background trees is a vibrant yellow, suggesting autumn. The lighting is warm, creating a golden glow through the yellow leaves.

City of Aspen

2020 Greenhouse Gas Emissions Report

January 2022

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Executive Summary

Protecting the environment is a salient value within the City of Aspen (Aspen) community. The city is committed to fighting climate change and preserving the natural beauty that characterizes the region. Since 2004, Aspen has tracked their (greenhouse gas) GHG emissions and implemented rigorous emission mitigation policies, establishing itself as a leading city in the fight against climate change.



In line with ICLEI's Race to Zero Pledge¹, Aspen recently revised its climate goals to strive for a 63% reduction in emissions by 2030 and a 100% reduction in emissions (i.e., achieving zero carbon) by 2050 (over a 2017 baseline).

Aspen and surrounding communities conducted 2019 and 2020 GHG emissions inventories to understand current emissions sources and to inform future climate action planning. Due to the COVID-19 pandemic, 2020 was not a representative year of typical GHG emissions. Therefore, both a 2019 and 2020 inventory were conducted to understand the impact of COVID-19 and broader trends.

Aspen's Emissions Reduction Goals

63% reduction of
GHG emissions by
2030 over 2017
baseline.

100% reduction of
GHG emissions (net-
zero) by 2050 over
2017 baseline.

SUMMARY OF 2020 INVENTORY RESULTS

- Aspen's emission total in 2020 was 179,086 metric tons of carbon dioxide equivalents (mtCO₂e). Since 2017, Aspen has reduced emissions by 23%.
- In line with national trends, the buildings sector produced the greatest amount of Aspen's GHG emissions, comprising 57% of the total. Between 2017 and 2020,

¹ See <https://iclei.org/race-to-zero/>.

residential emissions decreased 30% and commercial emissions decreased 18%. Natural gas generated the most emissions at 32% of the community's total, followed by electricity at 26%.

- Since 2017, residential and commercial energy emissions have decreased significantly. This can largely be credited with the adoption of renewable energy policies and programs by the city's electric utility providers: Aspen Electric has transitioned to 100% renewable energy and Holy Cross has been actively greening its fuel mix over the past several years.
- Transportation emissions were the second greatest contributor to the total, where 15% of Aspen's total emissions come from the aviation sector and on-road transportation makes up 11% of Aspen's total emissions. On-road emissions are more easily influenced by local policy and programs than aviation. While emissions from the aviation sector have increased since 2017, on-road transportation emissions have decreased significantly.

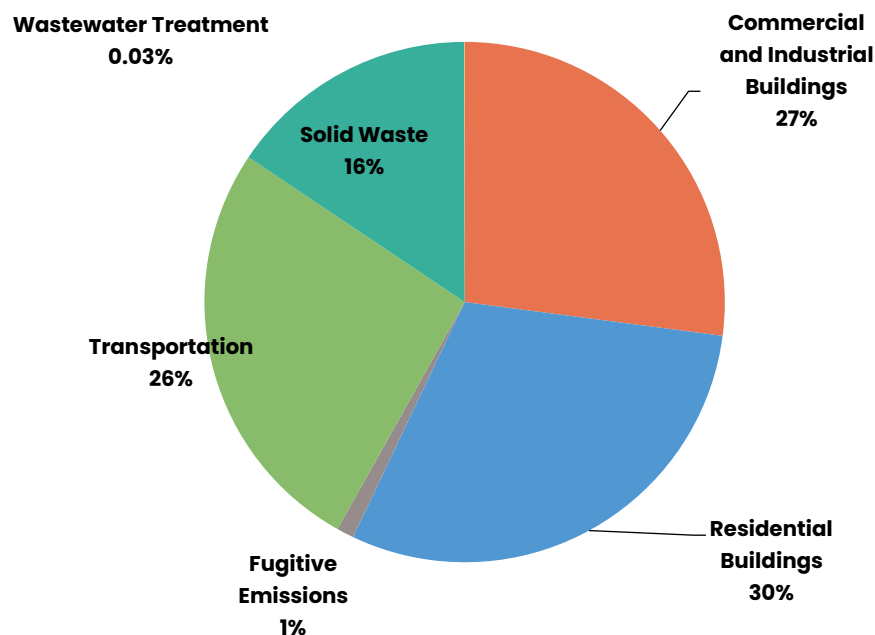


Figure ES 1: Aspen's 2020 emissions by sector.

- Aspen residents generated almost 26 tons of emissions per capita in 2020; while this is higher than the national average of approximately 20 tons per person,² the influx of population that Aspen experiences during the summer and winter tourism months is not reflected in the per capita total.
- Aspen's emissions decrease by 9% between 2019 and 2020. Much of the decrease in emissions during this time can be attributed to pandemic factors; specifically, the steep drop in transportation and commercial energy emissions.
- While Aspen is making good progress towards its goals by achieving a 23% reduction in emissions between 2017 and 2020, the emissions forecasts indicates that the community is unlikely to meet its emissions reduction targets without further action.

Key Findings for 2020

In 2020, the City of Aspen reduced overall emissions by 23% from the 2017 baseline.

The buildings sector contributed the largest share of emissions at 57%.

Residential buildings generated slightly more emissions than commercial buildings, and natural gas generated more emissions than electricity use.

Transportation activities, including those at the Aspen-Pitkin County Regional Airport, comprised 26% of emissions.

Waste emissions made up 16% of Aspen's 2020 inventory.

There was a 9% decrease in emissions from 2019 to 2020. This decrease in emissions can largely be attributed to the pandemic.

While Aspen is making good progress towards its goals, the community needs to take aggressive action to meet its emissions reduction targets.

² See https://www.epa.gov/sites/default/files/2021-04/documents/us-ghg-inventory-2021-chapter-executive-summary.pdf?VersionId=zIDuKzdiajVIVgYiik_CGXhk36JU02zr.

PROGRESS TOWARDS EMISSIONS GOALS

Emissions have decreased 23% since the 2017 inventory (assumptions used were consistent from 2017 to 2020 inventories). This significant decrease is due in large part to the reduced carbon intensity of purchased electricity in Aspen as well as Aspen's effective climate mitigation programs. The COVID-19 pandemic also played a role in reducing emissions, particularly in the transportation and commercial energy sectors.

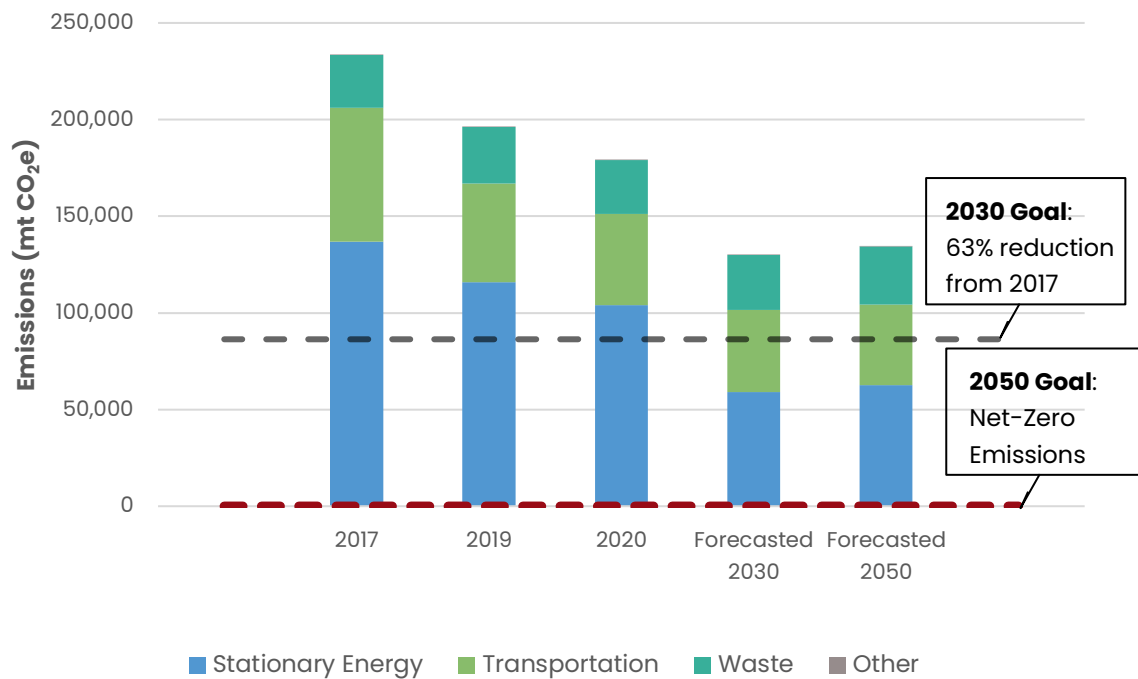


Figure ES 2: Aspen's business-as-usual forecasted emissions and reduction goals.

Aspen is making progress towards its goal of a 63% reduction in emissions by 2030, but based on a business-as-usual forecast, a concentrated effort will be needed to reach both the 2030 goal and the ambitious goal of reducing all emissions (net-zero) by 2050. Increasing the rate of implementation and intensity of emissions reductions strategies and policies, particularly those outlined in Aspen's CAP, will be necessary for Aspen to achieve its goals.

Introduction

The 2020 Intergovernmental Panel on Climate Change (IPCC) report issued a “code red for humanity,” warning that human activities are changing the climate at an unprecedented rate. The report states that, “unless rapid and deep reductions in CO₂ and other greenhouse gas (GHG) emissions occur,” global warming will exceed 1.5 degrees Celsius in the coming decades.ⁱ



The climate crisis could have long-term impacts on the local economy, environment, and human health in Aspen. The region could see temperature increases between 2.5–6.5 degrees Fahrenheit; hotter and drier summers; and greater amounts of winter precipitation falling in the form of rain rather than snow.ⁱⁱ Observed changes in regional conditions, such as the fact that Aspen is experiencing 31 more frost-free days per year than it was between 1980–1989, provide evidence that climate change is already manifesting itself locally.ⁱⁱⁱ As is the case globally, the degree to which Aspen will be affected by climate change over the medium and long term is directly tied to current and future emissions trajectories.

While tackling climate change requires global-scale emissions reductions, communities like Aspen have the power to lead in emissions reductions and inspire action by example. Through the implementation of ambitious local climate policies and dramatic GHG emission reductions, Aspen has the power to inspire regional, national, and international planning efforts.

About the GHG Inventory

The Community Office for Resource Efficiency (CORE), the City of Aspen (Aspen), and Pitkin County contracted Lotus Engineering and Sustainability, LLC (Lotus) to create 2019 and 2020 greenhouse (GHG) emissions inventories for Aspen and surrounding communities. The purpose of these inventories is to understand current GHG emission sources and guide future climate action planning. The inventories include all BASIC sources and sectors per the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC protocol) methodology,³ plus additional sources of emissions from aviation activities at the Aspen-Pitkin County Regional Airport. More information about the methodology of the inventory can be found in Appendix B.

GHG emissions are a product of emission factors and activity data and are reported in metric tons of carbon dioxide equivalent (mt CO₂e). Emission factors represent the carbon intensity of the fuel or materials used in a specific activity, while activity data refers to the data measured related to community activities, such as fuel consumed, electricity consumed, tons of waste generated, and vehicle miles traveled

GHG Emissions:

Scope 1, 2, and 3

Scope 1: GHG emissions from sources located within the community's boundary, including:

- Energy and transportation fuel combustion.
- Fugitive emissions (i.e., leakage of natural gas).
- Wastewater treated within the boundary.

Scope 2: Emissions occurring outside of the boundary because of the use of grid-supplied electricity, heat, steam, and/or cooling within the boundary.

Scope 3: GHG emissions that occur outside the boundary because of activities taking place within the boundary:

- Solid waste (including compost) treated outside the boundary.
- Transportation activities for which fuel combustion occurs outside the boundary.

³For more information regarding GPC see: http://c40-production-images.s3.amazonaws.com/other_uploads/images/143_GHGP_GPC_1.0.original.pdf?1426866613.

ASPEN'S EMISSIONS INVENTORY BOUNDARY

Aspen's GHG inventories prior to 2019 used an emissions inventory boundary (EIB) that included the City of Aspen and parts of unincorporated Pitkin County around the city, including ski areas, residential neighborhoods, and the Aspen/Pitkin County Airport. This boundary was used previously because it was assumed to capture emissions from the geographic area that represents the total of Aspen's core functionality and economy. Aviation activities are attributed to Aspen due to the prevalence of tourism-driven activities in the community

The 2019 and 2020 inventories use Aspen's legal boundaries to fully align with the GPC protocol and the methods used for other surrounding communities—in this way, using the City boundary avoids double-counting with inventories created for unincorporated Pitkin County. Due to the smaller geographic boundary in the 2019 and 2020 inventories compared to prior



years, emissions from previous Aspen inventories were originally calculated to be significantly higher. The 2017 Aspen inventory has been adjusted to reflect the new geographic boundary so accurate comparisons can be made between the 2017 baseline year and subsequent inventories.

COVID-19 IMPACT ON EMISSIONS

The COVID-19 pandemic brought unprecedented changes to communities across the world. Thus, 2020 was not a year that represents typical emissions behaviors. National GHG emissions declined 10% from 2019–2020, marking a record-breaking decrease in the United States. The national drop in emissions is largely attributed to the pandemic. To understand typical emissions behavior as well as the impact of COVID-19, Aspen and surrounding communities conducted an inventory for both 2019 and 2020.

Analyzing the changes from 2019 to 2020 provides insight into how the pandemic may have influenced emissions behavior.

In the City of Aspen, emissions decreased 9% from 2019–2020, closely mirroring the national trend. Commercial activity and transportation were the greatest sectors impacted by COVID-19 policy. There were notable reductions in each of these sectors. Commercial and industrial building energy decreased 14% from 2019–2020. The transportation sector saw an 8% decline in vehicle miles and a related reduction in on-road transportation emissions (decrease of 9%). Aviation emissions also decreased 8% between 2019–2020. The reduction in commercial and transportation emissions from 2019–2020 can largely be attributed to the pandemic, rather than drastic policy changes or program success.

Aspen's GHG Emissions Inventory Trends

OVERALL EMISSIONS TRENDS

In general, GHG emissions are driven by activity occurring within the community, and significant changes to community size, economy, and character will impact how emissions change over time. From 2017 to 2020, Aspen's population grew by nearly 2%, with an 8% increase occurring from 2017 to 2019, and then a 6% drop from 2019 to 2020. It should be noted, however, that population data does not account for the influx of visitors to the community in the summer and winter tourism months. In addition, census data was harder to collect in 2020, due to the COVID-19 pandemic. Population values, particularly those from 2020, may not be an accurate representation of the actual number of people living in Aspen over the year.

Table 1: Aspen population and housing trends.

Population and Housing Data				
Indicator	2017	2019	2020	2017 to 2020 difference
Population	6,879	7,431	7,004	1.8%
Number of housing units	5,907	6,483	6,213	5.2%

*2017 values reflect activity only within the City of Aspen boundaries, not the original totals for the EIB.

Aspen's emission total in 2020 was 179,086 metric tons of carbon dioxide equivalents (mtCO₂e). Since 2017, the Aspen community has reduced total CO₂e emissions by 23%. This decrease in emissions in 2020 is a significant accomplishment considering the growth in population and housing over the same time frame. The greatest reduction in emissions between 2017 and 2020 came from the transportation sector, in which emissions decreased by 32%. Stationary energy emissions decreased by 24% from 2017 to 2020.

EMISSIONS OVERVIEW FOR 2020 AND 2019

In accordance with the GPC protocol, emissions are classified by sector (residential and commercial energy, on-road transportation, and waste). These sectors are further categorized by the source of emissions (electricity, natural gas, mobile gasoline, diesel etc.).

In 2020, the residential building sector accounted for 30% of total emissions, while energy from commercial and industrial buildings made up 27% of total emissions. Altogether, emissions from building energy use contributed to over half of all emissions. The transportation sector was also a significant emitter, making up 26% of total emissions. This is followed by solid waste which contributed 16% to the total.

In 2020, the building and the transportation sectors were the greatest emitters. Residential and commercial buildings contributed to over half of total emissions (57%), and transportation contributed about 26% of total emissions. By source, natural gas makes up the greatest percentage of total emissions (32%) followed by building electricity (26%). The relative contribution of each source and sector remained relatively stable from 2019–2020.

Table 2: Aspen's 2019 and 2020 emissions by sector and percent change.

Sector	2019 Emissions	2020 Emissions	2019 to 2020 Change
Commercial and Industrial Buildings	56,167	48,484	-14%
Residential Buildings	57,295	53,700	-6%
Fugitive Emissions	2,293	1,920	-16%
Transportation	51,179	47,044	-8%
Solid Waste	29,171	27,878	-4%
Wastewater	65	60	-8%
Total	196,169	179,086	-9%

The breakdown of emissions by sector in Aspen's 2019 inventory was nearly identical to the 2020 results, see Figure 1 and Figure 2. Total emissions in 2019 were 196,169 mtCO₂e; between 2019 and 2020 emissions decreased by 9%.

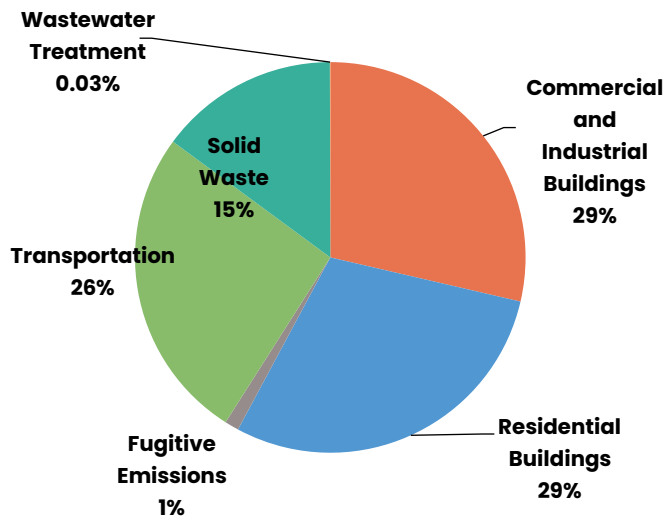


Figure 1: Aspen's 2019 Emissions by Sector

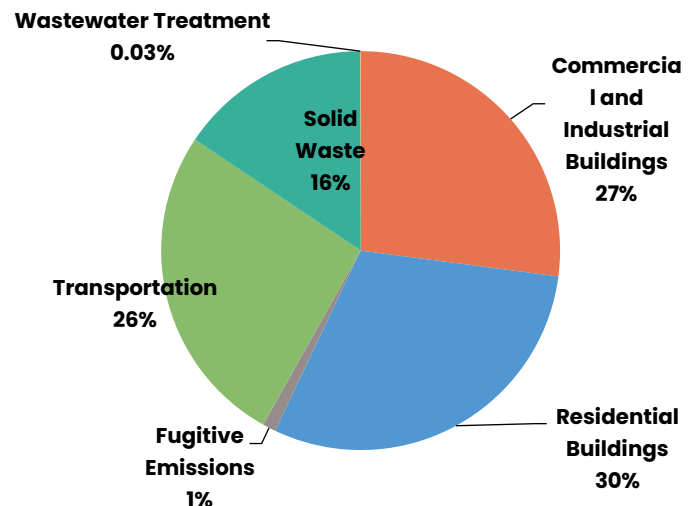


Figure 2: Aspen's 2020 Emissions by Source

Table 3: Aspen's 2019 and 2020 Emissions by Sector and Source

Sector	Source	2019 Emissions	2020 Emissions	2019 to 2020 Change
Energy	Electricity	47,053	46,309	-2%
	Natural Gas (including fugitive emissions)	68,134	57,067	-16%
	Propane	567	728	28%
Transportation	On-Road Gas and Diesel Vehicles	21,814	19,855	-9%
	On-Road EVs and EV Buses	131	129	-9%
	Aviation	29,234	27,060	-2%
Waste	Solid Waste (landfill and compost)	29,171	27,878	-4%
	Wastewater	65	60	-8%
Total		196,169	179,086	-9%

Emissions without the contribution from aviation are 166,935 mtCO₂e in 2019 and 152,025 mtCO₂e in 2020. See Figures 3 and 4.

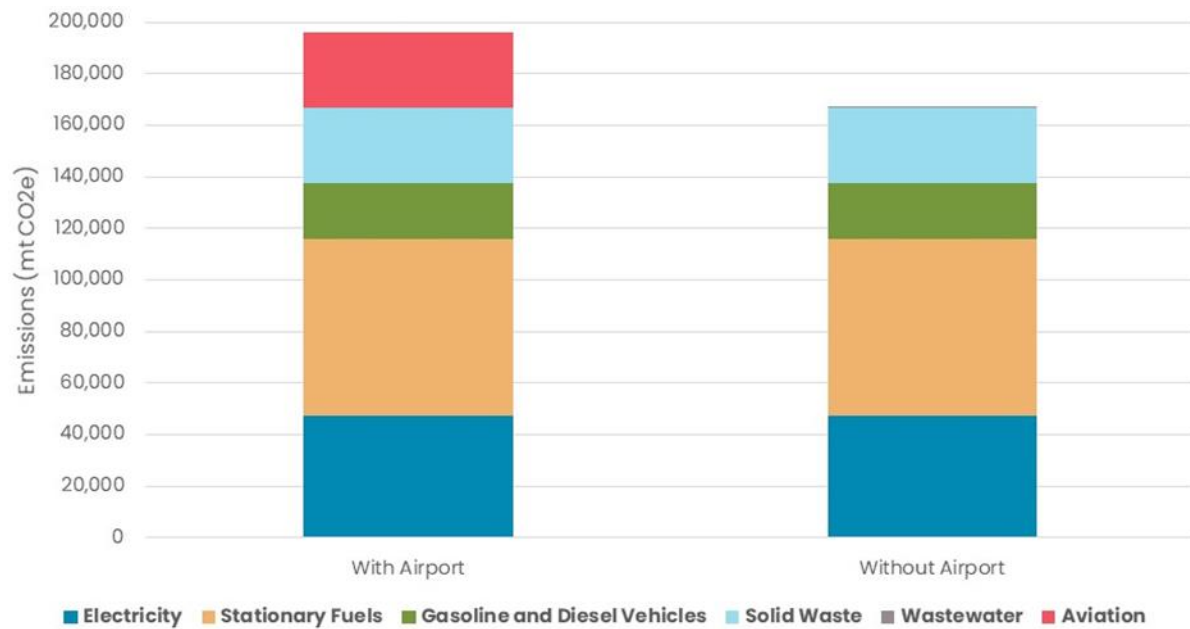


Figure 3: Aspen's 2019 Emissions by Source With and Without Aviation Contributions



Figure 4: Aspen's 2020 Emissions by Source With and Without Aviation Contributions

Natural gas makes up the greatest percentage of emissions at 32%, followed by building electricity at 26%. Solid waste and aviation are also significant contributors to overall emissions, comprising 16% and 15%, respectively. See Figures 5 and 6.

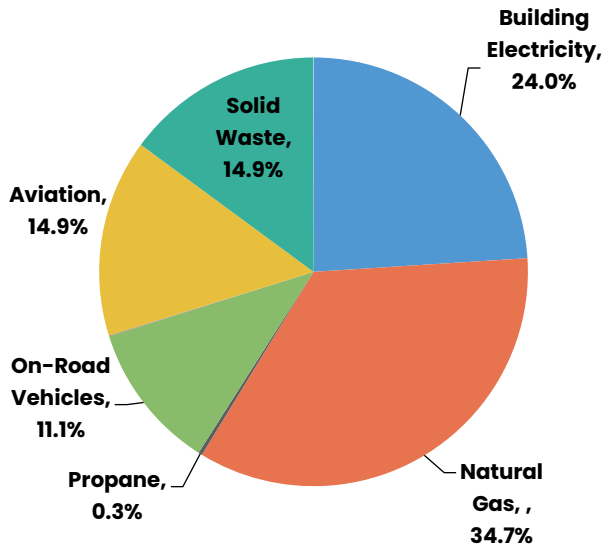


Figure 5: Aspen's 2019 Emissions by Source

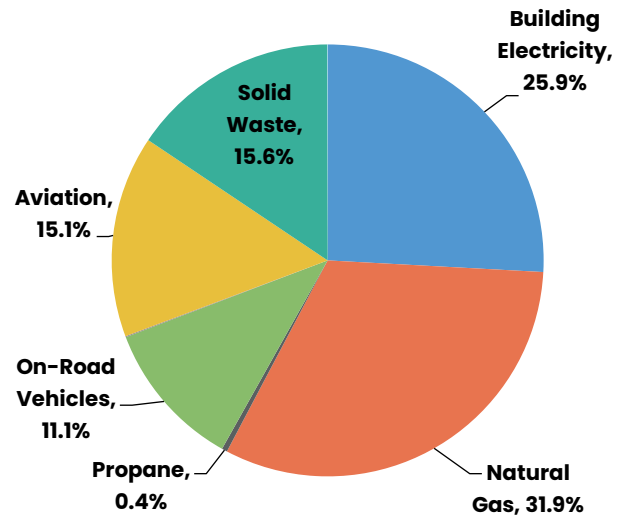


Figure 6: Aspen's 2020 Emissions by Source

Once again, the relative contribution of emissions sources was consistent from 2019 and 2020. In 2019, natural gas was the greatest contributor to overall emissions at 35%, and electricity made up 24% of total emissions. Solid waste and aviation both contributed 15%.

Aspen's GHG Emissions Details

BUILDING SECTOR EMISSIONS

Because emissions from residential and commercial buildings account for over half of all Aspen's emissions (57%), this presents significant opportunity for climate action efforts.

In 2020, residential electricity comprised 27% of building sector emissions, and residential natural gas accounted for 25% of total emissions. This is fairly comparable to the 2019 inventory in which residential electricity contributed 23% and residential natural gas made up 26% of total building emissions. See Figures 7 and 8.

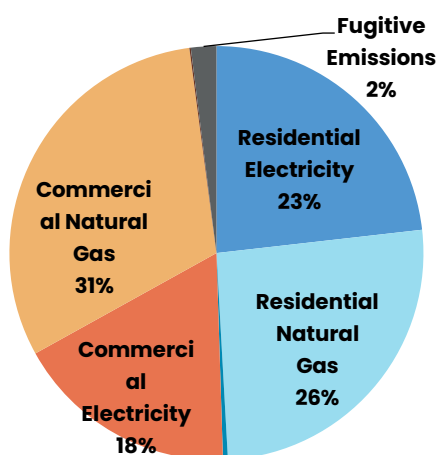


Figure 7: Aspen's 2019 Stationary Energy Emissions Details

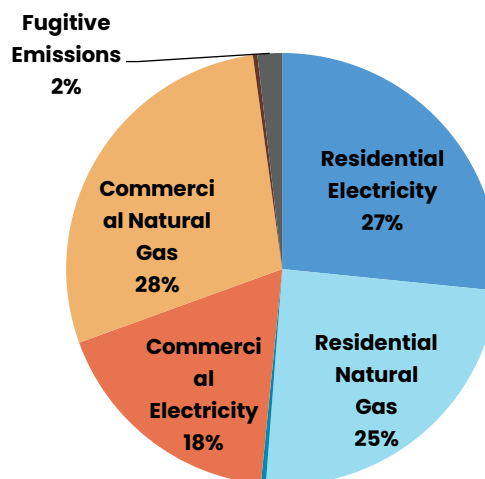


Figure 8: Aspen's 2020 Stationary Energy Emissions Details

Commercial and industrial energy uses, which includes multifamily housing, make up the other major proportion of emissions. In 2020, commercial electricity accounted for 18% of building emissions and commercial natural gas accounted for 28%. Once again, these emissions are fairly comparable to the 2019 inventory where commercial

electricity made up 17% of building emissions and commercial natural gas made up 31%. Residential and commercial building emissions decreased by 10% from 2019 to 2020, with more reductions seen in commercial buildings than residential buildings. This indicates that the slowdown in the commercial sector and tourism activities in 2020, due to the COVID-19 pandemic, were significant contributors to emissions reductions from this sector.

Since 2017, residential and commercial energy emissions have decreased significantly. Residential energy emissions have decreased 30% and commercial energy has been reduced by 18%. This can largely be credited with the adoption of renewable energy policies and programs by the city's electric utility providers. Aspen is served by two electrical utilities: Aspen Electric, the City-owned municipal utility which provides electricity for approximately 19% of Aspen customers, and Holy Cross Energy, which provides the remainder of electricity in Aspen. Aspen Electric has transitioned to 100% renewable energy. The emissions coming from electricity use in homes served by Aspen Electric are negligible.

Holy Cross has also been actively greening its fuel mix over the past several years, and in 2020 the utility's resource mix was reported to be 44% sourced from renewable energy (an increase from 26% renewably sourced in 2017).

A small share (1% in both 2019 and 2020) of stationary energy emissions are due to fugitive emissions that occur from the leakage of natural gas through the distribution system to homes and buildings.

Emissions from the building sector accounted for 57% of total emissions in 2020 and 58% in 2019. Emissions from the building energy sector have significantly decreased since 2017 (30% for residential buildings and 18% for commercial buildings). Much of this decrease can be attributed to the adoption of renewable energy sources by Aspen's main electrical utility. Emissions from stationary energy decreased 10% between 2019 and 2020, with more savings coming from commercial buildings than residential buildings, indicating that the slowdown in commercial activity during the COVID-19 pandemic was likely the primary driver of emissions reductions during this time period.

COVID-19 IMPACT

Emissions from the stationary energy sector decreased 10% between 2019 and 2020, with more savings from commercial buildings than residential buildings. The decrease in commercial activity during the COVID-19 pandemic was likely the primary driver of commercial building emissions reductions during this time period.

TRANSPORTATION SECTOR EMISSIONS

The relative contribution of the transportation sector stayed consistent from 2019–2020 (making up 26% of Aspen’s total emissions in both years). However, the metric tons of transportation emissions were reduced by over 4,000 mtCO₂e from 2019–2020.

Within the transportation sector, aviation is the greatest emitter, accounting for 58% of transportation emissions in 2020 (and 57% in 2019). Since 2017, aviation emissions have increased by nearly 63%. Between 2019 and 2020, however, emissions from the aviation sector decreased by 7%. This is likely a result of pandemic travel restrictions.

In both 2019 and 2020, on-road transportation in gasoline and diesel personal and freight vehicles made up about 41% of the emissions from the transportation sector. A very small proportion of transportation emissions are generated from transit activities through the Roaring Fork Transit Authority’s (RFTA) service in the City (2% in 2019 and 1% in 2020). Less than a quarter of one percent of transportation emissions come from the use of electric vehicles. See Figures 9 and 10.

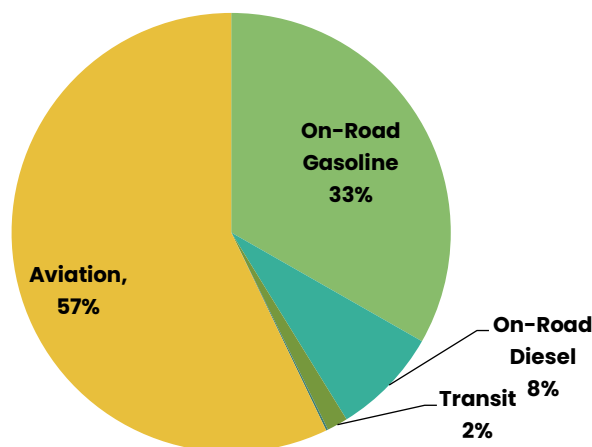


Figure 9: Aspen's 2019 Transportation Emissions Details

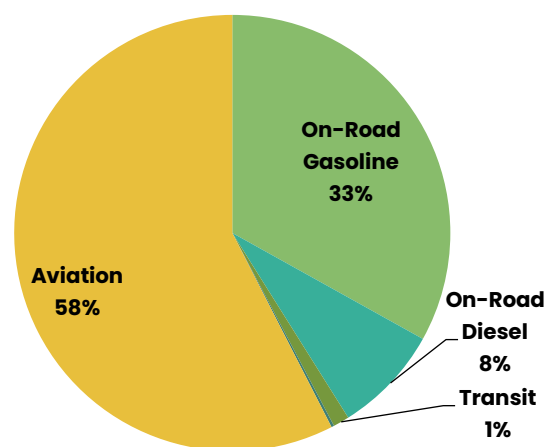


Figure 10: Aspen's 2020 Transportation Emissions Details

Total emissions from on-road activity in Aspen have decreased by 61% since 2017. This is primarily a result of a new methodology used to calculate vehicle miles traveled (VMT). The new methodology more accurately attributes regional trips to the City of Aspen and therefore reduces the amount of VMT accounted for in Aspen's inventory. Additionally, active efforts on the part of the City of Aspen and RFTA to improve public transit access and service in the community have aimed to decrease congestion. Aspen's CAP outlines several strategies that have likely contributed to reduced emissions in the on-road sector, including (but not limited to) expanding transit networks and incentives, expanding safe multi-modal (i.e., biking, walking, and transit) options in the community, and increasing the ratio of electric vehicles (EVs) in fleets throughout the community.

Transportation emissions made up 26% of all of the City of Aspen's emissions in 2020. The majority of these emissions come from on-road passenger and freight vehicles (41%) and in-boundary aviation (58%).

Since 2017, on-road transportation emissions have decreased significantly (62%). This is due in large part to an updated methodology to calculate VMT study. It can also be attributed, in part, to the success of the City's effort to improve multimodal and EV options.

COVID-19 IMPACT

Aspen's total VMT decreased 8% from 2019 to 2020. Correspondingly, from 2019–2020, on-road transportation emissions were reduced by 9%. Aviation emissions also experienced an 8% decrease in emissions from 2019–2020. Up until 2019, aviation emissions were increasing dramatically each year. The 2019–2020 drop in transportation emissions reductions can largely be attributed to the pandemic.

WASTE SECTOR EMISSIONS

The waste sector accounted for 16% of Aspen's total emissions in 2020 and 15% in 2019. Within the waste sector, almost the entirety of emissions came from landfilled waste (99%), while only 1% came from compost and 0.2% came from wastewater. Refer to Figure 11.

Total emissions from community-generated solid waste have increased slightly (2%) since 2017. Waste emissions are historically some of the most difficult to measure due to difficulties in accurately tracking and attributing waste to communities. Waste deposited at the Pitkin County Solid Waste Center (PCSW) is attributed to Aspen based on population; construction and demolition (C&D) waste, which makes up a significant portion (58%) of the waste tonnage in Aspen, is determined based on the total amount of C&D waste disposed of at PCSW and Aspen's proportion of building permits relative to surrounding communities.

In general, per-capita waste generation is extremely high in Aspen. On average, 17.3

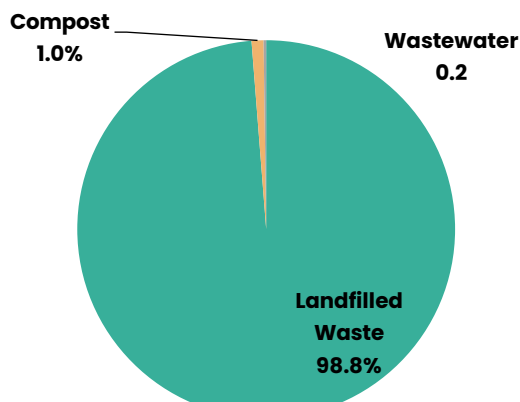


Figure 11: Aspen's 2020 Waste Emissions Details

pounds of waste is produced per capita each day in Aspen. This is nearly four times the US average of 4.5 pounds per capita per day. However, this per capita value only reflects Aspen's full-time resident population, and doesn't consider the fact that Aspen is a tourist-based economy. Therefore, all waste produced by out-of-town visitors is attributed to residents.

The vast majority of waste emissions in Aspen come from solid waste that is landfilled (99%); 1% of waste emissions come from composting food and other organic waste. Waste emissions have decreased by 2% from 2017 to 2020.

COVID-19 IMPACT

In general, there are a couple COVID-19 factors that could influence waste. On the one hand, the pandemic led to an increase in take-out packaging, disposable products, and masks that ended up in landfills. On the other hand, the pandemic led to a

decrease in tourism. This is particularly relevant for communities, like Aspen, that experience a large influx of visitors. The reduction in tourism may have reduced the city's waste and emissions in 2020.

Overall, waste emissions decreased 4% (1,293 mtCO₂e) from 2019–2020 in the City of Aspen. This is a relatively small decrease, and it is difficult to determine the degree to which the pandemic influenced this reduction.

Contributors to Aspen's Emissions Trends

To better understand the major drivers of emissions trends between 2017 and 2020, the ICLEI-Local Governments for Sustainability Contribution Analysis tool⁴ was completed for Aspen. This tool normalizes changes in emissions with external factors such as population change and weather patterns to determine the primary drivers in emissions changes between the two years.

Based on this analysis, the known drivers that increased emissions produced in Aspen between 2017 and 2020:

- Increased commercial energy use per job.
- Population growth.
- Colder winter.

The primary drivers that led to a 23% reduction in emissions between 2017 and 2020 were:

- Decrease in energy use per household.
- Decrease in VMT per person.
- Decrease in jobs in the area.
- Electricity and heating fuels mix.

The graph below shows the factors that drove up emissions (red) as well as the greatest contributors to the decrease in emissions (blue) from 2017–2020. According to the graph, increased commercial energy use per job and population growth were significant factors in driving up emissions. Conversely, lower energy use per household

⁴ See <https://icleiusa.org/ghg-contribution-analysis/>.

and decreased VMT per person were the primary contributors to reducing emissions between 2017 and 2020. Refer to Figure 12.

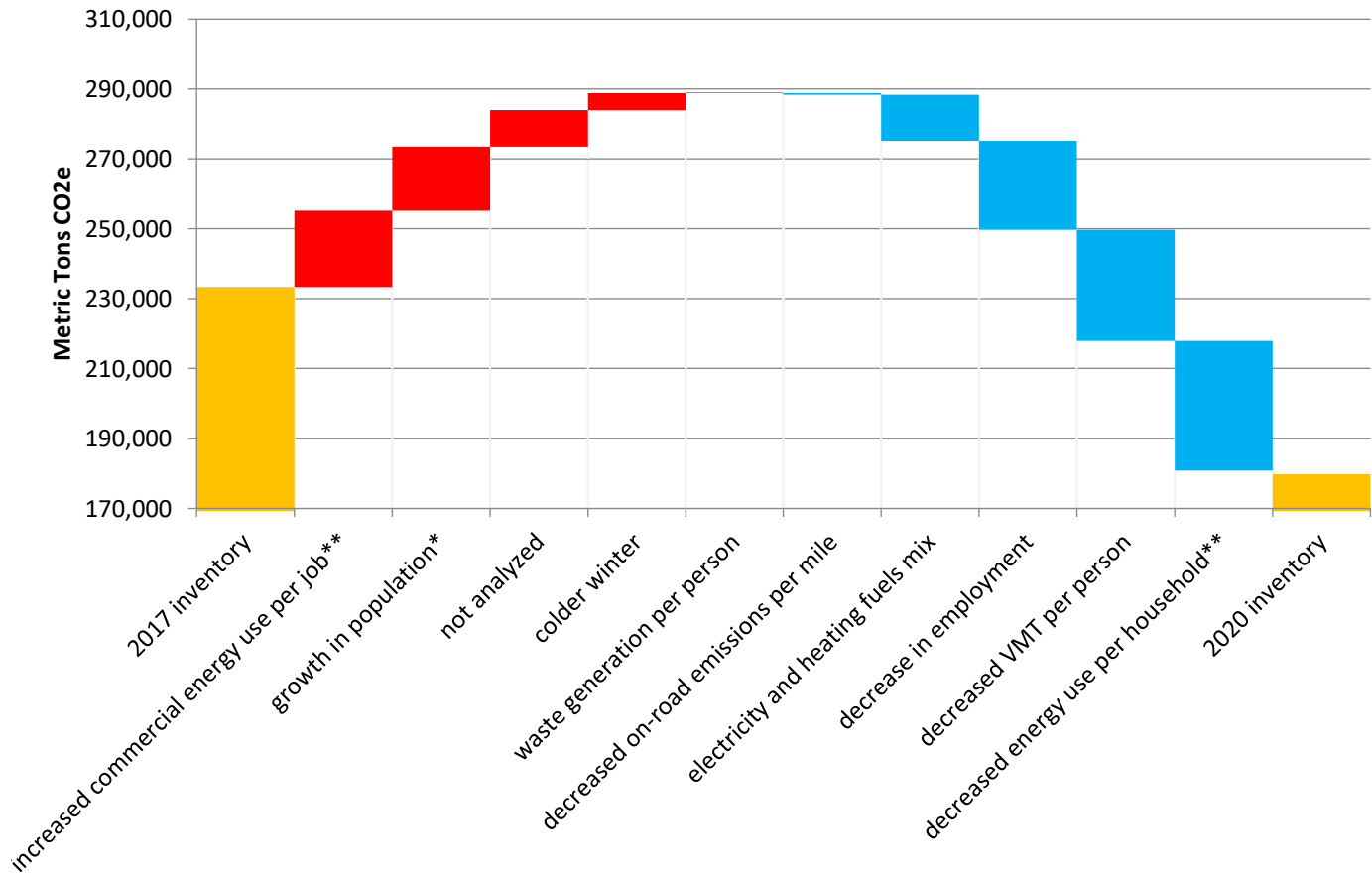


Figure 12: Aspen's 2017-2020 Contribution Analysis

Forecasted Emissions and Progress Towards Aspen's Goals

Aspen has established aggressive emission reduction goals to align with science-based targets—the City is striving for a 63% reduction in emissions from the 2017 baseline by 2030, and to be net-zero emissions by 2050.

While Aspen is making good progress towards its goals by achieving a 23% reduction in emissions between 2017 and 2020, the community is unlikely to meet its emissions reduction targets without further action. Figure 13 shows the business-as-usual

emissions forecast (i.e., the most likely emissions trajectory if no further action is taken) compared to Aspen's 2030 and 2050 goals.

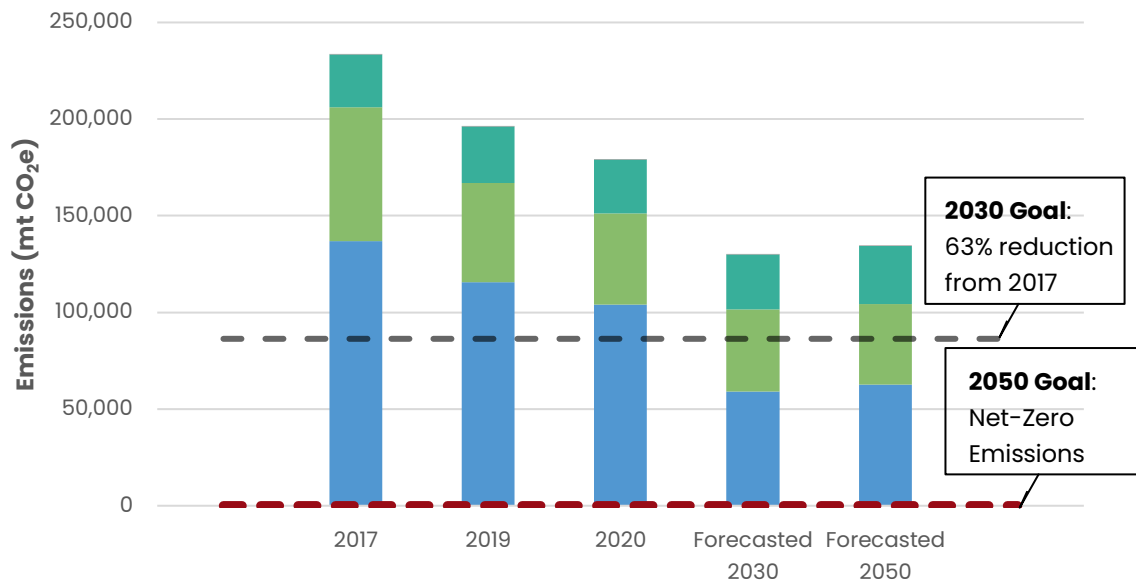


Figure 13: Aspen's business-as-usual forecasted emissions and reduction goals

Aspen's emissions are anticipated to grow between 2030 and 2050 in line with expected community population growth. In order for Aspen to reach its goals, additional policies, programs, and community engagement will be needed. Areas of opportunity may include reducing emissions from building energy use through energy reduction programs and policies and building electrification policies. Additional progress may come from supporting greater adoption of EVs and decreasing the use of single occupancy vehicles in the community.

Conclusion

The Aspen community has reduced its overall GHG emissions by 23% from the 2017 baseline. This impressive reduction in emissions demonstrates Aspen's leadership and commitment to mitigating the impacts of climate change. Aspen's innovative approach to emissions reductions, including moving the municipal-owned electric utility to 100% renewable energy, investing in projects to increase community-wide building energy efficiency, and improving public transit systems, have in large part driven these emissions reductions. In addition, Aspen has implemented successful

waste diversion programs, which have reduced emissions from the waste sector, a small amount, although there is more room for progress here.

Aspen continues to establish itself as a leading community. In the coming decades, climate mitigation efforts must continue and intensify to reach the City's goal of net-zero emissions by 2050. Through a continued effort to improve and accelerate the data-driven strategies, projects, programs, and policies outlined in Aspen's climate action plan, the City can ensure that Aspen remains at the forefront of climate action.

Appendix A: Table of All Emissions by Source and Sector

Emissions Inventory by Scope Summary				
Scope	2019 Emissions	2019 % of Total	2020 Emissions	2020 % of Total
Scope 1	90,515	46%	77,649	43%
Scope 2	47,184	24%	46,438	26%
Scope 3	58,469	30%	54,998	31%
Total	196,169		179,086	

Emissions by Sector Summary					
Sector	2019 Emissions	Percent of 2019 Total	2020 Emissions	Percent of 2020 Total	2019 to 2020 Change
Commercial and Industrial Buildings	56,167	29%	48,484	27%	-14%
Residential Buildings	57,295	29%	53,700	30%	-6%
Fugitive Emissions	2,293	1%	1,920	1%	-16%
Transportation	51,179	26%	47,044	26%	-8%
Solid Waste	29,171	15%	27,878	16%	-4%
Wastewater	65	0.03%	60	0.03%	-8%
Total	196,169		179,086		-9%

All Emissions by Source					
Sector	Source	2019 Emissions	2019 % of Total	2020 Emissions	2020 % of Total
Energy	Electricity	47,053	24%	46,309	26%
	Natural Gas	68,134	35%	57,067	32%
	Propane	567	0.3%	728	0.4%
Transportation	On-Road Gas and Diesel Vehicles	21,814	11%	19,855	11%
	On-Road EVs and EV Buses	131	0.07%	129	0.07%
	Aviation	29,234	15%	27,060	15%
Waste	Solid Waste (landfill and compost)	29,171	15%	27,878	16%
	Wastewater	65	0.03%	60	0.03%
Total		196,169		179,086	

Appendix B: Inventory Methodology

Lotus Engineering and Sustainability, LLC (Lotus) was contracted by the Community Office for Resource Efficiency (CORE), the City of Aspen, and Pitkin County to create 2019 and 2020 community-wide greenhouse gas (GHG) emissions inventories for the City of Aspen. The purpose of these GHG emissions inventories is to create a clear picture of current GHG emission sources in Aspen and provide an updated inventory that will guide climate action planning.

INVENTORY METHODOLOGY

The 2019 and 2020 GHG inventories use the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC protocol) methodology.⁵ The GPC provides a transparent and consistent GHG accounting methodology for reporting community GHG emissions. There are two reporting levels for the community framework:

- BASIC: The BASIC level includes stationary energy, in-boundary transportation, and community-generated waste.
- BASIC+: The BASIC+ level includes BASIC emissions sources, as well as more comprehensive coverage of emissions sources such as transboundary transportation; electricity transmission and distribution losses; industrial processes and product use; and agriculture, forestry, and other land uses.

The 2019 and 2020 community GHG inventories were developed in compliance with the GPC BASIC reporting level. Emissions from transboundary aviation, which is a BASIC+ source, were additionally included in these inventories because they represent emissions occurring primarily as a direct result of the community's tourism-based economy.

⁵For more information regarding GPC see: http://c40-production-images.s3.amazonaws.com/other_uploads/images/143_GHGP_GPC_1.0.original.pdf?1426866613.

CALCULATING EMISSIONS

GHG emissions are a product of emission factors and activity data. Emission factors represent the carbon intensity of the fuel or materials used in a specific activity. Activity data refers to the data measured for the community GHG emission inventory calculations, such as fuel consumed, electricity consumed, tons of waste generated, and vehicle miles traveled. Activity data is influenced by community indicators (e.g., population, economic growth, etc.), energy consumption, and other consumption-related behaviors (e.g., mode of transportation, etc.). Changes in emissions result from the interplay of activity data and emission factors.

EMISSIONS INVENTORY BOUNDARY

Aspen's GHG inventories prior to 2019 used an emissions inventory boundary (EIB) to calculate emissions; this EIB included the City of Aspen and parts of unincorporated Pitkin County around the city, including ski areas, residential neighborhoods, and the Aspen/Pitkin County Airport. This boundary was used previously because it was assumed to capture emissions from the geographic area that represents the total of Aspen's core functionality and economy. The 2019 and 2020 inventories do not use the EIB, but instead, use the City of Aspen's legal boundaries to fully align with the GPC protocol and the methods used for other surrounding communities. The emissions outside Aspen's city limit are now accounted for in the unincorporated Pitkin County inventories. Due to the larger geographic boundary in the 2019/2020

GHG Emissions:

Scope 1, 2, and 3

Scope 1: GHG emissions from sources located within the community's boundary, including:

- Energy and transportation fuel combustion.
- Fugitive emissions (i.e., leakage of natural gas).
- Wastewater treated within the boundary.

Scope 2: Emissions occurring outside of the boundary because of the use of grid-supplied electricity, heat, steam, and/or cooling within the boundary.

Scope 3: GHG emissions that occur outside the boundary because of activities taking place within the boundary:

- Solid waste (including compost) treated outside the boundary.
- Transportation activities for which fuel combustion occurs outside the boundary.

inventory, emissions from previous Aspen inventories are significantly higher. The 2017 Aspen inventory has been adjusted to reflect the new geographic boundary so accurate comparisons can be made to the 2017 baseline year.

EMISSIONS SCOPE, SECTORS, AND SOURCES

The inventory analyzes emissions by scope and further breaks down emissions into applicable sectors (e.g., residential building energy use, on-road transportation, etc.) and source (e.g., electricity, natural gas, mobile gasoline, etc.). The 2020 inventory quantifies emissions from the scopes, sources, and sectors in the text box to the right.

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