Alameda County Greenhouse Gas Emissions Analysis: 2003 Emissions Inventory for the Unincorporated Areas & County Government Operations

Executive Summary

Background

Alameda County has long been a leader in taking action to promote environmental protection and sustainability at the local level. As part of this commitment, the County has implemented many innovative climate protection programs within its own operations and throughout the unincorporated community. In 2006, the County adopted a resolution committing to reduce its greenhouse gas emissions, prepare for the eventual impacts of climate change, and adopt a cross-agency approach for integrating climate change into its decision making process. In 2007 the County adopted the Cool Counties Climate Stabilization Declaration, which included a specific target of reducing emissions 80% by 2050.

This inventory provides policymakers with valuable information for developing a strategic plan to reduce greenhouse gas emissions. It provides an overview of the County's emissions levels and sources, which can be used to prioritize future emissions reduction policies and programs. It also and establishes a baseline against which future trends and the impact of current initiatives can be measured. The inventory is the first of a five-step process for addressing the challenge of climate change. Those steps include:

1) Conduct an **inventory** of local greenhouse gas emissions;
2) Establish greenhouse gas emissions **reduction target(s)**;
3) Develop a **climate action plan** for achieving the emissions reduction target(s);
4) **Implement** the climate action plan; and,
5) **Re-inventory** emissions to monitor and report on progress.

Methodology

The County's goal is to create a policy-relevant inventory of greenhouse gas emissions following internationally accepted standards.[1] The inventory focuses on both greenhouse gas emissions from the government's internal operations and from the communities in the unincorporated areas of the County.[2] Input data (i.e. energy usage, vehicle miles traveled, waste generation, fleet energy use, etc.) were provided by PG&E, StopWaste.org, and various State and County agencies. These data sets were converted to greenhouse gas emissions by applying regionally appropriate emission factors. It is an end-user/tail-pipe inventory of emissions and as such does not account for the additional upstream and downstream emissions associated with the production and transportation of the goods and services consumed within the County.

A baseline year of 2003 was chosen for Alameda County's inventory because accurate data are available and because it is prior to the implementation of a number of large emission reduction projects (e.g. large solar installations, completion of the new LEED gold certified Juvenile Justice Center). Choosing an historic base-year was desirable because it allowed the County to quantify and demonstrate the impact of previously implemented emission reduction activities and to better understand the scope of effort that will be required to achieve the needed emissions reductions.

[1] This inventory was completed before the State of California adopted the Local Government Operations Protocol, but followed the internationally recognized emission inventory framework developed by ICLEI – Local Governments for Sustainability.
[2] As the County government has limited influence on activities with the 14 incorporated cities that fall within the County's boarder, this inventory focused on the unincorporated areas over which County has a direct influence.

Within this inventory, the three main greenhouse gas emissions (carbon dioxide, methane, and nitrous oxide) are quantified, aggregated, and reported in terms of metric tons of carbon dioxide equivalents (CO_2e). Carbon dioxide equivalents is a convention used to aggregate and report different greenhouse gases in terms of their impact on the climate (e.g., methane is 21 times more potent than carbon dioxide; therefore 1 ton CH_4 = 21 tons CO_2e).

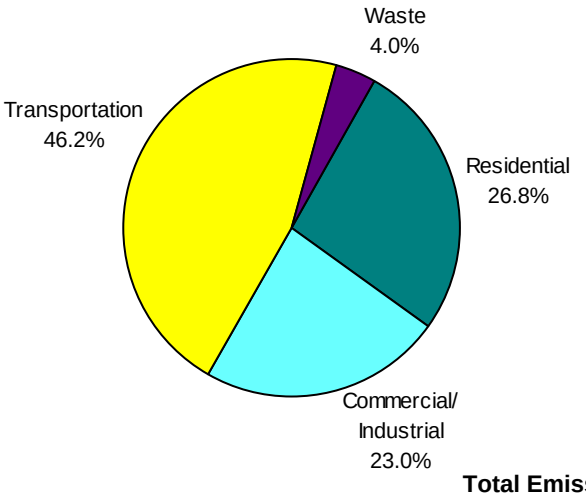
Unincorporated Community - Emissions Results

The unincorporated areas of Alameda County emitted approximately ***736,579 metric tons of CO_2e in the base year 2003.*** On-road transportation accounted for 46% of the emissions from the unincorporated community, with the majority of these emissions from the gasoline burned by passenger vehicles. [3]

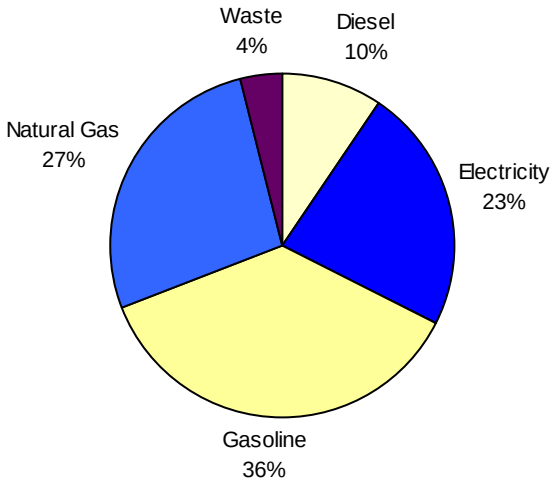
Electricity and natural gas use in the built environment (homes, businesses, factories, etc.) accounted for much of the rest of the unincorporated communities' greenhouse gas emissions. Those emissions were split between residential sources (27%) and commercial/industrial sources (23%).[4] The inventory also showed that natural gas accounted for a larger percentage of the emissions from the built environment than electricity – especially in the residential sector. This suggests that the heating needs of the existing buildings are a potentially significant source of emissions.

Waste materials sent from the unincorporated communities to area landfills generated the remaining emissions (4%). The largest share of the waste sector's emissions occurred as a result of sending paper products to area landfills.

Community Greenhouse Gas (GHG) Emissions by Sector (2003)



Community Greenhouse Gas Emissions by Source (2003)



Total Emissions: 736,579 metric tons CO_2e

Future changes in emissions were estimated based on the anticipated growth in population, employment, and the California Energy Commission's analysis of transportation trends. Without action being taken to reduce emissions levels, greenhouse gas emissions from unincorporated Alameda County are predicted to grow by approximately 21.5% between 2003 and 2050. This would be an increase from 736,579 to 895,285 metric tons CO_2e. The transportation sector was forecast to have the largest annual emissions

[3] The transportation sector only includes local roads; data on state highways were not included in the analysis.
[4] Due to privacy rules, industrial consumption is not reported independently and has been included with the commercial sector.

growth, followed by the commercial/industrial sector. This trend of increasing emissions under a business as usual scenario will need to be accounted for when creating a plan to meet the County's emissions reduction targets

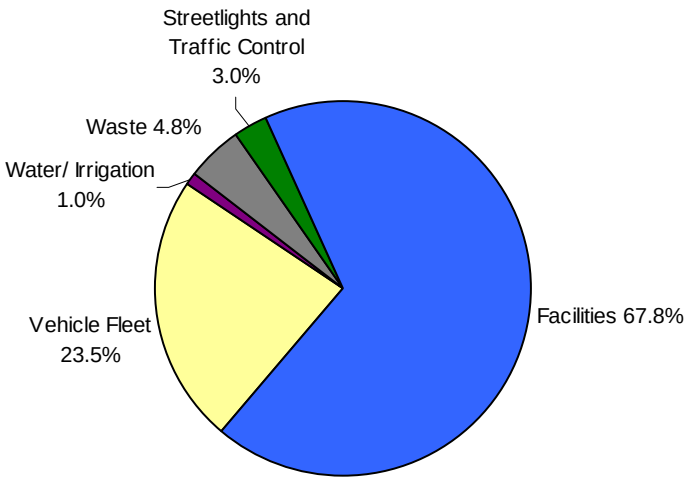
Government Operations - Emissions Results

Alameda County's government operations resulted in the emission of 32,295 *metric tons of CO_2e in 2003*. Of these greenhouse gases, the majority (68%) were released by energy use within the County's facilities (buildings, bridges, etc). Emissions from the County vehicle fleet were the next largest source of emissions (24%). Specifically, passenger vehicles emitted the most greenhouse gasses, followed by light-trucks/SUVs. Landfilled waste from County facilities, County operated street-lights and traffic signals, and County flood control/irrigation controllers each released a small portion of the remaining emissions.[5]

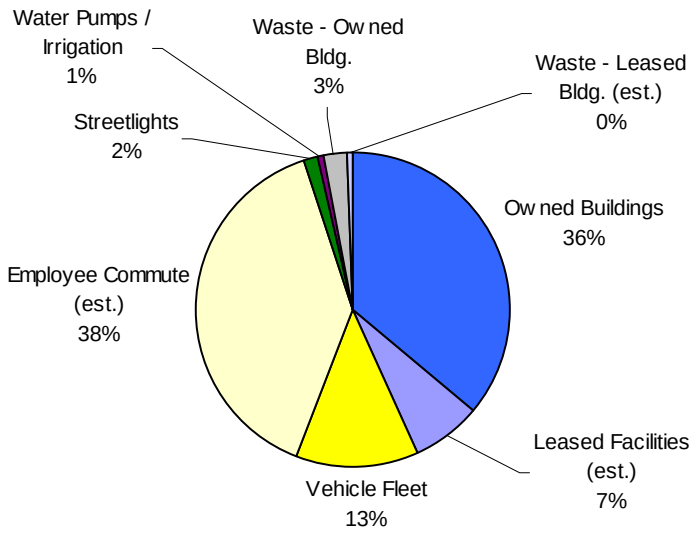
An estimate was also made of other sources of emissions associated with, but not directly released from, government operations. This additional analysis included vehicle emissions from County employee commutes, as well as the energy use and waste generated at facilities the County leases. When included in the inventory, these sectors increase the government operations emissions by a remarkable 87% to 60,546 metric tons CO_2e. It also increases the relative importance of vehicle-related emissions from government activities. In this expanded analysis, vehicle-related emissions (employee commute and fleet vehicles) account for 51.7% of the government's emissions profile, and County facilities remain a significant source (36%). Data were not readily available to estimate emissions from the use of personal vehicles for County business.

Within the government operations, emissions are expected to fluctuate from year to year, but no changes are expected that would result in significant emissions growth. Therefore, a forecast for emissions from government operations was not conducted.

Government Operations GHG Emissions by Sector (2003)



Government Operations Emissions by Sector Including Select Associated Emissions (2003)



[5] As water and sewage treatment and delivery is the responsibility of the East Bay Municipal Utility District, the energy used in pumps and treatment facilities is not included in this inventory.

Conclusion

Meeting the County's greenhouse gas reduction targets will require a tremendous effort. The County has begun developing a comprehensive Climate Action Plan to take on that challenge. There are two major components to the effort, one related to the unincorporated communities and one related to the County's emissions associated with its operations and service delivery. The County's strategy is to engage both the unincorporated communities as well as its employees in developing the Plan to ensure that a broad set of solutions are brought to the table. This report presents a baseline greenhouse gas emissions inventory that will be used by the County to help focus the effort in identifying specific emission reduction actions and strategies. The inventory will also serve as a baseline that the County will use to measure the effectiveness of those emission activities.

As local government greenhouse gas inventory analysis is a developing field, continuing to develop and refine quantitative tools will be an important component of meeting the County's goals. Though this is an evolving field, the information presented in this report is sufficiently robust to guide policy, identify mitigation strategies, and implement emissions reduction actions. Bold action is required today to meet the significant challenge that we have in front of us. The County will use this information as a tool to meet those challenges.