



2020 COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

June 2022

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 2020 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 2020 inventory indicates that Chula Vista's annual citywide GHG levels are 1,098,000 metric tons of carbon dioxide equivalent (MT CO_{2e}). Compared to 2005, Chula Vista's citywide GHG emissions have decreased by 17% and per capita emissions have decreased by thirty seven percent (37%). While these reductions are good and allowed the City to reach its 2020 GHG reduction goal, the largest reduction came from the transportation sector, which decreased thirteen percent (13%) below 2018 but is expected to increase again as telecommuting options related to Covid-19 are removed. The natural gas sector continues to be the only sector above its 2005 baseline and saw a two percent (2%) increase in natural gas emissions since 2018. GHG emissions from solid waste decreased by four percent (4%) while emissions from water increased eight percent (8%) due to an eleven percent (11%) increase in water use since 2018. In order to reach the City Council adopted 2030 community emissions reduction goal of fifty seven percent (57%) below 2018 emission levels, the City will have to reduce its GHG emissions by more than 605,220 MT CO_{2e} or about fifty five percent (55%). All remaining emissions will either need to be eliminated or offset to reach the net zero emission goal by 2045. There is no "safe" level of GHG emissions and every additional pound of GHG emissions contribute to devastating impacts of climate change felt every day around the world. As mentioned in the Climate Emergency Declaration adopted by City Council in March 2022, it is important for Chula Vista, future generations and all life on the planet that we reduce GHG emissions to zero as soon as possible.

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" and most recently the Race to Zero (<https://unfccc.int/climate-action/race-to-zero-campaign>). Through this involvement, the City has committed itself to reducing its greenhouse gas emissions.

Like the 2018 GHG inventory, the City's 2020 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 the unprecedented impacts of Covid-19 on transportation, SANDAG was not able to provide a Vehicle Miles Traveled (VMT) estimate. EPIC created an estimate based on internal-internal (I-I) VMT that was estimated based on 2016 I-I VMT and 2016-2020 VMT rate of increase on Chula Vista local roads from CalTrans Highway Performance Monitoring (HPMS) data. 2020 Chula Vista internal-external/external-internal (I-E/E-I) VMT is estimated based on 2016 I-E/E-I VMT and 2016-2020 San Diego regional VMT rate of increase from CalTrans Performance Measure System (PeMS). 2016 Chula Vista I-I and I-E/E-I VMT are from SANDAG ABM2+ version 14.2.2. As such, there is no transportation related emission reported in SANDAG's Climate Action Data Portal (<https://climatedata.sandag.org>), 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. There was an error found in the 2018 waste disposed at the landfill so that was changed from 265,974 to the 209,700 and that was included in the SANDAG ReCAP report. 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 CO₂ equivalent (or CO_{2e}), which allows greenhouse gases of different strengths to be added together.

Results

In 2020, community GHG emissions from Chula Vista totaled 1,098,000 MT CO_{2e} (Table 1, Figure 1). The sector with the greatest level of emissions was transportation or mobile sources at 581,000 MT CO_{2e} or fifty three percent (53%) of total emissions. The electricity sector was the second highest source at 260,000 MT CO_{2e} representing twenty four percent (24%) of total community emissions, followed by the natural gas energy use at 191,000 MT CO_{2e} or seventeen percent (17%) of total emission and the lowest contributor to total MT CO_{2e} was solid waste at 50,000 MT CO_{2e} or five percent (5%) of the total. Compared to 2005 and 2018, total citywide emissions in 2020 were seventeen percent (17%) and four percent (4%) lower shown on Figure 1. 2020 per capita emissions are approximately thirty seven percent (37%) below 2005 levels and eleven percent (11%) below 2018 levels. Emissions from all energy sectors have decreased by four percent (4%) or 21,000 MT CO_{2e} in total since 2005. Transportation-based emissions are estimated to have decreased nineteen percent (19%) or 136,000 MT CO_{2e} since 2005 and 87,000

MT CO_{2e}, or thirteen percent (13%), since 2018. The solid waste sector had emissions eighteen percent (18%) below the 2005 baseline and four percent (4%) lower than 2018. Emissions from water (embedded energy) were eight percent (8%) above 2018 emissions but are still seventy four percent (74%) below the baseline. Emissions from wastewater remained even at 3,000 MT CO_{2e}.

Annual Consumption (Metric Units)						Annual Greenhouse Gas (GHG) Emissions (Metric Tons CO _{2e})							
	2005	2018	2020	% Change (2020 vs. 2005)	% Change (2020 vs. 2018)		2005	2018	2020	% Change (2020 vs. 2005)	% Change (2020 vs. 2018)		
Population	217,543	268,060	272,202	25%	2%	Per Capita	6.04	4.28	4.03	-33%	-6%		
Housing Units	73,115	83,493	86,009	18%	3%	Per Housing Unit	18.0	13.73	12.77	-29%	-7%		
Land Area (Acres)	33,024	33,024	33,024	0%	0%	Per Acre	39.8	34.7	33.25	-17%	-4%		
Annual Vehicle Miles Traveled (VMT)	1,429,425,787	1,645,858,507	1,360,678,007	-5%	-17%	Transportation (MTCO _{2e})	717,000	668,000	581,000	-19%	-13%		
Energy Use (MMBtu)	Natural Gas	3,421,917	3,453,568	3,499,165	2%	1%	Energy Use (MTCO _{2e})	Natural Gas	182,000	188,000	191,000	5%	2%
	Electricity	2,617,242	2,780,480	2,765,073	6%	-1%		Electricity	290,000	223,000	260,000	-10%	17%
	Total	6,039,159	6,234,048	6,264,238	4%	0%		Total	472,000	411,000	451,000	-4%	10%
Solid Waste (Tons)	217,459	209,700	202,072	-7%	-4%	Solid Waste (MTCO _{2e})	61,000	52,000	50,000	-18%	-4%		
Potable Water (million gallons)	12,666	7,925	8,346	-34%	5%	Water (MTCO _{2e})	50,000	12,000	13,000	-74%	8%		
Waste Water (million gallons per day)	NA	15.55	16.60	NA	7%	Waste Water*** (MTCO _{2e})	15,000	3,000	3,000	-80%	0%		
<p>* All GHG emissions are reported in CO₂ Equivalent (CO_{2e}) 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_{2e}) in global warming potential.</p> <p>** 2020 Chula Vista internal-internal (I-I) VMT is estimated based on 2016 I-I VMT and 2016-2020 VMT rate of increase on Chula Vista local roads from CalTrans Highway Performance Monitoring (HPMS) data. 2020 Chula Vista internal-external/external-internal (I-E/I-E) VMT is estimated based on 2016 I-E/I-E VMT and 2016-2020 San Diego regional VMT rate of increase from CalTrans Performance Measure System (PeMS). 2016 Chula Vista I-I and I-E/I-E VMT are from SANDAG ABM2+ version 14.2.2.</p>						Total GHG Emissions (MTCO _{2e})	1,315,000	1,146,000	1,098,000	-17%	-4%		
						2020 Reduction Goal (15% Below 2005)			1,117,750				
						Reductions Needed To Reach Goal			Goal Achieved				
						2030 Reduction Goal (57% Below 2018)			492,780				
						Reductions Needed To Reach Goal			605,220				

Table 1: Demographics, activity data and greenhouse gas emissions for 2005, 2018 and 2020

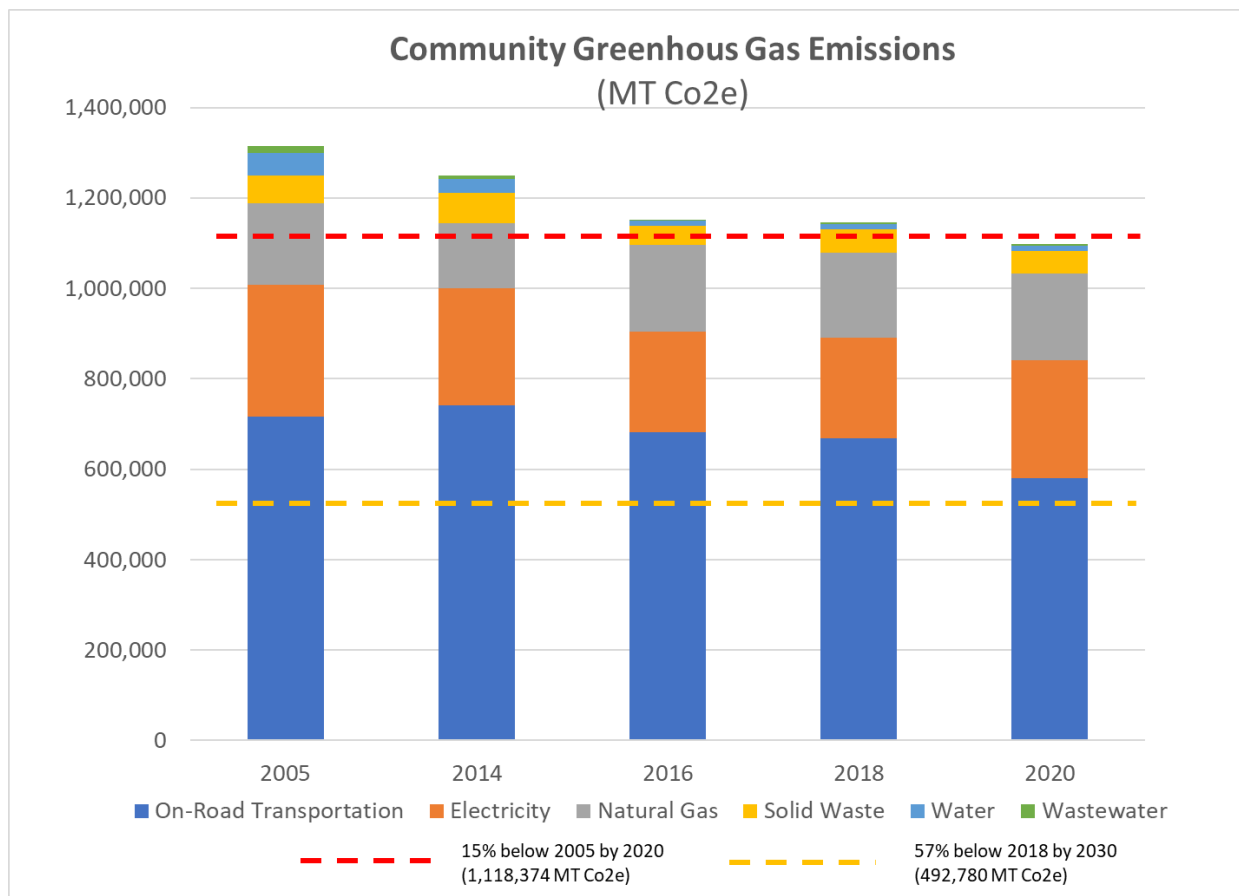
Discussion

2018 community emissions saw a reduction of 48,000 MT CO_{2e} or four percent (4%), see figure 1. These reductions enabled the City to reach its 2020 GHG reduction goal. That said we anticipate increases in transportation emissions as telecommuting options related to Covid-19 are phased out or reduced over time. The reductions occurred despite the City’s continued population growth of thirty two percent (32%) since 2005. Factoring population growth into emissions by looking at

per capita GHG emissions shows a thirty seven percent (37%) reduction since 2005. While there is good overall progress increased reductions will need to be made to meet our 2030 science based reduction goal of 57% below 2018.

Transportation Sector

Table 1 above shows that the transportation sector in both VMT and GHG emissions have decreased thirteen percent (13%) and seventeen percent (17%)respectively since 2018. This decrease was largely from the reduced transportation due to travel restrictions from Covid-19 which supported both an increase in vehicle fuel efficiency and the adoption of zero emission vehicles. For more information on the impacts of Covid-19 on San Diego Counties transportation, please view a SANDAG study found online at https://www.sandag.org/uploads/publicationid/publicationid_4756_28849.pdf. 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. An important element of the City’s smart growth will be the Bayfront development that will begin construction in 2022 and will be located near transit and provide electric vehicle charging to promote clean transportation. Additionally, the City continues to implement its Active Transportation Plan (www.chulavistaca.gov/departments/engineering/active-transportation-plan) with the completion of the Bike Lanes on Broadway (7.8 new miles) project, bikes lanes on Main and the Sweetwater



Bike Path project that were completed in 2020 and opened for the public shortly thereafter. Where possible, staff added buffered bike lane to streets that are undergoing other improvement 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 and F Street promenade from Bay Blvd to Broadway.

Energy Sector

Activity data for the energy sector showed similar community wide energy usage since 2018 but the community is using four percent (4%) more energy than the 2005 baseline. Even with stable energy usage there was an emission increase of ten percent (10%) due largely to SDG&E's pull back from renewable and clean electricity. In 2018 SDG&E was providing 43% of their electricity from renewable sources however in 2020 only 31% came from renewable sources. The State of California has set a goal for all electricity sold to be renewable or zero carbon by 2045 (SB100) and the City and San Diego Community Power have set a goal for 100% renewable electricity by 2035. While SDG&E is beginning to look at incorporating renewable biogases like hydrogen and renewable natural gas, these efforts are still in early stages and look to have limits of working with existing natural gas infrastructure and will not be able to be a decarbonized energy source. The natural gas sector is the only sector to have emissions increased over its 2005 baseline, so as electricity continues to get more clean and renewable transitioning natural gas appliances to electric will be even more important. To date, more than 50 California cities, including Encinitas and Solana Beach, have adopted building codes that require all electric construction in an effort to reduce pollution and not invest in infrastructure that will not be able to be fully used and result in a stranded asset later. Efforts to decarbonize will benefit from the 2021 adoption of the City's commercial benchmarking ordinance (<https://www.chulavistaca.gov/departments/clean/benchmarking>), which will help increase energy efficiency savings and reduce energy bills for Chula Vista businesses.

Waste Sector

In part due to significant outreach and education efforts, GHG emissions from solid waste have decreased by four percent (4%) since 2018. Staff will continue their outreach and education efforts to implement the zero-waste plan and expand organics collections to also include food waste. More information about residential food and yard waste collection and the City's free food waste kitchen caddy program can be found here: www.chulavistaca.gov/departments/clean/environmental-services/residential-organic-waste-recycling.

Forecast and Target Setting

EPIC, working with data from SANDAG, was able to update the City's forecasting by modeling a Business-As-Usual (BAU) path and a legislatively-adjusted BAU emissions path, defined below.

- BAU – The BAU projection accounts for the growth in population, employment and housing and assumes no policy changes after the latest CAP inventory year or the CAP baseline year.
- Legislatively-adjusted BAU – Legislatively-adjusted BAU accounts for growth in population, employment and housing and accounts for the future impact of adopted federal and State policies that affect GHG emissions at the time of CAP development.

One of the main state climate planning documents that is used to forecast state actions is the California Air Resources Board Scoping Plan, most recently released in 2017. Some of the statewide actions included in the scoping plan are the electrical Renewable Portfolio Standards, the Low Carbon Fuel Standard, SB 1383 organics collection and the state’s zero emission vehicle goals. For more information about the modeling of emission reductions, please view the SANDAG RECAP TECHNICAL APPENDIX II Methods to Calculate GHG Emissions Impacts of CAP Measures at www.sandag.org/index.asp?classid=17&subclassid=46&projectid=565&fuseaction=projects_detail. Table 2, below, shows that total BAU emissions are expected to increase by about seventeen percent (17%) and per capita emissions by about ten percent (10%). These BAU scenarios are then compared to the City’s reduction targets for 2030 and 2045 that were provided by ICLEI in Figure 2. These science-based targets were part of the Climate Emergency Declaration Resolution City Council adopted in March 2022 and reflect the need to maintain global temperatures below 1.5°C as laid out in the Paris Climate Agreement (for more information please visit: www.sciencebasedtargets.org). These ambitious goals are important to adopt, as mentioned in the Climate Emergency Declaration, since “a global climate crisis exists and poses a serious, urgent and pressing threat to the well-being of Chula Vista, its inhabitants, economy, and environment, and therefore there is need for immediate actions to address the global climate crisis”.

Year	On-Road Transportation	Electricity	Natural Gas	Solid Waste	Water	Wastewater	Total	Per Capita MT CO ₂ e
	MT CO ₂ e							
2020	581,000	260,000	191,000	50,000	13,000	3,000	1,098,000	3.82
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 CO₂e: metric tons CO₂e; Inventory years: 2020; 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, 2045 and 2050

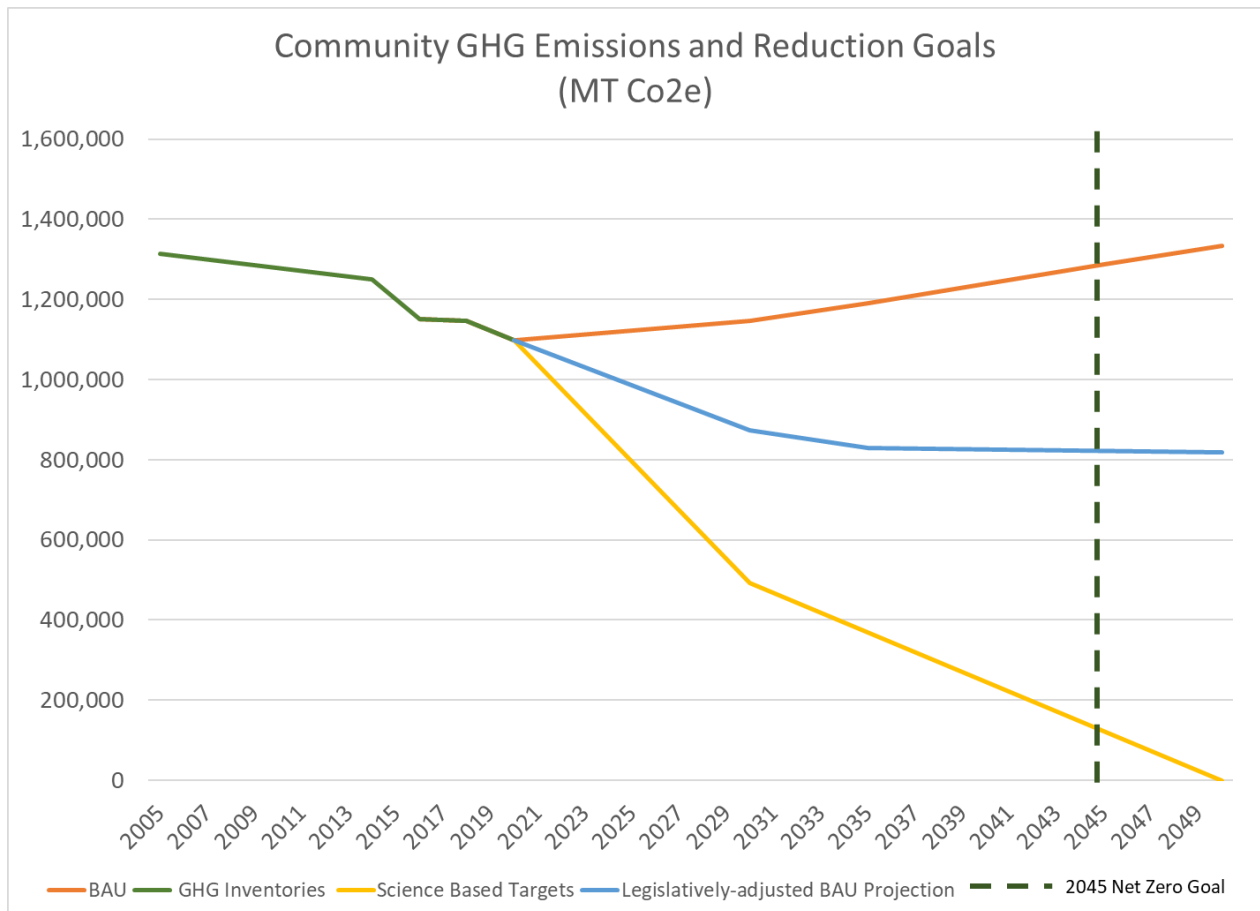


Figure 2: GHG Emissions, BAU Emissions Projection and Reduction Goals

Next Steps

As staff works to update the City’s Climate Action Plan and incorporate the recommendations from the Climate Change Working Group, as well as the most recent science and new City programs, there have also been some significant milestones reached. A highlight of the implementation actions being taken are:

- San Diego Community Power (SDCP) enrolled all eligible customers at 55% GHG-free electricity, launched a 100% renewable rate and a Feed-In-Tarif program
- Promote the Sustainable Home Tool Kit (www.chulavistaca.gov/departments/clean/retrofit) and Electric Induction Cooktop (www.ehomecooktops.com) lending programs at the Chula Vista Library
- Update existing electric vehicle chargers at City facilities and install new chargers at a City owned lot near Third Avenue
- Implement Commercial and Multi-Family Benchmarking and Building Performance Ordinance
- Provide the Chula Vista Climate Action Challenge (www.cvclimatechallenge.com) in the community, with more than 320 homes engaged

- Adoption of the Waste Reduction Strategic Plan, also referred to as the Zero Waste Plan, in March 2022
- Plans to launch food waste collection program and expand compost use at municipal facilities

SANDAG is expecting to provide the 2020 ReCAP Snapshot, which will be added to this report on the City's website once published later this year. Additionally, SANDAG will be providing a transportation mode share estimate to help City staff better track and plan for how people move around our community. Staff will continue to engage other local partners to advance regional climate planning, such as San Diego Regional Climate Collaborative and SANDAG's Regional Climate Action Planning (ReCAP) Framework, that will guide future GHG inventories and help ensure consistency across San Diego County.