2016 COMMUNITY GREENHOUSE GAS EMISSIONS INVENTORY

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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 2016 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 inventory's community component 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 2016 inventory indicates that Chula Vista's annual citywide GHG levels are 1,152,000 metric tons of carbon dioxide equivalent (MT CO_2e). Compared to 2005, Chula Vista's citywide GHG emissions have decreased by 12% and per capita emissions have decreased by 28%. While the total reductions in GHG emissions is positive, looking at the activity data behind the emissions shows mixed results. The largest sector, transportation, saw a 2% increase in Vehicle Miles Traveled (VMT) since 2014 but due mainly to increasing fuel efficiency standards emission decreased by 8%. The energy sector saw an increase of both electricity and natural gas usage, 2% and 13% respectively, but due largely to a cleaner grid from the addition of renewable electricity, electricity emissions decreased by 14%. That was not enough to offset the increase from natural gas emission, which brought combined energy emissions to 3% above their 2014 levels. 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 34,250 MT CO_2e or about 3%. An additional reduction of 49% below 2016 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.

Unlike previous GHG inventories that were prepared by City staff the City's 2016 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. While efforts were made to ensure comparability between the 2016 and previous GHG inventories there may be some differences in data sources or analysis that could affect a direct comparison between this inventory and previous inventories. For a full review of the inventory methodology please review the attached "TECHNICAL APPENDIX I" or it can be found online at 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_2 equivalent (or CO_2e), which allows greenhouse gases of different strengths to be added together.

Three significant changes to the methodology were:

1. Energy usage from the Port of San Diego was excluded from the City's inventory and included in the Port's GHG inventory because the Port has final regulatory authority over Port land.
2. Alternative Daily Cover (ADC), typically organic or "green" waste that is used to cover landfills at the end of the day was not included because the State listed this use as a waste diversion. There were approximately 8,000 MT CO2e from ADC in 2014 but by 2020 state law will not count ADC as diversion.
3. Energy usage is presented by fuel type, electricity or natural gas, not end use sector, residential, commercial or industrial.

RESULTS

In 2016, community GHG emissions from Chula Vista totaled 1,152,000 MT CO_2e (Table 1, Figure 1). The sector with the greatest amount of emissions (59% of total) was transportation or mobile sources. The electricity sector was the second highest source producing a quarter (19%) of total community emissions, followed by the natural gas energy use (17%) and solid waste (4%) sectors. Compared to 2005 and 2014, total citywide emissions in 2016 were 8% and 12% lower, respectively (Figure 1). 2016 per capita emissions are approximately 28% below 2005 levels and 1% below 2014 levels. Emissions from all energy sectors have decreased by 12% or 56,000 MT CO_2e in total since 2005 but there was a 3%, or 13,000 MT CO_2e increase since 2014. Transportation-based emissions are estimated to have decreased 5% or 36,000 MT CO_2e since 2005 and 60,000 MT CO_2e, or 8%, since 2014. The solid waste sector had emissions decrease 33% since the 2005 baseline and 46% since 2014. Emissions from water (embedded energy) have decreased 78% since 2005 while emissions from wastewater treatment have decreased 80% during the same time.

DISCUSSION

Community Emissions

Similar to the 2014 community inventories, this year saw a total GHG emission reduction of 8% from the most recent inventory (2014) and a 12% reduction below the baseline (2005). 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 21% 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 energy usage, where trends are going in the wrong direction and more reductions are needed.

Annual Consumption (Metric Units)						
		2005	2014	2016	% Change (2016 vs. 2005)	% Change (2016 vs. 2014)
Population		217,543	260,765	263,611	21%	1%
Housing Units		73,115	81,267	81,876	12%	1%
Land Area (Acres)		33,024	33,024	33,024	0%	0%
Annual Vehicle Miles Traveled (VMT)		1,429,425,787	1,585,833,977	1,612,143,717	13%	2%
Energy Use (MMBtu)	Natural Gas	3,421,917	2,705,498	3,531,230	3%	31%
	Electricity	2,617,242	2,756,313	2,824,740	8%	2%
	Total	6,039,159	5,461,811	6,355,970	5%	16%
Solid Waste (Tons)		217,459	257,144	165,335	-24%	-36%
Potable Water (million gallons)		12,666	8,034	6,674	-47%	-17%
Waste Water (million gallons per day)		NA	15.47	15.31	NA	-1%

Annual Greenhouse Gas (GHG) Emissions (Metric Tons CO2e)						
		2005	2014	2016	% Change (2016 vs. 2005)	% Change (2016 vs. 2014)
Per Capita		6.04	4.42	4.37	-28%	-1%
Per Housing Unit		18.0	14.2	14.1	-22%	-1%
Per Acre		39.8	34.9	34.9	-12%	0%
Transportation ($MTCO_2e$)		717,000	741,000	681,000	-5%	-8%
Energy Use ($MTCO_2e$)	Natural Gas	182,000	144,000	192,000	5%	33%
	Electricity	290,000	259,000	224,000	-23%	-14%
	Total	472,000	403,000	416,000	-12%	3%
Solid Waste ($MTCO_2e$)		61,000	67,000	41,000	-33%	-39%
Water (MTCO2e)		50,000	31,000	11,000	-78%	-65%
Waste Water*** (MTCO2e)		15,000	8,000	3,000	-80%	-63%
Total GHG Emissions ($MTCO_2e$)		1,315,000	1,250,000	1,152,000	-12%	-8%
2020 Reduction Goal (15% Below 2005)				1,117,750		
Reductions Needed To Reach Goal				34,250		
2030 Reduction Goal (55% Below 2005)				591,750		
Reductions Needed To Reach Goal				560,250		

* All GHG emissions are reported in CO_2 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 CO2e) in global warming potential.

** 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.

*** Due to better data avlability methodology for calculating wastewater emission were updated in 2012.

Table 1: Demographics, activity data and greenhouse gas emissions for 2005, 2014 and 2016

Looking at activity data from the transportation sector shows that while GHG emissions have decreased, Vehicle Miles Traveled have actually increased 2% since 2016 and 13% since 2005. This increase was compensated by the increase in vehicle fuel efficiency and the adoption of zero emission vehicles but efforts at the Federal level 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, with projects like the redevelopment of the old City Public Works Yard to facilitate more development near existing transit. Additionally, the City is updating its Bike and Pedestrian master Plans into the Active Transportation Plan, which will help prioritize and support the continued development of biking and walking infrastructure project. One early project in that effort is the Bikes on Broadway which will install new bike lanes on Broadway in 2020.

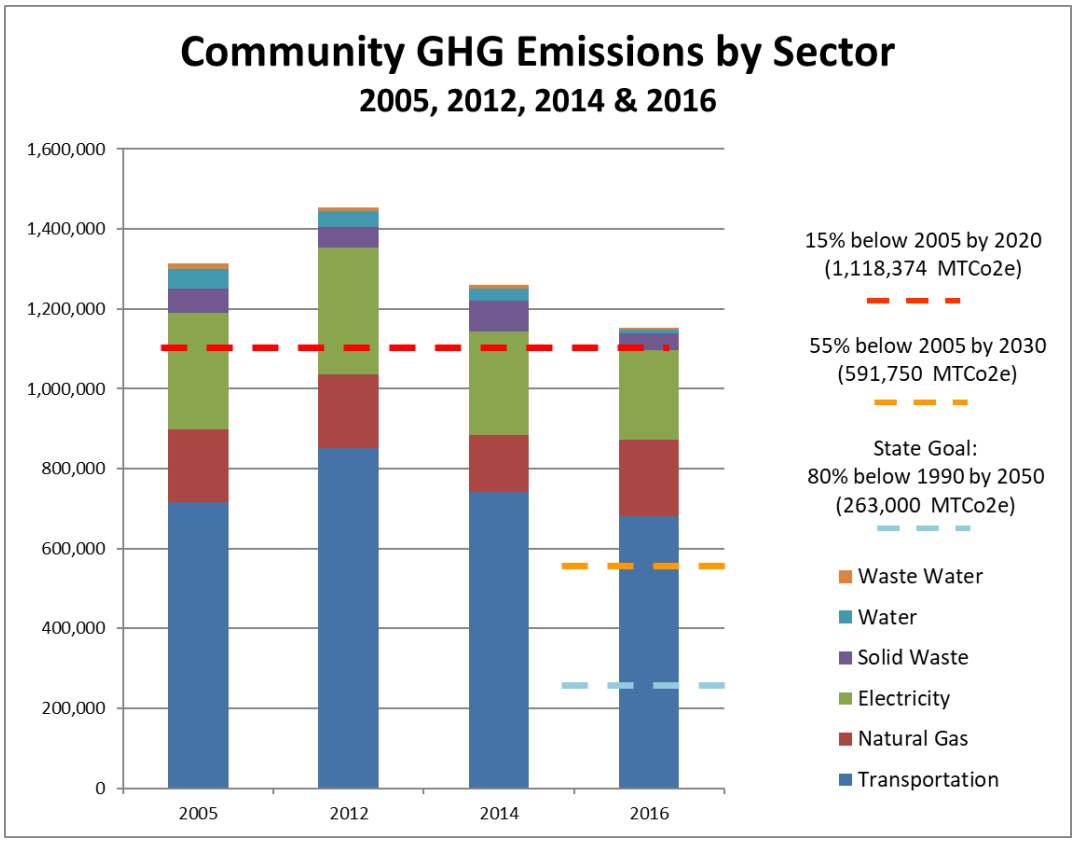

Figure 1: Total GHG emissions from community sources (by sector) in 2005, 2012, 2014, and 2016. The red dashed line represents the City's 2020 carbon reduction goal, the yellow dashed line represents the City's 2030 reduction goal and the blue dashed line represents the State's 2050 carbon reduction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

Like the transportation sector, activity data from the energy sector showed a 16% increase since 2014 and a 5% increase since 2005. 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 43% of their electricity from renewable sources in 2016 (up from 35% in 2015). In recent years SDG&E has added an additional 2% of renewable provided energy to their portfolio to bring the total up to 45% from renewable sources by 2019. 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 carbon free 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 from

increased renewable electricity, but energy efficiency efforts will continue to play an important role in emission reductions and efforts will need to be made to transition away from natural gas usage if no widespread adoption of renewable natural gas takes place. Other programs to support emission reductions from the energy sector include the green financing programs, such as Go Green Financing (www.gogreenfinancing.com) which helps residents finance energy conservation building improvements and the Local Government Partnership with SDG&E which will be ending in December 2020 but in 2019 provided 548 Free Resource & Energy Business Evaluations (FREBE) and 65 Home Energy & Water Check-Ups to help identify energy-saving improvements at buildings and homes.

The waste sector saw significant reductions partially based on lower economic activity but, despite significant outreach and education efforts, staff expect emissions to increase in future inventories. Finally, the water and waste water sectors saw significant reductions from both 2014 and 2005. The reductions from the water and waste water sectors were from significant water efficiency outreach, such as requiring landscapes in new construction to use less water and providing low-flow faucet aerators to Chula Vista residents and businesses, and the historic multi-year drought that was driving reductions in water consumption.

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 69% of actions included in the 2017 CAP were either completed or ongoing. Some of the implementation actions being taken are: the adoption of the CCA Feasibility Study, which lead to joining San Diego Community Power in an effort to provide 100% renewable electricity, efforts to adopt ordinances that would require energy efficiency retrofits in older existing homes and a benchmarking ordinance that would increase transparency into energy usage large commercial buildings and require energy efficiency improvements for under-performing buildings. EPIC is already under contract to provide a 2018 Community GHG inventory for the City but SANDAG has notified jurisdictions they will not be able to provide a 2018 VMT update so that sector will look similar. Staff will also be waiting for SANDAG to provide VMT estimates for 2030 and beyond to update the 2030 GHG forecast. Staff will continue to engage other reginal 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.