CITY OF LARKSPUR

GREENHOUSE GAS INVENTORY FOR COMMUNITY EMISSIONS FOR THE YEAR 2018

April 2020

Prepared by the
Marin Climate & Energy Partnership

MARIN CLIMATE & ENERGY PARTNERSHIP

Table of Contents

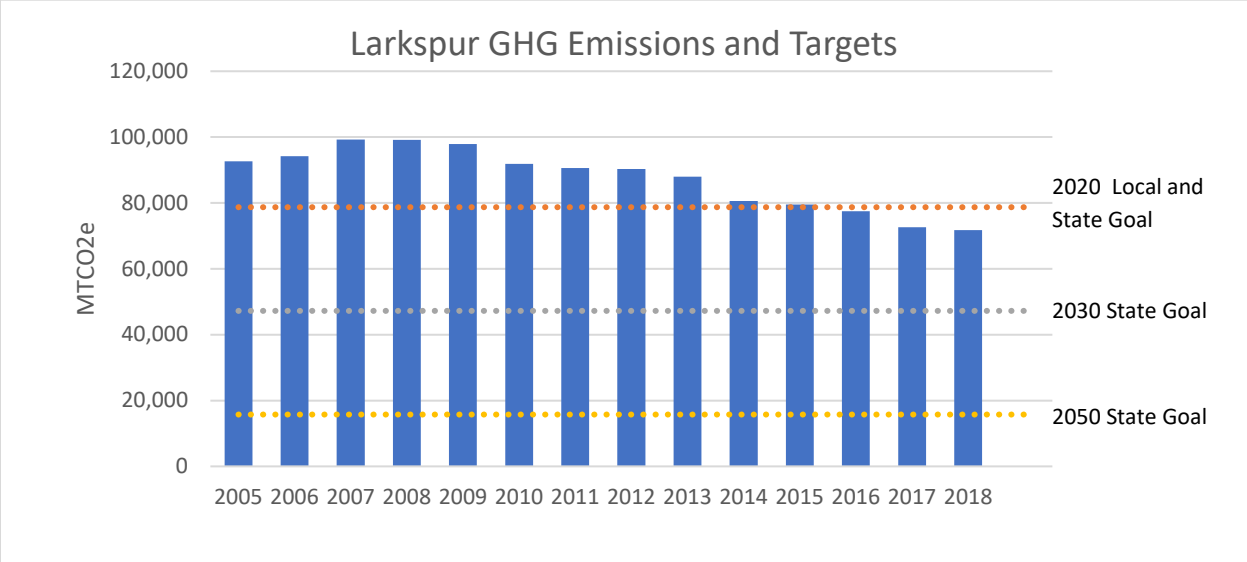
EXECUTIVE SUMMARY

THE TAKEAWAY:

COMMUNITY EMISSIONS DOWN 23% SINCE 2005

Larkspur publishes annual community greenhouse gas (GHG) emissions estimates through the Marin Climate & Energy Partnership (MCEP). Annual inventories 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 to meet the statewide goal to reduce emissions 40% below 1990 levels by 2030.

This report reviews emissions generated from the community from 2005 through 2018, the most recent year data is available. The inventory shows that the Larkspur community has reduced emissions 23% since 2005, meeting its 2020 goal four years ahead of schedule in 2016. Emissions dropped from about 92,602 metric tons carbon dioxide equivalents ($MTCO_2e$) in 2005 to 71,740 $MTCO_2e$ in 2018. The community emissions trend and targets are shown below. Larkspur needs to reduce emissions another 24,510 $MTCO_2e$ to meet the State target for 2030 and another 56,000 $MTCO_2e$ to meet the State target for 2050, which is 80% below 1990 levels.



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 Larkspur is a member of MCEP and works with representatives from the County of Marin and 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. Community inventories are available on the MCEP website at marinclimate.org and are used to update the Marin Sustainability Tracker.

INTRODUCTION

PURPOSE OF INVENTORY

The objective of this greenhouse gas emissions inventory is to identify the sources and quantify the amounts of greenhouse gas emissions generated by the activities of the Larkspur community in 2018. This inventory provides a comparison to baseline 2005 emissions and identifies the sectors where significant reductions in greenhouse gas emissions have occurred. In some instances, previous year emissions were updated with new data and/or recalculated to ensure the same methodology was employed for all inventory years.

GENERAL METHODOLOGY

This inventory uses national standards for the accounting and reporting of greenhouse gas emissions. The U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, version 1.2 (July 2019) was used for the quantification and reporting of community emissions. Quantification methodologies, emission factors, and activity and source data are detailed in the appendix.

Community emissions are categorized according to seven sectors:

- Residential
- Non-Residential
- Transportation
- Off-Road Vehicles and Equipment
- Waste
- Water
- Wastewater

CALCULATING EMISSIONS

Emissions are quantified by multiplying the measurable activity data – e.g., kilowatt hours of electricity, therms of natural gas, and gallons of diesel or gasoline – by emissions factors specific to the energy source. Most emissions factors are the same from year to year. Emission factors for electricity, however, change from year to year due to the specific sources that are used to produce electricity. For example, electricity that is produced from coal generates more greenhouse gases than electricity that is generated from natural gas and therefore has a higher emissions factor. Electricity that is produced solely from renewable energy sources such as solar and wind has an emissions factor of zero.

This inventory calculates individual greenhouse gases – e.g., carbon dioxide, methane and nitrous oxide – and converts each greenhouse gas emission to a standard metric, known as "carbon dioxide equivalents" or CO_2e, to provide an apple-to-apples comparison among the various emissions. Table 1 shows the greenhouse gases identified in this inventory and their global warming potential (GWP), a measure of the amount of warming each gas causes when compared to a similar amount of carbon dioxide. Methane, for example, is 28 times as potent as carbon dioxide; therefore, one metric ton of methane is equivalent to 28 metric tons of carbon dioxide. Greenhouse gas emissions are reported in this inventory as metric tons of carbon dioxide equivalents, or $MTCO_2e$.

TABLE 1: GREENHOUSE GASES

Gas	Chemical Formula	Emission Source	Global Warming Potential
Carbon Dioxide	CO_2	Combustion of natural gas, gasoline, diesel, and other fuels	1
Methane	CH_4	Combustion, anaerobic decomposition of organic waste in landfills and wastewater	28
Nitrous Oxide	N_2O	Combustion, wastewater treatment	265

Source: IPCC Fifth Assessment Report (2014)

TYPES OF EMISSIONS

Emissions from each of the greenhouse gases can come in a number of forms:

- **Stationary or mobile combustion** resulting from the on-site combustion of fuels (natural gas, diesel, gasoline, etc.) to generate heat or electricity, or to power vehicles and equipment.
- **Purchased electricity** resulting from the generation of power from utilities outside the jurisdictional boundary.
- **Fugitive emissions** resulting from the unintentional release of greenhouse gases into the atmosphere, such as leaked refrigerants and methane from waste decomposition.
- **Process emissions** from physical or chemical processing of a material, such as wastewater treatment.

UNDERSTANDING TOTALS

The totals listed in the tables and discussed in the report are a summation of emissions using available estimation methods. Each inventoried sector may have additional emissions sources associated with them that were unaccounted for due to a lack of data or robust quantification methods. For example, greenhouse gas emissions associated with air travel and the production of goods outside the community's boundary are not included in the inventory. Additionally, the community inventory does not include refrigerants released into the atmosphere from the use of air conditioning in cars and buildings.

COMMUNITY INVENTORY

COMMUNITY INVENTORY SUMMARY

In 2005, the activities taking place by the Larkspur community resulted in approximately 92,602 metric tons of CO_2e. In 2018, those activities resulted in approximately 71,740 metric tons of CO_2e, a reduction of 23% from 2005 levels. This means that the City has met the local and State goal to reduce emissions 15% below the 2005 baseline by 2020.

The community inventory tracks emissions in seven sectors:

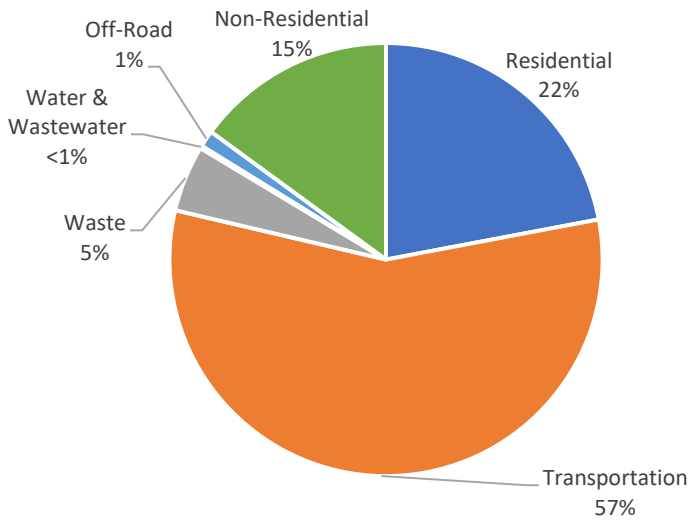
- The **Residential** sector represents emissions generated from the use of electricity, natural gas, and propane in Larkspur homes.
- The **Non-Residential** sector represents emissions generated from the use of electricity and natural gas in commercial, industrial and governmental buildings and facilities.
- The **Transportation** sector includes tailpipe emissions from passenger vehicle trips originating and ending in Larkspur, as well as tailpipe emissions generated by medium and heavy-duty vehicles travelling on Marin County roads based on the City's share of certain truck-generating industries. Emissions from buses serving Larkspur while travelling on roads within the jurisdiction are also included. Electricity used to power electric vehicles is embedded in electricity consumption reported in the Residential and Non-Residential sectors.
- The **Waste** sector represents fugitive methane emissions that are generated over time as organic material decomposes in the landfill. Although most methane is captured or flared off at the landfill, approximately 25% escapes into the atmosphere.
- The **Off-Road** sector represents emissions from the combustion of gasoline and diesel fuel from the operation of off-road vehicles and equipment used for construction and landscape maintenance.
- The **Water** sector represents emissions from energy used to pump, treat and convey potable water from the water source to Larkspur water users.
- The **Wastewater** sector represents stationary, process and fugitive greenhouse gases that are created during the treatment of wastewater generated by the community, as well as emissions created from electricity used to convey and treat wastewater.

Table 2 shows how emissions in each sector have changed since 2005. The greatest reductions have occurred in the Residential sector (-8,091 $MTCO_2e$), followed by the Non-Residential sector (-6,970 $MTCO_2e$) and the Transportation sector (-4,386 $MTCO_2e$). **Figure 1** shows the relative contribution of emissions from these sectors in 2018. The likely reasons for the largest emissions decreases are described in the remainder of this report.

TABLE 2: EMISSIONS SUMMARY BY SECTOR ($MTCO_2E$), 2005 THROUGH 2018

Year	Residential	Commercial	Transportation	Waste	Off-Road	Water	Wastewater	Total	% Change from 2005
2005	23,897	17,700	45,012	3,966	1,246	507	275	92,602	
2006	23,707	17,303	47,285	3,925	1,281	444	264	94,209	2%
2007	25,882	18,961	48,404	3,522	1,526	597	332	99,225	7%
2008	26,346	19,194	48,559	2,931	1,260	551	339	99,179	7%
2009	25,803	18,140	49,464	2,522	1,102	553	299	97,884	6%
2010	23,650	15,589	48,516	2,481	1,032	316	246	91,830	-1%
2011	23,260	15,376	48,099	2,418	1,024	223	228	90,627	-2%
2012	22,746	15,208	48,377	2,507	1,010	242	242	90,332	-2%
2013	21,703	15,336	46,935	2,532	991	282	237	88,014	-5%
2014	17,846	13,960	44,774	2,573	977	246	205	80,581	-13%
2015	17,960	13,429	44,110	2,695	966	202	203	79,563	-14%
2016	17,573	12,528	42,957	3,185	946	136	186	77,512	-16%
2017	15,678	10,552	41,956	3,330	920	39	140	72,614	-22%
2018	15,805	10,730	40,626	3,552	887	14	125	71,740	-23%
Change from 2005	-8,091	-6,970	-4,386	-414	-359	-493	-150	-20,863	
% Change from 2005	-34%	-39%	-10%	-10%	-29%	-97%	-55%	-23%	

FIGURE 1: EMISSIONS BY SECTOR, 2018

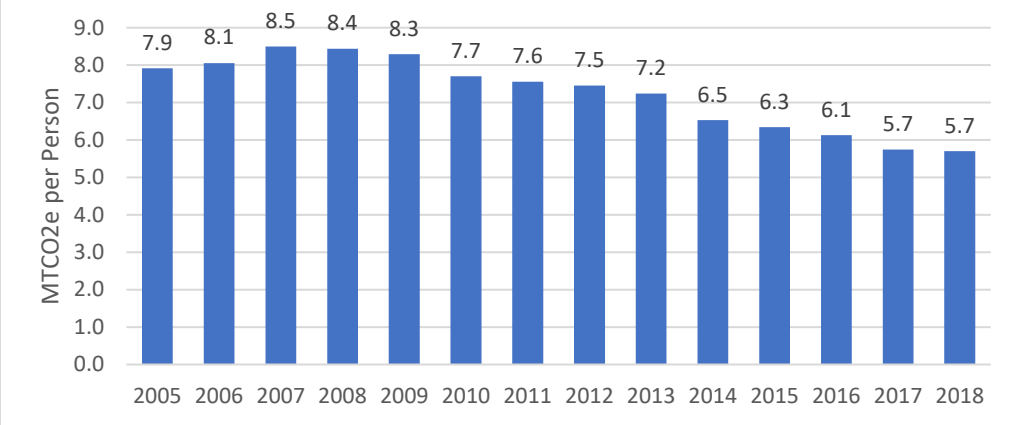


Per Capita Emissions

Per capita emissions can be a useful metric for measuring progress in reducing greenhouse gases and for comparing one community's emissions with neighboring cities and against regional and national averages. That said, due to differences in emission inventory methods, it can be difficult to produce directly comparable per capita emissions numbers. Per capita emission rates may be compared among Marin jurisdictions, although some jurisdictions may have higher rates due to the presence of commercial and industrial uses.

Dividing the total community-wide GHG emissions by residents yields a result of 7.9 metric tons CO_2e per capita in 2005. Per capita emissions decreased 28% between 2005 and 2018, falling to 5.7 metric tons per person. Figure 2 shows the trend in per capita emissions over time. It is important to understand that this number is not the same as the carbon footprint of the average individual living in Larkspur, which would include lifecycle emissions, emissions resulting from air travel, the manufacturing and distribution of products and food, etc.

Figure 2: Emissions Per Capita



Major Sources of Emissions

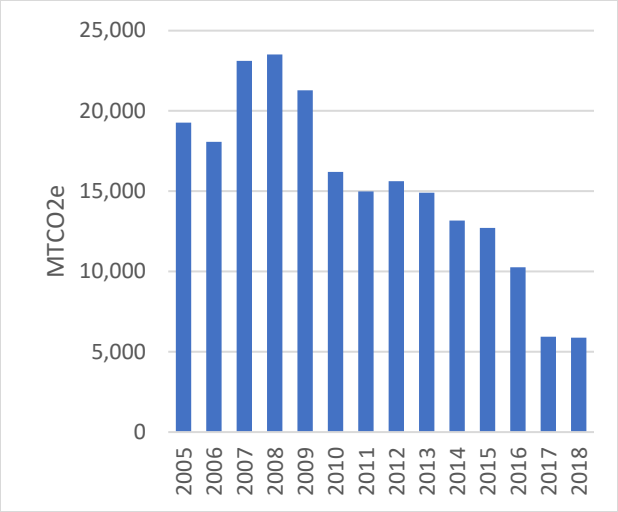
The following sections provide a year-by-year analysis of the changes in GHG emissions from the City's largest sources: electricity, natural gas, transportation, waste, and water use. Whenever possible, each section discusses the change in emissions from previous years and the likely influence of state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

Electricity Use

Electricity use in homes and businesses in Larkspur decreased about 14% between 2005 and 2018. The Residential sector, which used 48% of all electricity in Larkspur in 2018, reduced electricity use 9% since 2005. Electricity use decreased 17% in the Non-Residential sector over the same period. Electricity reductions have most likely occurred due to improved energy efficiency, conservation, and solar installation. Distributed solar generation from local roofs, carports and ground-mounted systems provided about 6% of the electricity used in Marin County in 2018.

Electricity-related greenhouse gas emissions in the Residential and Non-Residential sectors decreased 70% since 2005, as shown in Figure 3. This is primarily due to the lower carbon intensity of electricity. PG&E has been steadily increasing the amount of renewable energy in its electricity mix, which was 58% less carbon intensive in 2018 than it was in 2005. MCE, which began providing electricity to Larkspur customers in 2012, has historically provided electricity that is less carbon intensive than PG&E electricity. In 2018, MCE Light Green electricity was 38% less carbon intensive than PG&E. MCE carries about 64% of the electricity load in Larkspur. In 2018, about 8% of MCE electricity purchased by Larkspur customers was 100% renewable Deep Green electricity, including the City government.

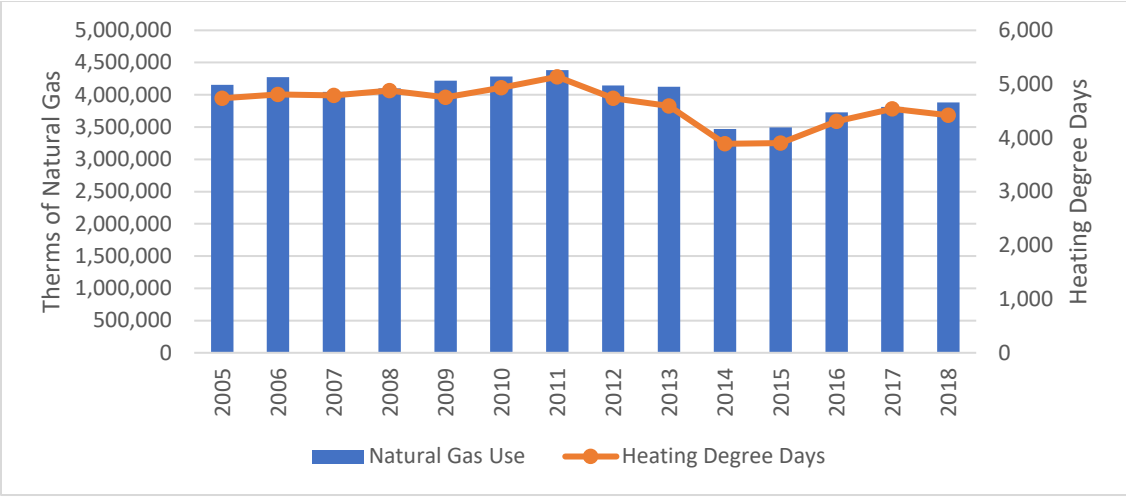
FIGURE 3: ELECTRICITY EMISSIONS



Natural Gas Use

Natural gas is used in residential, commercial and industrial buildings to provide space and water heating and power appliances. 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 Larkspur to fluctuate from year to year, from a high of 4.38 million therms in 2011 to a low of 3.47 million therms in 2014. Emissions from natural gas consumption increased 2% between 2017 and 2018. The chart below compares natural gas usage in Larkspur 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. Overall, natural gas use has declined 7% since 2005.

FIGURE 4: NATURAL GAS USE



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

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 and commercial buildings to be zero net energy by 2030.

Transportation

Transportation activities accounted for approximately 57% of Larkspur's emissions in 2018. Vehicle miles traveled have increased approximately 10% since 2005. Transportation emissions have decreased 10%; the decline is due to more fuel-efficient and alternatively fueled cars. Marin County continues to be a leader in zero emission vehicles (ZEVs) – second only to Santa Clara County – with 7,116 ZEVs in Marin in January 2019, or about 4% of registered automobiles. ZEVs include battery electric cars, plug-in hybrid electric cars, hydrogen fuel cell cars, and zero-emission motorcycles.

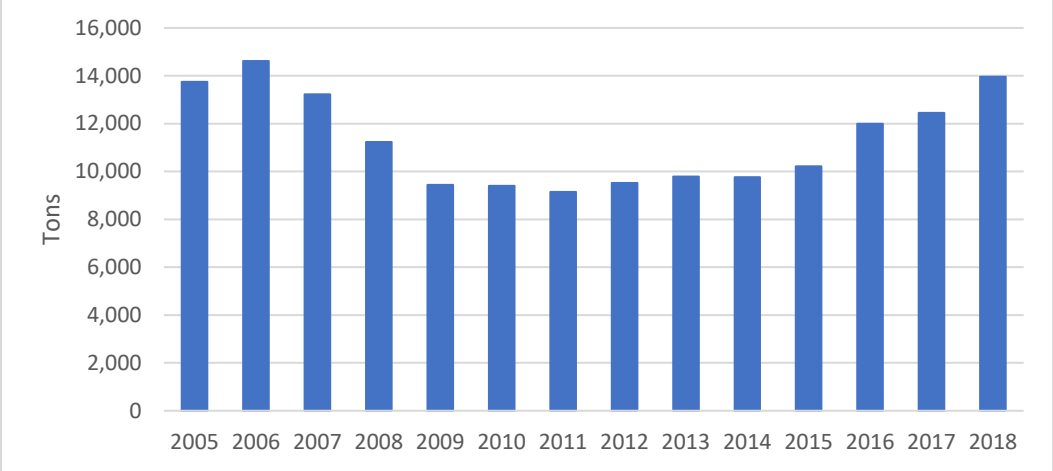
While it is difficult to pinpoint exactly how each land use and transportation policy affects emissions, the City has undertaken many efforts to reduce transportation emissions. The City encourages workforce housing and has made it easier for residents to use carbon-free modes of transportation, such as bicycling and walking, through improvements to the transportation network.

Waste Disposal

Waste generated by the community hit a low in 2011 but has since increased as shown in the chart below (based on countywide disposal data). Landfilled waste increased 12% between 2017 and 2018 but is now 2% above the 2005 baseline. The increase is waste disposal is most likely due to the robust economy.

Despite the increase in disposed tons, emissions from waste disposal decreased 10% due to due to the lower organic content of material used for alternative daily cover.

FIGURE 5: DISPOSED WASTE

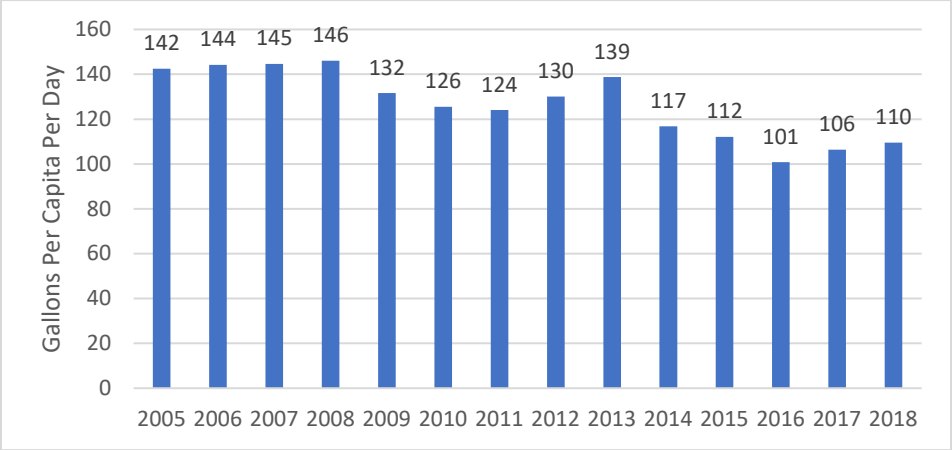


Source: CalRecycle, includes alternative daily cover

WATER USE

Per capita water use declined 23% since 2005. Emissions, which are based on an estimate of energy used to pump, treat, and convey water from the water source to the City limits, dropped 97% between 2005 and 2018. The additional reduction is due to the lower carbon intensity of electricity. The Marin Municipal Water District (MMWD) began purchasing MCE Deep Green electricity in mid-2017. The Sonoma County Water Agency (SCWA), which supplied approximately 20% of MMWD's water in 2018, uses renewable and carbon-free sources for its electricity needs; a small amount of emissions comes from stationary and mobile combustion of fuels used in SCWA's operations.

FIGURE 6: PER CAPITA WATER USE



Source: Marin Municipal Water District

MMWD provides rebates and programs to reduce water use. Rebates are available to replace fixtures with high-efficiency clothes washers and to purchase cisterns and rain barrels. MMWD provides free home and landscape water-use evaluations as well as free high-efficiency showerheads and faucet aerators.

APPENDIX: COMMUNITY INVENTORY

Community GHG Emissions Summary Table

Jurisdiction: City of Larkspur
Population: 12,588 (CA Department of Finance)
Number of Households: 6,019 (CA Department of Finance)

Inventory Year: 2018
Date Prepared: April 13, 2020
Reporting Framework: Communitywide Activities

ID	Emissions Type	Source or Activity	Included, Required Activities	Included, Optional Activities	Excluded (IE, NA, NO or NE)	Notes	Emissions ($MTCO_2e$)
1.0	Built Environment						
1.1	Use of fuel in residential and commercial stationary combustion equipment	Both	●				20,662
1.2	Industrial stationary sources	Source			NE		
1.3	Power generation in the community	Source			NO		
1.4	Use of electricity in the community	Activity	●			Includes transmission and distribution losses	5,873
1.5	District heating/cooling facilities in the community	Source			NE		
1.6	Use of district heating/cooling facilities in the community	Activity			NE		
1.7	Industrial process emissions in the community	Source			NO		
1.8	Refrigerant leakage in the community	Source			NE		
2.0	Transportation and Other Mobile Sources						
2.1	On-road passenger vehicles operating within the community boundary	Source			IE	Obtained data for preferred activity-based method instead	
2.2	On-road passenger vehicles associated with community land uses	Activity	●				34,178
2.3	On-road freight and service vehicles operating within the community boundary	Source			IE	Obtained data for preferred activity-based method instead	
2.4	On-road freight and service vehicles associated with community land uses	Activity	●				6,018
2.5	On-road transit vehicles associated with community land uses	Activity		●			431
2.6	Transit rail vehicles operating with the community boundary	Source			NO		
2.7	Use of transit rail travel by the community	Activity			NE		
2.8	Inter-city passenger rail vehicles operating within the community boundary	Source			NO		

2.9	Freight rail vehicles operating within the community boundary	Source			NO		
2.10	Marine vessels operating within the community boundary	Source			NE		
2.11	Use of ferries by the community	Activity			NE		
2.12	Off-road surface vehicles and other mobile equipment operating within the community boundary	Source		●			887
2.13	Use of air travel by the community	Activity			NE		
3.0	Solid Waste						
3.1	Operation of solid waste disposal facilities in the community	Source			NO		
3.2	Generation and disposal of solid waste by the community	Activity	●			Includes alternative daily cover	3,552
4.0	Water and Wastewater						
4.1	Operation of water delivery facilities in the community	Source			IE	Energy use is included in 1.1 and 1.4.	
4.2	Use of energy associated with use of potable water by the community	Activity	●				14
4.3	Use of energy associated with generation of wastewater by the community	Activity	●				20
4.4	Process emissions from operation of wastewater treatment facilities located in the community	Source			NO		
4.5	Process emissions associated with generation of wastewater by the community	Activity	●				105
4.6	Use of septic systems in the community	Source			NE		
5.0	Agriculture						
5.1	Domesticated animal production	Source			NE		
5.2	Manure decomposition and treatment	Source			NE		
6.0	Upstream Impacts of Communitywide Activities						
6.1	Upstream impacts of fuels used in stationary applications by the community	Activity			NE		
6.2	Upstream and transmission and distribution (T&D) impacts of purchased electricity used by the community	Activity			IE	Transmission and distribution losses included in 1.4.	
6.3	Upstream impacts of fuels used by water and wastewater facilities for water used and wastewater generated within the community boundary	Activity			IE	Included in 4.2 and 4.3.	
6.4	Upstream impacts of select materials (concrete, food, paper, carpets, etc.) used by the whole community.	Activity			NE		

Legend

IE – Included Elsewhere: Emissions for this activity are estimated and presented in another category of the inventory. The category where these emissions are included should be noted in the explanation.

NE – Not Estimated: Emissions occur but have not been estimate or reported (e.g., data unavailable, effort required not justifiable).

NA – Not Applicable: The activity occurs but does not cause emissions; explanation should be provided.
NO – Not Occurring: The source or activity does not occur or exist within the community.

Community Emissions Data Sources and Calculation Methodologies

Sector/ID	Emissions Source	Source and/or Activity Data	Emission Factor and Methodology
1.0 Built Environment			
1.1 Stationary Combustion	Stationary Combustion (CO_2, CH_4 & N_2O)	Known fuel use (meter readings by PG&E) and estimated fuel use (American Community Survey 5-Year Estimates, and U.S. Energy Information Administration Household Site Fuel Consumption data).	Default CO_2, CH_4 & N_2O emission factors by fuel type (U.S. Community Protocol v. 1.1 Tables B.1 and B.3). U.S. Community Protocol v. 1.1, Appendix C, Method BE.1.1 and BE.1.2.
1.4 Electricity Use	Electricity Use (CO_2, CH_4 & N_2O)	Known electricity use (meter readings by PG&E and MCE) and estimated direct access electricity consumption.	Verified utility-specific emission factors (PG&E and MCE) and eGrid subregion default emission factors. U.S. Community Protocol v. 1.1, Appendix C, Method BE.2.1.
	Electric Power Transmission and Distribution Losses (CO_2, CH_4 & N_2O)	Estimated electricity grid loss for Western region from eGrid.	U.S. Community Protocol v. 1.1, Appendix C, Method BE.4.1.
2.0 Transportation and Other Mobile Sources			
2.2 On-Road Passenger Vehicle Operation	On-Road Mobile Combustion (CO_2)	Estimated passenger vehicle miles traveled associated with origin and destination land uses (Metropolitan Transportation Commission, http://capvmt.us-west-2.elasticbeanstalk.com/data).	CO_2 for on-road passenger vehicles quantified in the EMFAC2017 model. Passenger vehicle emissions calculated according to U.S. Community Protocol v. 1.1, Appendix D, Method TR.1.A.
	On-Road Mobile Combustion (CH_4 & N_2O)	Estimated vehicle miles traveled associated with origin and destination land uses (Metropolitan Transportation Commission, http://capvmt.us-west-2.elasticbeanstalk.com/data).	CH_4 and N_2O for on-road passenger vehicles quantified in the EMFAC2017 model and adjusted for IPCC AR5 100-year values. Passenger vehicle emissions calculated according to U.S. Community Protocol v. 1.1, Appendix D, Method TR.1.A.
2.4 On-Road Freight and Service Truck Freight Operation	On-Road Mobile Combustion (CO_2)	Estimated commercial vehicle miles traveled within the boundary (Metropolitan Transportation Commission utilizing the 2017 Regional Transportation Plan).	CO_2 for on-road commercial vehicles quantified in the EMFAC2017 model. Emissions allocated utilizing LEHD data according to U.S. Community Protocol v. 1.1, Appendix D, Method TR.2.A.
	On-Road Mobile Combustion (CH_4 & N_2O)	Estimated commercial vehicle miles traveled within the boundary (Metropolitan Transportation Commission utilizing Plan Bay Area 2040 and the 2017 Regional Transportation Plan).	CH_4 and N_2O for on-road commercial vehicles quantified in the EMFAC2017 model and adjusted for IPCC AR5 100-year values. Emissions allocated utilizing LEHD data according to U.S. Community Protocol v. 1.1, Appendix D, Method TR.2.A.
2.5 On-Road Transit Operation	On-Road Mobile Combustion (CO_2)	Estimated vehicle miles traveled within the boundary (Marin Transit and Golden Gate Transit) and estimated diesel fuel efficiency for transit fleet (Golden Gate Transit). Fuel type provided by Marin Transit and Golden Gate Transit.	Renewable diesel emission factor provided by NEXGEN. U.S. Community Protocol v. 1.1, Appendix D, Method TR.4.A.
	On-Road Mobile Combustion (CH_4 & N_2O)	Estimated vehicle miles traveled within the boundary (Marin Transit and Golden Gate Transit) and estimated diesel fuel efficiency for transit fleet (Golden Gate Transit). Fuel type	Renewable diesel emission factor provided by NEXGEN. U.S. Community Protocol v. 1.1, Appendix D, Method TR.4.B.

		provided by Marin Transit and Golden Gate Transit.	
2.12 Off-Road Vehicles and Equipment	Off-Road Mobile Combustion (CO_2)	Estimated fuel use from OFFROAD 2007 for Lawn and Garden and from OFFROAD2017 for Construction equipment. All categories are allocated by share of countywide households.	CO_2 emissions calculated according U.S. Community Protocol v. 1.1, Appendix D, Method TR.8. Emission factors provided in Table TR.1.6.
	Off-Road Mobile Combustion (CH_4 & N_2O)	Estimated fuel use from OFFROAD 2007 for Lawn and Garden and from OFFROAD2017 for Construction equipment. All categories are allocated by share of countywide households.	CH_4 and N_2O emissions calculated according to U.S. Community Protocol v. 1.1, Appendix D, Method TR.8. Emission factors provided in the Local Government Operations Protocol Table G.11 and G.14.
3.0 Solid Waste			
3.2 Solid Waste Generation and Disposal	Fugitive Emissions from Landfilled Waste (CH_4)	Estimated landfilled tons based on reporting to CalRecycle by Marin County Solid and Hazardous Waste JPA and allocated to jurisdiction based on share of countywide population. Waste characterization based on the Statewide Waste Characterization Study (2008 and 2014) and Alternative Daily Cover by Jurisdiction of Origin and Material Type as reported to CalRecycle.	Emission factors calculated utilizing U.S. Community Protocol for Accounting and Report of Greenhouse Gas Emissions, Version 1.1, July 2013, Appendix E, Method SW.4.
4.0 Water and Wastewater			
4.2 Water Supply & Conveyance, Treatment and Distribution	Electricity Use (CO_2)	Water production consumption (district-wide gpcd) and electricity usage provided by Marin Municipal Water District (MMWD). Sonoma County Water Agency (SCWA) delivery amount provided by SCWA.	Verified utility-specific emission factors (PG&E, MCE and SCWA). Emissions calculated according to U.S. Community Protocol v. 1.1, Appendix F, Method WW.14.
	Electricity Use (CH_4 & N_2O)	Water consumption (district-wide gpcd) and electricity usage provided by Marin Municipal Water District (MMWD).	eGrid subregion default emission factors. Emissions calculated according to U.S. Community Protocol v. 1.1, Appendix F, Method WW.14.
4.5 Treatment of Wastewater	Stationary Emissions from Combustion of Digester Gas (CH_4)	Known amount of digester gas produced per day and known percent of methane in digester gas provided by Central Marin Sanitation Agency.	Emissions calculated according to U.S. Community Protocol v. 1.1, Appendix F, Method WW.1.a.
	Stationary Emissions from Combustion of Digester Gas (N_2O)	Known amount of digester gas produced per day and known percent of methane in digester gas provided by Central Marin Sanitation Agency.	Emissions calculated according to U.S. Community Protocol v. 1.1, Appendix F, Method WW.2.a.
	Process Emissions from	Estimated population served by wastewater treatment plant	Emissions calculated according to U.S. Community Protocol v. 1.1,

	Wastewater Treatment Plant without Nitrification or Denitrification	provided by Central Marin Sanitation Agency.	Appendix F, Method WW.8.
	Fugitive Emissions from Effluent Discharge (N_2O)	Estimated population served by wastewater treatment plant provided by Central Marin Sanitation Agency. Assumed significant industrial or commercial input.	Emissions calculated according to U.S. Community Protocol v. 1.1, Appendix F, Method WW.12(alt).