

TOWN OF TRUCKEE
KEEP TRUCKEE GREEN

2022 Community-Wide Greenhouse Gas Emissions Inventory

April 2025

TOWN OF
TRUCKEE

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Introduction

The Truckee Town Council has set a priority to reduce greenhouse gas (GHG) emissions to reduce the impacts of climate change and become a leader in environmental sustainability. To measure and quantify progress, the Town has adopted the following targets for reducing community-wide GHG emissions relative to a 2008 baseline:

- 40% reduction by 2030
- 80% reduction by 2040
- Achieve carbon neutrality by 2045

Truckee's Climate Action Plan (CAP) outlines goals, policies and actions to reduce the Town's GHG emissions in sectors consistent with this report. The Town has committed to updating this CAP at least every five years, which includes conducting a community-wide GHG emissions inventory. Creating a community-wide inventory of GHG emissions provides Town of Truckee residents, businesses, and leaders with information needed to implement GHG reduction measures into their own practices and operations, furthering the advancement of the Town's community-wide GHG reduction targets, and informing opportunities to update measures included in the Town's CAP.

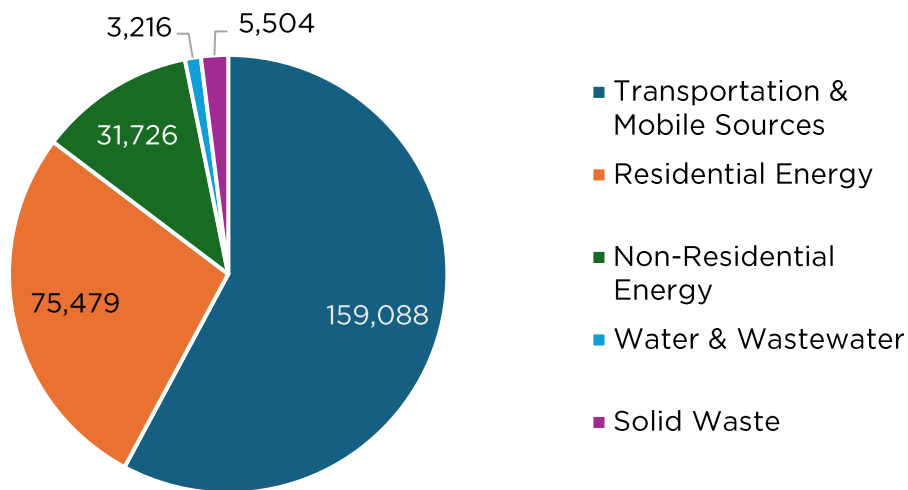
This report documents the results of the 2022 GHG emissions inventory, with comparisons to the 2008 baseline and 2016 re-inventory. This inventory measures the GHG emissions associated with activities and sources within the Town of Truckee jurisdictional boundary. Emissions from the following sectors were included: transportation and mobile sources, residential energy, non-residential energy, water and wastewater, and solid waste. This report is intended to continue to guide GHG emission reduction efforts, provide a comparison to the Town's previous inventories, and demonstrate progress towards reduction goals.

Consistent with previous inventories of 2008 and 2016 community-wide emissions, all estimates follow the U.S. Community Protocol (USCP) for Accounting and Reporting of Greenhouse Gas Emissions. This protocol establishes reporting requirements and accounting guidance for quantifying GHG emissions associated with a community scale. ClearPath, a tool developed by Local Government for Sustainability USA (ICLEI), was utilized to calculate emissions according to USCP requirements. Although the protocol provides a common framework for calculating community emissions, it is important to note that any emissions inventory represents an estimate using the best available data and calculation methodologies at the time it was conducted. These estimates are subject to change as better data and calculation methodologies become available. When conducting the 2022 inventory, modifications were made to the 2008 and 2016 baseline emissions based on updated data available for transportation, wastewater, and solid waste. These updated estimates are included in this report as revised totals for previous inventory years.

2022 GHG Emissions Summary

In 2022, community-wide GHG emissions totaled 274,995 metric tons of carbon dioxide equivalent (MT CO₂e). As seen in Figure 1, Transportation and Mobile Sources continue to be the largest emissions sector, followed by Residential Energy, Non-Residential Energy, Solid Waste, and Water and Wastewater.

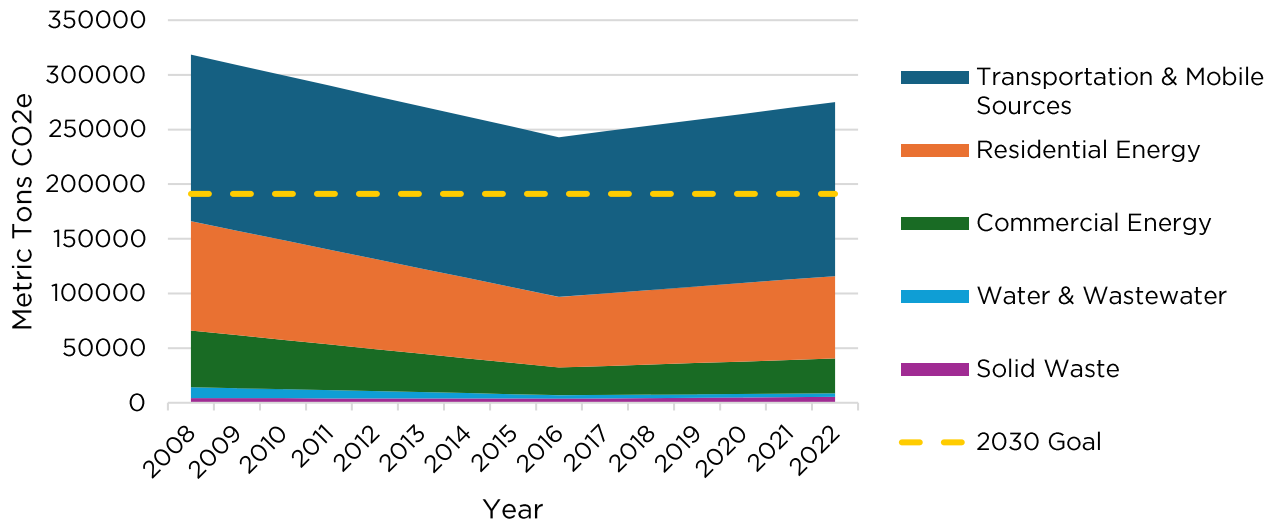
Figure 1: Community GHG Emissions by Sector (Metric Tons CO₂e)



GHG Emissions Trends

While 2022 community-wide emissions are 14% below the 2008 baseline, total emissions have increased 13% since the last inventory in 2016. The transportation and mobile sources sector accounts for the largest share of emissions and increased by 4% since 2008. Solid waste emissions have also increased by 28% since 2008. All other sectors saw emission reductions since the baseline year.

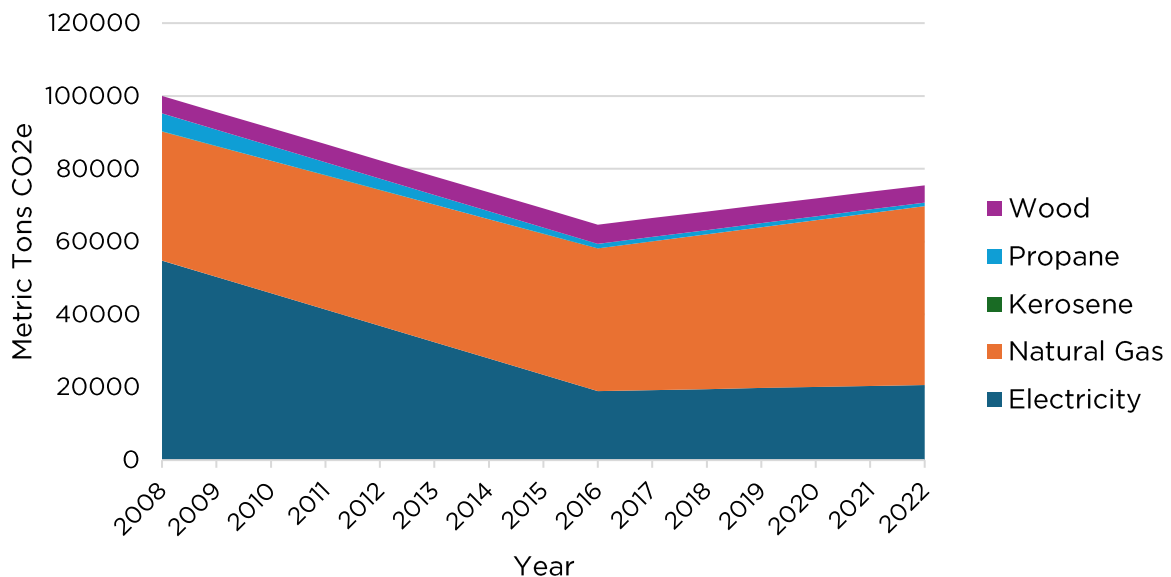
Figure 2: Community GHG Emissions 2008-2022



Residential Energy Use

Emissions from the Residential Energy Use sector include emissions associated with the energy used to power and heat residential buildings. Residential energy use is the second largest emission sector, accounting for 27% of total emissions in 2022.

Figure 3: Residential Energy Use GHG Emissions 2008-2022



Emissions from residential energy use decreased 25% since 2008 and increased 17% since 2016. The reduction in emissions since 2008 can be attributed to the local electric utility providers' increase in renewable energy sources. Since 2008, electricity

use has increased 18%, yet the associated GHG emissions have decreased by 62%. In 2008, only 4.5% of the power provided by Truckee Donner Public Utility District (TDPUD) came from renewable sources, while in 2022 it was 45.5%. Liberty Utilities sourced 26% of its electricity from renewables in 2022.

The upward trend in GHG emissions from residential energy since 2016 is driven by natural gas use. Residential use of natural gas has increased 38% since 2008 and is now responsible for 65% of total Residential Energy Use GHG emissions. Reducing residential natural gas use, which is primarily used for space heating, will need be a focus of community-wide GHG emissions reduction efforts in order to achieve adopted targets.

Table 1: Residential Energy Use

Residential Energy Use	Usage			Percent Change	
	2008	2016	2022	2008-2022	2016-2022
Electricity (kWh)	87,444,939	95,534,941	102,986,457	+18%	+8%
Natural Gas (Therms)	6,663,470	7,364,464	9,223,723	+38%	+25%
Kerosene (Gallons)	9,910	2,827	0	-100%	-100%
Propane (Gallons)	838,915	213,327	182,196	-78%	-15%
Wood (MmBtu)	524,838	579,034	477,128	-9%	-18%

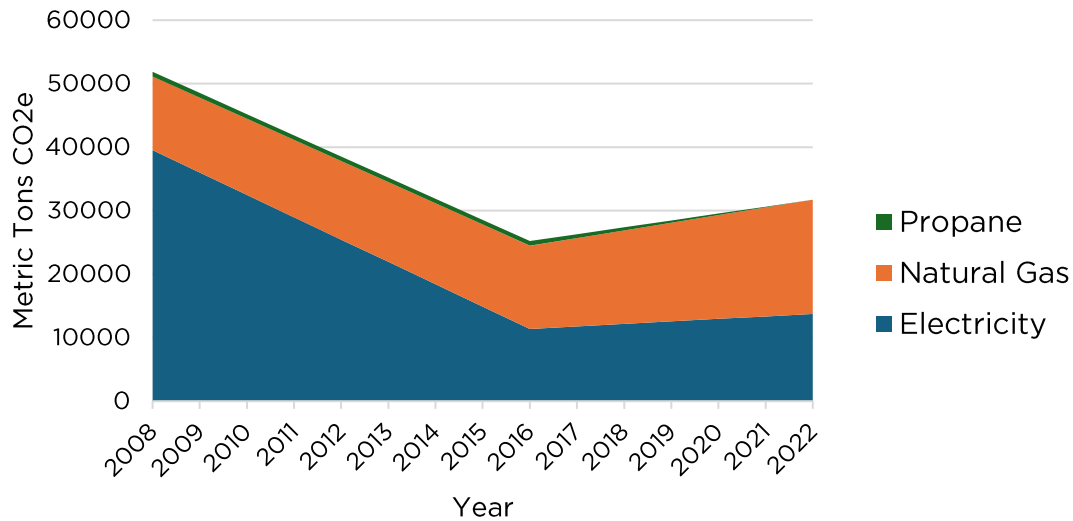
Most of Truckee’s residential energy use and associated emissions come from primary residences, despite these being less than half of the overall residential building stock. This is due to most second homes being used only intermittently. In 2022, 74% of total residential energy use in Truckee was from primary homes.

Residential electricity and natural gas emissions were calculated using 2022 consumption data provided by utility providers TDPUD, Liberty Utilities, and Southwest Gas. Non-utility fuel use was estimated based on U.S. Census Bureau data and California average per-household fuel use for each fuel type.

Non-Residential Energy Use

Emissions from the Non-Residential Energy Use sector are primarily from the energy used to power and heat non-residential buildings, along with a smaller amount of energy used for infrastructure such as outdoor lighting.

Figure 4: Non-Residential Energy Use GHG Emissions 2008-2022



Emissions from non-residential energy have decreased 39% since 2008, while increasing 26% between 2016 and 2022. The majority of emission reductions in this sector can also be attributed to local electric utility providers' increase in renewable sources on the electric grid. TDPUD has increased the amount of renewable energy sources from 4.5% in 2008 to 45.5% in 2022. Liberty Utilities sourced 26% of its electricity from renewables in 2022. As seen in Table 2, energy use has steadily increased between 2016 and 2022, with natural gas use increasing by 37%, and electricity use increasing by 12%. Natural gas is responsible for the largest share of emissions in the non-residential energy use sector, accounting for 57% of emissions. Reducing emissions from natural gas use will continue to be a priority in achieving GHG reduction targets.

Non-residential propane consumption estimates are not provided through US census data. Propane consumption estimates for previous inventories were obtained from Truckee-based propane services for 2008 but could not be provided for 2016 or 2022, and staff does not anticipate this data being included in future inventories. Programs designed to address natural gas use in commercial buildings would also support reduction in propane use, so the lack of data is not anticipated to be a barrier in addressing this source of emissions.

Table 2: Non-Residential Energy Use

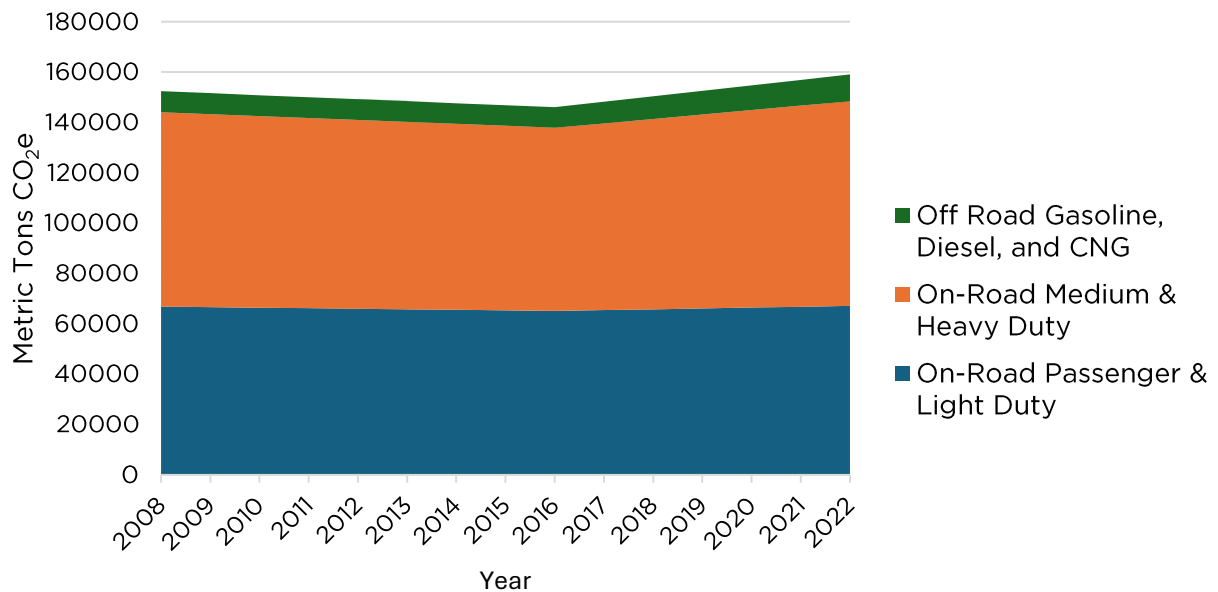
Fuel Type	Usage			Percent Change	
	2008	2016	2022	2008-2022	2016-2022
Electricity (kWh)	6,2815,326	6,1291,408	68,722,325	+9%	+12%
Natural Gas (Therms)	2,183,380	2,467,396	3,378,457	+55%	+37%
Propane (Gallons)	123,856	123,856	-	-	-

Non-residential energy use emissions were calculated using 2022 electricity consumption data provided by utility providers TDPUD, Liberty Utilities, and Southwest Gas. Emissions resulting from the energy used for potable water service and wastewater treatment within the jurisdictional boundary are subtracted from the Non-Residential Energy Use Sector and are instead reported in the Community Potable Water and Wastewater Treatment Sector, per protocol guidance.

Community Transportation

Emissions from the Community Transportation sector include emissions from fuel combustion from on- and off-road vehicle travel.

Figure 5: Community Transportation GHG Emissions 2008-2022



Emissions from transportation and mobile services decreased by 4% since 2008 and increased by 9% between 2016 and 2022. Community transportation is the largest emissions sector, accounting for 58% of community-wide emissions.

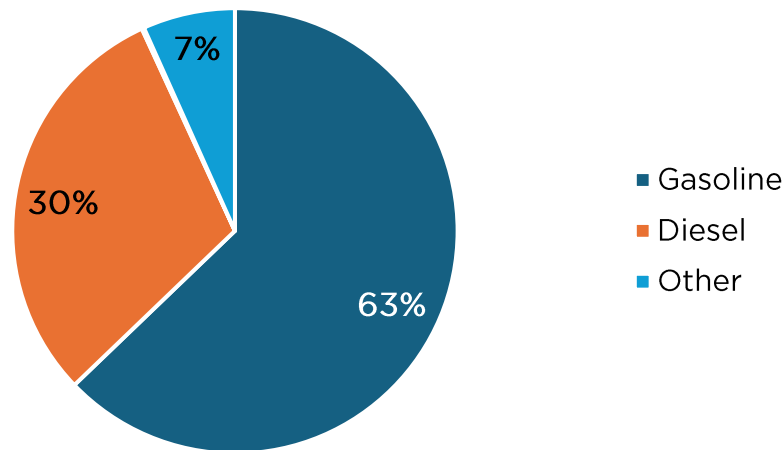
Emissions are calculated based on estimated vehicle miles traveled (VMT), which are based on a 2018 traffic analysis and data collected from individual Bluetooth devices to assess trip patterns. 100% of the VMT from internal trips beginning and ending in Truckee are attributed to Truckee's VMT generation. Trips that originate outside the jurisdiction and end in Truckee, and trips that originate in Truckee and end outside the jurisdiction attribute 50% of the VMT to Truckee. Consistent with standard California Environmental Quality Act analyses, the VMT estimates do not include trip lengths in Nevada. While this will result in under-counting of trip miles originating or ending across the state line, staff do not have data that would allow for estimation of these missing trip miles. Since this data gap is consistent across all inventory years, staff do not believe it will substantially impact GHG emissions reduction goals, as they are based on a percentage of baseline emissions.

Emission estimates are based on VMT and vehicle emission factors sourced from the California Air Resources Board. Per the USCP methodology, electricity emissions from electric and plug-in hybrid vehicles are captured in the built environment energy use sectors. Transportation emissions for plug-in hybrid vehicles only include the portion of estimated miles traveled using fuel combustion. Electric vehicle miles traveled are provided below as an informational item but are not included in transportation emission calculations.

Figure 6: 2022 Community On-Road Transportation Vehicle Miles Traveled

Vehicle Type	Vehicle Miles Traveled (miles)			Percent Change	
	2008	2016	2022	2008-2022	2016-2022
On-Road Passenger & Light Duty- Gasoline	166,141,924	1,77,065,025	199,930,114	+20%	+13%
On-Road Passenger & Light Duty- Diesel	780,143	1,935,648	1,089,489	+40%	-44%
On-Road Medium & Heavy Duty - Gasoline	54,159,748	48,126,407	59,014,283	+9%	+23%
On-Road Medium & Heavy Duty - Diesel	33,714,980	35,993,575	39,371,278	+17%	+9%
On-Road Medium & Heavy Duty - Natural Gas	43,684	162,713	163,120	+273%	+0.3%
On-Road Passenger and Light Duty - Plug-in Hybrid	-	296,324	1,304,503	-	-
Total VMT	254,840,478	263,579,691	300,872,788	18%	14%
<i>Electric Vehicles</i>	<i>1,226</i>	<i>5,973</i>	<i>47,543</i>	<i>+3,778%</i>	<i>+696%</i>

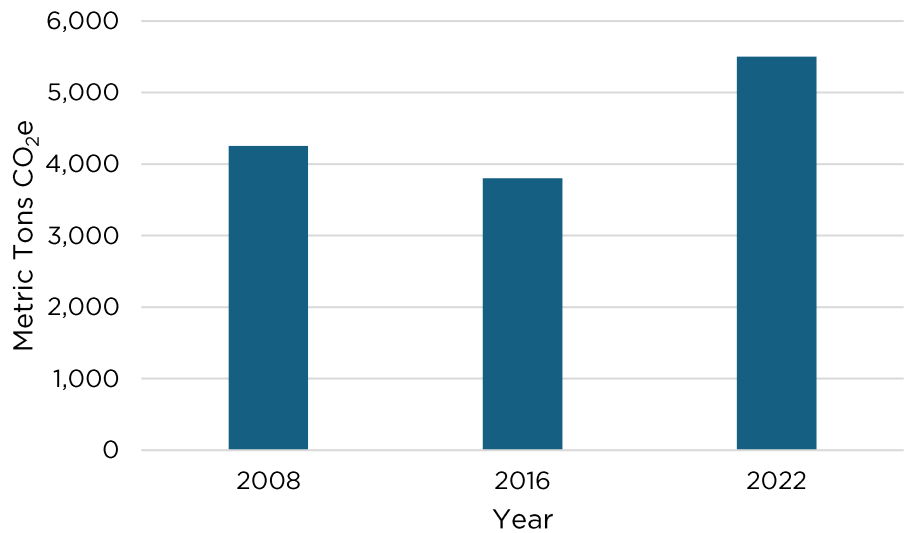
Figure 7: 2022 Community Transportation Emissions (Metric Tons CO₂e)



Community Solid Waste

Community solid waste emissions are an estimate of the methane generated by the anaerobic decomposition of organic waste (such as paper, food scraps, plant debris, wood, etc.) in a landfill over the period of decomposition.

Figure 8: Community Solid Waste GHG Emissions



Emissions from community solid waste increased 28% since 2008, and 43% between 2016 and 2022. The increase in emissions is due to the increase in tons of waste generated in Truckee and sent to landfills. Tonnages are obtained from CalRecycle’s Recycling and Disposal Reporting System. Statewide waste characterization factors

are applied to the total tonnage to estimate the makeup of organic material in the waste, and emission factors are applied based on the type of organic material. Emission estimates for collection and transportation of community generated solid waste are included in community transportation sector emissions and are not measured separately.

In 2018, the Town implemented updated waste collection programs which provide source-separated mixed recycling and yard waste collection for residents and businesses, and food waste collection for large commercial generators. In addition, the Town offers a public food waste drop-off service for residents to divert food waste from landfills. These updated collection programs have undoubtedly reduced the amount of organic waste sent to landfill from Truckee. However, for purposes of this report, GHG emissions are estimated using statewide waste characterization data, which averages the amount of organic waste sent to landfill across California jurisdictions. This is consistent with the methodology used for the 2008 and 2016 inventories. Due to unique factors in our area such as Truckee's high-elevation waiver from Senate Bill 1383, which exempts high-elevation jurisdictions from food waste diversion requirements, Truckee's mix of organic material in landfilled waste is expected to increasingly diverge from the statewide average. Assumptions used in this inventory are likely to slightly underestimate the amount of organic waste sent to landfill and subsequent emissions from Truckee. For future inventories, the Town plans to conduct a local waste characterization study to estimate the local percentage of organic waste in landfilled material from Truckee.

Annual disposal tonnage for previous years is regularly updated by CalRecycle as new data becomes available. Tonnage and emission estimates were updated for 2008 and 2016 inventory years based on updated data available from CalRecycle.

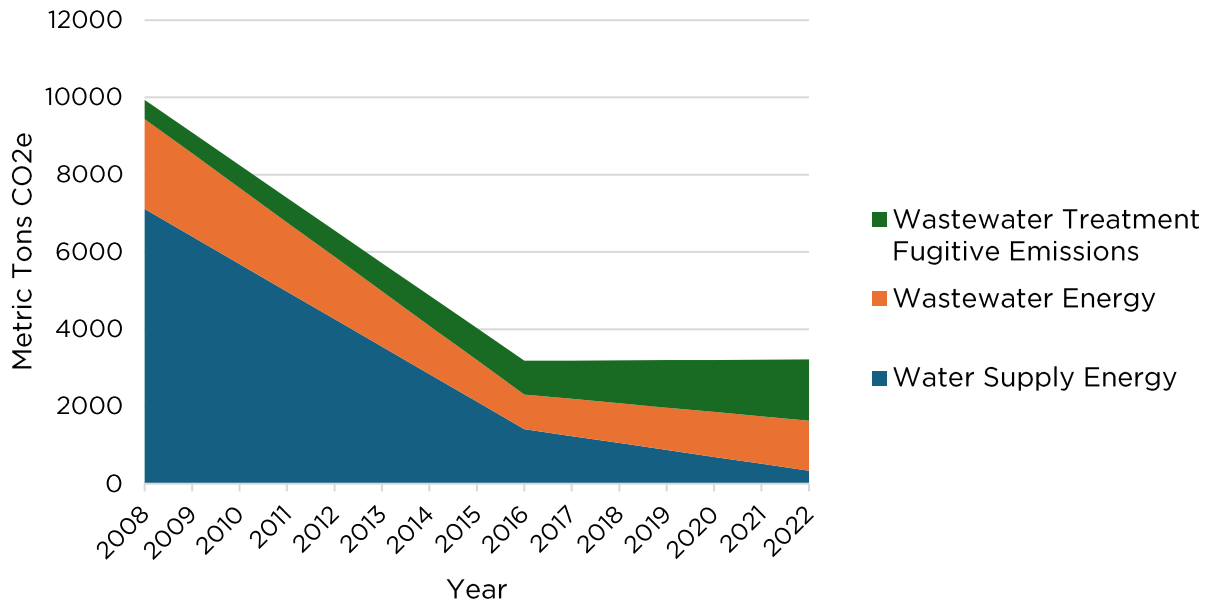
Table 3: Community Generated Solid Waste

Waste Sent to Landfill	Tons/Year			Percent Change		Tons per Household		
	2008	2016	2022	2008-2022	2016-2022	2008	2016	2022
Disposal	17,296	15,566	20,621	+19%	+32%	2.8	2.5	3.3
Green Waste-Beneficial Reuse (ADC)	-	1,405	1,288	-	-8%	-	-	-

Community Potable Water and Wastewater Treatment

Emissions from water and wastewater treatment are associated with the electricity used to transport water and wastewater, and process emissions generated from wastewater treatment.

Figure 9: Potable Water and Wastewater Treatment GHG Emissions 2008-2022



Emissions from water and wastewater treatment decreased 68% since 2008 and increased 1% between 2016 and 2022. The significant decrease in emissions is due to the reduction in GHG emissions associated with electricity use required to supply potable water and electricity use at the wastewater treatment plant. Due to the TDPUD's cleaner energy sources, wastewater emissions associated with energy use have significantly reduced.

Emissions from wastewater treatment include estimated emissions from septic systems as well as treatment at the Truckee Tahoe Sanitation Agency Wastewater Treatment Plant. Emissions associated with the wastewater treatment process have increased by 222% since 2008. These emission estimates are based on population, which have increased due to the increase in population since 2008. The population data used is an estimate of full-time residents, employees, and visitors. Due to our community's high visitation rates, the population served by wastewater treatment facilities can be difficult to accurately estimate.

Updates were made to the 2008 and 2016 wastewater treatment emission data to correct errors in the calculations. Previous calculations underestimated the population and used incorrect methodology to estimate emissions from wastewater treatment that resulted in double-counting of some emissions. Updated emission estimates for 2008 and 2016 are reflected in this report, which only slightly altered emissions by 1-2% from original estimates.

Electricity associated with water and wastewater are included in this sector, and removed from the non-residential energy use sector, consistent with USCP recommendations, so that emissions associated with water use can be viewed together. Energy use data for distribution of potable water is provided by TDPUD.

Wastewater treatment data is provided by Tahoe-Truckee Sanitation Agency and energy use associated with transportation of wastewater is provided by Truckee Sanitary District. The count of septic systems is an estimate based on the number of households without sewer connections.