County of Ventura Government Operations
Carbon Footprint
2005 Through 2010

Presented to County of Ventura Board of Supervisors
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Contents

Carbon Footprint for Government Operations

Background

- In 2008, the County of Ventura Board of Supervisors (Board) directed its County Executive Office to develop a carbon footprint for government operations and to make recommendations on reducing greenhouse gas (GHG) emissions.

- In 2010, the County Executive Office reported on GHG inventories (i.e., carbon footprints) for calendar years 2005 through 2008, following The Climate Registry's General Reporting and Local Government Operations Protocols.[i] Using 2005 as a base year, the Board directed staff to achieve a 15% reduction in emissions by 2020 and to develop a carbon action plan.

- In 2011, the County Executive Office:

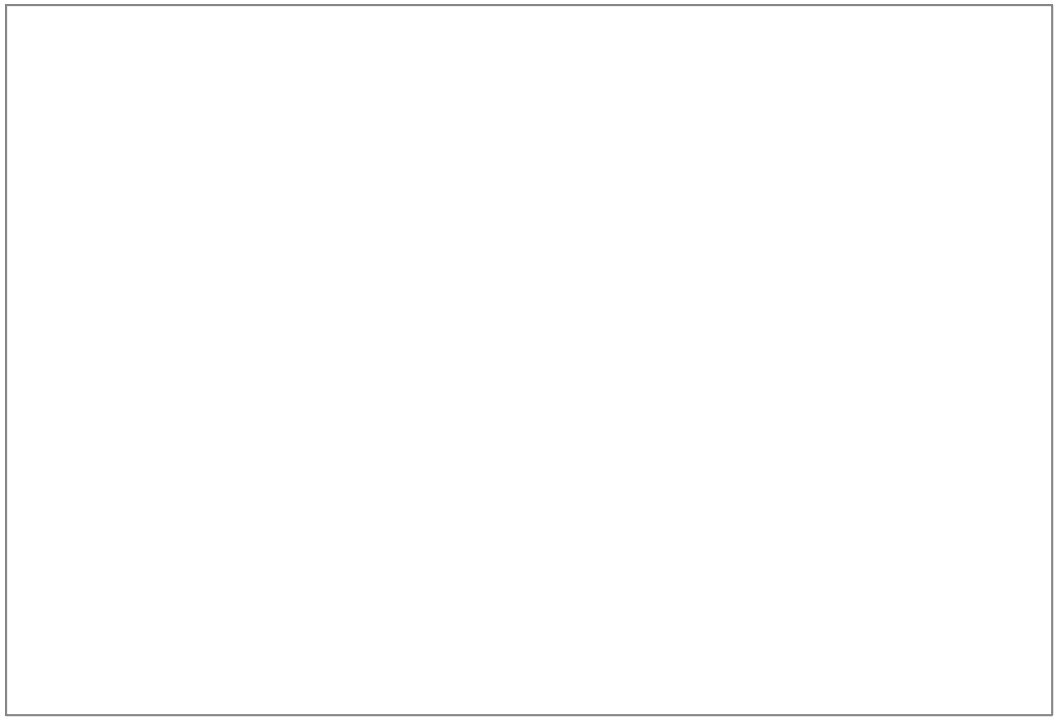
    - Presented a Climate Protection Plan to the Board. The April 2011 plan was a blueprint for achieving the GHG reduction target of 15% while enhancing broader government sustainability.

- Compiled inventories for 2009 and 2010, and made adjustments to 2005 through 2008 inventories. The most significant change is related to the way the County is able to calculate emissions from purchased electricity. Until 2008, Southern California Edison (SCE) publicly reported its greenhouse gas emissions to the California Climate Action Registry. The Registry then published SCE-specific emissions factors of pounds per MWh. Traditionally, this factor was considerably lower than the State average because SCE's power mix relies heavily on natural gas power plants instead of coal. As of April 2012, SCE has not reported emissions to The Climate Registry, and has not provided a specific emission factor for Climate Registry reporters. As a result, The Climate Registry has directed the County to use the Statewide emission factor. For consistency, all inventories back to 2005 and associated reduction goals have been adjusted to account for this change. While this represents a slight increase in carbon emissions, it does not change the actual KWhs used by the County or kWh reductions required to meet the County reduction target of 15%.

Carbon Sources

Overview

GHG emissions under the County's operational control result from use of electricity, burning of natural gas and operation of County owned fleet vehicles. GHG reporting protocols identify emissions from direct combustion (like natural gas and vehicle fuel) as Scope 1 and emissions from imported electricity as Scope 2. All other emissions are considered to be Scope 3. Reporting of scope 3 emissions is optional.



On average, between 2005 and 2010, Scope 2 electricity use accounted for more than half of the County's annual emissions, followed by Scope 1 vehicles (approximately one-third) and natural gas (a little more than 10%).

Electricity (Scope 2)

Between 2005 and 2010, the County of Ventura purchased approximately 71 million kilowatt hours of electricity from Southern California Edison annually. (This is roughly equivalent to the electricity used by 12,000 California households, or about 9% of the electricity used by the City of Los Angeles for its government operations.)

The County buys electricity from Southern California Edison (SCE) and from solar companies contracted to provide zero carbon power to the County from photovoltaic systems installed on County facilities. More recently, the County has begun acquiring its own solar arrays. Between 2005 and 2010, annual electricity purchased from SCE accounted for between 52% and 54% of all County GHG emissions. In 2010, annual GHG emissions associated with electricity were 20,901 metric tons of CO_2e.[ii]

More than 60% of the County's 2010 electricity was used at seven locations:

Facility	Kilowatt Hours (2010)	Metric Tons Carbon Dioxide Equivalent (CO_2e)
County Government Center, Ventura	18,729,654	5,807
Ventura County Medical Center, Ventura	9,780,211	3,032
Todd Road Jail, Santa Paula	4,421,244	1,370
Juvenile Justice Complex, Oxnard	3,242,338	1,005
Waterworks District No. 1 – Moorpark Wastewater Treatment Plant, Moorpark	2,779,029	861
Waterworks District 1 Kingsgrove Groundwater Pumping Station, Somis	1,630,660	505
Santa Paula Hospital, Santa Paula	1,312,237	406

The electricity used by six County Agencies/Departments accounted for approximately 70% of all Scope 2 (electricity-based) emissions:

Agency	Percent of Indirect Emissions (2010)
Health Care	23%
Sheriff	19%
Public Works (Water and Wastewater)	16%
Probation	5%
Fire Department (HQ and Stations)	4%
Public Works (Street Lights and Traffic Signals)	3%

Natural Gas (Scope 1)

The County purchases an average of 889,000 therms of natural gas per year, primarily for space heating and boilers. At around 12% of total emissions, natural gas combustion is a relatively small contributor to the County carbon footprint.

More than 75% of all Scope 1 emissions from natural gas combustion are associated with operations at six facilities:

Facility	Therms (2010)	Metric Tons Carbon Dioxide Equivalent (CO_2e)
County Government Center, Ventura	336,706	1,793
Todd Road Jail, Santa Paula	163,512	866
Juvenile Justice Complex, Oxnard	116,946	622
Ventura County Medical Center and HCA HQ Knoll Drive, Ventura	83,076	442
East Valley Sheriff's Station, Thousand Oaks	23,031	122

County Owned Vehicles (Scope 1)

Emissions from County owned and operated vehicles accounted for almost a third of the County's carbon footprint in 2010, or 11,729 MT CO_2e[iii]. Vehicles are managed by two Agencies: the General Services Agency (GSA) and the Fire Department. Approximately 18% of all mobile emissions come from diesel fuel, the bulk of which is used in Fire Department and heavy duty vehicles. The remainder of emissions are associated with gasoline fueled cars and trucks.

GSA manages approximately 1200 vehicles, accounting for about 85% of vehicle emissions in 2010. Approximately 16% of GSA emissions are associated with diesel fueled vehicles, with the remainder primarily resulting from gasoline fueled vehicles (small passenger cars and trucks) and some natural gas vehicles. Since 2002, the County's General Services Agency has replaced almost 40% of its gasoline vehicles with alternative technologies, including hybrids, natural gas and zero emission vehicles.

As noted above, public safety accounts for a large portion of County emissions from vehicles. The Fire Department separately manages its fleet of passenger vehicles and specialized fire vehicles and equipment. Fire vehicles account for about 18% of total mobile emissions for County operations. In 2010, more than half of gasoline purchased by GSA was used by the County Sheriff. In total, public safety emissions represent at least half of the County's vehicle-based carbon footprint.[iv]

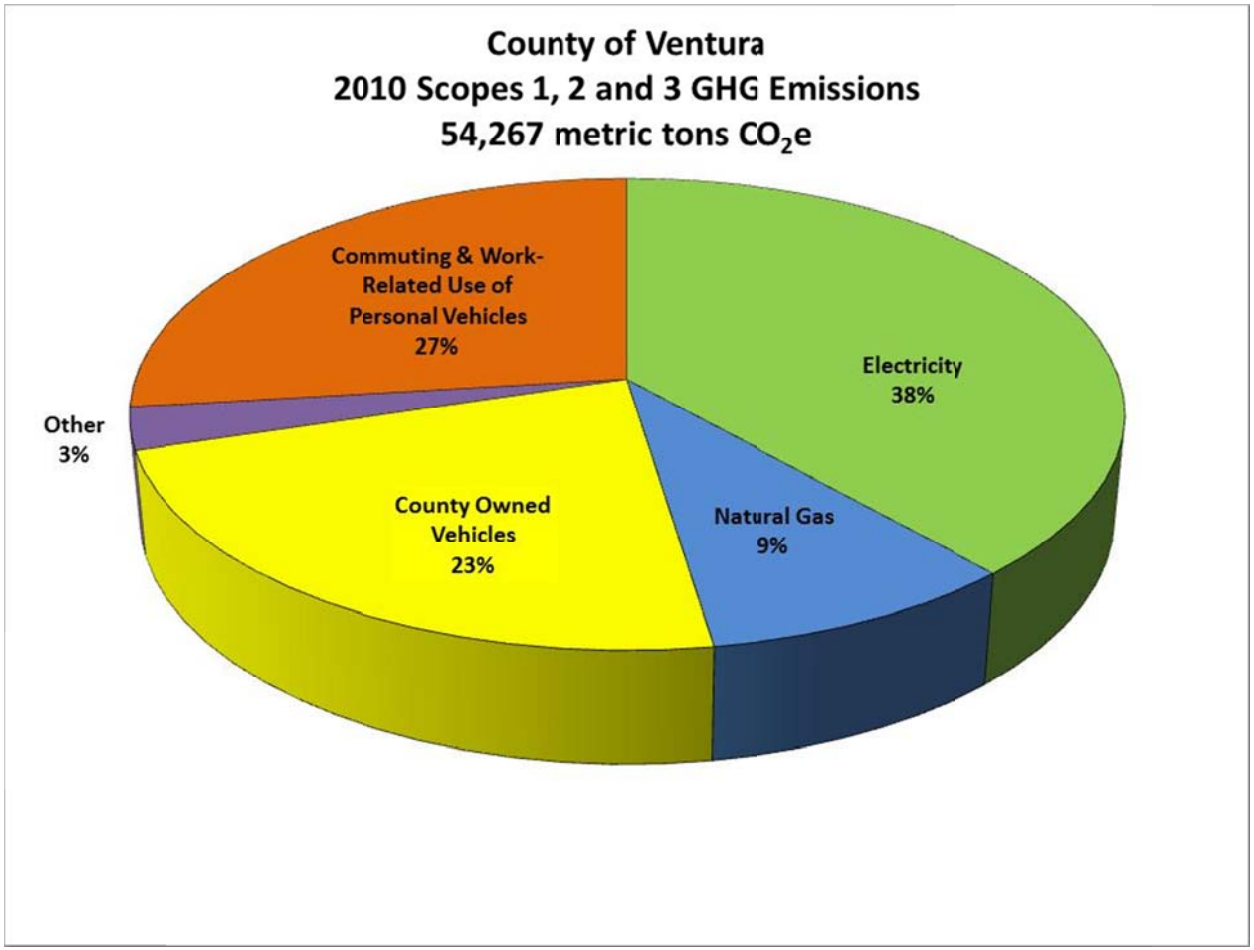
Commuting and Use of Personal Vehicles (Scope 3)

Scope 3 emissions result from activities that are outside the direct control of an organization. These can include emissions from airline travel, supply chain (e.g., delivery of goods, emissions embedded in products), and employee commuting. The County selected employee commuting and use of personal vehicles for work-related activities as potentially high sources of Scope 3 GHG emissions. To identify commuting emissions, in February 2010 the County conducted a survey of all employees to determine their vehicle use patterns. This data was used to estimate vehicle miles and associated GHGs. To identify emissions related to personal use of vehicles for work-related activities, the County collated data from employee reimbursements, which included information on miles travelled.

These emissions were:

Source	Metric Tons CO_2e
Employee Commutes (2010)	13,645
Use of Personal Vehicles for Work-Related Activities	956
Total	**14,601**

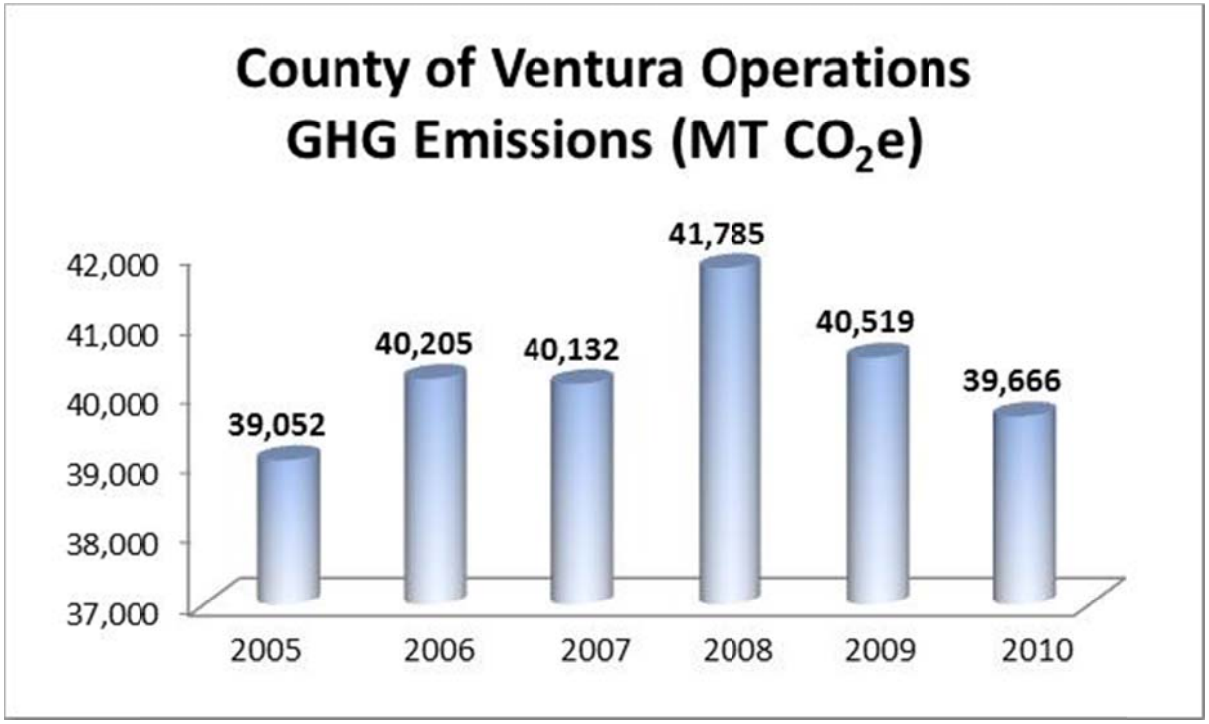
Including Scope 3 emissions in the carbon footprint demonstrates the significant impact of employee commuting and travel. Emissions from the use of personal vehicles exceed emissions from County owned vehicles by 4%.



Changes Over Time

Summary

Scopes 1 and 2 emissions from County government operations in 2010 were slightly higher (1.6%) than in 2005. However, in comparison to 2008, emissions were down 3% in 2009 and another 2.1% in 2010, for a total of 5.1% in two years.



Emission Increases

2010 emissions from electricity were slightly higher than those in 2005 (up by 1.3%), although they were reduced by 6.8% between 2008 and 2010.

Emissions have remained stable (and decreased) despite significant upward pressures, including:

- acquisition and opening of the Santa Paula Hospital
- construction and operation of a new Fire Department Headquarters building on the Camarillo Airport site,
- opening of a service building for GSA and Public Works in Saticoy, replacing smaller facilities, and
- replacement fire stations and health care clinics

The most significant increase in emissions from electricity resulted from expanded use of locally pumped groundwater in Moorpark and Somis, to replace water imported from the California State Water Project. Using local water is consistent with guidance from the California State Department of Water Resources and associated State water policies. In 2010, 16 pumps and pumping stations delivering water in Moorpark and Somis accounted for more than 8% of emissions from electricity. This compares to 2005, when 14 pumps were associated with only a little more than 2% of all electricity emissions.

Scope 3 and the Water-Energy Nexus

The California Energy Commission estimates that approximately 20% of all energy used in California is related to water. As a result, there is an increasing interest in public accountability for the "water-energy" nexus. Emissions from electricity embedded in water are defined as GHG Scope 3, because they occur in the supply chain and not through direct use.

Locally pumped water has been an important factor in controlling the costs of water for Ventura County Waterworks' customers: local residents, businesses and agriculture. The percentage of imported water for Water Districts 1 and 19 changed from 94% in 2005 to 71% in 2010. However, replacing imported water with locally pumped sources has resulted in a simultaneous increase in electricity use and reportable Scope 2 GHG emissions.

Although the County's carbon footprint was larger in 2010 because it pumped more local water, the effect was to reduce emissions in the water "supply chain". In other words, the State as a whole had a smaller footprint because it reduced the volume of water travelling through pump stations from the Columbia River to southern California water purveyors and then to Ventura County.

A preliminary estimate, based on published data, suggests that the energy used to deliver one acre-foot of local water in Ventura is approximately two-thirds of that for imported water. Because local water uses less electricity than imported, carbon intensity for all delivered water dropped from .78 metric tons CO_2 per acre foot in 2005 to .72 metric tons in 2010. While Scope 2 emissions of electricity for water pumping ***increased*** *1,614 metric tons, estimated emissions from imported water* ***decreased*** *by 2,435 metric tons. This decrease is roughly equivalent to the Scope 2 emissions from the Ventura County Medical Center.*

Emission Decreases

Facilities

Despite significant increases in emissions from water delivery and new facilities, the County's 2010 footprint for electricity was only slightly higher than in 2005, and was down by 5.1% over 2009. These decreases were the direct result of energy efficiency projects, including measures leading to LEED certification, installation of solar arrays, and building retrofits. Emissions at the Government Center were reduced by 8%, and at the Ventura County Medical Center by 6%. The installation of photovoltaic panels at the Vanguard Building in Oxnard resulted in a 42% reduction in GHG emissions over the base year of 2005.

Emissions from natural gas decreased by approximately 6% between 2008 and 2010 and are now down 4.5% from the 2005 baseline. These reductions, like those from electricity use, are the result of energy efficiency improvements, including those at the VCMC and replacement of facilities with more energy efficient ones.

In addition to savings at large facilities, there are many other facilities where emissions have been reduced through energy efficiency improvements. These include fire stations, office facilities and health care clinics.

Vehicles

After increases between 2005 and 2008, vehicle emissions decreased about 5% in 2009 and remained stable in 2010. The earlier increases resulted from growth in County operations and increased demand for public safety vehicles. At the same time, the County continued its vehicle management program that included

- purchasing high efficiency vehicles, including hybrids and zero emission vehicles, and
- sustainability practices to ensure that existing vehicles achieved the highest fuel efficiencies.

This policy began showing results in 2009, when emissions were reduced by 5%, with smaller decreases in 2010. New diesel equipment purchases by the Fire Department also resulted in higher efficiency and decreased emissions.

Reduction Target: Results and Challenges

The County's Board of Supervisors has committed to reducing its 2005 carbon footprint by 15%, by 2020. With small adjustments made to the 2005 inventory (discussed on Page 2), the revised reduction target is 5,857 MT CO_2e.

- The 2010 inventory is roughly unchanged from 2005. The requirement for local water pumping has offset substantial carbon benefits from energy efficiency and alternative energy projects.

- While emissions climbed between 2005 and 2008, in the following two years, they had been reduced by 2,119 MT CO_2e. In that time period, the County was able to achieve a 5% reduction in GHG emissions from County government operations.

- All things held equal, if the reductions in 2009 and 2010 represent a trend, the County is on track to reach its reduction target by 2020. The most significant challenges to achieving the 15% reduction target include:

    - projected growth in County operations, including the requirement to provide health care and public safety services,

    - the cost of ongoing energy efficiency improvements in County owned facilities, and

    - total vehicle miles travelled in all County vehicles, regardless of technology.

- As the focal point for County efforts to cost-effectively reduce the County's carbon footprint, the Climate Protection Team will continue its work to achieve sustainable government operations and a reduced carbon footprint.

[i] The Climate Registry (TCR) is a nonprofit collaboration among North American states, provinces, territories and Native Sovereign Nations that sets consistent and transparent standards to calculate, verify and publicly report greenhouse gas emissions into a single registry. These standards include a General Reporting Protocol and Local Government Operations Protocol. As a member of TCR, the County has committed to use these protocols to publicly report its Scope 1 and 2 emissions (i.e., emissions from electricity use, natural gas and County fleets). TCR also provides an option for members to report emissions outside its control, known as Scope 3 emissions. The two sets of emissions included in this report are those associated with employee commuting and use of personal vehicles for work-related activities. Following these protocols, the County collected data on the following greenhouse gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and SF_6. Fugitive emissions of HFCs, primarily used in air conditioning, represented a very small portion of the total GHG emissions from County operations. There were no PFCs or SF_6 emissions. This 2005 to 2010 public report addresses the first three gases only: CO_2, CH_4, and N_2O.

[ii] Converting all emissions to CO_2e allows for different gases to be directly compared in terms of their potential to cause global warming. For example, one ton of methane traps 21 times more heat than a ton of carbon dioxide; therefore, one ton of methane is equal to 21 tons CO_2e. Similarly, 1 ton of N_2O equals 310 tons CO_2e.

[iii] Note that this estimate does not include emissions from jet fuel and over-reports on compressed natural gas in vehicles. The inventory will be corrected prior to verification and any changes will be reported in the 2011 Carbon Footprint report.

[iv] The inventory calculations may increase slightly before verification, to account for revised estimates of jet fuel usage, and additional data on emissions from natural gas vehicles.