

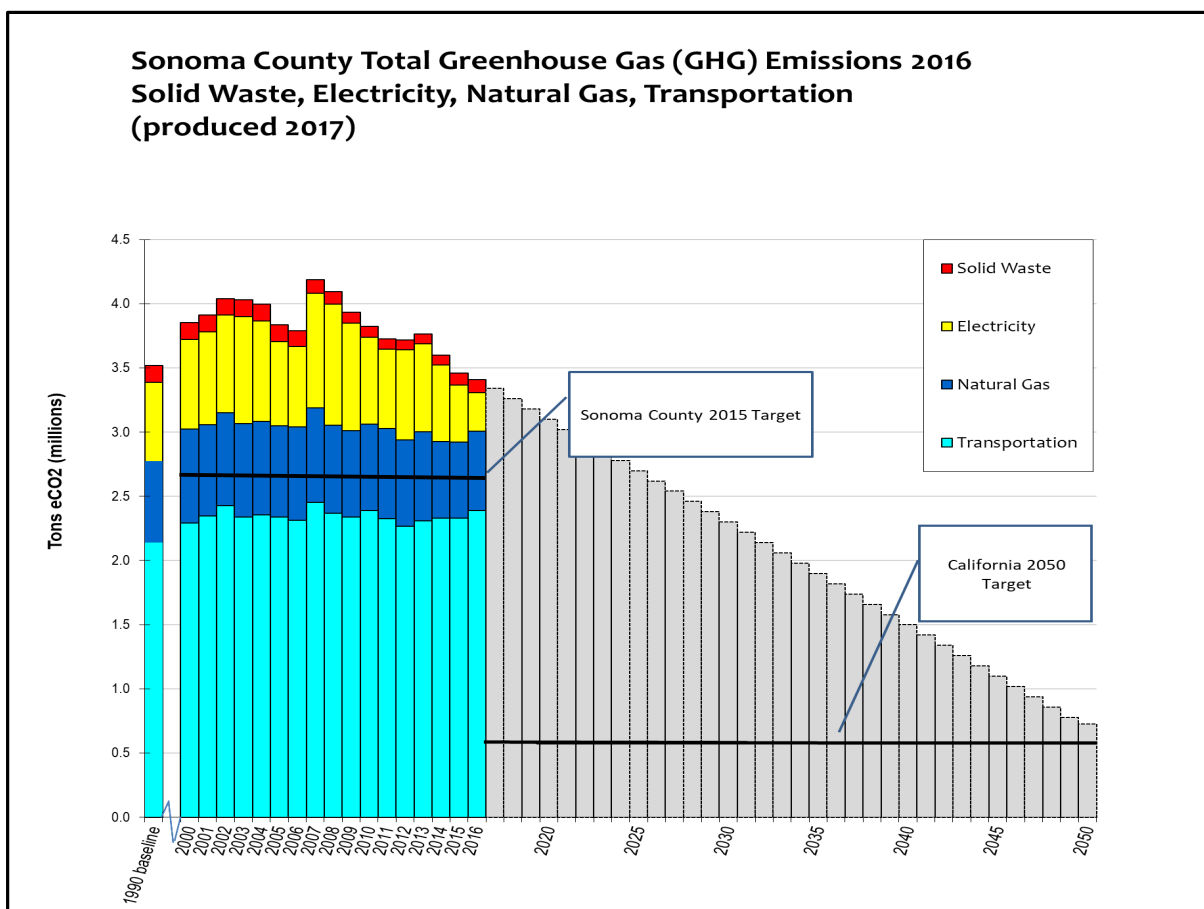
# SONOMA COUNTY GREENHOUSE GAS REPORT FOR 2016

ISSUED BY CENTER FOR CLIMATE PROTECTION, MARCH 2018

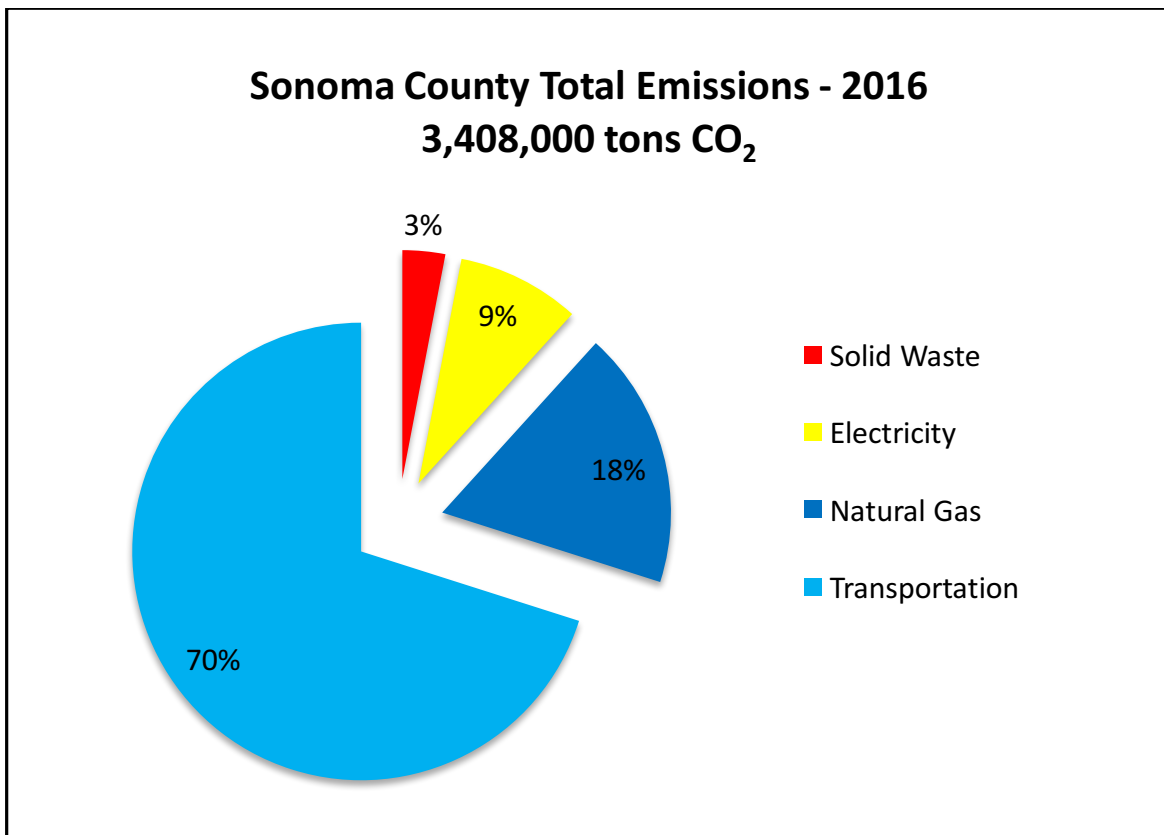
BY KEN WELLS, CONSULTANT, GUIDING SUSTAINABILITY

Sonoma County produced about 3.4 million tons of greenhouse gas (GHG) emissions in 2016. This is less than the approximately 3.5 million tons that the county produced in 1990, and a decrease of about 20% from 2007 when the county produced a peak of about 4.2 million tons. The reduction in Sonoma County's GHG emissions is due to significant electricity sector emission reductions, thanks to Sonoma Clean Power.

In 2005 all nine Sonoma County cities and the County pledged by resolution to reduce emissions 25% below 1990 levels, equal to about 2.8 million tons of eCO<sub>2</sub>, by 2015. This goal corresponds to the scientific imperative for a life-sustaining climate, known as atmospheric carbon stabilization by mid-century. To have met this goal, emission reduction measures would have overcome powerful forces, particularly increases in population and an economy based largely on fossil fuels.



Emissions shown in millions of tons of equivalent carbon dioxide (eCO<sub>2</sub>)



**Sonoma County GHG emissions, 2012 - 2016**  
Shown in million tons eCO<sub>2</sub>

<i>Year</i>	<i>Transportation</i>	<i>Electricity</i>	<i>Natural Gas</i>	<i>Solid Waste</i>	<i>Total</i>
<b>2012</b>	2.266	.702	.673	.074	3.716
<b>2013</b>	2.310	.683	.694	.077	3.765
<b>2014</b>	2.331	.596	.597	.078	3.603
<b>2015</b>	2.328	.445	.593	.093	3.460
<b>2016</b>	2.388	.297	.620	.103	3.408

Although Sonoma County has made significant climate protection strides, this report shows that there is a long way to go.

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

## SONOMA COUNTY CLIMATE PROTECTION MILESTONES - HIGHLIGHTS

- 2002 - All nine Sonoma County cities and the County pledged to reduce GHG emissions.
- 2005 - All nine cities and the County passed resolutions adopting a GHG reduction target aligned with the scientific imperative – 25% below 1990 levels by 2015.
- 2014 - Sonoma Clean Power started serving customers, delivering greener electricity at lower rates than the incumbent utility.

### 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. Calculations are based on transportation models.

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.

## ELECTRICITY

Two factors are used to calculate the GHG emissions from electricity, the amount of electricity consumed and the emissions intensity of the amount consumed. The *emissions factor* is the number used to measure emission intensity and compare the GHG impacts of different electricity sources. 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 (SCP) began serving a portion of Sonoma County customers with a power mix that produced significantly fewer GHG emissions than the mix from the incumbent utility, PG&E. By 2016, SCP was serving nearly 90% of eligible Sonoma County customers. With this transition has come a dramatic decrease in emissions from the electricity sector, a 55% drop between 2015 and 2016. In 2014 electricity use generated 17% of the County's GHG emissions, and by 2016, electricity produced only 9% of the County's emissions. Although 2016's low emission factor was influenced by large purchases of hydropower, and may increase somewhat in 2017, GHG emissions in the electricity sector are expected to continue a downward trend. Moreover, fuel switching in the transportation and natural gas sectors – from fossil fuel to electricity – will reduce overall GHG emissions even more.

## NATURAL GAS

Unlike electricity, the emissions intensity of natural gas is generally consistent, although gas from tar sands and other similar sources may have a higher emissions intensity. Weather fluctuations affect GHG emissions from both electricity and natural gas sectors. During wetter weather, more electricity from hydropower is produced. The amount of energy used for heating and cooling is impacted by temperature, especially in the natural gas sector. GHG emissions are lower when the weather is milder and higher when it is colder.

## TRANSPORTATION

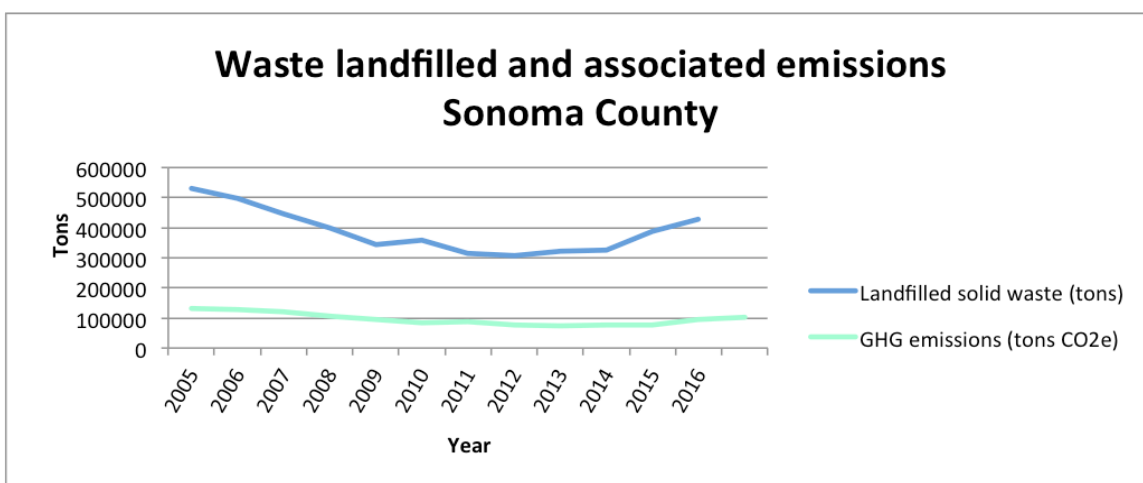
Transportation accounts for about 70% of Sonoma County's total emissions. Transportation emissions began decreasing in 2009, but started increasing again in 2013, concurrent with recovery from the recession and a growing local economy. Although Vehicle Miles Traveled (VMT) has been growing steadily, increasing fuel efficiency has offset that growth, leaving GHG emissions roughly even for the past 10 years. All indications are that VMT will continue to increase.

Few local measures reduce transportation emissions significantly. Sonoma Clean Power has identified electric vehicles as a top priority, and has initiated programs to accelerate the transition to 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 landfilled solid waste has risen relatively significantly over the past two years, along with the associated GHG emissions. This reflects the growing local economy. The impacts from this sector can be reduced through local policies, including enforcement of CalRecycle recycling and composting regulations, and diversion of organics from the waste stream, with food waste being the single largest component remaining.



## 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 from the Center for Climate Protection. 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.<sup>1</sup> 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.<sup>2</sup>

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 Sonoma County Regional Climate Protection Authority (RCPA) produced a GHG emissions report for Sonoma County as part of its work on Climate Action 2020. A memo comparing and discussing its methodology with the one used for this report is available from the RCPA. Also, the RCPA is updating their GHG emission report.

---

<sup>1</sup> Scope 1 and Scope 2, or direct and indirect emissions.

<sup>2</sup> Upstream or lifecycle emissions due to production of goods, also known as Scope 3 emissions.

## SOURCES AND SUPPORT

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](http://www.climateprotection.org).

Highway Performance Monitoring System (HPMS) Data for Vehicle Miles Traveled Library  
<http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php>

Average Fuel Efficiency of U.S. Light Duty Vehicles  
[https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national\\_transportation\\_statistics/index.html#chapter\\_4](https://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_statistics/index.html#chapter_4)

U.S. Federal Highway Administration, Vehicle Miles Traveled [TRFVOLUSM227NFWA]; retrieved from FRED, Federal Reserve Bank of St. Louis, <https://fred.stlouisfed.org/series/TRFVOLUSM227NFWA>

Sonoma County Waste Management Agency, Patrick Carter, Executive Director

City of Healdsburg <http://www.cityofhealdsburg.org/231/Power-Content-Label>

The Climate Registry (electricity emissions coefficient data). Data available at [www.climateregistry.org](http://www.climateregistry.org), public reports, view public reports, access public reports, Pacific Gas and Electric.

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 of terms: <http://epa.gov/climatechange/glossary.html>

More on Sonoma County GHG emissions and solutions: [www.climateprotection.org](http://www.climateprotection.org), [www.coolplan.org](http://www.coolplan.org), [www.rcpa.ca.gov](http://www.rcpa.ca.gov)

Thanks to Chris Barney, Sonoma County Transportation Authority; Julianne Alontave and Cam-Giang Nguyen, California Energy Commission; Geof Syphers, Rebecca Simonson, Stephanie Reynolds, Sonoma Clean Power; Patrick Carter, Sonoma County Waste Management Agency; and Terry Crowley, City of Healdsburg; for their help in producing this report.

*The mission of the Climate Protection Campaign 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. [www.climateprotection.org](http://www.climateprotection.org)*