



## **2018 COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY**

January 2021

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### **SUMMARY**

As part of Chula Vista's climate action program and its commitment to reduce greenhouse gas (GHG) or "carbon" emissions, the Economic Development Department's Conservation Section performs emission inventories to identify GHG sources and to help guide policy decisions. The 2018 GHG Emissions Inventory is the City's latest evaluation of its progress in reaching its emissions reduction goal and builds upon past inventory efforts. The City's community inventory was created by University of San Diego's Energy Policy Initiatives Center (EPIC) as part of the ReCAP Snapshot Project led by San Diego Association of Governments (SANDAG) and uses ICLEI's U.S. Community Protocol to ensure the City's GHG inventories comply with industry best practices.

The 2018 inventory indicates that Chula Vista's annual citywide GHG levels are 1,146,000 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e). Compared to 2005, Chula Vista's citywide GHG emissions have decreased by 13% and per capita emissions have decreased by 29%. While the total reductions in GHG emissions is positive, the reduction trajectory has decreased since the last inventory and looking at some activity data behind the emissions shows the challenges in making continued deep emission reductions. The largest sector, transportation, saw a 2% increase in Vehicle Miles Traveled (VMT) since 2016 but due mainly to increasing fuel efficiency standards emission decreased by 2%. The natural gas sector is the only sector to be above its 2005 baseline although there was a 2% reduction in natural gas emissions since 2016. As expected, due to increased economic activity and despite significant outreach and education efforts, GHG emissions from solid waste and water sectors increased by 27% and 9% respectively since 2016. Reductions were seen in the remaining sectors based on lower activity. In order to reach the current 2020 community emissions reduction goal of 15% below 2005 emission levels, the City will have to reduce its GHG emissions by more than 28,250 MT CO<sub>2</sub>e or about 2%. An additional reduction of 48% below 2018 levels would be needed to meet the City's 2030 goal.

### **METHODOLOGY**

Chula Vista has been a regional and national leader in climate action policies and programs designed to reduce GHG, or "carbon" emissions. The City has participated in the United Nations Framework Convention on Climate Change, ICLEI Cities for Climate Protection Campaign, the Conference of Mayor's Climate Protection Agreement and the America's Pledge "We Are Still In." Through this involvement, the City has committed itself to reducing its greenhouse gas emissions.

Like the last GHG inventory the City's 2018 GHG Emissions Inventory was compiled and calculated by the University of San Diego's Energy Policy Initiatives Center (EPIC) utilizing SANDAG's Regional Climate Action Planning (ReCAP) Framework (<https://www.sandag.org/index.asp?classid=17&subclassid=46&projectid=565&fuseaction=projects.detail>). SANDAG has collaborated with local agency staff and leading climate planning experts to prepare a planning framework that identifies best practices and guidance for preparing Climate Action Plans (CAP) and monitoring their implementation over time. The ReCAP establishes a technical framework for regionally-consistent climate action planning that preserves local policy flexibility for the unique needs and circumstances of each local jurisdiction. Due to data availability SANDAG included 2016 VMT data in the 2018 ReCAP Snapshots but EPIC was able to provide a 2018 update based on demographic updates since 2016. This is the reason for the 13,000 MT CO<sub>2</sub>e difference between the SANDAG ReCAP total and the City's Community Inventory. A full review of the inventory methodology can be found online at [www.sandag.org/uploads/cap/ReCapTAI.pdf](http://www.sandag.org/uploads/cap/ReCapTAI.pdf). Many of the GHG inventory methodologies stayed the same and continued to use the U.S. Community Protocol (Version 1.0). In the protocol, the emissions from five main parameters – building energy consumption, transportation, water (embedded energy), wastewater, and solid waste – are evaluated. These parameters are based solely on “end use activities” and their emissions are expressed as CO<sub>2</sub> equivalent (or CO<sub>2</sub>e), which allows greenhouse gases of different strengths to be added together.

## RESULTS

In 2018, community GHG emissions from Chula Vista totaled 1,146,000 MT CO<sub>2</sub>e (Table 1, Figure 1). The sector with the greatest amount of emissions (58% of total) was transportation or mobile sources. The electricity sector was the second highest source producing 19% of total community emissions, followed by the natural gas energy use (16%) and solid waste (5%). Compared to 2005 and 2016, total citywide emissions in 2018 were 12% and 1% lower, respectively (Figure 1). 2018 per capita emissions are approximately 29% below 2005 levels and 1% below 2016 levels. Emissions from all energy sectors have decreased by 13% or 61,000 MT CO<sub>2</sub>e in total since 2005 and there was a 1%, or 5,000 MT CO<sub>2</sub>e decrease since 2016. Transportation-based emissions are estimated to have decreased 7% or 49,000 MT CO<sub>2</sub>e since 2005 and 13,000 MT CO<sub>2</sub>e, or 2%, since 2016. The solid waste sector had emissions 15% below the 2005 baseline but 11,000 MT CO<sub>2</sub>e or 27% more than 2016. Emissions from water (embedded energy) were 9% above 2016 emissions but is still 76% below the baseline. Emissions from wastewater stayed at 3,000 MT CO<sub>2</sub>e.

## DISCUSSION

### *Community Emissions*

2018 community emissions saw a modest reduction of 6,000 MT CO<sub>2</sub>e or 1%, see figure 1. These reductions put the City within 2% of meeting its 2020 GHG reduction goal. The reductions occurred in spite of the City's continued population growth of 23% since 2005. Factoring that growth into emissions by looking at per capita GHG emissions shows a 28% reduction since 2005. That is good overall progress, but there were individual areas, such as transportation VMT and natural gas emissions, that are still above their 2005 baseline and more reductions are needed.

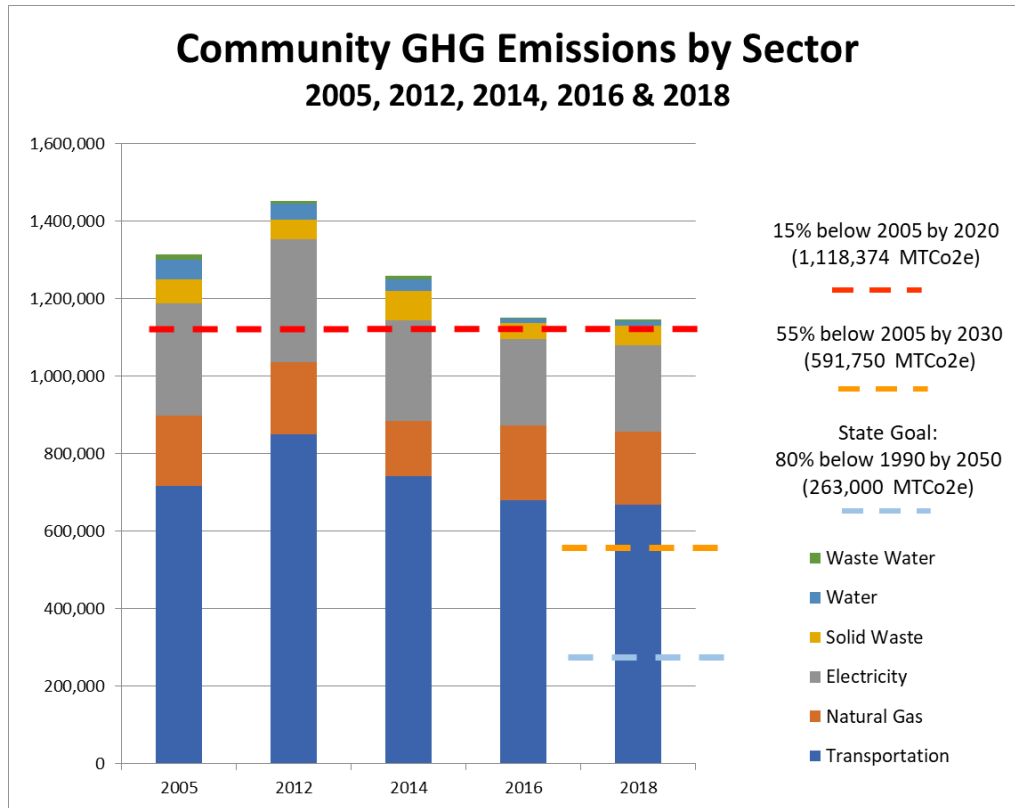
Annual Consumption (Metric Units)						Annual Greenhouse Gas (GHG) Emissions (Metric Tons CO <sub>2</sub> e)							
	2005	2016	2018	% Change (2018 vs. 2005)	% Change (2018 vs. 2016)		2005	2016	2018	% Change (2018 vs. 2005)	% Change (2018 vs. 2016)		
<b>Population</b>	217,543	263,611	268,060	23%	2%	<b>Per Capita</b>	6.04	4.37	4.28	-29%	-2%		
<b>Housing Units</b>	73,115	81,876	83,493	14%	2%	<b>Per Housing Unit</b>	18.0	14.1	13.73	-24%	-2%		
<b>Land Area (Acres)</b>	33,024	33,024	33,024	0%	0%	<b>Per Acre</b>	39.8	34.9	34.7	-13%	-1%		
<b>Annual Vehicle Miles Traveled (VMT)</b>	1,429,425,787	1,612,143,717	1,645,858,507	15%	2%	<b>Transportation (MTCO<sub>2</sub>e)</b>	717,000	681,000	668,000	-7%	-2%		
<b>Energy Use (MMBtu)</b>	<b>Natural Gas</b>	3,421,917	3,531,230	3,453,568	1%	-2%	<b>Energy Use (MTCO<sub>2</sub>e)</b>	<b>Natural Gas</b>	182,000	192,000	188,000	3%	-2%
	<b>Electricity</b>	2,617,242	2,824,740	2,780,480	6%	-2%		<b>Electricity</b>	290,000	224,000	223,000	-23%	0%
	<b>Total</b>	6,039,159	6,355,970	6,234,048	3%	-2%		<b>Total</b>	472,000	416,000	411,000	-13%	-1%
<b>Solid Waste (Tons)</b>	217,459	165,335	265,974	22%	61%	<b>Solid Waste (MTCO<sub>2</sub>e)</b>	61,000	41,000	52,000	-15%	27%		
<b>Potable Water (million gallons)</b>	12,666	6,674	7,925	-37%	19%	<b>Water (MTCO<sub>2</sub>e)</b>	50,000	11,000	12,000	-76%	9%		
<b>Waste Water (million gallons per day)</b>	NA	15.31	15.55	NA	2%	<b>Waste Water*** (MTCO<sub>2</sub>e)</b>	15,000	3,000	3,000	-80%	0%		
<p>* All GHG emissions are reported in CO<sub>2</sub> Equivalent (CO<sub>2</sub>e) which allows emissions of different strengths to be added together. For example, one metric ton of methane emissions is equivalent to 21 metric tons of carbon dioxide (or CO<sub>2</sub>e) in global warming potential.</p> <p>** Due to methodology changes energy usage from Port of San Diego facilities within the City and waste tonnage of Alternative Daily Cover were removed. Both were included in 2005, 2012 and 2014 inventories.</p> <p>*** Due to better data availability methodology for calculating wastewater emission were updated in 2012.</p>						<b>Total GHG Emissions (MTCO<sub>2</sub>e)</b>	1,315,000	1,152,000	1,146,000	-13%	-1%		
						<b>2020 Reduction Goal (15% Below 2005)</b>					1,117,750		
						<b>Reductions Needed To Reach Goal</b>					28,250		
						<b>2030 Reduction Goal (55% Below 2005)</b>					591,750		
						<b>Reductions Needed To Reach Goal</b>					554,250		

**Table 1:** Demographics, activity data and greenhouse gas emissions for 2005, 2016 and 2018

## Transportation Sector

Looking at activity data from the transportation sector shows that while GHG emissions have decreased, Vehicle Miles Traveled have increased 2% since 2016 and 15% since 2005. This increase was compensated by the increase in vehicle fuel efficiency and the adoption of zero emission vehicles but efforts to roll back some fuel efficiency standards could limit future emissions reductions from this sector if VMT reductions are not also seen. Other local, state and federal programs are continuing to actively target this sector by reducing the carbon-intensity of vehicle fuels, improving fuel efficiency and promoting alternative transportation options. The City continues to integrate “smart growth” design principles into its development review and approval process. Additionally, the City has updated its Bike and Pedestrian master Plans into the Active Transportation Plan ([www.chulavistaca.gov/departments/engineering/active-transportation-plan](http://www.chulavistaca.gov/departments/engineering/active-transportation-plan)) and projects identified as priority in the plan will be included in fiscal year 2022 Capital Improvement Projects budget request. The Bike Lanes on Broadway (7.8 new miles), bikes lanes on Main and the Sweetwater Bike Path project are expected to be completed in 2020 and opened for the public shortly after. Where possible staff add buffered bike lane to streets that are receiving other work. Staff are also working with regional partners for more long-term projects such as the

pedestrian bridge over Otay River, Bayshore Bikeway bike path from E Street to Lagoon Drive & F Street promenade from Bay Blvd to Broadway.



**Figure 1:** Total GHG emissions from community sources (by sector) in 2005, 2012, 2014, 2016 and 2018. The red dashed line represents the City’s 2020 carbon reduction goal, the yellow dashed line represents the City’s 2030 reduction goal and the blue dashed line represents the State’s 2050 carbon reduction goal

### Energy Sector

Activity data for the energy sector showed a 2% decrease in community wide energy usage since 2016 but the community is still using 3% more energy than the 2005 baseline. Even with that increase in energy usage there was an emission reduction due largely to the shift to renewable and clean electricity, with SDG&E providing 45% of their electricity from renewable sources in 2018 (up from 35% in 2015). The State has set a goal for all electricity sold to be renewable or zero carbon by 2045 (SB100) and the City has set a goal for 100% renewable electricity by 2035. There is not a similar effort to provide renewable natural gas although SDG&E will aim to incorporate 5% renewable natural gas into their system by 2022. This shows that over the long term there is a path for emission reductions for electricity, but energy efficiency efforts will continue to play an important role in reducing emissions and utility bills. Community wide Chula Vista saved more than 48,000 MMBtu of energy through energy efficiency programs with SDG&E, this represents about 0.8% of all energy used in 2018. The adoption of the energy efficiency ordinance for existing home will help increase energy efficiency savings. Decarbonization of the natural gas sector will need to build off the energy efficiency results and provide clean energy for existing

natural gas users but also ensure affordability for the remaining users as the system is faced with a reduction in users and an increase in costs associated with increased safety requirements. To date 40 Californian cities, including Carlsbad locally, have adopted building codes to reduce their reliance on gas.

**Waste Sector**

As expected, due to increased economic activity and despite significant outreach and education efforts, GHG emissions from solid waste increased since 2016. Staff will continue their outreach and education efforts as they work to adopt a zero-waste plan and expand organics collections.

**2016 Comparison**

Unlike the previous two GHG inventories this inventory does not show significant emission reductions. This is mainly from less reduction from the large sectors (transportation and energy use) with more emissions from smaller sectors that are more closely tied to the economy in general (waste and water). This showcases the value of ambitious early actions that are beginning to become business as usual, such as the renewable portfolio standard and cleaner transportation, and the challenge of producing the continued reductions that are necessary to meet our long-term goals as our community and economy grow. Efforts should be made to evaluate current actions not only on the current cost effectiveness but in relationship to future GHG reductions costs (such as future retrofits what will be needed on new municipal buildings).

**FORECAST AND TARGET SETTING**

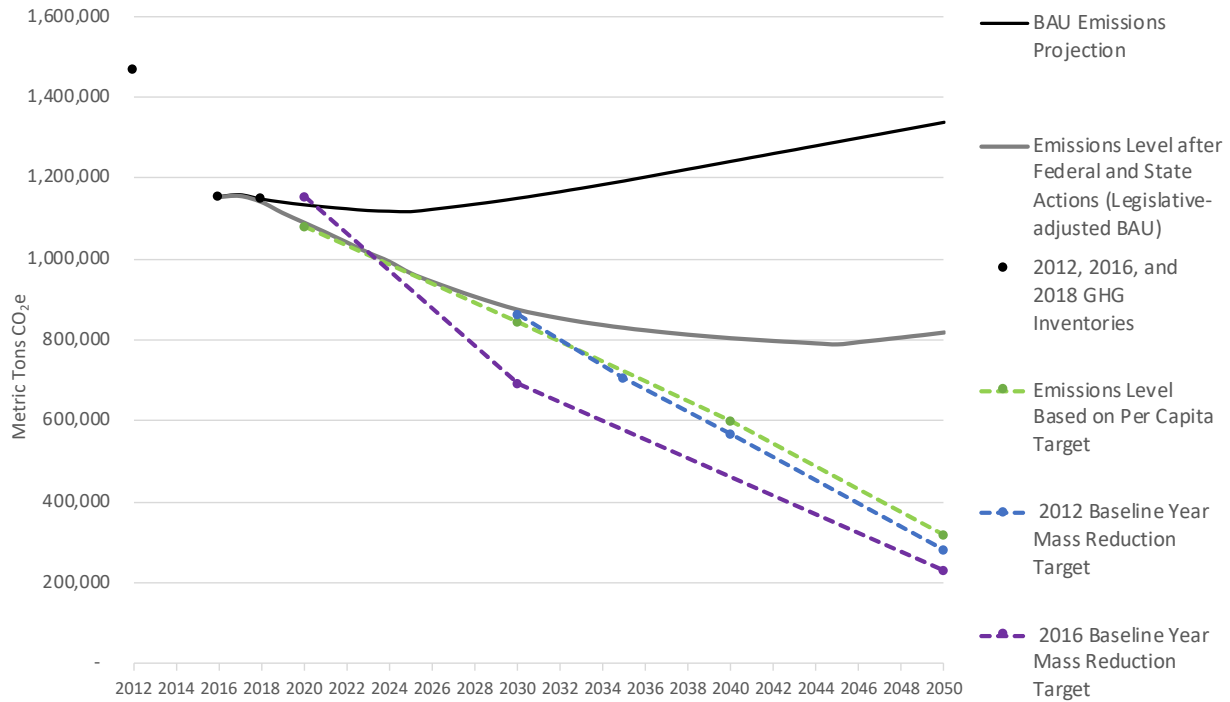
EPIC, working with data from SANDAG, was able to update the City’s Business-As-Usual (BAU) forecast and model some new GHG reduction targets in line with the states reduction goals. A BAU forecast looks at expected demographic growth and what the associated change to GHG emissions would be if no new GHG reduction policies were put in place. Table two below shows that total BAU emissions are expected to increase by about 16% and per capita emissions are slightly reduced.

Year	On-Road Transportation	Electricity	Natural Gas	Solid Waste	Water	Wastewater	Total	Per Capita MT CO <sub>2</sub> e
	MT CO <sub>2</sub> e							
2016	681,000	224,000	192,000	41,000	11,000	3,000	1,152,000	4.4
2018	668,000	223,000	188,000	52,000	12,000	3,000	1,146,000	4.3
2030	634,000	241,000	203,000	55,000	12,000	3,000	1,147,000	4.1
2035	655,000	252,000	211,000	56,000	13,000	3,000	1,190,000	4.1
2045	704,000	276,000	231,000	60,000	14,000	3,000	1,287,000	4.2
2050	729,000	288,000	240,000	61,000	14,000	3,000	1,335,000	4.2

GHG emissions have been rounded to thousands.  
 MT CO<sub>2</sub>e: metric tons CO<sub>2</sub>e; Inventory years: 2016 and 2018; business-as-usual projection years without policy change: 2030, 2035, 2045, and 2050.  
 Per capita emissions are based on these categories only, and cannot be compared with California statewide per capita emissions.  
 Energy Policy Initiatives Center 2020

**Table 2:** Business-as-usual greenhouse gas emissions forecast for 2030, 2035, 2040, 2045 and 2050

EPIC also recommended updating the City’s 2005 baseline and provided three options. The first two options are to use either 2012 or 2016 as a new baseline and adopt the states percent reductions goals of 40% by 2030, 40% by 2040 and 50% by 2050. The third option is to adopt a Per Capita reduction goal in line with the state’s percentage goals. All three options are shown on Figure 2 on the next page and show a downward trajectory. Staff recommend adopting the per capita emissions reduction targets because they show a downward trajectory, are a clear and easy to understand and better address planned population growth. Staff will bring these potential reduction goals back to City Council for adoption with the Climate Change Working Group proposed recommendation that include setting a goal to be carbon neutral by 2045.



Energy Policy Initiatives Center 2020

**Figure 2:** Comparison of Three Target Options and BAU Emissions Projection

**NEXT STEPS**

With the adoption of the City’s most recent Climate Action Plan in late 2017, City staff are working to implement the 11 GHG reduction strategies. The most recent progress shows that 71% of actions included in the 2017 CAP were either completed or ongoing. Some of the implementation actions being taken are:

- San Diego Community Power (SDCP) plans to start serving customers in early 2021,
- Implementation of ordinance requiring energy efficiency retrofits in older existing homes,
- Adoption of a benchmarking ordinance for commercial buildings,
- Continue the Chula Vista Climate Action Challenge,
- Expansion of organics collection program.

SANDAG is expecting to provide the 2020 ReCAP Snapshot, which will be used to create the City's community GHG inventories, in 2022. SDG&E has notified staff that they will not be able to provide similar data in 2020 and staff are working with regional partners to evaluate the new utility data but at the time it is the only source available. Staff will continue to engage other regional partners to advance regional climate planning such as San Diego Climate Collaborative and the Regional Climate Action Planning (ReCAP) Framework, provided by SANDAG, that will guide future GHG inventories and help ensure consistency across the region.

Due to the impacts of Covid-19 on Chula Vista some emissions sectors, such as transportation, are expected to see unique decreases in the 2020 inventory while increases are expected in others such as waste. National emissions are expected to be about 14% lower than 2019 but are also expected to return after governments can repeal Covid-19 related emergency orders. The extreme level of behavior change that was required to produce the reductions showcase the need for institutional changes that support but do not only rely on consumer behavior. For example, the recently adopted local existing home energy retrofit requirement or that states executive order setting a goal to ban the sale of new gasoline powered vehicles by 2035 try to allow the resident to do that activity they want, upgrade a home or travel in a new car, but in a cleaner way that will be the new minimum standard.