

CONTRA COSTA COUNTY GOVERNMENT OPERATIONS GREENHOUSE GAS EMISSIONS INVENTORY: 2017 With 2006 Baseline Comparison

As part of Contra Costa County's (County's) Climate Action Plan (CAP) update, the County updated its greenhouse gas (GHG) inventory for government operations. The County government operations emissions inventory is an assessment of emissions resulting from County operations from a variety of sources over the course of a calendar year.

Contra Costa County prepared a community-wide GHG inventory as part of the Envision Contra Costa 2040 General Plan. This community-wide inventory serves as a foundation for policies in the General Plan, CAP, and their associated environmental review as required by the California Environmental Quality Act (CEQA). To maintain the project schedule and ensure it would be completed in a timely manner, the County prepared the GHG inventory early in the General Plan and CAP update process. At the time of the inventory's preparation, the most recent year with available data for the community-wide inventory was 2017. The County prepared this government operations inventory to be consistent with the community-wide inventory, allowing them to be easily compared and to support effective GHG reduction. As a result, this government operations inventory has been prepared for the calendar year 2017. The 2017 government operations inventory complements an earlier government operations inventory for the calendar year 2006.

This summary presents an overview of the GHG emissions attributed to County operations and activities in years 2017 and 2006 for comparison purposes. The County operations emissions included in this inventory were determined using the operational control framework, which includes emissions sources and activities for which the County has the full authority to introduce and implement operating policies. The County operations inventory also includes two additional emissions sectors for which the County has limited control: emissions from employee-generated solid waste and emissions from employees' personal commutes to work. The Local Government Operations Protocol recommends including these optional sources even though the County does not have full operational control over these emissions. Data from these inventories will serve as a guidepost to local GHG emissions-reduction efforts.

Inventory Methodology

This section provides information on the protocols used to guide the Contra Costa County GHG inventories for government operations. The updated 2017 inventory uses consistent and current methods described in this section.

GHG inventories follow the methods and approaches outlined in guidance documents, known as protocols. Complying with these protocols allows for more accurate analyses and comparisons across jurisdictions. County staff, with guidance from PlaceWorks,¹ completed all government operations emissions estimates in accordance with the Local Government Operations Protocol and the United States Community Protocol, which both outline commonly accepted methods for performing GHG inventories and are recommended by state agencies for local governments. PlaceWorks provided a peer review of the inventory data and emissions calculations and County staff reviewed the activity data and emissions factors used to calculate emissions.

All measurements of GHG emissions are in the common unit of metric tons of carbon dioxide equivalent (MTCO_{2e}), which allows for the different strengths of various GHGs to be expressed in a single unit.

Emissions Summary

In 2017, Contra Costa County municipal operations emissions totaled 43,376 MTCO_{2e} for the sectors reported in this inventory (see Table 1). This is a 20-percent decrease (10,757 MTCO_{2e}) in GHG emissions from the 54,133 MTCO_{2e} in the 2006 baseline inventory. This is primarily the result of reductions in energy use, reductions in County fleet emissions, and reductions in employee waste disposal. The 2017 inventory also includes emissions from wastewater treatment and refrigerants, which were not included in the 2006 inventory. In summary:

- The largest source of emissions in 2017 is from the Employee Commute sector (25,795 MTCO_{2e}). In the 2006 inventory, Employee Commute is also the largest contributor of GHG emissions (23,527 MTCO_{2e}).
- Significant emissions also originate from the Buildings and Facilities sector (12,503 MTCO_{2e} in 2017) and Government (County) Fleet (3,428 MTCO_{2e} in 2017).
- Emissions from every sector except for Employee Commute decreased between 2006 and 2017. There was a 10-percent increase in GHG emissions related to Employee Commute over this time.
- The greatest reduction in the amount of emissions occurred in the Buildings and Facilities sector (decrease of 6,757 MTCO_{2e}), followed by Government (County) Fleet sector (decrease of 5,074 MTCO_{2e}), and Solid Waste (decrease of 1,072 MTCO_{2e}).
- The number of County employees increased over inventory years by 19 percent, accounting for 1,335 new positions in 2017.
- County employee transportation vehicle miles traveled increased, although this increase was slightly offset by improvements in vehicle efficiency. As a result, overall employee commute emissions increased 10 percent from 2006 to 2017.

¹ PlaceWorks is the environmental consulting firm working on the County's Climate Action Plan and General Plan updates.

Contra Costa County Government Operations GHG Emissions Inventory

- Energy usage in Buildings and Facilities as well as the Public Lighting sector emissions decreased overall due in large part to lower utility electricity emissions factors and energy efficiency.
- Annual solid waste volumes generated by the employees reflected a decrease.

Figure 1 compares 2017 GHG emissions to the 2006 baseline GHG emissions for the County operations inventory.

Figure 1: 2006 Baseline and 2017 County-Operations GHG Emissions Summary

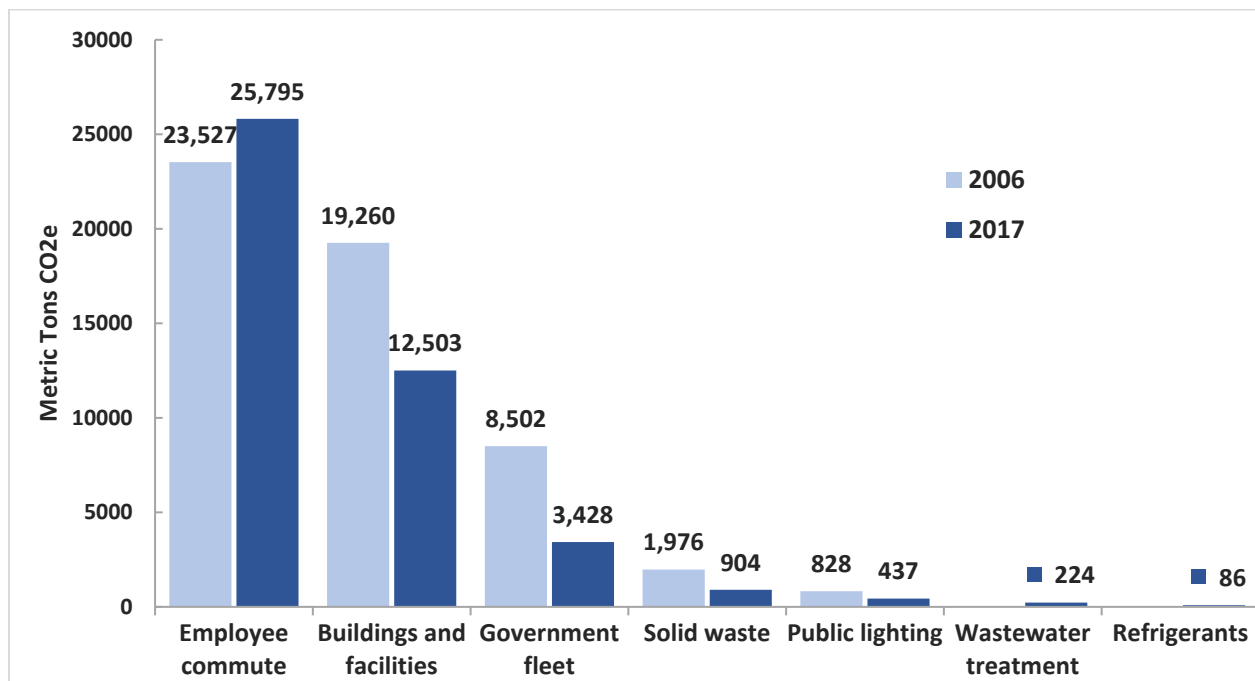


Table 1: 2006 Baseline and 2017 County-Operations GHG Emissions Summary

SECTOR	2006 GHG EMISSIONS (MTCO ₂ E)	2017 GHG EMISSIONS (MTCO ₂ E)	PERCENT CHANGE
Employee commute	23,527	25,795	10%
Buildings and facilities	19,260	12,503	-35%
Government fleet	8,502	3,428	-60%
Government-generated solid waste	1,976	904	-54%
Public lighting	828	437	-47%
Water and wastewater	Not included	224	—
Refrigerants	Not included	86	—
Total	54,133	43,376	-20%

Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.

Information Items

	2006	2017	PERCENT CHANGE
Number of employees	8,423	10,030	19%

Changes in GHG Emissions

Many factors contribute to changes in GHG emissions. Key factors may include changes in electricity use, changes in the carbon intensity of electricity, changes in natural gas use, changes in vehicle miles traveled, changes in vehicle fuel economy, changes in the carbon intensity of vehicle fuels, changes in generated waste tonnage, demographic changes (e.g., changes in population, household, and job numbers) and changes in temperature (affecting heating and cooling demand).

Employee Commute and Travel

Tables 2 and 3 summarize changes in 2006 and 2017 related to employee commute activities.

Table 2: 2006 Baseline and 2017 Employee Commute and Travel Emissions

ACTIVITY/SOURCE	2006 MTCO ₂ E	2017 MTCO ₂ E	PERCENT CHANGE
Employee commute	23,527	25,795	10%
Overall GHG emissions percent	43%	59%	—

Table 3: 2017 Employee Commute Activity Data and GHG Emissions

ACTIVITY/SOURCE	ACTIVITY DATA	UNITS	GHG EMISSIONS (MTCO ₂ E)	PERCENT
Driving alone (gas)	77,173,499	Vehicle miles	24,597	95%
Driving alone (electric)	4,494,566	Vehicle miles	0	0%
Carpool	1,155,502	Passenger miles	354	1%
Transit (BART, bus)	641,827	Passenger miles	96	Less than 1%
Motorcycle	425,051	Vehicle miles	749	3%
Active transportation (walk, bike)	66,591	Miles	0	0%
Telecommute	88,816	Miles	0	0%
Total	84,045,855	Miles	25,795	100%

Note: All numbers are rounded to the nearest 10. Totals may not add up to the sum of individual rows due to rounding.

Although employees’ personal commute is not under the direct operational control of the County, there are a variety of tools and resources available to influence employees’ commute patterns. For this reason, emissions are included in this inventory. Employee commute accounted for in the emissions inventory includes business travel; travel via personal vehicles; carpool; alternative transportation methods, including biking and walking; air travel; and public transit.

Employee commute is the largest source of GHG emissions reported for County operations. In 2017, County employees’ commute to work contributed to 25,795 MTCO₂e, accounting for 59 percent of total GHG emissions for the year. This is a 10-percent increase in GHG emissions from the 23,527 MTCO₂e reported in 2006. Over the years, there was an increase in the number of employees from 8,423 to 10,030 between 2006 and 2017. Commute emissions reflect increased vehicle fuel efficiency, although changes in the number of employees and increases in commute distance balance that out.

Buildings and Facilities

The buildings and facilities sector includes electricity and natural gas use at County-owned and operated buildings and facilities. Energy use is the source of 29 percent of GHG emissions reported for County operations for year 2017. Emissions from this sector totaled 12,503 MTCO₂e in 2017 (see Table 4). This is a 35-percent decrease in GHG emissions related to buildings and facilities from the 19,026 MTCO₂e in the 2006 inventory.

Table 4: 2006 Baseline and 2017 Buildings and Facilities Energy Use Emissions

SUBSECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E	PERCENT CHANGE
Buildings and facilities – natural gas	11,359	6,302	-44%
Buildings and facilities – electricity	7,667	6,200	-19%
Total	19,026	12,503	-35%
Overall GHG emissions percent	40%	29%	—

Government (County) Fleet

The vehicles and equipment used in the County’s daily operations burn gasoline, diesel, propane, and compressed natural gas fuel, resulting in the emission of GHGs.

Contra Costa’s 2017 vehicle fleet emissions totaled 3,428 MTCO₂e (see Table 5). This is a 59-percent decrease in GHG emissions from the 8,502 MTCO₂e in the 2006 inventory. This is primarily the result of a decrease in on-road vehicle miles traveled and an increase in fuel efficiency between inventory years.

Table 5: 2006 Baseline and 2017 Vehicle Fleet Emissions

SECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E	PERCENT CHANGE
Government fleet	8,502	3,428	-59%
Overall GHG emissions percent	16%	8%	—

Solid Waste

County operations generates solid waste during normal activity, much of which is eventually landfilled. Emissions from this sector are estimates of methane generation that will result from decomposing waste that was sent to the landfill in the inventory year. Solid waste generated by County employees contributed to a total of 904 MTCO₂e in year 2017 (see Table 6). Solid waste collected from County operations saw a reduction of 54 percent in emissions since the 2006 baseline, where this sector contributed to 1,976 MTCO₂e.

Table 6: 2006 Baseline and 2017 Government-Generated Solid Waste

SECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E	PERCENT CHANGE
Government-generated solid waste	1,976	904	-54%
Overall GHG emissions percent	4%	2%	—

Public Lighting

Emissions from public lighting owned by the County totaled 437 MTCO₂e in 2017 (see Table 7). This is a 47-percent decrease from the 828 MTCO₂e reported in 2006.

Table 7: 2006 Baseline and 2017 Public Lighting

SECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E	PERCENT CHANGE
Public lighting	828	437	-47%
Overall GHG emissions percent	2%	1%	—

Water and Wastewater

The water and wastewater treatment sector includes the emissions generated by the electricity needed to move and process the water used in and the wastewater generated by County government facilities, along with direct emissions caused by the processing of County-generated wastewater. Water use and wastewater generation at County facilities generated 224 MTCO₂e in 2017 (see Table 8). The water and wastewater sector was not included in the 2006 baseline inventory.

Table 8: 2006 Baseline and 2017 Wastewater Treatment

SECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E
Wastewater treatment	Not included	224

Refrigerants

Vehicles and buildings with air conditioning use refrigerants that can leak from vehicles during normal operation and maintenance, and these refrigerants are often GHGs with very high global warming potential. Global warming potential is a measure of how much heat a GHG traps in the atmosphere up to a specific time horizon, relative to carbon dioxide. Emissions from refrigerant leaks were accounted for in the 2017 GHG emissions inventory for municipal operations. This sector was not included in the 2006 baseline inventory.

Refrigerant emissions contributed to 86 MTCO₂e in 2017 (see Table 9).

Table 9: 2006 Baseline and 2017 Refrigerants

SECTOR	2006 MTCO ₂ E	2017 MTCO ₂ E
Refrigerants	Not included	86

Conclusions and Next Steps

The data presented in these inventories is intended to provide valuable information that the County can use to inform future planning efforts, identify cost-saving opportunities, and identify planning priorities.

As the County moves forward with the development of emissions-reduction strategies in the Contra Costa County CAP, the County should prioritize strategies, including energy conservation, renewable energy, vehicle fuel type and efficiency improvements, alternative transportation, vehicle trip reduction, land use and transit planning, waste reduction, and other measures that can achieve benefits beyond reducing emissions, including carbon sequestration efforts. The County should continue to update its government operations GHG emissions inventories every 5 to 10 years to monitor progress.