Ketchum

2018 Inventory of Community Greenhouse Gas Emissions

Photo Credit: Sam Ferrone

Produced by City of Ketchum and Ketchum Sustainability Advisory Committee

With Assistance from ICLEI - Local Governments for Sustainability USA

April 9, 2021

Ketchum *Leading by Example*

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City of Ketchum

March 18, 2021

Dear Ketchum Community:

The City of Ketchum adopted its first Sustainability Action Plan in 2019. The 5-year plan lists specific actions the City and the community can take to shift our trajectory toward greater sustainability, including limiting our greenhouse gas emissions. This is why it is so important for our community to accurately measure greenhouse gas emissions and to implement plans to minimize those emissions as quickly as possible.

One of the first actions recommended by the plan is to develop a greenhouse gas inventory in alignment with the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) standard. Now, Ketchum has applied this standard in developing our 2018 Greenhouse Gas Inventory and we can now accurately evaluate our progress in reducing emissions over time. We are collaborating with hundreds of other cities to build common information about contributions to climate change, and with this inventory are able to compare among ourselves.

This challenge is momentous, and it will take our entire community to respond – together. This inventory report helps create information necessary to form that process. I look forward to continuing our community dialog to ensure we do our part to address climate change.

Sincerely,

Neil Bradshaw
Mayor

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Executive Summary

The City of Ketchum recognizes that greenhouse gas (GHG) emissions from human activity are catalyzing profound climate change, the consequences of which pose substantial risks to the future health, wellbeing, and prosperity of our community. Climate change is warming the earth, which is causing more lighting strikes and affecting water supplies and snowpack. More lightning has been a cause of increasing wildfires in recent years, which are a threat to Ketchum and the local economy. Furthermore, Ketchum has multiple opportunities to benefit by acting quickly to reduce community GHG emissions. Benefits of action include reducing energy and transportation costs for residents and businesses, creating green jobs, improving health of residents, and making your community a more attractive place to live and locate a business. Ketchum has a tourism-based economy due to many amenities such as the Sun Valley ski resort, which was recently ranked number one in the nation by Ski Magazine. Ketchum is also located at the "end of the line" and faced potential natural gas shortages a few years ago as well as power outages due to a single electric line. It has been heavily debated in the community whether the planned redundant electric line is the best solution, so conserving energy is another approach, which also reduces emissions.

Ketchum has begun the climate action planning process, starting with inventorying emissions back in 2007 and creating a Ketchum Energy Advisory Committee, which later became the Ketchum Sustainability Advisory Committee. Sustainability goals were set, and annual sustainability action plans were created in 2019 and 2020. In 2019, the opportunity arose to collaborate with the other jurisdictions in the Wood River Valley and work with ICLEI on a more current inventory. This report provides estimates of greenhouse gas emissions resulting from activities in Ketchum as a whole in 2018, i.e., "community-wide emissions." ICLEI also provides a protocol for government-based emissions, but this report incorporates municipal emissions into the community-wide emissions rather than publishing separate inventories.

Key Findings

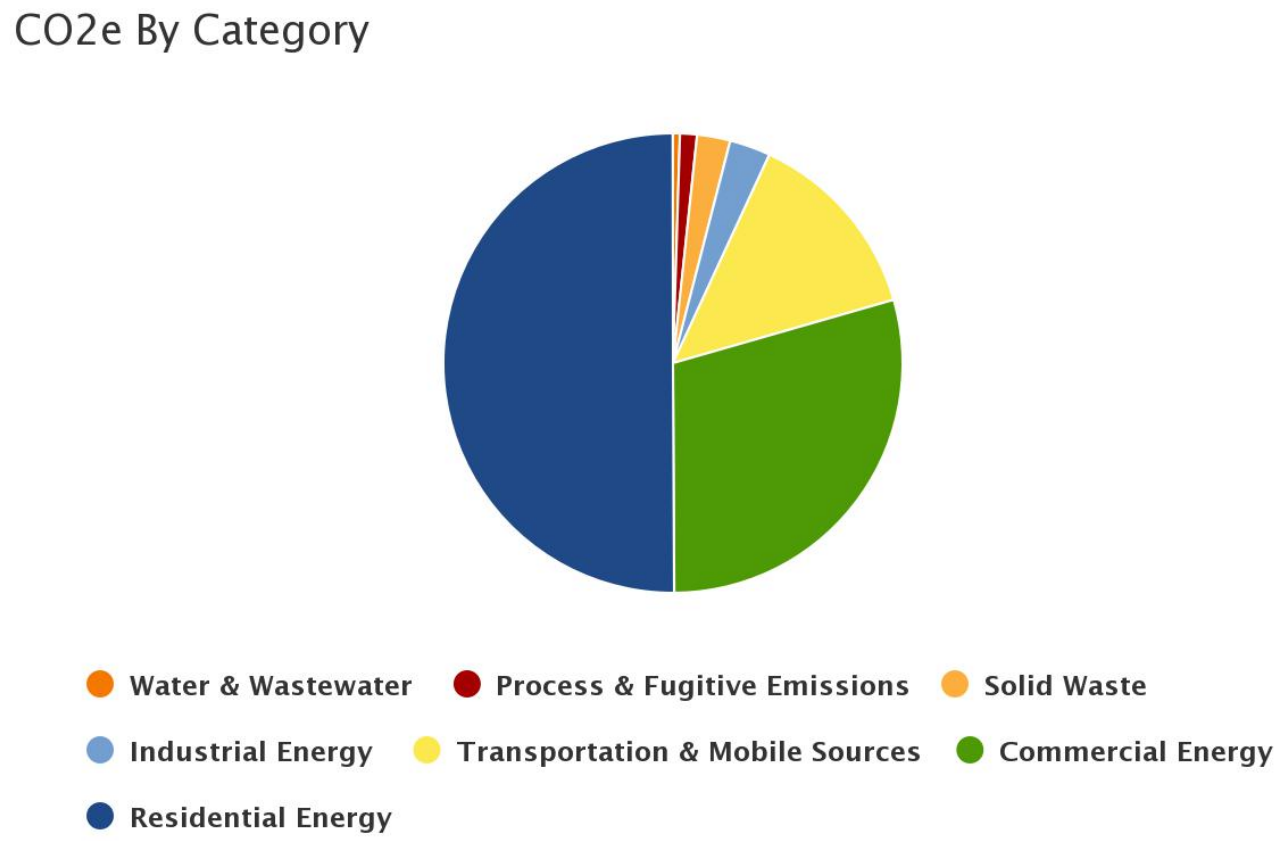
Community-Wide Emissions

There are a variety of emissions sources and activities included in the community-wide inventory even though the City of Ketchum does not have significant and direct influence over all sources and activities. The largest contributor is residential energy with 50% of emissions. The next largest contributor is commercial energy with 29% of emissions. Actions to reduce emissions in both these sectors will be a

key part of a climate action plan. Each of these contributors is more than transportation at 14%, industrial energy at 3%, solid waste at 2%, process and fugitive at 1% and water and wastewater at less than 1%.

It is worth noting that solid waste has significantly less emissions than typical communities because the Milner Butte landfill that receives solid waste from Blaine County has a sophisticated gas-to-fuel system. Methane, which is a powerful greenhouse gas with a 100-year global warming potential 28 times that of CO2 according to the Intergovernmental Panel on Climate Change's (IPCC) 5th Assessment Report, is captured and converted to electricity to power nearby homes. This not only prevents significant and harmful emissions from going into our atmosphere, it is also estimated to generate $36m in revenue over the next 20 years.

Figure 1: Community-Wide Emissions



Residential Energy, especially electricity, is the largest contributor to emissions in Ketchum. This will be an important activity on which to focus efforts in developing a climate action plan. Commercial Energy and Transportation also account for a large part of emissions and will also be important to address.

Next Steps

The City's next planned actions are creating a formal climate action plan and specific planned emissions reduction actions based on the emissions reduction targets set in 2018, which include:

1. Align with the 2030 Challenge and upgrade existing municipal buildings towards a 50% reduction in energy use by 2030 compared to a 2007 baseline and ensure new buildings are carbon neutral by 2030
2. Ensure critical loads are met with resilient sources of energy by 2030
3. Eliminate emissions from municipal vehicles by 2030
4. De-carbonize all city facilities by 2030

In December of 2020, the City of Ketchum approved even more ambitious climate goals, which were also adopted by the City of Hailey, City of Bellevue, and Blaine County. These goals are:

1. One Hundred Percent (100%) clean energy for municipal electricity use by 2030, including at least 75% clean energy by 2025; and

2. One Hundred Percent (100%) Clean Energy for the community-wide electricity supply by 2035; and

3. Transition city and county fleet vehicles and equipment to 100% electric power as technologically and economically feasible by 2035

4. One Hundred Percent (100%) clean energy for all energy use by 2045.

Next steps are to continue to focus on conserving energy and reducing emissions in municipal buildings and operations to "lead by example" for the community, but this inventory has brought increased focus to the residential energy use of the community.

Climate Change Background

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping solar radiation. This phenomenon is known as the greenhouse effect. Overwhelming evidence shows that human activities are increasing the concentration of greenhouse gases and changing the global climate. The most significant contributor is the burning of fossil fuels for transportation, electricity generation and other purposes, which introduces large amounts of carbon dioxide and other greenhouse gases into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise.

Ketchum could be impacted by drought, reduction in snowfall, increased risk of wildfire, a lowering water table, and other local risks associated with climate change. Current and expected impacts to Ketchum related to climate change are explained below. Other expected impacts in Idaho include frequent and damaging storms accompanied by flooding and landslides, summer water shortages as a result of reduced snowpack, and the disruption of ecosystems, habitats, and agricultural activities.

Many communities in the United States have taken responsibility for addressing climate change at the local level. Reducing fossil fuel use in the community can have many benefits in addition to reducing greenhouse gas emissions. More efficient use of energy decreases utility and transportation costs for residents and businesses. Retrofitting homes and businesses to be more efficient creates local jobs. In addition, money not spent on energy is more likely to be spent at local businesses and add to the local economy. Reducing fossil fuel use improves air quality and increasing opportunities for walking and bicycling improves residents' health.

Evidence of Human-Caused Climate Change

The Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report affirms that "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level."[1] Researchers have made progress in their understanding of how the Earth's climate is changing in space and time through improvements and extensions of numerous datasets and data analyses, broader geographical coverage, better understanding of uncertainties and a wider variety of measurements.[2] These

[1] IPCC, 2014: Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Core Writing Team, R.K Pachauri, and L.A. Meyer (eds.)]. Geneva, Switzerland, 151 pp

[2] IPCC, 2014: Summary for Policymakers. In: Climate Change 2014: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

refinements expand upon the findings of previous IPCC Assessments – today, observational evidence from all continents and most oceans shows that "regional changes in temperature have had discernible impacts on physical and biological systems."

The Fifth Assessment asserts that "it is *extremely likely* that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcings together. Globally, economic and population growth continued to be the most important drivers of increases in CO2 emissions from fossil fuel combustion. Changes in many extreme weather and climate events have been observed since about 1950. Some of these changes have been linked to human influences, including a decrease in cold temperature extremes, an increase in warm temperature extremes, an increase in extreme high sea levels and an increase in the number of heavy precipitation events in a number of regions". As shown in Figure 2, indicators such as global averaged sea level change and globally averaged combined land and ocean surface temperature anomaly have all increased since the beginning of the 20th century and are continuing to trend upward.

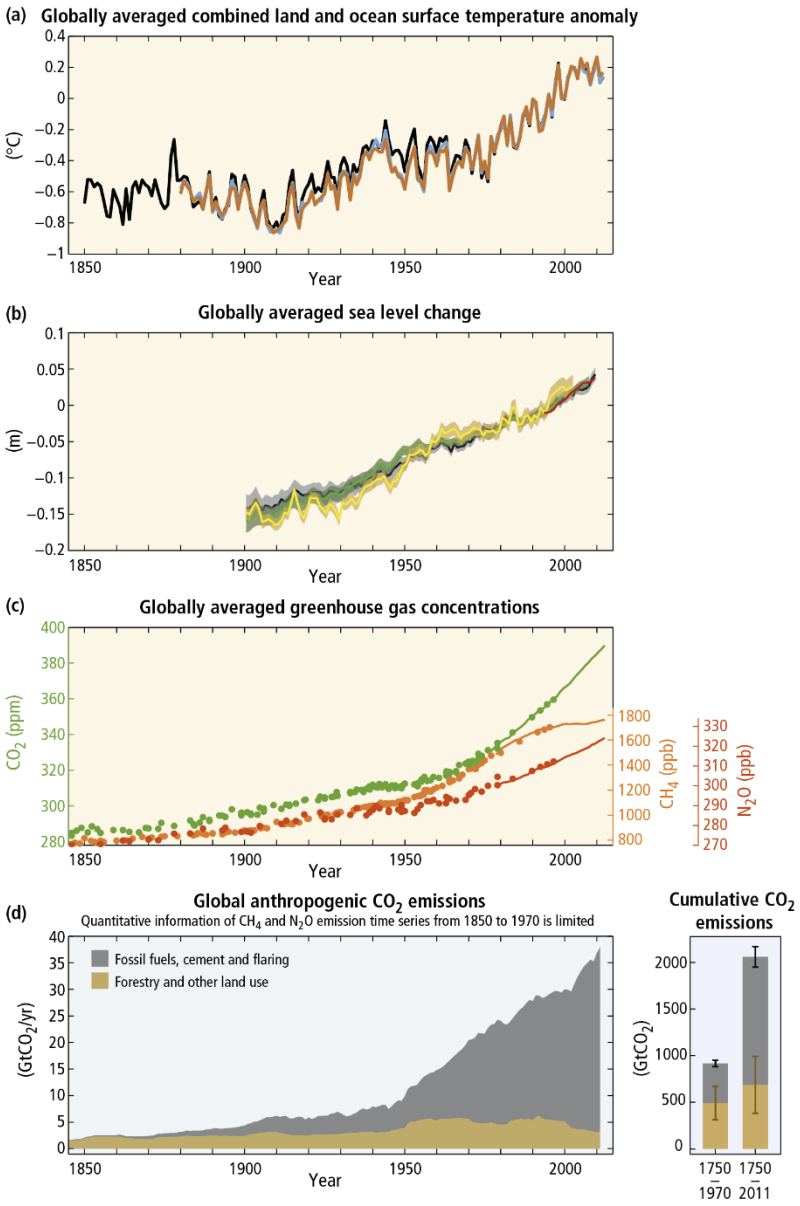


Figure 2: Observations and other indicators of a changing global climate system

In short, the Earth is already responding to climate change drivers introduced by mankind.

Regional and Local Impacts

Scientific leaders have determined that we must act to mitigate climate change by the year 2030. Locally, governments and residents have a responsibility to protect homes and businesses from the following risks:

- Frequent and damaging storms accompanied by flooding and landslides

- More frequent, longer duration and more impactful flooding
- Summer water shortages as a result of reduced snow pack
- More frequent and higher intensity wildfires
- Drought and depletion of the aquifer
- Disruption of ecosystems, habitats, and agricultural activities
- Shorter winters in a tourism economy that includes a winter season

There is opportunity to be a part of the solution for a global problem and for future generations.

Climate Policy Context

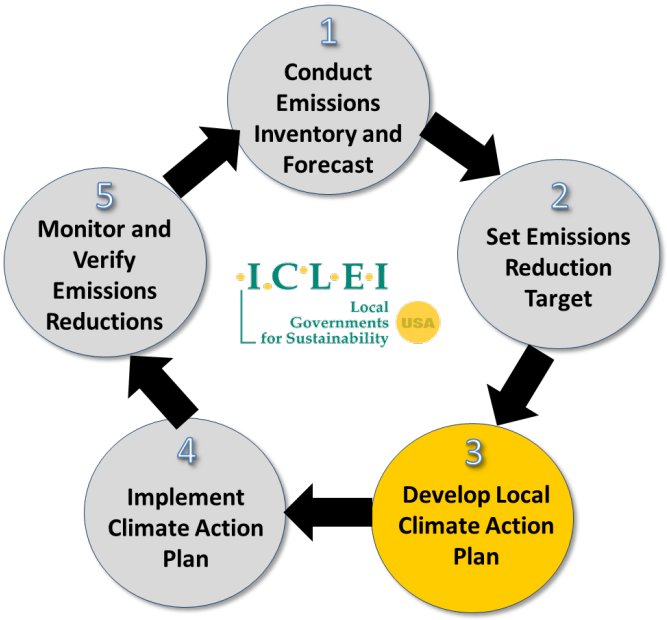
Ketchum is located in Blaine County, which tends to have a more Democratic governance and populace, and in the State of Idaho where there is a Republican-dominated Legislature. In the past year, the Republican Governor was the one of the first State politicians to recognize that climate change is caused by humans. On January 16, 2019 Governor Brad Little took an important step forward for climate change policy in Idaho and acknowledged the existence and challenges brought by climate change to Idaho communities. On March 6, that conversation finally started. The House Environment, Energy, and Technology Committee held Idaho's first-ever official hearing on climate change. Idaho experts discussed the risks and opportunities our state may face in a changing climate.

ICLEI Climate Mitigation Program

In response to the problem of climate change, many communities in the United States are taking responsibility for addressing emissions at the local level. Since many of the major sources of greenhouse gas emissions are directly or indirectly controlled through local policies, local governments have a strong role to play in reducing greenhouse gas emissions within their boundaries. Through proactive measures around land use patterns, transportation demand management, energy efficiency, green building, waste diversion, and more, local governments can dramatically reduce emissions in their communities. In addition, local governments are primarily responsible for the provision of emergency services and the mitigation of natural disaster impacts.

ICLEI provides a framework and methodology for local governments to identify and reduce greenhouse gas emissions, organized along Five Milestones, also shown in Figure 3:

1. Conduct an inventory and forecast of local greenhouse gas emissions;
2. Establish a greenhouse gas emissions reduction target;
3. Develop a climate action plan for achieving the emissions reduction target;
4. Implement the climate action plan; and,
5. Monitor and report on progress.



This report represents the completion of ICLEI's Climate Mitigation Milestone One for the community as a whole and provides a foundation for future work to reduce greenhouse gas emissions in Ketchum.

Figure 3: ICLEI Climate Mitigation Milestones

Sustainability & Climate Change Mitigation Activities in Ketchum

Ketchum has already implemented programs that have or will lead to ancillary benefits in the form of energy conservation and greenhouse gas mitigation.

These lead-by-example projects to reduce government emissions include:

- The Wastewater Treatment Facility joined an Idaho Power cohort and has reduced electricity use by about 30 percent. The cohort led to adopting an Energy Efficiency Initiative Policy Statement in 2014 aimed at saving energy in operations. Currently, the City is enrolled in a U.S. Department of Energy Sustainable Wastewater Infrastructure of the Future Energy Recovery (SWIFter) Initiative with the introductory meeting on April 13, 2021. It is aimed at providing customized technical assistance on energy and related data management, energy efficiency improvements, advanced technology integration, and project financing.

- The Water Division also joined an Idaho Power Cohort and as of January 2021 has saved over 250,000 Kilowatt hours.
- The Water Division also embarked on a multi-year project to upgrade the Ketchum spring water line over four phases and began the final phase 4 in 2021. To date the City has abandoned over 23,000 lineal feet of dilapidated water lines and is currently not producing approximately 11.5 million gallons

per month. This equates to an annual amount of approximately 140 million gallons per year not produced at a cost savings of $1,425 dollars per month.

- The Streets Department has purchased an assortment of hand tools that are battery powered: drills, impact wrenches and an impact hammer for paver demo.
- The Facilities Maintenance Department has replaced about one-quarter of their small engine machines (e.g., weed whacker, blowers, and mowers) with battery-powered models.
- Installed solar PV and electric vehicle charging stations at the Ore Wagon Museum.
- Conducted energy audits of 7 municipal buildings through the State Office of Energy and Mineral Resources (OEMR) Leading by Example program for ASHRAE level I audits by the University of Idaho Integrated Design Lab (IDL).
- Performed a lighting audit of all municipal buildings and upgraded to more efficient and safer LED lighting.
- Upgraded the HVAC (heating, ventilating, and air conditioning) at the Streets Warehouse building to improve energy efficiency and indoor air quality.
- Upgraded the insulation, air sealing, exhaust fans, and refrigerator at the Parks and Rec building.
- Secured $15,000 in in-kind grant funding from OEMR for energy saving upgrades.
- Engaged BSU through the national DOE Industrial Assessment Program to audit and develop renewable energy solutions for the Wastewater Treatment Plant and the Northwood Pumping Station as part of an overall effort to provide resilient back-up power for critical services.
- Engaged IDL to conduct a deeper energy analysis of the new Ketchum City Hall.
- Established LEED Silver requirements for the new Ketchum Fire Station.
- Replaced a gas boiler at the water department building with an electric boiler to reduce the carbon emissions associated with gas-powered equipment and appliances.
- Committed approximately $25,000 per year for several years to make irrigation upgrades to not only save water but also save energy due to the water energy nexus whereby it takes energy to pump and transport water.
- Continued installation of missing sidewalks throughout the city to promote walkability and reduce carbon emissions.
- Installed bicycle lanes and sharrows throughout town to reduce vehicle usage carbon emissions.

Additionally, to encourage lower community emissions, the City amended local building codes in 2012 to require all new residential construction to be NGBS or LEED Silver certified with additional green requirements for additions and remodels and has continued as the largest single supporter of Mountain Rides to provide public transportation across the Wood River Valley.

Inventory Methodology

Understanding a Greenhouse Gas Emissions Inventory

The first step toward achieving tangible greenhouse gas emission reductions requires identifying baseline emissions levels and sources and activities generating emissions in the community. This report presents emissions from the Ketchum community as a whole. The government operations inventory is a subset of the community inventory; for example, data on commercial energy use by the community includes energy consumed by municipal buildings, and community vehicle-miles-traveled estimates include miles driven by municipal fleet vehicles.

As local governments have continued to join the climate protection movement, the need for a standardized approach to quantify GHG emissions has proven essential. This inventory uses the approach and methods provided by the Community Greenhouse Gas Emissions Protocol (Community Protocol)[3].

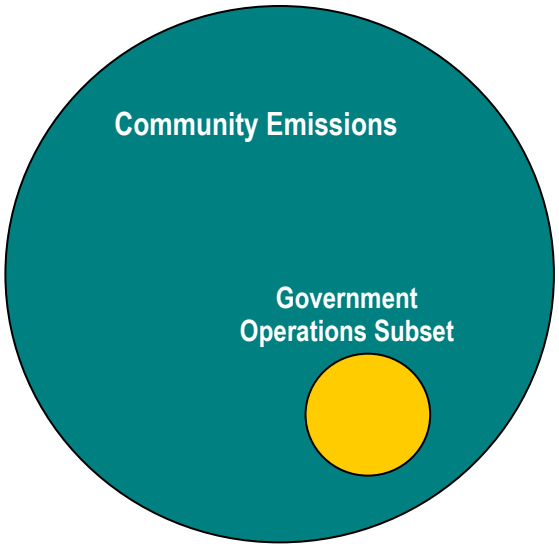


Figure 4: Relationship of Community and Government Operations Inventories

Community Emissions Protocol

The Community Protocol was released by ICLEI in October 2012 and represents a new national standard in guidance to help U.S. local governments develop effective community GHG emissions inventories. It establishes reporting requirements for all community GHG emissions inventories, provides detailed accounting guidance for quantifying GHG emissions associated with a range of emission sources and community activities, and provides a number of optional reporting frameworks to help local governments customize their community GHG emissions inventory reports based on their local goals and capacities.

Quantifying Greenhouse Gas Emissions

Sources and Activities

Communities contribute to greenhouse gas emissions in many ways. Two central categorizations of emissions are used in the community inventory: 1) GHG emissions that are produced by "sources" located within the community boundary, and 2) GHG emissions produced as a consequence of community "activities".

[3] http://www.icleiusa.org/tools/ghg-protocol/community-protocol

Source	Activity
Any physical process inside the jurisdictional boundary that releases GHG emissions into the atmosphere	The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions.

By reporting on both GHG emissions sources and activities, local governments can develop and promote a deeper understanding of GHG emissions associated with their communities. A purely source-based emissions inventory could be summed to estimate total emissions released within the community's jurisdictional boundary. In contrast, a purely activity-based emissions inventory could provide perspective on the efficiency of the community, even when the associated emissions occur outside the jurisdictional boundary.

Base Year

The inventory process requires the selection of a base year with which to compare current emissions. Ketchum's community greenhouse gas emissions inventory utilizes **2018** as its base year but an earlier inventory was done in **2007** using data from 2005. In 2007, the sources of data for an inventory were not always consistent with the current sources and protocol so the 2005 data is not directly comparable to the 2018 data. More specifically, the residential, commercial, and industrial emissions are directly comparable, but the transportation, solid waste, and fugitive emissions have some variances in the methodology of sourcing data between the two inventories.

A comparison of 2005 emissions vs. 2018 emissions is shown in Figure 5 below.

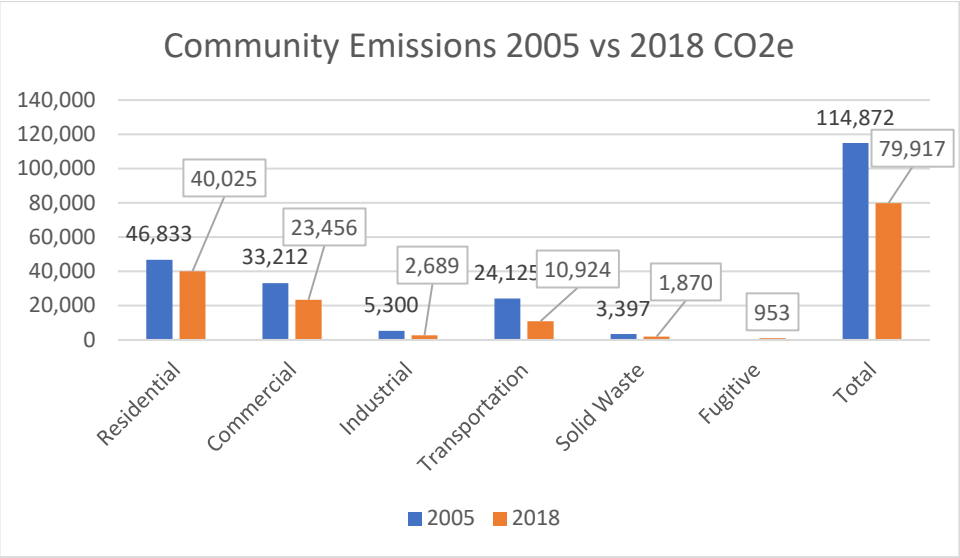


Figure 5: Community Emissions – 2005 vs 2018 CO2e

Emissions in 2018 were lower in every category except fugitive emissions, which were not calculated in 2005. Even though total emissions were approximately thirty-percent lower in 2018, the amount of residential electricity used was 88,973,340 kWh in 2018 compared to only 53,144,057 kWh in 2005. This is likely due to the grid becoming "greener" even though total usage increased. In addition, the proportions were different in 2005 in which commercial energy use and transportation made up a higher percentage while residential energy use was a lower portion in 2005 than in 2018. Transportation has also become "greener" with more fuel-efficient and electric vehicles. See the comparisons in Figure 5 below.

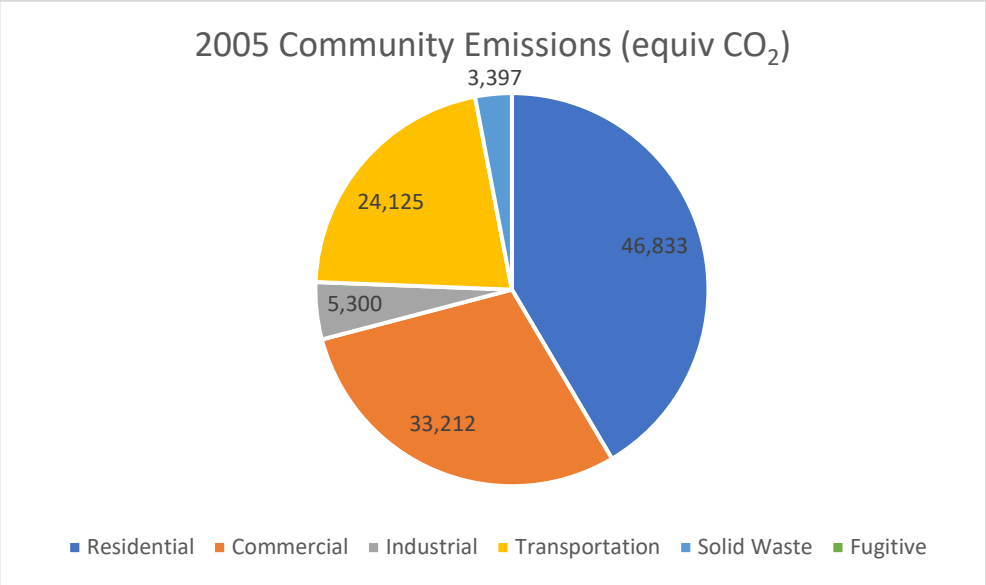


Figure 6: 2005 Community Emissions

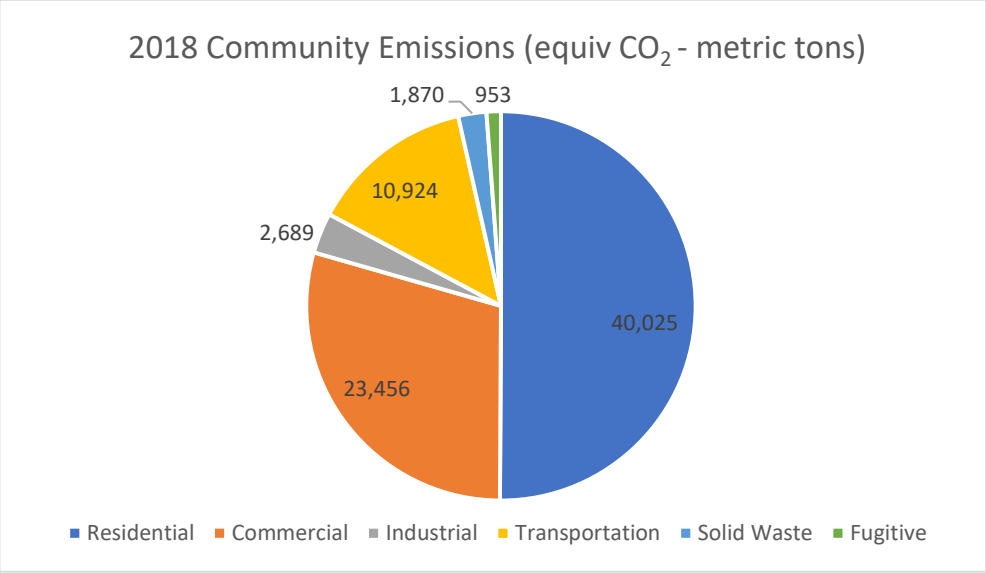


Figure 6: 2018 Community Emissions

Quantification Methods

Greenhouse gas emissions can be quantified in two ways:

- Measurement-based methodologies refer to the direct measurement of greenhouse gas emissions (from a monitoring system) emitted from a flue of a power plant, wastewater treatment plant, landfill, or industrial facility.[4]
- Calculation-based methodologies calculate emissions using activity data and emission factors. To calculate emissions accordingly, the basic equation below is used: *Activity Data x Emission Factor = Emissions*

All emissions sources in this inventory are quantified using calculation-based methodologies. Activity data refer to the relevant measurement of energy use or other greenhouse gas-generating processes such as fuel consumption by fuel type, metered annual electricity consumption, and annual vehicle miles traveled. Please see appendices for a detailed listing of the activity data used in composing this inventory.

Known emission factors are used to convert energy usage or other activity data into associated quantities of emissions. Emissions factors are usually expressed in terms of emissions per unit of activity data (e.g. lbs CO_2/kWh of electricity).

[4] Ketchum's community inventory includes emissions data provided by local utilities and other sources that was gathered through calculation-based methodology.

Community Emissions Inventory Results

Following the Community Protocol, this inventory report organizes emissions in several frames. Each frame includes a particular set of emissions sources and activities, and each helps to tell a different story about community emissions. This report looks at Ketchum's community emissions through two frames:

- Community-Wide Activities
- Household Consumption

And, a comparison to another nearby community, the City of Hailey, is included to provide another perspective.

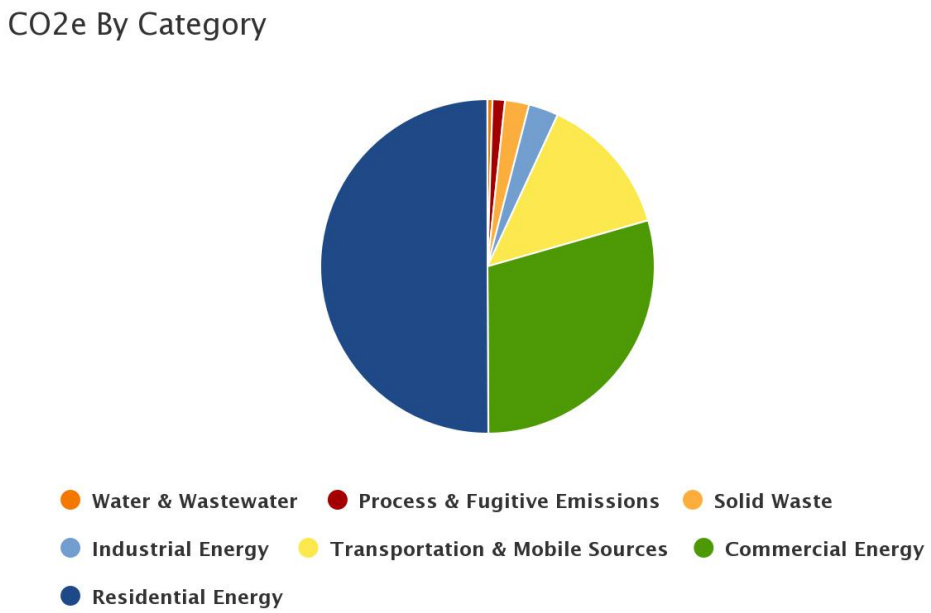
Community Profile

To put emissions inventory data in context, it is helpful to have some basic information about community such as population and number of households. This information is provided in Table 1.

Table 1: Ketchum Community Indicators

Estimated 2018 Population	**2,827**
Estimated 2018 Households	**1,213**

Figure 8: Community-Wide Emissions



Community-Wide Activities Frame

Ketchum has chosen to also look at emissions through the community-wide activities frame. This frame includes emissions that result from the use of energy, materials, and services by all members of the community, regardless of whether Ketchum has significant influence over those emissions. These emissions may be occurring within or outside of the community boundary. This frame includes all the six Basic Emissions Generating Activities required by the community protocol: residential energy, commercial energy, industrial energy, transportation, solid waste, process and fugitive, and water & wastewater. It does not include use of air travel because the airport chose to use a different and industry-specific protocol. When used for comparison across communities, this framework is helpful in illustrating relative urban efficiencies. Table 2 summarizes emissions from community-wide activities.

Table 2: Community-Wide Activity GHG Emissions by Activity

Source or Activity	Activity Data Quantity and Unit	Emissions Factor	Emissions (metric tons CO2e)
Residential Use of Electricity	88,973,340 (kWh)	0.08497	26,516
Commercial Use of Electricity	49,362,490 (kWh)	0.08497	14,316
Industrial Use of Electricity	14,017 (kWh)	0.08497	4
Residential Stationary Combustion	2,539,945 (Therms)	53.02	13,509
Commercial Stationary Combustion	1,718,412 (Therms)	53.02	9,140
Industrial Stationary Combustion	432,493 (Therms)	53.02	2,295
On-road Passenger Vehicle Travel	18,221,556 (VMT)	0.07024	8,196
On-road Freight Vehicle Travel	1,661,646 (VMT)	0.0739344827586207	2,728
Use of Electricity in Potable Water Treatment and Distribution	Included in Commercial Energy Use		
Use of Electricity in Wastewater Treatment	4,468 (kWh)	0.08497	390

Generation of Solid Waste	7,902 tons	Varies based on EPA methodology	1,649
Total Community-Wide Activity Emissions			**78,743 metric tons CO2e**

Looking at the community-wide activities frame shows that, while not all under significant local government influence, residential and commercial energy use are important ways in which the Ketchum community contributes to emissions. Households and businesses in Ketchum may want to consider these activities as they think about how to reduce their own emissions. It will be important for Ketchum to focus on these emissions sources and activities in developing a climate action plan. The total emissions of 78,743 metric tons CO2e will be the baseline for setting an emissions reduction target and measuring future emissions.

Household Consumption Frame

The final frame through which Ketchum has chosen to look at emissions is that of household consumption. The household consumption frame helps to illustrate the full, life cycle impacts of residents' activities. Household consumption includes lifecycle emissions associated with household electricity use, household natural gas use, household personal vehicle transportation, household use of public transportation, household use of water and wastewater services, household production of garbage, and household use of materials and services. Many of these emissions overlap with those looked at through the local government influence and communitywide activities frames. But the household consumption frame also includes emissions that are not included in the other frames, in particular emissions from goods and services that are produced outside the community.

Consumption-based emissions for communities in the U.S. are often – but not always – higher than in-boundary emissions. Consumption based emissions are also larger than geographic emissions for the nation as a whole although communities with small residential populations, limited government presence, and large industrial or tourism activities (businesses serving non-resident customers) would find their consumption-based emissions to be relatively small. But regardless of whether consumption-based emissions are larger or smaller, some of the emissions are *different*, and they represent additional ways in which the community contributes to climate change and by extension, additional opportunities for the community to reduce its contribution to climate change. Table 3 shows total household consumption emissions for Ketchum based on this GHG inventory.

Table 3: Total Household Consumption Emissions for Ketchum

Average Household Emissions	Number of Households	Total Household Consumption Emissions
33 metric tons CO2e	1,213	40,025* metric tons CO2e

* This includes residential electricity and natural gas. Other emissions estimated in Figure 6 have not been quantified in the household inventory.

A range of actions can help to reduce these emissions, including encouraging alternative modes of transportation, energy efficiency for homes, materials management, reduction of wasted food, and sustainable purchasing practices. The City of Ketchum may want to look at educational efforts in some of these areas as part of its climate action plan.

Consumption emissions for an average household can be obtained from calculators such as at http://coolclimate.berkeley.edu. Residents who want to learn more about consumption-based emissions from their own household can use the calculator to obtain emissions based on their personal energy use, transportation and purchasing.

Comparison to Hailey Total Emissions

Because this inventory process was a collaboration between several local cities and Blaine County, an additional frame through which Ketchum has chosen to look at emissions is that of a comparison to the City of Hailey. The comparison shows that emission sources are not consistent between cities within this valley. For example, Ketchum has a much higher proportion of emissions from residential energy while Hailey has a higher proportion from transportation.

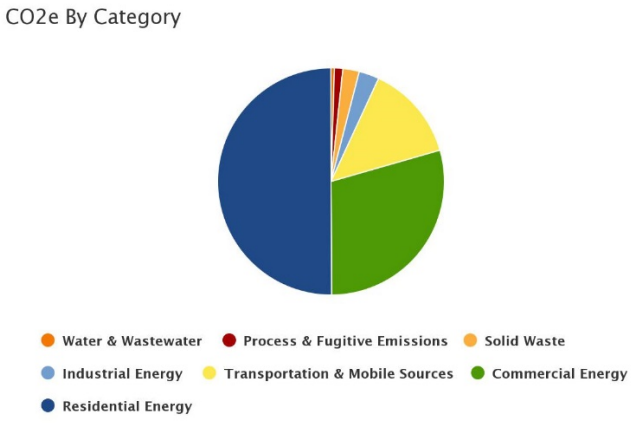


Figure 9: Ketchum Community-Wide Emissions

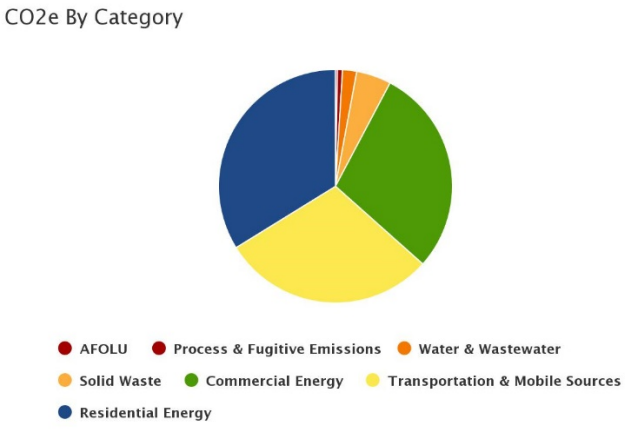


Figure 10: Hailey Community-Wide Emissions

In addition, it is interesting to compare the per resident and per household emissions for each community. Hailey residents contribute less than one-third the emissions of Ketchum residents and Hailey households contribute less than one-quarter the emissions of Ketchum households.

Table 4: Total Per Resident and Per Household Consumption Emissions for Ketchum

Ketchum			
Estimated 2018 Population	2,827	78,743 CO2e	27.85 CO2e per resident
Estimated 2018 Households	1,213	40,025 CO2e	33.00 CO2e per household

Table 5: Total Per Resident and Per Household Consumption Emissions for Hailey

Hailey			
Estimated 2018 Population	8,259	71,937 CO2e	8.71 CO2e per resident
Estimated 2018 Households	3,198	24,317 CO2e	7.60 CO2e per household

Conclusion

This analysis found that the Ketchum community as a whole was responsible for emitting 78,743 metric tons of CO_2e in the base year 2018, with emissions from the residential electricity sector contributing fifty-percent of total emissions, which is the largest proportion.

As Ketchum moves forward with considering emission reduction strategies and works to create a local climate action plan, the City should identify and quantify the emission reduction benefits of climate and sustainability strategies that could be implemented in the future, including energy efficiency, renewable energy, vehicle fuel efficiency, alternative transportation, vehicle trip reduction, land use and transit planning, waste reduction, and other strategies. Through these efforts and others, the City of Ketchum can achieve additional benefits beyond reducing emissions, including saving money and improving Ketchum's economic vitality and its quality of life. City staff will continue to update this inventory as additional data become available and will aim to conduct a complete inventory at least every two years.

Appendix A: Community Inventory Details

Table A-1 provides details on calculation methods and data sources for each included activity and source. *Note that data was stored in ClearPath and on the Blaine County server.*

Table A-1: Community Inventory Calculation Method and Data Source Details

Residential use of electricity	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	88973340	kWh	26516	CO2e	IPCo	protocol
Method and data source notes: Idaho Power, contact the local Customer Rep						

Commercial use of electricity	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	49362490	kWh	14316	CO2e	IPCo	protocol
Method and data source notes: Idaho Power, contact the local Customer Rep						

Residential use of stationary combustion equipment	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	2539945	therms	13509	CO2e	IMG	protocol
Method and data source notes: Intermountain Gas, contact the regional Vice President, mark.chiles@mdu.com						

Commercial use of stationary combustion equipment	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	1718412	therms	9140	CO2e	IMG	protocol
Method and data source notes: Intermountain Gas, contact the regional Vice President, mark.chiles@mdu.com						

On-road passenger vehicle travel associated with community land uses	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	18461556	VMT	8196	CO2e	State	protocol
Method and data source notes: Based on VMT data from the State of Idaho						

On-road freight and service vehicle travel associated with community land uses	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	1661646	VMT	2689	CO2e	State	protocol
Method and data source notes: Based on VMT data from the State of Idaho						

Generation of solid waste by the community	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	7902	Tons	1649	CO2e	CCD	protocol
Method and data source notes: Clear Creek Disposal and Southern Idaho Solid Waste						

Use of energy associated with use of potable water	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	N/A	N/A	N/A	CO2e	N/A	protocol
Method and data source notes: Included in commercial or industrial energy use.						

Use of energy associated with generation of wastewater	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	4468	kWh	390	CO2e	IPCo	protocol
Method and data source notes: City of Ketchum staff						

Industrial use of electricity	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	14017	kWh	4	CO2e	IPCo	protocol
Method and data source notes: Idaho Power, contact the local Customer Rep						

Industrial use of stationary combustion equipment	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	432493	therms	2295	CO2e	IMG	protocol
Method and data source notes: Intermountain Gas, contact regional Vice President mark.chiles@mdu.com						

Process and Fugitive Emissions	Activity data		Emissions factor			Method
	Value	Unit	Value	Unit	Source	
	5492938	therms	508	CO2e	IMG	protocol
Method and data source notes: Intermountain Gas, contact the regional Vice President, mark.chiles@mdu.com						