
CITY OF NOVATO

2014 ANNUAL GREENHOUSE GAS EMISSIONS INVENTORY



March 2017

Prepared by the
Marin Climate & Energy Partnership

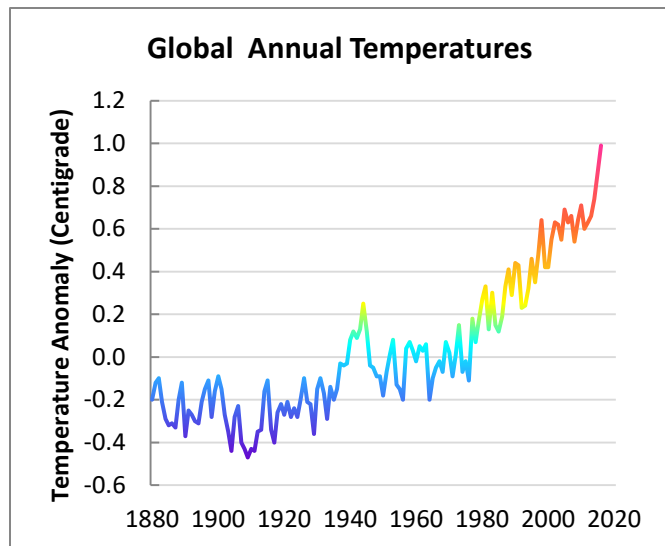


The Takeaway

Novato's greenhouse gas emissions dropped 11% between 2005 and 2014, meaning the City has made significant progress in meeting local and statewide reduction goals for 2020. The largest reductions were due to decreases in electricity and natural gas use and emissions. Decreases in waste disposal also played a part. Although Novato is on track to meeting its target to reduce emissions 15% by 2020, new State legislation has set longer-term goals to reduce emissions 40% below baseline emissions by 2030.

Introduction

2016 was an historic year for climate change. Not only did our planet beat the 2015 record for warmest year in the modern temperature record, carbon dioxide levels officially passed the symbolic 400 parts per million mark. On the good news front, California has set another milestone to reduce greenhouse gas emissions with the adoption of SB 32 in 2016. This landmark legislation builds on the reduction target established for the year 2020 under AB 32 and now requires the State to reduce greenhouse gas emissions to 40% below 1990 levels by 2030. The State's long-term goal is to reduce emissions to 80% below 1990 levels by 2050, which is what scientists say is necessary to limit global warming to 2°C and avoid the most catastrophic effects of climate change. That will take a complete overhaul of our transportation and energy systems, as well as probably some innovative ways to sequester carbon dioxide. But at least we're making progress, and both California and Novato are on track to meet their 2020 targets.

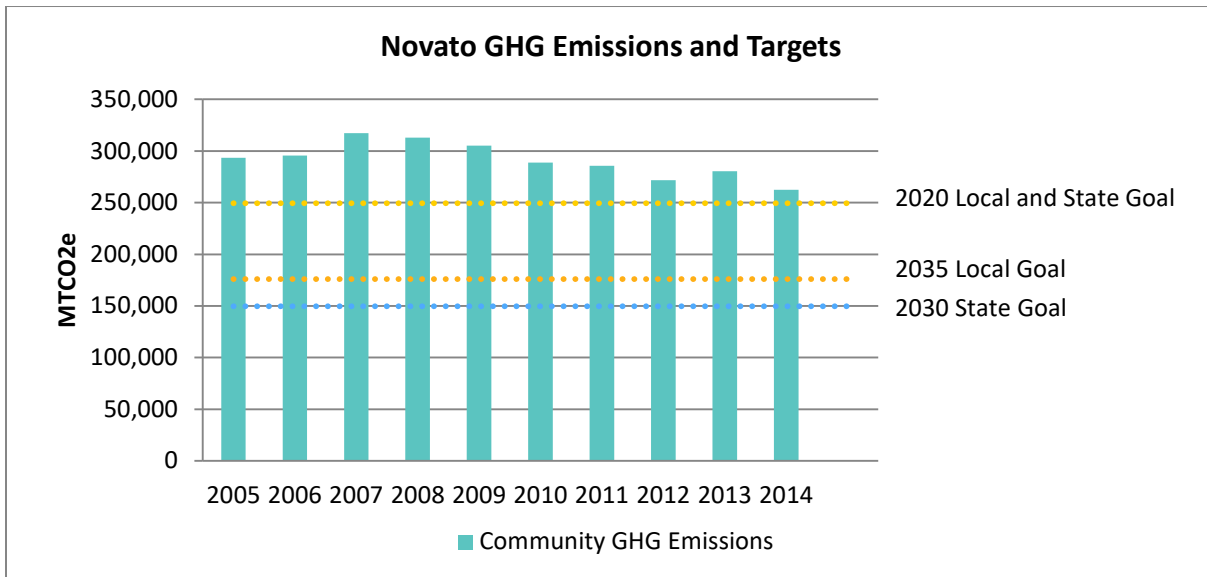


Source: NASA

Beginning in 2017, Novato will publish annual community greenhouse gas (GHG) emissions estimates through the Marin Climate & Energy Partnership (MCEP). Annual inventories will help the City to more closely monitor its progress in meeting its local goal to reduce community emissions 15% below baseline (2005) emissions by 2020 and 40% by 2035. Annual inventories are intended to supplement the full emissions inventories that are conducted every five years and were last prepared for 2010 emissions.

This report reviews emissions generated from the community from 2005 through 2014 (the most recent year data is available). The inventory shows that the City is making significant progress, with emissions

11% below baseline emissions in 2014. Emissions dropped from about 293,400 metric tons CO₂e (MTCO₂e) in 2005 to 262,500 MTCO₂e in 2014. The emissions trend and targets are shown below.



Recognizing the need for a collaborative approach to greenhouse gas reductions, city and county leaders launched the Marin Climate and Energy Partnership (MCEP) in 2007. The City of Novato is a member of MCEP and works with representatives from the County of Marin and all of the other Marin cities and towns to address and streamline the implementation of a variety of greenhouse gas reduction measures. Funding for this inventory was provided by the Marin County Energy Watch Partnership which administers public goods charges collected by PG&E. The annual inventories will be available on the MCEP website at marinclimate.org and will be used to update the [Marin Sustainability Tracker](#).

Emissions Reductions by Sector

This annual assessment tracks emissions in the seven sectors identified in the 2010 emissions inventory.

- The **Residential** and **Commercial** sectors represent emissions generated from the use of electricity, natural gas and propane in Novato homes and commercial and governmental buildings and facilities.
- The **Transportation** sector includes tailpipe emissions from vehicles travelling on roads within the city limits and a proportionate share of vehicles travelling on state highways within Marin County.
- The **Off-Road** sector represents emissions from off-road vehicles and equipment used for construction and lawn and garden maintenance.
- The **Water** and **Wastewater** sectors represent emissions from energy used to pump, convey and treat water and wastewater, as well as fugitive greenhouse gasses that are created during the wastewater treatment process.
- The **Waste** sector includes fugitive methane emissions that are generated over time as organic material decomposes in the landfill.

Table 1 shows how emissions in these sectors have changed since 2005. The greatest reductions have occurred in the Residential (-20,297 MTCO₂e) and Commercial sectors (-5,179 MTCO₂e), which account for 83% of total reductions. There have also been significant declines on a percentage basis in the Waste sector. The likely reasons for the largest emissions decreases are described in further detail in the remainder of this report.

Table 1: Novato Greenhouse Gas Emissions by Sector, 2005-2014

Year	Residential Energy	Commercial Energy	Transportation	Waste	Water	Wastewater	Off-Road	Total	% Change from 2005
2005	84,267	56,961	127,485	11,451	2,144	6,929	4,190	293,426	0%
2006	85,108	55,145	129,912	12,217	2,105	6,964	4,107	295,558	1%
2007	93,927	67,749	129,903	11,337	2,858	7,364	4,025	317,162	8%
2008	94,575	66,739	127,517	9,741	2,979	7,454	3,943	312,948	7%
2009	91,715	65,005	126,548	8,212	2,618	7,349	3,861	305,308	4%
2010	83,867	56,653	128,197	7,734	1,673	7,037	3,778	288,940	-2%
2011	84,243	55,014	126,708	7,503	1,560	7,029	3,754	285,811	-3%
2012	79,173	56,178	115,712	7,800	1,850	7,200	3,723	271,636	-7%
2013	78,103	54,858	126,418	8,037	1,919	7,303	3,695	280,332	-4%
2014	63,970	51,782	126,126	7,809	1,855	7,364	3,650	262,556	-11%
Change from 2005	-20,297	-5,179	-1,358	-3,642	-289	435	-540	-30,870	
% Change from 2005	-24%	-9%	-1%	-32%	-13%	6%	-13%	-11%	

Major Emissions Sources

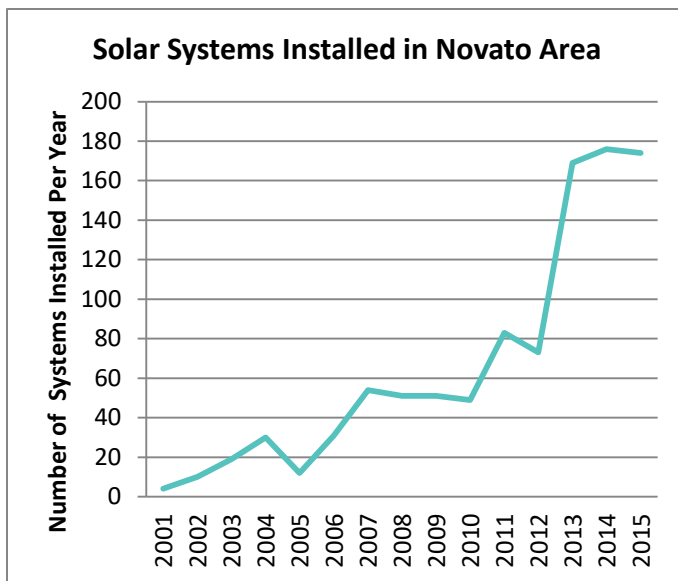
The following sections provide a year-by-year analysis of the changes in GHG emissions from the City's largest sources: electricity, natural gas, transportation, and waste disposal. Whenever possible, each section discussion includes the change in emissions from previous years and the likely influence of state and local programs or policies and external factors on reducing emissions.

Electricity Use and GHG Emissions

Electricity use in homes and businesses in Novato declined about 2% between 2013 and 2014 and dropped less than 1% since 2005, from about 284.5 million kWh in 2005 to 282.1 million kWh in 2014. The Residential sector, which uses 44% of all electricity in Novato, has reduced its electricity use 5% since 2005. Electricity use increased nearly 3% in the Commercial sector over the same period.

Electricity reductions have most likely occurred due to improved energy efficiency, conservation, and solar installation.

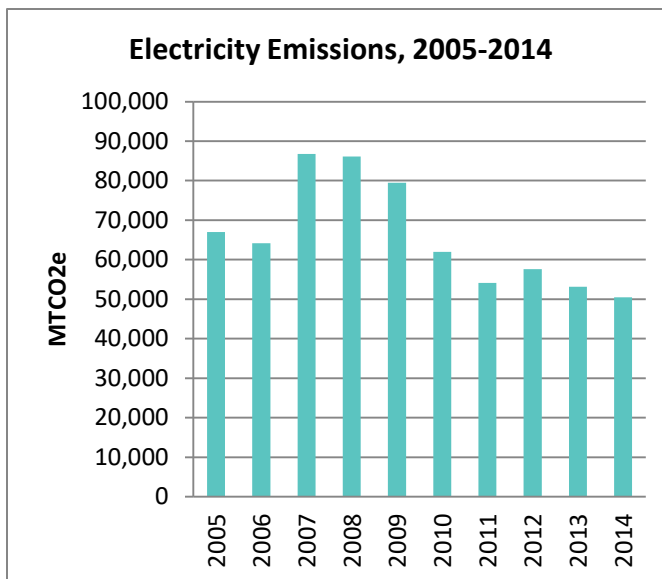
Property owners continued to install solar panels in 2014, with 175 new residential systems and one new commercial system connected to the grid. As of September 2016, there were 1,148 solar energy systems in the Novato area, including unincorporated areas with Novato zip codes. The vast majority (96%) are residential systems. Approximately 2.6% of single family homes in the Novato area now have solar energy systems. The rise in installation of distributed solar has been enabled in part by a 54% reduction in installed solar cost since 2008 and a recently-extended 30% federal tax credit.^{1, 2}



Source: California Solar Statistics

Novato has adopted solar permit streamlining procedures and fee waivers in order to encourage solar installation, and the City has enabled PACE programs that offer property owners a way to finance solar installations and energy efficiency projects as an assessment on property tax bills. By the end of 2015, 30 projects totaling \$626,000 had been financed through PACE.

Electricity-related greenhouse gas emissions in the Residential and Commercial sectors decreased 5% between 2013 and 2014. Emissions dropped 25% since 2005. This is primarily due to the lower carbon intensity of electricity. PG&E electricity has been steadily increasing the amount of renewable energy in its power mix, and its electricity was 11% less carbon intensive in 2014 than it was in 2005. MCE, which began providing electricity to Novato customers in 2012, has historically provided electricity that is less carbon intensive than PG&E electricity. In 2014, MCE electricity was 23% less carbon



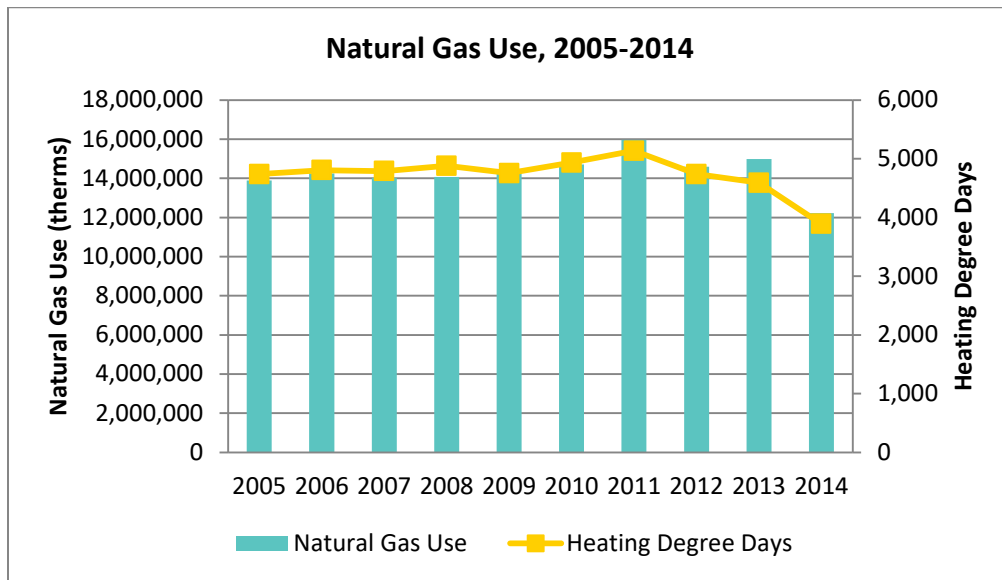
¹ U.S. Department of Energy, "Revolution...Now: The Future Arrives for Five Clean Energy Technologies – 2016 Update," September 2016, http://energy.gov/sites/prod/files/2016/09/f33/Revolutiona%CC%82%E2%82%ACNow%202016%20Report_2.pdf.

² The Solar Investment Tax Credit was been extended in 2015 through 2019. The tax credit will drop to 26% in 2020 and 22% in 2021.

intensive than PG&E. MCE carries about 61% of the electricity load in Novato. In 2015, about 0.4% of the electricity purchased by MCE Novato customers was Deep Green.

Natural Gas Use and GHG Emissions

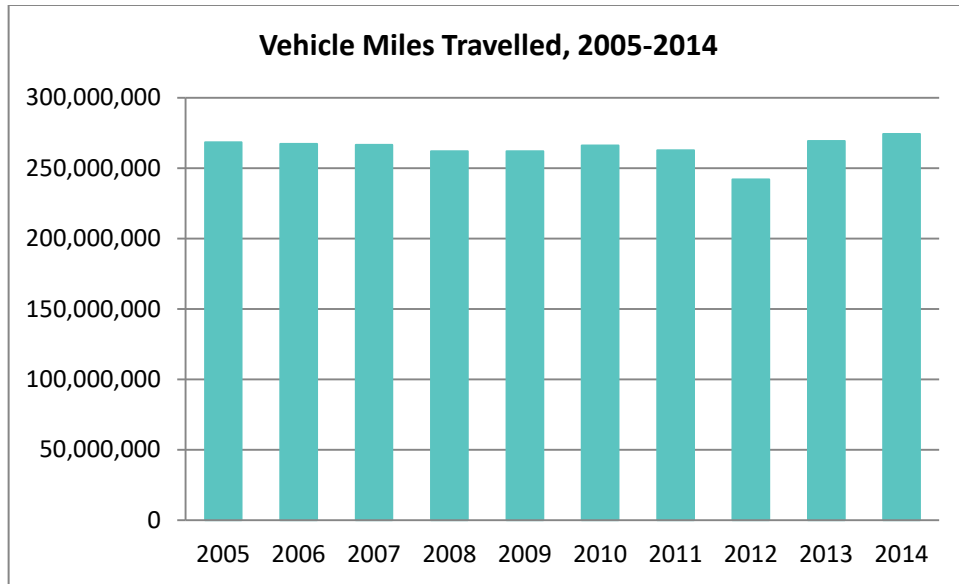
Natural gas is used in residential and commercial buildings to provide space heating and power equipment. Use of natural gas is highly variable depending on the weather conditions in a given year. This variability has led natural gas use consumption in Novato to fluctuate from year to year, from a high of 16.0 million therms in 2011 to a low of 12.2 million therms in 2014. Emissions from natural gas consumption fell 18% between 2013 and 2014, most likely due to a warmer year than usual. The chart below compares natural gas usage in Novato to regional heating degree days, a measure of how much energy is required to warm the interior of a building relative to the outside temperature. Warmer days result in fewer heating degree days. As shown below, natural gas consumption is highly correlated to heating degree days. Reduction in energy use may also be attributed to energy efficiency programs and rebates, local green building ordinances, and State building codes. California’s goal is to require all new residential buildings to be zero net energy by 2020 and all new commercial buildings to be zero net energy by 2030.



Source (heating degree days): U.S. Department of Commerce, National Climatic Data Center

Transportation and GHG Emissions

Transportation activities accounted for approximately 48% of Novato’s emissions in 2014. Vehicle miles travelled on local roads and a proportionate share of state highways within Marin County have increased 2% since 2005, while emissions have decreased 1% due to more fuel-efficient and alternatively fueled cars. The California clean car fuel standards and regular turnover of the vehicle fleet have lowered emissions from 1.05 pounds per mile in 2005 to 1.01 pounds per mile in 2014.



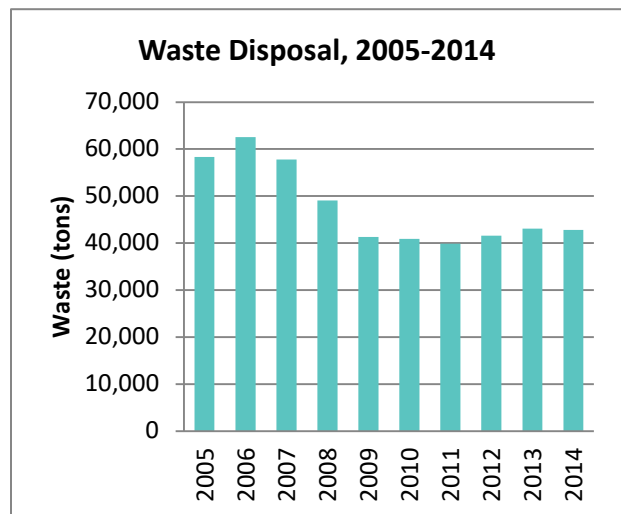
Source: Caltrans Highway Performance Monitoring System Public Roads Data

While it is difficult to pinpoint exactly how each land use and transportation policy affects emissions, the City has undertaken many efforts to reduce emissions from transportation, including providing free electricity at 6 municipal EV charging stations.

Waste Disposal and GHG Emissions

Waste disposal from the community declined 35% between 2005 and 2011, but has since increased as shown in the chart. Nonetheless, it is encouraging to see that disposal tonnage has held on to most of the declines despite a strong local economy. Emissions from waste disposal decreased 3% between 2013 and 2014, and were 37% below 2005 levels in 2014.

The associated decrease in emissions from waste disposal is a result of the City's goals to expand recycling efforts and implement food waste collections and composting programs.



Source: CalRecycle

Outreach and Coordination

In addition to the programs and actions described above, the City pursued a range of outreach activities and participated in several multi-agency efforts, including:

- Utilized the City's newsletter, social media, and press to promote sustainability efforts
- Participated in and supported the Marin Climate and Energy Partnership
- Partnered with Resilient Neighborhoods to enroll Novato households in a program to learn about sustainability and take actions to reduce household greenhouse gas emissions

Summary, Priorities and Next Steps

Novato has made significant progress in reducing GHG emissions since 2005 and has nearly met its 2020 reduction target. However, the City will need to continue to implement policies and programs that further reduce emissions to achieve statewide targets to reduce emissions another 40% by 2030.