Sonoma County Greenhouse Gas Report for 2014

Issued by Center for Climate Protection, July 2015
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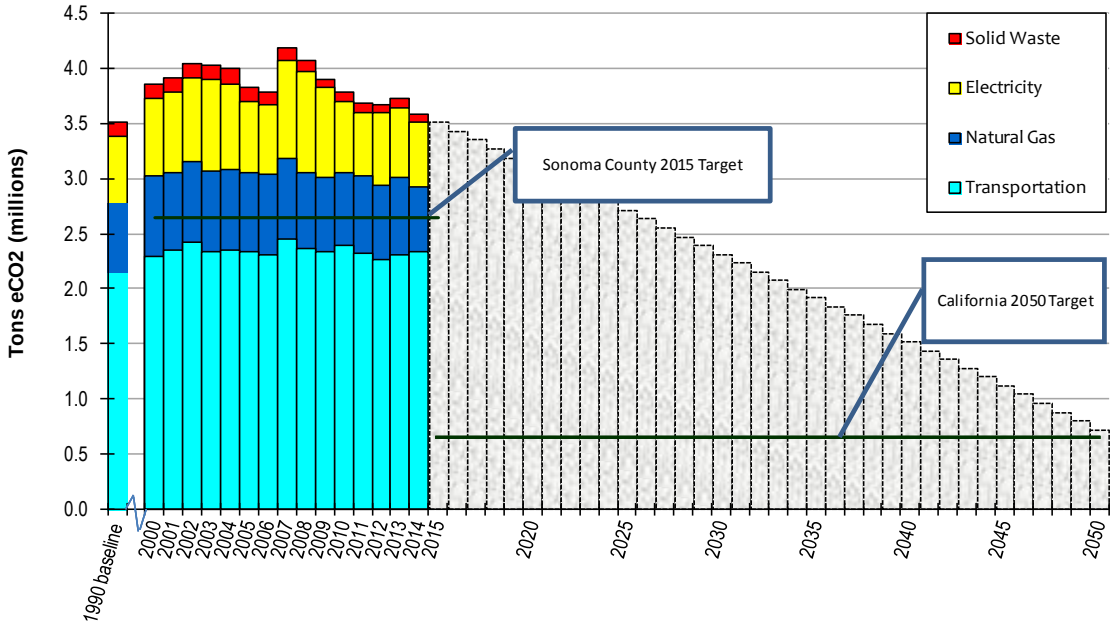
Sonoma County produced about 3.6 million tons of greenhouse gas (GHG) emissions in 2014. This is a decrease of about 14% from 2007 when the county emitted about 4.2 million tons.

In 2005 all nine Sonoma County cities and the county pledged by resolution to reduce emissions 25% below 1990 levels, equal to about 2.6 million tons of eCO2, by 2015. This goal corresponds to achieving what is known scientifically as atmospheric carbon stabilization by mid-century, the imperative for a life-sustaining climate. To meet the goal, emission reduction measures must overcome powerful forces, particularly increases in population and an economy largely based on fossil fuels.

Although Sonoma County is unlikely to achieve its 25% target by 2015, we have reasons for hope. Sonoma Clean Power's greener electricity mix promises to play a critical role going forward, and the State of California's high priority on decarbonization will also help Sonoma County decrease its emissions.

Sonoma County Total Greenhouse Gas (GHG) Emissions 2014
Solid Waste, Electricity, Natural Gas, Transportation
(Produced 2015)



BACKGROUND

Sonoma County has taken bold steps for climate protection including several national precedents:

- 2002 - All nine Sonoma County cities and the County pledged to reduce greenhouse gas (GHG) emissions.
- 2003 - All nine cities and the County completed inventories of the emissions produced by their internal municipal operations.
- 2005 - All Sonoma County mayors signed the U.S. Mayors Climate Protection Agreement.
- 2005 - All nine cities and the County passed resolutions adopting a GHG reduction target aligned with the scientific imperative – 25 percent below 1990 levels by 2015.
- 2008 - The Climate Protection Campaign in partnership with Sonoma County local governments, businesses, and community representatives issued a Community Climate Action Plan that identified the most cost-effective local solutions for significant GHG reductions (www.coolplan.org).
- 2009 - All nine cities and the County began participating in the Sonoma County Energy Independence Program, and all began participating in the Sonoma County Regional Climate Protection Authority.
- 2010 – The Town of Windsor began Windsor Efficiency PAYS®.
- 2012 – The County and the Water Agency formed Sonoma Clean Power.
- 2013 – Cotati, Santa Rosa, Sebastopol, the City of Sonoma, and Windsor joined Sonoma Clean Power.
- 2014 – Cloverdale, Rohnert Park, and Petaluma joined Sonoma Clean Power. Sonoma Clean Power starts serving customers, delivering greener electricity at lower rates than the incumbent utility.

Although Sonoma County is a climate protection leader, this report shows that there's a long way to go.

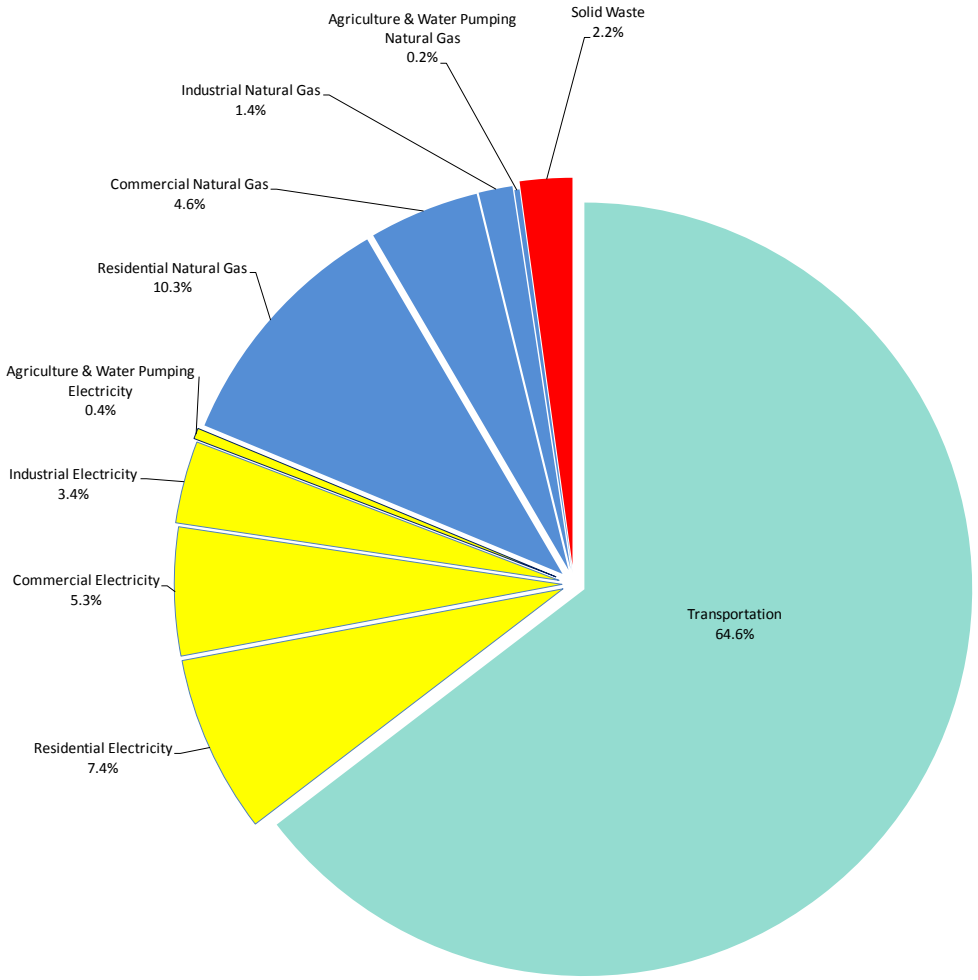
Reducing GHG emissions has vast co-benefits such as improving economic vitality, public health, and energy security. Recent reports conclude that tackling climate change will deliver long-term economic gains as well.

GREENHOUSE GAS CALCULATIONS ARE NOT PRECISE.

The accuracy of GHG emission calculations varies from sector to sector. For example, electricity and natural gas calculations are more accurate, and transportation less. For transportation, there is no way at present to accurately and cost-effectively measure the tailpipe GHG emissions of vehicles as they travel within Sonoma County. We must rely on models and make estimates.

By using consistent methodology when calculating GHG emissions, we are able to detect trends. By focusing on order-of-magnitude differences, for example, the relative contributions of the four major sectors that produce GHG emissions, and on overall trends in emission production, we can determine our progress toward our goals and find opportunities to reduce emissions.

Sonoma County Total Emissions - 2014
3,588,000 tons CO2e



Sonoma County GHG emissions for the last five years
(Shown in thousand tons eCO_2)

Year	*Transportation*	*Electricity*	*Natural Gas*	*Solid Waste*	*Total*
2010	2,387	642	674	87	3,790
2011	2,324	579	704	79	3,686
2012	2,266	660	673	74	3,674
2013	2,310	642	694	78	3,724
2014	2,331	581	597	79	3,588

ELECTRICITY & NATURAL GAS

To calculate the GHG emissions from electricity, two factors must be used, the volume consumed and the emissions intensity of the volume consumed. Unlike electricity, the emissions intensity of natural gas is generally standard, although gas from tar sands and other similar sources may have a higher emissions intensity.

Emissions intensity is a factor of the amount of GHG emitted per megawatt-hour supplied. Intensity is determined by the power mix from generation sources such as natural gas, coal, hydroelectricity, nuclear, geothermal, solar, and wind. In May 2014 Sonoma Clean Power began serving a portion of Sonoma County customers with a power mix that produces significantly fewer GHG emissions.

Sonoma Clean Power 2014 Greenhouse Gas Emissions

Sources	Volume (MWh)	Emissions Factor (lbs/MWh)	Emissions (TonsCO_2e)
RPS Eligible Renewables			
Biomass & Biowaste	19,069	0	0
Geothermal	67,620	51	1,724
Wind	102,076	0	0
Large Hydroelectric	258,312	0	0
Unspecified Power	134,217	944	63,323
TOTAL	581,294	224**	65,047

*SCP chooses to report unbundled renewable energy credits as Unspecified Power for GHG purposes.
** This emissions factor is for CleanStart, SCP's default service. The emissions factor for EverGreen, SCP's 100% local renewable service, is 51. By comparison, PG&E's emissions factor for 2013 was 427. PG&E's 2014 emissions factor will be available Oct. 2015 at the earliest.

Overall starting in 2008, per capita electricity use in Sonoma County declined, possibly due to improvements in energy efficiency, increases in onsite generation from solar photovoltaic systems, milder winters and cooler summers, or a combination of several factors. The recession-hit commercial and industrial sectors experienced greater reductions in total usage, while agriculture and water pumping experienced minor reductions.

In 2014 Sonoma County's electricity and natural gas emissions decreased by nearly 12% from 2013. The emissions intensity of power generation decreased due to the increase in renewable supply by both PG&E and Sonoma Clean Power. Healdsburg's power supplied by other sources increased due to a decrease in the amount of hydropower.

Weather fluctuations affect electricity and natural gas emissions because weather impacts the amount of electricity produced from hydropower, and impacts the amount of energy used for heating and cooling.

TRANSPORTATION

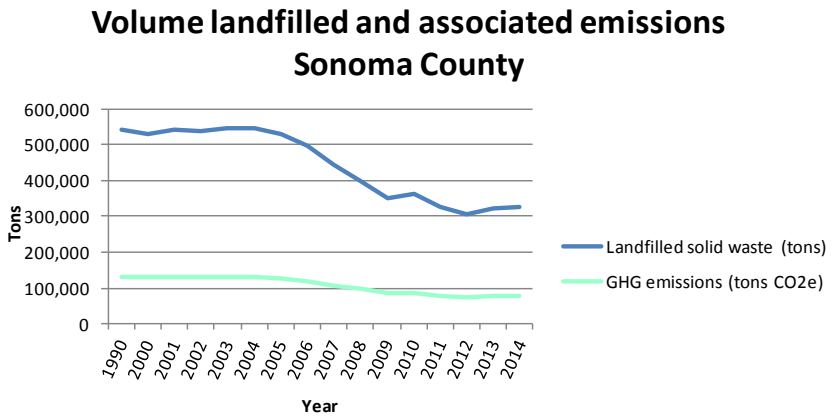
Transportation accounts for about 65% of Sonoma County's total emissions. Transportation emissions began decreasing in 2009, but started increasing again in 2013. Causes may be a growing economy, increased population, or a combination of these factors. Regardless of annual variations, vehicle miles traveled are expected to increase.

The price of fuel strongly influences people's transportation choices. However, local policies have little bearing on fuel costs. Consequently, local measures to reduce transportation emissions remain elusive. With the creation of Sonoma Clean Power which has identified electric vehicles as a top priority, and with the greater variety of available vehicles, new local options exist to accelerate adoption of electric vehicles and thereby reduce GHG emissions.

Other local measures that impact transportation emissions are policies such as city-centered growth rather than sprawl, and measures that shift trips from single occupancy vehicles to modes such as walking, biking, and ridesharing.

SOLID WASTE

The amount of organic material buried in the landfill, and the management of the methane from decomposing landfilled organic waste determine the amount of GHG emissions produced from solid waste. Sonoma County's emissions in this sector have recently risen slightly, likely due to more waste being generated as a result of the economic recovery. To reduce GHG emissions, organic material must be diverted from the landfill through means such as recycling and composting. Besides compost, organic material can also be used to produce local, zero-carbon thermal and electrical energy.



Accounting Methods and Scope of Assessment

Standard GHG accounting protocols developed by Cities for Climate Protection® were used to produce this and previous GHG reports for Sonoma County. Included are emissions from sources located in Sonoma County, i.e., gasoline, diesel, and natural gas, and from sources for electricity, most of which are located outside Sonoma County.[1] Gases included are carbon dioxide, methane, and nitrous oxide. All values are short tons (2000 pounds per short ton) equivalent carbon dioxide instead of metric tons (2204.6 pounds per metric ton) so that this report would be more understandable to readers.

Sources not included are combustion of aviation fuels, propane, other fuel oil (e.g., bunker fuel), liquid fuels used for non-agricultural off road vehicles and stationary sources (methanol, red dye diesel, aviation fuels), coal (except from delivered electricity), waste oil, methane and nitrous oxide emissions associated with livestock cultivation, process emissions or leakage (carbon dioxide, methane, nitrous oxide) from industrial processes, methane emissions from human waste or winery wastewater ponds, and agriculture-related emissions. Emissions associated with the production or disposal of products outside Sonoma County (even if those products were purchased by people living or working here) are also not included.[2]

Emissions from forestry and agriculture are not included due to the lack of a standard, cost-effective methodology. However, in the 2011 GHG emissions report for Sonoma County, emissions from agriculture were calculated and discussed. In addition, emissions sinks that may be represented by forestry, agriculture, and soil management practices are not included.

The Regional Climate Protection Authority (RCPA) is also producing GHG emissions reports for Sonoma County as part of its work on Climate Action 2020. A memo comparing its methodology with the one used for this report is available from the RCPA.

A spreadsheet with data used for this report, and a discussion of the factors and methodology used to calculate emissions in the transportation sector are available at www.climateprotection.org.

[1] Scope 1 and Scope 2, or direct and indirect emissions.
[2] Upstream or lifecycle emissions due to production of goods, also known as Scope 3 emissions.

Sources and Support

Highway Performance Monitoring System data available at California Department of Transportation Data Library: http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php

California fuel sales from California Energy Commission website http://energyalmanac.ca.gov/gasoline/retail_fuel_outlet_survey/retail_gasoline_sales_by_county.html

California Energy Commission

City of Healdsburg (electricity emissions coefficient data) http://www.ci.healdsburg.ca.us/index.aspx?page=379

The Climate Registry (electricity emissions coefficient data)—to access this data, go to the climateregistry.org, public reports, view public reports, access public reports, Pacific Gas and Electric. See the "2010 EPS Report" tab titled "Optional Delivery Metrics." See also http://www.pgecorp.com/sustainability/en08_climate.jsp for information about the decrease in emissions factor, and www.pge.com/ for energy mix.

Sonoma County solar installations http://www.californiasolarstatistics.ca.gov/reports/locale_stats/

CalRecycle http://www.calrecycle.ca.gov/DataCentral/Materials.htm

Population data U.S. Census Bureau www.google.com/publicdata

ICLEI—Local Governments for Sustainability (CAPCA emissions calculation software; "U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions v1.0." Oct 2012)

Glossary available at: http://epa.gov/climatechange/glossary.html

Sonoma County's GHG emissions from agriculture were calculated and discussed in the 2011 report http://climateprotection.org/wp-content/uploads/2012/12/2011-GHG-Report-for-Sonoma-County-Nov-12-2012.pdf

More on Sonoma County GHG emissions and solutions: www.climateprotection.org, www.coolplan.org, www.sctainfo.org/rcpa.htm

Thanks to Chris Barney, Sonoma County Transportation Authority; Harold Brazil, Metropolitan Transportation Commission; Steven Mac, Andrea Gough, and Cam-Giang Nguyen, California Energy Commission; Geof Syphers, Sonoma Clean Power; and Lauren Casey, Sonoma County Regional Climate Protection Authority; for their support for this report.

The mission of the Center for Climate Protection is to inspire, align, and mobilize action in response to the climate crisis. We work with government, business, youth, and the broader community to advance practical, science-based solutions for significant greenhouse gas reductions. We create model programs for communities everywhere. *www.climateprotection.org*

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