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Climate Action Plan 2018 Annual Report

July 2018

City of Santa Clara

The Center of What's Possible

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Introduction

Background

The City of Santa Clara has a long-standing commitment to creating a sustainable City for all community members. Under Assembly Bill 32 (AB 32), the City is required to reduce Greenhouse Gas (GHG) emissions 15% below 1990 levels by 2020. To fulfill this goal, the City prepared a 2008 Community GHG inventory; this 2008 inventory is considered to be equivalent to the amount of 1990 emissions, giving the City a baseline for 2020 reduction targets. The City prepared a 2010 Local Government Operations (LGO) Inventory to obtain a comprehensive overview of the amount of GHG emitted from the entire City.

With this baseline of GHG emissions, the City was able to create a plan to reduce GHG emissions and achieve a 15% reduction by 2020. The City's first Climate Action Plan (CAP) was adopted in December 2013. This Climate Action Plan identified 19 actionable measures to reduce GHG emissions 15% below 2008 baseline levels and three "reach measures" to reduce emissions 55% below baseline levels by the recommended target year of 2035.

A 2015 Community GHG Inventory was completed and the City produced its first Climate Action Plan Annual Report in 2016, which compared emissions from 2008 to 2015 as well as reporting the progress on the measures laid out in the 2013 CAP.

2018 CAP Annual Report

The 2013 CAP meets the criteria for a Qualified GHG Reduction Strategy, established by the California Environmental Quality Act (CEQA) Guidelines, which are supported by the Bay Area Air Quality Management District (BAAQMD). This status allows the City to use the CAP to streamline the environmental review process for new development if the proposed project demonstrates consistency with the CAP. The City must conduct regular and ongoing monitoring of CAP implementation to ensure that the CAP continues to be a Qualified GHG Reduction Strategy. CAP Implementation Program 1 (Monitor and report progress toward target achievement) requires the City to conduct annual monitoring activities to satisfy the Guidelines.

This report describes the new 2016 LGO and Community inventories and provides an update of the CAP measures between August 2016 and May 2018.

Key Terms

This report uses several key terms to explain CAP progress, including the following:

- **Greenhouse gas (GHG):** A gas capable of trapping heat inside the earth's atmosphere. These gases stop heat radiated out from the earth's surface and reflect it back, rather than allowing it to escape, not unlike the glass ceiling and walls of a greenhouse. Consistent with the US Community Protocol and the Local Government Operations Protocol (LGOP), the six GHGs assessed in Santa Clara's CAP are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). GHGs are often measured in units of carbon dioxide equivalent (CO2e), so that GHGs can be measured and analyzed for their cumulative impact.

- **Activity:** Any action that results in GHG emissions, directly or indirectly. Activity data is used to measure how much of an action (possibly GHG emitting) occurs in any given year, such as how much natural gas was used in 2015. The measurement unit of activity data varies depending on the activity (e.g., kilowatt hours for electricity use).

- **Baseline year:** The year against which future emissions changes are measured, for purposes of progress tracking and reduction target setting. Consistent with Assembly Bill (AB) 32, many communities in California use a baseline year between 2005 and 2008. Santa Clara's baseline year is 2008.

- **Carbon dioxide equivalent (CO2e):** A unit of measurement commonly used to measure GHGs, which accounts for the varying potency of different GHGs. GHGs in this report are shown in metric tons of carbon dioxide equivalent (MTCO2e).

- **Emission factor:** The amount of GHGs released for each unit of an activity (e.g., GHGs per unit of natural gas used). Factors are provided by utility companies, state agencies, and guidance documents.

- **Sector:** A category of activities responsible for GHG emissions, such as transportation, water use, or energy use. Sectors may comprise multiple GHG sources and activities, called subsectors.

GHG Emissions Summary

This section provides an overview of GHG emission monitoring methods, regulatory guidance, and assessment and comparison of GHG emissions in 2008 (the CAP's baseline year) to 2016.

GHG Emissions Monitoring Methods

City staff utilized Local Governments for Sustainability's (ICLEI) ClearPath GHG Inventory tool to quantify 2016 LGO and Community emissions in Santa Clara since 2008. The Local Government Operations Protocol and the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions, which are national standards for GHG Inventories adopted by California Air Resources Board (ARB) in conjunction with ICLEI, were used as guiding documents to complete the 2016 GHG inventories. With the guidance of ICLEI, the GHG emissions were collected and calculated for both the LGO and Community inventories fulfilling CAP Implementation Program 2 (Update the baseline emissions inventory and Climate Action Plan every five years).

Regulatory Setting

AB 4420 was the first California law to address climate change, by directing the state to prepare a GHG inventory and study the impacts of climate change. Since the bill's passage in 1988, California has adopted several laws to assess climate change, analyze and reduce GHG emissions and their effects, and prepare for the impacts of a warming planet. Local governments are affected by these laws and regulations, although only some include specific requirements for specific jurisdictions.

Executive Order S-3-05

In 2005, then-Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, declaring that California is vulnerable to the impacts of climate change through reductions in the Sierra Nevada snowpack (a major source of water for the state), reduced air quality, and rising sea levels. EO S-3-05 also sets the following GHG reduction goals for the state:

- Reduce emissions to 2000 levels by 2010
- Reduce emissions to 1990 levels by 2020
- Reduce emissions 80% below 1990 levels by 2050

The California Global Warming Solutions Act of 2006 (AB 32)

The California Global Warming Solutions Act of 2006, AB 32, codifies the goals set in EO S-3-05 and sets a target for the state to reduce its total GHG emissions to 1990 levels by 2020 through a series of market-based and regulatory mechanisms. These mechanisms are discussed in the AB 32 Scoping Plan, developed by the California Air Resources Board (CARB). The actions established in the Scoping Plan are included in Santa Clara's GHG inventory and provide additional credits for emissions reductions to help the City meet its targets. Actions in the Scoping Plan include producing 33% of the state's electricity from renewable sources by 2020, implementing clean car standards, and developing a cap-and-trade program for major stationary sources of GHGs. The Scoping Plan identifies local governments as strategic partners to achieve the statewide reduction goal and establishes a GHG emissions reduction of 15% below existing levels (generally interpreted as emission levels between 2005 and 2008) as being comparable to a return to 1990 levels, which helped inform the City's reduction target.

California Renewables Portfolio Standard

One of the most ambitious renewable energy standards in the country, the Renewables Portfolio Standard (RPS) mandates that 33% of electricity delivered by investor-owned utilities in California be generated by renewable sources like solar, wind, and geothermal by 2020. Senate Bill (SB) 1078 first codified the California RPS in 2002, requiring a 20% renewable electricity mix by 2010. SB X 1-2 further strengthened the RPS in April 2011, requiring a 33% renewable electricity mix by 2020. In 2015, SB 350 introduced a revision to the RPS that added an interim target of 50% of utility power coming from renewable energy sources by 2030, prior to Santa Clara's 2035 recommended reduction target. This enhances the ability of RPS to continue to help the City meet emission reduction targets in 2020 and 2035 by providing cleaner (therefore lower-emission) energy supply to all users.

Title 24, Energy Efficiency Standards

Title 24 of the California Code of Regulations is a statewide standard applied by local agencies through building permits. It includes requirements for the structural, plumbing, electrical, and mechanical systems of buildings and for fire and life safety, energy conservation, green design, and accessibility in and around buildings. Part 6 (the California Energy Code) and Part 11 (the California Green Building Standards Code) include prescriptive and performance-based standards to reduce electricity and natural gas use in every new building constructed in California.

In 2015, the California Energy Commission and the California Public Utilities Commission released the New Residential Zero Net Energy Action Plan 2015–2020, which is supported by Title 24 Part 6. This plan establishes a roadmap for 2020, when Title 24 will support the development of all new residential homes to be zero net energy (ZNE), meaning they produce as much energy (through solar or other renewable sources) as they use. When this Action Plan is implemented, Santa Clara is expected to see a decrease in emissions from new buildings, led by guidance in the new Title 24 and ZNE Action Plan.

Community GHG Inventory

2008 Community GHG Inventory

The City conducted a 2008 Community GHG inventory to gather baseline data with activity data from that year. This data was used to determine actionable steps to reduce GHG emissions in the 2013 CAP.

Figure 1 below reflects the total emissions by sector for the year 2008. The Commercial and Industrial sector comprised 60% (1,110,100 $MTCO_2e$) of total emissions; Transportation and Mobile Sources comprised 30% (554,300 $MTCO_2e$) of total emissions in Santa Clara. Residential sources emitted 8% (153,200 $MTCO_2e$), Solid Waste emitted 1% (27,500 MTCO2e) and Water & Wastewater emitted 1% (9,200 $MTCO_2e$) of total emissions.

Figure 1. 2008 Community Baseline Emissions ($MTCO_2e$)

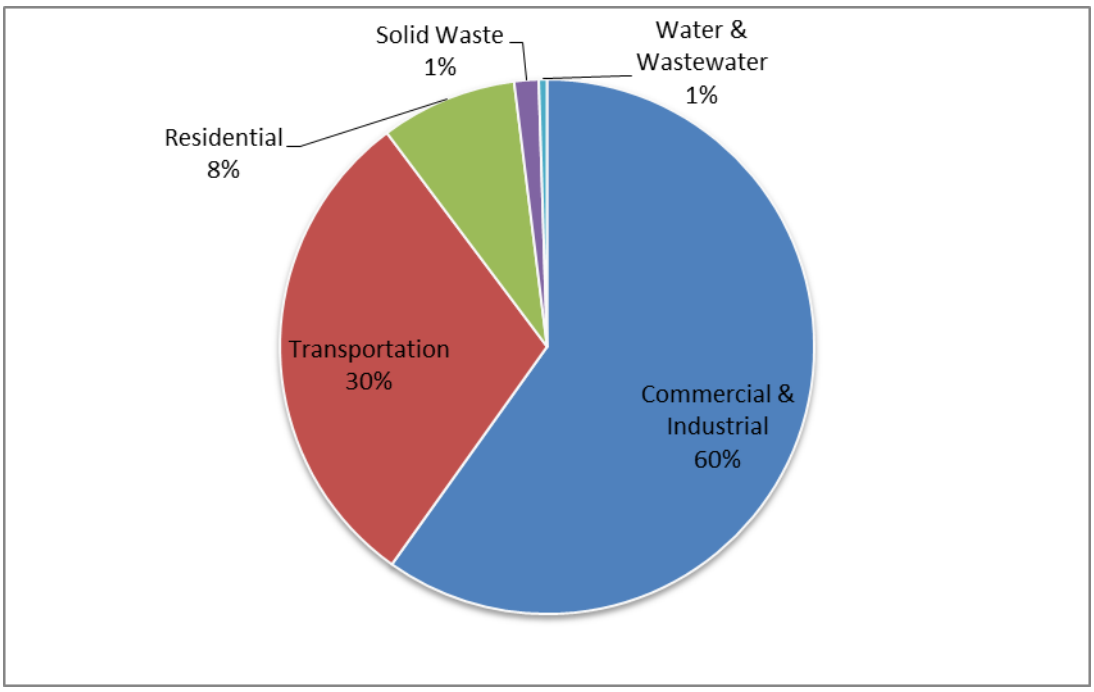


Table 1. 2008 Community GHG Inventory Emissions and Activity Data by Sector

Sector	Carbon dioxide emissions ($MTCO_2e$)	Activity Data
Commercial and Industrial Energy Use	1,110,100	2,597,934,040 KWh 57,176,860 therms
Transportation and Mobile Sources	554,300	3,190 daily VMT
Residential Energy Use	153,200	221,994,930 KWh 15,841,850 therms
Solid Waste	27,500	153,330 tons
Water and Wastewater	9,200	7390 MG
Total Emissions	1,854,300	

2016 Community GHG Inventory

City staff collected activity data to quantify GHG emissions for the year of 2016 and compare emissions to 2008 levels.

Figure 2 below reflects the total emissions by sector for the year 2016. The Commercial and Industrial sector comprised 61% (1,080,261MTCO$_2$e) of total emissions; Transportation and Mobile Sources comprised 29% (505,989 MTCO$_2$e) of total emissions in Santa Clara. Residential sources emitted 8% (132,912 MTCO$_2$e), Solid Waste emitted 1% (25,724 MTCO2e) and Water & Wastewater emitted 1% (24,292 MTCO$_2$e) of total emissions.

Figure 2. 2016 Community GHG Inventory Emissions (MTCO$_2$e)

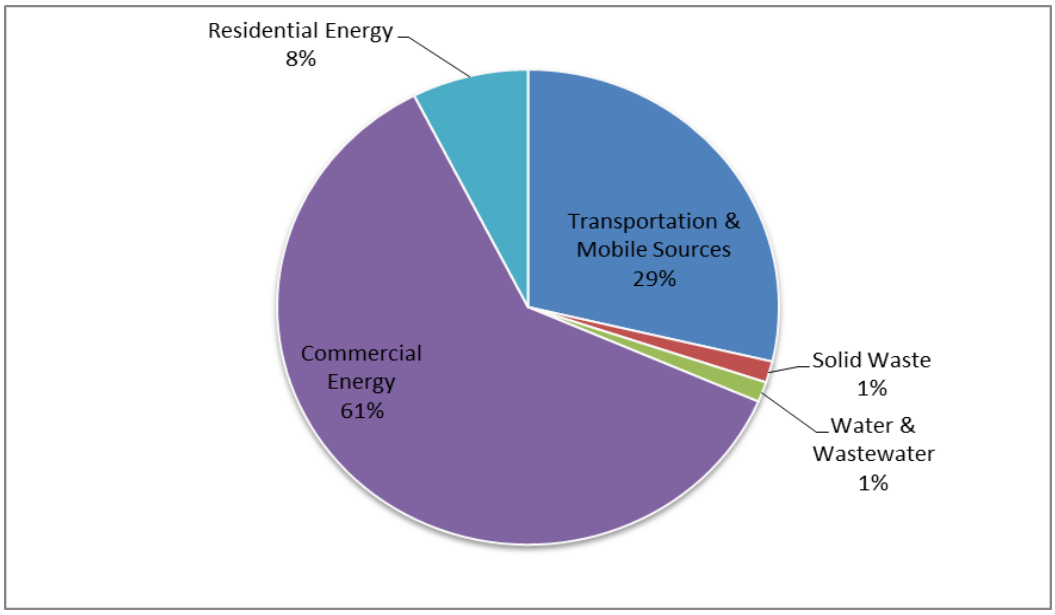


Table 2. 2016 Community GHG Inventory Emissions by Sector

Sector	Carbon dioxide emissions ($MTCO_2e$)	Activity Data
Commercial Energy	1,080,261	3,166,836,762 KWh 18,795,477 therms
Residential Energy	132,912	194,252,567.30 KWh 13,686,921 therms
Transportation & Mobile Sources	505,989	990,000,000 VMT
Solid Waste	25,724	168,237.08 tons
Water & Wastewater	24,292	29,138,000 KWh 383,340 therms
Total Emissions	1,769,178	

Changes from 2008 to 2016

Figure 3 and Table 3 below represent the changes in emissions in Santa Clara from 2008 to 2016. The Commercial and Industrial greenhouse gas emissions decreased by 3% (29,839 MTCO2e) even though energy use increased by 21%. Transportation and Mobile Sources decreased by 9% (48,311 $MTCO_2e$). Residential energy use decreased by 13% (20,288 $MTCO_2e$). Solid Waste decreased by 6% (1,776 MTCO2e).

Water and Wastewater appears to have increased by 62% (15,092 $MTCO_2e$). The City of Santa Clara sends its wastewater to the City of San Jose and City of Santa Clara Regional Wastewater Facility. Under Community protocols, energy use (electricity and natural gas) should be included in Community inventories. The reasons for the increase can either be the facility needed more energy to process water, the City of Santa Clara is discharging more water to the facility than before, or the facility was not included in the 2008 inventory.

Figure 3. Comparison of $MTCO_2e$ between 2008 and 2016.

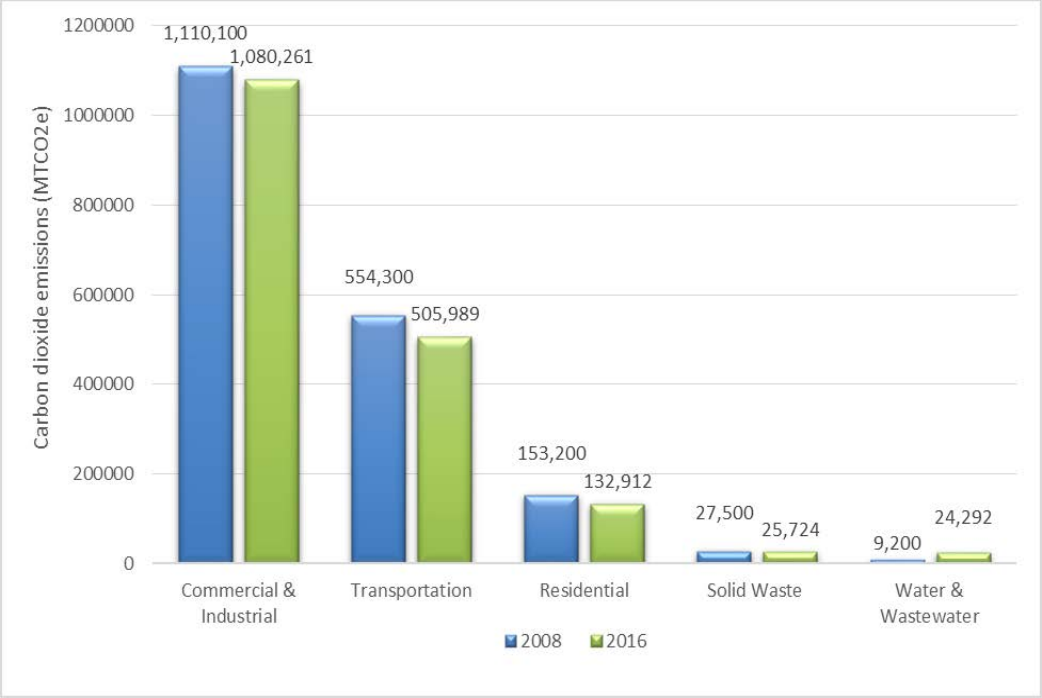


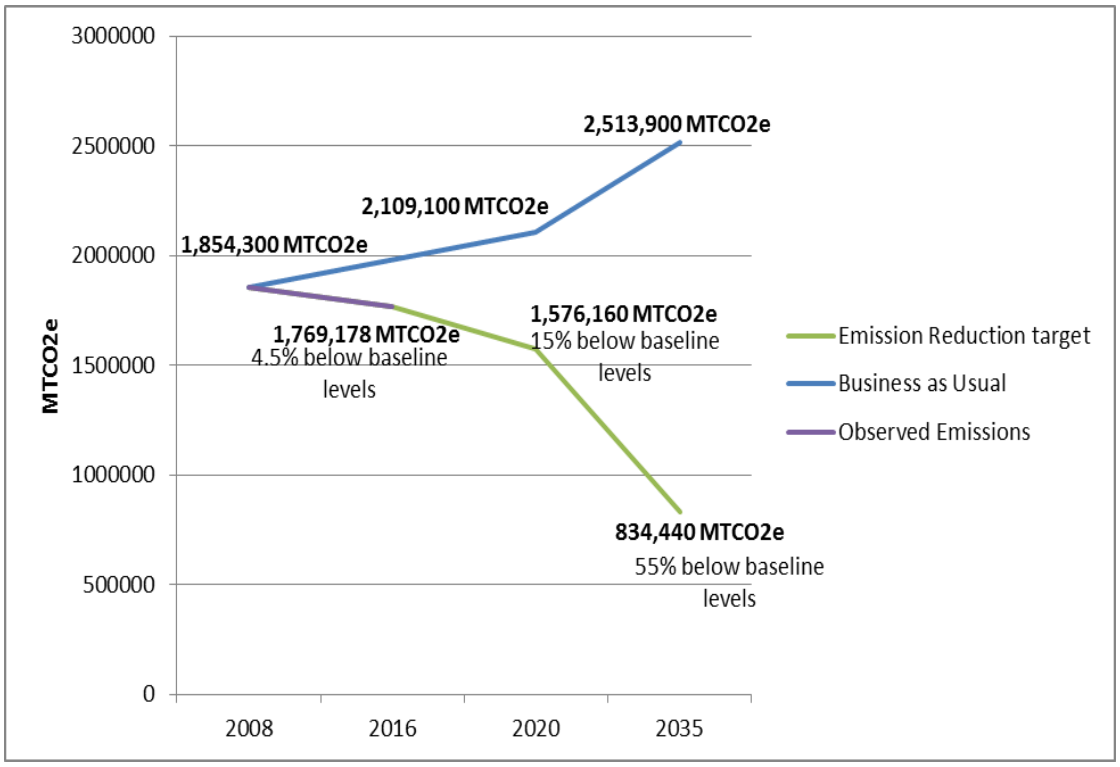
Table 3. Changes in $MTCO_2e$ between 2008 and 2016

Community Sectors	2008	2016
Commercial & Industrial	1,110,100	1,080,261
Transportation	554,300	505,989
Residential	153,200	132,912
Solid Waste	27,500	25,724
Water & Wastewater	9,200	24,292
Total Emissions	1,854,300	1,769,178

GHG Inventory Results

From the analysis of the above 2016 GHG Community Inventory, the total emissions from 2016 is **1,769,178 $MTCO_2e$.** The GHG emissions from 2008 were 1,854,300 $MTCO_2e$. In conclusion a reduction of 85,122 MTCO2e has been realized. This represents a 4.5% reduction of GHG emissions from the baseline. The City needs to reduce GHG emissions by 10.5% to reach 2020 goals. **Figure 4** below shows a trendline of emissions from 2008 to 2035, with the emissions from the 2016 GHG inventory and the amount of emissions that need to be reached by 2020 and 2035.

Figure 4. Observed and Projected Emissions from 2008 to 2035 ($MTCO_2e$)



2015 Estimated GHG Inventory

A 2015 GHG Inventory was conducted for the 2016 Climate Action Plan Annual Report. As this GHG Inventory was an estimate of 2015 emissions, it did not include activity data for every sector and used software to estimate emissions. The 2015 GHG Inventory also did not include natural gas usage from large commercial emitters for the 2015 year so data was used from 2013. Because these were estimates, the 2015 GHG Inventory was excluded from this report. With ICLEI's ClearPath tool, the City will be better able to collect and report GHG emissions moving forward.

2016 Local Government Operation Inventory

Figure 5, Figure 6 and Table 4 below reflect the total Local Government Operation emissions by sector for the year 2016. The City of Santa Clara has a municipally operated electric utility, Silicon Valley Power (SVP), thus the largest emitter for GHG emissions for the Local Government Operation is the electric power production sector, comprising 97% (517,247 $MTCO_2e$) of total municipal emissions. All other sectors make up the remaining 3%. The second largest emitter is the employee commute emitting 6,057 $MTCO_2e$. Municipal buildings and facilities emitted 4,984 $MTCO_2e$, the City's vehicle fleet emitted 2,804 $MTCO_2e$, solid waste emitted 1,715 $MTCO_2e$, water and wastewater transport emitted 1,639 $MTCO_2e$, and lastly; street lights and traffic signals emitted 859 $MTCO_2e$. The amount of electricity consumed at all three power plants amount to 42,461,000 KWh. During the year of 2016, the Gianera plant was not active due to compliance testing. The EPA recorded a total of 517,247 $MTCO_2e$ emitted from the Donald Von Raesfeld (DVR) and Co-gen power plants for the year 2016.

Figure 5. Local Government Operations $MTCO_2e$ percentage by Sector. Graph reflects the electric power production's large portion of emissions in comparison to the remaining sectors.

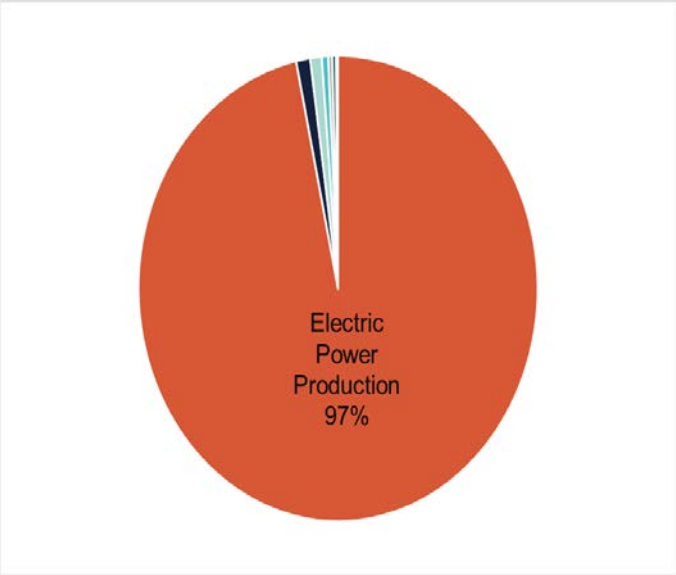


Figure 6. Local Government Operations $MTCO_2e$ percentage by Sector excluding electric power production. Graph reflects all sectors of a LGO inventory excluding electric power production.

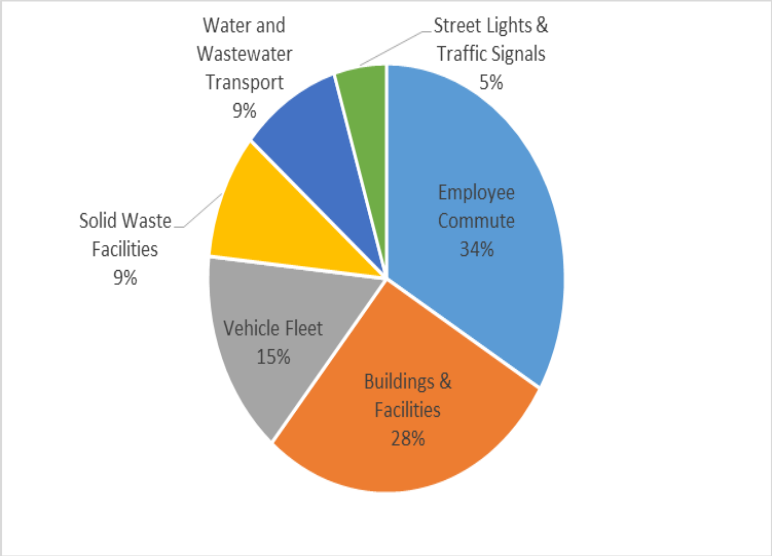


Table 4. Local Government Operations $MTCO_2e$ by Sector.

LGO Sector	Carbon dioxide emissions (MTCO2e)
Electric Power Production	517,247
Employee Commute	6,057
Buildings and Facilities	4, 984
Vehicle Fleet	2,804
Solid Waste	1,715
Water and Wastewater Transport	1,639
Streetlights and Traffic Signals	859
Total	535,305

Climate Action Plan (CAP) Actions to Date

The Climate Action Plan adopted in 2013, described 19 actionable measures the City could implement to reduce Greenhouse Gas (GHG) emissions and comply with AB 32. These measures were associated with performance metrics and the possible amount of metric tons of carbon dioxide emissions ($MTCO_2e$) to be reduced from the City's overall emissions. City staff from Community Development, Silicon Valley Power, Water & Sewer Utilities and Public Works Departments worked to accumulate updates for each measure.

The total $MTCO_2e$ reductions seen with the completion of seven of the nineteen measures was estimated to be approximately **430,000 $MTCO_2e$.** The GHG reductions resulting from the measures below will decrease the overall amount of GHG emissions for the City. These reductions, including the City's divestment from coal-fired power generation, will be quantified and shown in the next Greenhouse Gas Inventory for the calendar year 2018.

CAP Measure Updates

Focus Area 1: Coal Free and Large Renewables

1.1 Coal Free by 2020

Measure 1.1 directed the City to replace coal energy sources with natural gas to reduce the GHG emissions from Silicon Valley Power's (SVP) energy portfolio. From the year 2008 to 2015, SVP's coal use decreased from 24% to 9% of the energy mix. As of January 1st of 2018, SVP has completely divested from coal, eliminating the amount of coal in the City's energy mix. The City's energy mix now consists only of wind, solar, geothermal, hydroelectric, landfill gas and natural gas. The goal of this measure was reached before 2020, reducing approximately **388,800 $MTCO_2e$.** In the year 2016, SVP's carbon intensity amounted to 666 pounds of Carbon dioxide per Megawatt hour (CO_2/MWh); in 2017, that was reduced to 430 pounds of CO_2/MWh with the use of additional hydroelectric generation. With the elimination of coal from the energy mix, SVP's carbon intensity is forecasted at 380 pounds of CO_2/MWh for the year of 2018. Furthermore, as of January 1st, 2018, all residential customers now receive carbon-free energy. This was an essential step in the City's efforts to provide renewable energy and reduce its impact on the climate while continuing to supplying sufficient energy to all customers.

Figure 7. Comparison of Silicon Valley Power's (SVP) energy content. Comparison of energy content for the years 2008, 2013, 2016 and 2017.

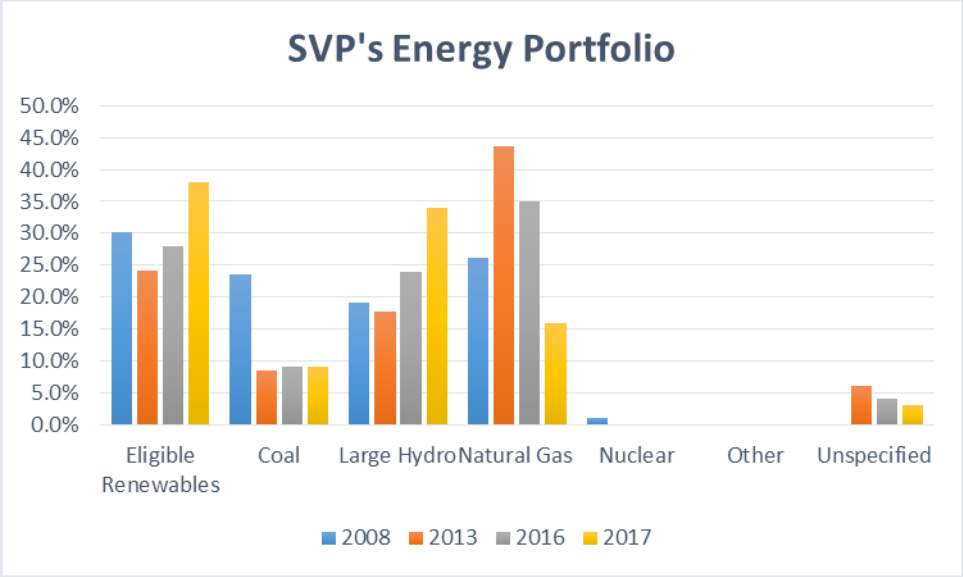
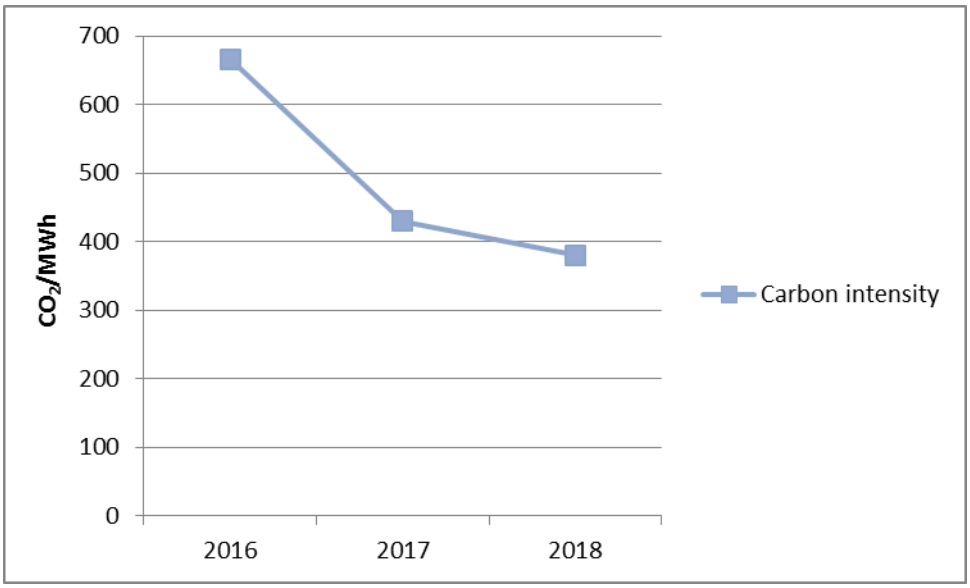


Figure 8. Silicon Valley Power's Carbon Intensity. Reduction of Carbon intensity from 2016, 2017 to 2018.



1.2 Renewable Energy Resources

Under Measure 1.2, the City aimed to investigate the usage of City owned properties outside of City limits to construct large-scale renewable energy projects. The 2016 CAP Annual Report reported for the development of a 20 Megawatt (MW) wind farm in the Altamont Pass area and a 20 MW solar installation in Kern County. Since 2016, SVP has been investigating other areas for

solar and are expected to expand in the future. The use of local renewable energy resources will increase the opportunity to further reduce GHG emissions in the City. Increased sources of renewable energy will enable the City to expand and provide more renewable energy and further reduce GHG emission.

1.3 Utility-Installed Renewables

For Measure 1.3, the 2013 CAP directed the City to develop 5 MW of utility-installed solar photovoltaics (PV) projects within the City limits. The 2016 CAP Annual Report recorded a total of 515 KW (0.515 MW) of solar programs that were implemented since 2013. This amounted to a GHG reduction estimate of **120 MTCO$_2$e**, which is equivalent to 419 pounds of coal burned or 939 miles driven by a passenger vehicle. The City has accomplished 10.3% of this goal and will continue efforts to install additional solar PV systems within City limits, including solar installations occurring within the next few years through the Neighborhood Solar Program.

Focus Area 2: Energy Efficiency Programs

2.1 Community Electricity Efficiency

Measure 2.1 required the City to achieve City-adopted energy efficiency targets which state a 5% reduction in community energy use by 2020. This was to be completed through incentives, pilot programs and rebate programs. Every year SVP reports energy efficiency savings to the Northern California Power Agency (NCPA) through these different programs. The 2016 CAP Annual Report stated 80% of this initial target was reached, by saving a total of 132,736 MWh of community energy. For the fiscal years 2015-2017, there was an additional reported total of 32,524 MWh community energy savings. These combined savings from 2008 to 2017 amount to 165,260 MWh of community energy savings, exceeding the original goal of 159,100 MWh. In total, these programs led to an emission reduction of approximately **28,700 MTCO$_2$e**.

2.2 Community Natural Gas Efficiency

Under Measure 2.2, the City was directed to work with community and social services to provide outreach and information on different Pacific Gas and Electric (PG&E) programs to encourage voluntary natural gas retrofits. The goal was to have 5% of multifamily homes, 7% of single-family homes, and 7% of nonresidential buildings to participate in these voluntary programs. Different programs PG&E offers includes the Solar Water Heating, Multifamily Cooling Optimizer Program, installing Excess Flow Valves, Automated Demand Response incentive, and other energy efficiency rebates. The City is aware of these different programs and will work towards conducting outreach.

2.3 Data Centers

Measure 2.3 in the 2013 CAP highlighted the large amount of energy use from the high number of data centers in the City, indicating that 28% of energy usage comes from data centers in Santa Clara. This measure required 10% of new data centers to utilize energy efficient practices. The 2016 CAP Annual Report mentioned new regulations under Title 24 that require the utilization of economizer technology-cooling technologies that use outside air to cool hardware and reduce energy usage-which make the operation of data centers more efficient and more cost effective. Since 2013, there have been 12 new data centers developed in the City of Santa Clara. Also as of 2013, Silicon Valley Power's baseline for data centers requires either waterside or airside economizer technology. This means 100% of new data centers since 2013 have utilized energy-efficient economizers, exceeding the goal of 10% of new data centers utilizing energy efficient technologies.

The City does however have data centers developed before 2013 that do not have these economizer technologies. In total, accounting for new and old data centers, 70% of data centers in the City have economizer technologies. Of these, approximately three have power usage effectiveness (PUE) rating of 1.2 or lower. This power usage effectiveness standard is a goal of Strategy 2.3 in the 2013 Climate Action Plan. These actions have amounted to approximately a **4,000 MTCO$_2$e** reduction.

2.4 Customer-Installed Solar

Under Measure 2.4, the City was directed to increase the amount of customer installed solar, generating a total of 6 MW of energy. This includes residential customers and non-residential business customers. SVP had a residential rebate program that allowed customers to efficiently install solar panels at an economically reasonable rate. The Planning Division also continues to ensure that solar panel installation permits are expedited for residential and non-residential areas. The 2016 CAP Annual Report noted the installation of 1.5 MW of residential solar panels and 10.5 MW of non-residential solar panels, exceeding the 2020 goal of 6 MW as well as the 2035 goal of 10 MW. The total 12 MW of installed solar has resulted in a 3,000 MTCO$_2$e reduction since 2008. From January 2017 to May 2018, there has been a total of 3.3 MW of commercial solar installed and 550 KW of single family residential solar installed, for a new total of 16.1 MW of solar This increase results in a GHG reduction estimate of **4,027 MTCO$_2$e** since 2008.

2.5 Municipal Energy Efficiency

Measure 2.5 directs the City to reduce municipal energy usage by 10% through energy retrofits previously proposed by a contracted energy auditor as well as upgrade equipment with energy efficient models. The City was to achieve this measure by replacing energy inefficient equipment in 50% of municipally owned buildings and facilities. Most City facilities are also equipped with energy efficient computers, printers and air-cooled air conditioning units; the City has also

purchased four electric vehicles (EVs) to add to its vehicle fleet. The City will continue efforts and investigate ways to participate in energy efficient programs.

2.6 Municipal Renewables

Measure 2.6 directed the City to install 1 MW of solar on City facilities to increase renewable energy usage. The City has begun the process of completing this measure; two City facilities have been selected to attain solar panels, the Northside Library and the Police Department building. These solar panels will be installed in the next few years. The City will continue to determine other City facilities that could install solar panels and reach the goal of 1MW solar installs.

Focus Area 3: Water Conservation

3.1 Urban Water Management Plan Targets

Measure 3.1 required the City to abide by the 2010 Urban Water Management Plan (UWMP) and comply with the Senate Bill 7 (SBx7-7) goal to save 1,362 acre-feet of water (443,000,000 gallons) by 2020. The 2016 CAP Annual Report noted the completion of this measure by saving 6,328 acre-feet (2,060,000,000 gallons) of water from 2008 through 2016. The completion of this measure led to a reduction estimate of **210 $MTCO_2e$**. Since the 2016 report, the City has adopted a 2015 UWMP which called for a progress update on the SBx7-7 goals of a 20% reduction by 2020 which the City accomplished in 2016. The City will be updating the UWMP in the near future and will be looking for methods to create water use efficiency standards. As of 2017, the amount of water used, expressed in Gallons per Capita per Day (GPCD), for the City of Santa Clara is 134 gallons.

Focus Area 4: Waste Reduction

4.1 Food Waste Collection

Measure 4.1 encourages the City to increase food waste and composting services to 25% of restaurants to recycle food scraps diverting them from the landfill. This measure was put in place to ensure compliance with Assembly Bill 1826 (AB 1826), which requires commercial businesses to recycle organic waste by 2021. In 2016, the City of Santa Clara's pilot program for commercial businesses had five businesses participating. As of May 2018, there are 131 businesses recycling food scraps with approximately 30 of those businesses being participating restaurants. The City will continue efforts to fulfill AB 1826 requirements; in addition, the City has adopted a Mandatory Organic Waste Recycling ordinance that reiterates AB 1826 requirements and the showcases the City's determination to comply. The City has further increased efforts to divert food waste from landfills by piloting a residential food scraps recycling program in order to fulfill Senate Bill 1383 (SB 1383) with specific reductions for different types of organic waste.

4.2 Increased Waste Diversion

Measure 4.2 directed the City to work with regional partners and increase landfill diversion rates from 58% to 80% by 2020. As of 2017, the City's diversion rate is 59% by population and 60% by Employment. With the Pilot Residential Food Scrap Recycling Program and the Mandatory Organics Recycling of Commercial food scraps, both backed by State laws Senate Bill 1383 (SB 1383) and Assembly Bill 1826 (AB 1826) respectively, Santa Clara is required to divert organics 50% by 2020 and 75% by 2025 from the landfill. Working with regional partners, the City is also ramping up efforts to implement a new program called "A la Carte" which is a food recovery program for Santa Clara County. This food recovery program will pick up excess food from designated stops and distribute food to those in need. The City has also increased outreach for recycling as well as greenwaste disposal, and will continue to aim for an overall diversion rate of 80% by 2020.

Focus Area 5: Off-Road Equipment

5.1 Lawn and Garden Equipment

Under Measure 5.1 the City aimed to encourage community fuel switching of diesel powered lawn and garden equipment to electric equipment. The plan had a goal of 1,170 leaf blowers and 130 lawn mowers being switched to electric equipment by 2020. The CAP directed the City to work with BAAQMD and its Lawn Mower Exchange Program; as of 2016, three residents used the program and successfully fuel switched, but the program is no longer operational due to limited interest. The City will explore alternative strategies for off-road equipment as part of the Climate Action Plan update, possibly working with regional partners on this effort.

5.2 Alternative Construction Fuels

Measure 5.2 required construction equipment for development projects to comply with BAAQMD best management practices. This measure specifically called for construction vehicle fuel switching from conventional technologies to alternative fuels such as hybrid, electricity, biodiesel, or compressed natural gas (CNG). The use of alternative fuel in construction vehicles improves the overall air quality for the community, while additionally reducing the amount of GHGs released during the construction of new development. Stated in the 2016 CAP Annual Report, 12% of construction projects used alternative-fueled vehicles as of July 2016 reducing GHG emissions by approximately **2,440 MTCO$_2$e**. All development approvals have requirements in their environmental documents to use BAAQMD best management practices, which includes the encouragement of fuel switching to alternative fuels. The City can make further progress on this measure by adding the use of alternative fuels in construction vehicles to the conditions of approval for new development permits and updating project monitoring software to account for the type of fuel used for construction vehicles at each development site. The City conducts pre-construction meetings to review developments' plans prior to

construction; to further the progress of this measure; the City can open these meetings to include building and planning staff to ensure completion of CAP measures.

Focus Area 6: Transportation and Land Use

6.1 Transportation Demand Management Program

Measure 6.1 directed the City to require developments in transportation districts, noted in Table 1 below, to adopt and implement their own Transportation Demand Management (TDM) Plan. Under this measure, developments were required to achieve a minimum of 5% to 10% reductions in Vehicle Miles Travelled (VMT) resulting from TDM Plans contributing to an overall 1% reduction in VMT citywide. Since the CAP's adoption, 26 new developments have been required to have a TDM Plan, and from those, three have been constructed and one has implemented a TDM plan. The TDM plan from this development describes adding bike facilities, a fitness center, ridesharing and car-matching programs, and incentives for VTA ECO Passes. The developments are required to create annual reports on their TDM plans to provide information to calculate overall VMT reduction. The City has not received an annual report regarding the one TDM program developed, but looks forward to receiving and analyzing it in the near future. The City will continue to require TDM Plans in their conditions of approval for all new developments in transportation districts as well as monitor developments' annual report submissions.

Table 5. Transportation Districts. Transportation districts determine the minimum amount of VMT reduction and VMT reduction from TDM plans required for developments in each General Plan land use designation.

	General Plan Land Use Designation							
	Medium-Density Residential	High-Density Residential	Regional Commercial	Neighborhood Mixed Use	Community Mixed Use	Regional Mixed Use	Low Intensity Office/R&D	High Intensity Office/R&D
Average trip generation rate [1, 2]	6	7	8	8	8	8	11	7
Transportation Districts	**Minimum % VMT reduction per project [3, 4, 5] (Minimum % VMT reduction per project from TDM) [6, 7]**							
1 - North of Caltrain	15% (5%)	20% (10%)					25% (10%)	20% (10%)
2 - Downtown					20% (10%)			
3 - El Camino Real Corridor		15% (5%)			20% (10%)	20% (10%)		
4 - Stevens Creek Blvd			5% (n/a)		15% (5%)			

Notes:

1. *Average trip generation rates represent the number of daily trips per housing unit (for residential projects) or per 1,000 square feet (for nonresidential projects).*
2. *For commercial and mixed-use designations, average trip generation rates describe employee and resident trips rather than retail visitor trips.*
3. *Highlighted cells indicate that the General Plan land use designation is present in the transportation district.*
4. *The VMT reductions for each land use in each district exceed the total cumulative VMT reductions anticipated for each district in Appendix B, as projects consisting of less than or equal to 25 dwelling units or 10,000 nonresidential square feet would typically be considered exempt.*
5. *All projects subject to minimum vehicle miles traveled reduction requirements are subject to annual reporting requirements.*
6. *Staff retains discretion to require a TDM program as a condition of approval for discretionary projects not located in one of the four identified districts.*
7. *TDM reductions are expressed as minimum requirements. However, staff retains discretion to require greater levels of TDM as a condition of approval for discretionary projects.*

Sources:

City of Santa Clara General Plan. 2010. http://santaclaraca.gov/ftp/csc/pdf/general-plan/SantaClara_Ch8-6_1-3-11_Final.pdf
Fehr & Peers. 2013. VMT+ Tool http://www.fehrandpeers.com/vmt/

6.2 Municipal Transportation Demand Management

Under Measure 6.2, the 2013 CAP required the City to create a Transportation Demand Management (TDM) program for City employees to utilize. A TDM program would not only reduce City generated single occupancy vehicle use (SOV) and VMT but would also act as an example for other developments in the City to create and maintain programs. A TDM program would help reduce the amount of VMT taken by City employees on a daily basis. The City has taken steps to start a program by collecting and analyzing baseline data regarding employee commutes. The collected information expressed that 85% of employees drive alone to work resulting in approximately 102 $MTCO_2$ emissions from City employee commutes. The City has also collected information regarding different departments' employee work schedule and has begun compiling possible TDM actions to reduce VMT. Now that the City has collected baseline data for the City employee commute patterns, a TDM program for the City can be expected in the near future.

6.3 Electric Vehicle Parking

Measure 6.3 advised the City to increase the number of electric vehicle (EV) parking spaces in the City to 430 new spots in commercial, industrial and multi-family residential zones. From 2008 to 2016, 376 EV charging stations were installed, 64 of which were located at City facilities. Since then, 79 more charging stations have been installed, amounting to a total of 455 charging stations installed in public spaces leading to approximately **1,480 MTCO$_2$e reduction.** The City is also planning to update the Santa Clara Municipal Code to require new nonresidential and residential developments to include EV chargers.

Focus Area 7: Urban Heat Island Effect

7.1 Urban Forestry

Measure 7.1 directed to City to plant a total of 2,500 trees, requiring new developments to plant a minimum of two shade trees on the site. The City created a mandatory 2:1 replacement rule for developments, requiring two trees to be planted for every one tree removed during new construction. The 2016 CAP Annual Report noted 3,792 trees planned in new developments since 2013, accomplishing the goal of 2,500 trees. The planting of these trees resulted in approximately **110 MTCO$_2$e reduction**. The City will continue to uphold the mandatory 2:1 replacement rule.

7.2 Urban Cooling

Measure 7.2 required new parking lots and spaces to utilize light-colored (low-albedo) or permeable materials to combat the urban heat island effect. Combating the heat island effect by paving surfaces with low-albedo materials will allow heat and radiation from the sun to reflect off the surface and back into the atmosphere rather than being caught in darker-colored pavements and heating up the surface. This effect can often lead to increased energy usage for AC units in buildings to mitigate the warmer surrounding temperatures. The City should consider drafting language for this measure to include in developments' conditions of approval.

Recommendations

- The City should staff a Sustainability Committee to track and monitor Climate Action Plan measures and conduct Greenhouse Gas inventories.
- The City needs to update the Greenhouse Gas Inventory every year, starting with calendar year 2018. This needs to include both an LGO inventory and a Community inventory. Starting with the 2018 calendar year will reflect SVP's divestment from coal and all other $MTCO_2e$ reductions.
- For each subsequent GHG Inventory, ensure that the same methodology and data source are used repeatedly to get the best comparison over the years.
- For the next Climate Action Plan, each department should be included in the planning process and should have a monitoring method in place or should create a monitoring method for each measure they are responsible for before the CAP is adopted.

Appendix A

Table 5. Emission Factors for 2016 GHG Inventory.

Sector/Activity	CO2	CH4	N2O	Unit
Silicon Valley Power Electricity Carbon Intensity	666 (lbs/MWh)	129 (lbs/GWh)	44.4 (lbs/GWh)	N/A
Residential natural gas	53.02	0.005	1×10^{-4}	(Kg/MMBtu)
Commercial natural gas	53.02	0.005	1×10^{-4}	(Kg/MMBtu)
Diesel Commercial Transportation	1309.2	0.0051	0.0048	G/mile
Gas Commercial Transportation	737.1	0.0333	0.0134	G/mile
Diesel Passenger Transportation	427.6	0.005	0.001	G/mile
Gas Passenger Transportation	357.4	0.0187	0.011	G/mile
Diesel Bus Transportation	2118.7	0.001	0.0015	G/mile
Gas Bus Transportation	1308.5	0.0201	0.017	G/mile

Appendix B

Table 6. Emissions Summary Table. Table explaining CO_2 emissions, included and excluded data, and Global Protocol for Community GHG inventory reference numbers for the 2016 Community GHG Inventory.

Inventory Record	Calculator	Scope	GPC Ref Number	CO2 (MT)	CO2e (MT)	Notation Keys*
Residential Energy						
Residential Energy-SVP fact sheet	Emissions from Grid Electricity	Scope 2	I.1.2	67,685	69,357	IE
Residential Electricity Use 2016	Emissions from Grid Electricity	Scope 2	I.1.2	58,682	60,132	Included
Residential Therm Usage 2016	Emissions from Stationary Fuel Combustion	Scope 1	I.1.1	72,568	72,780	Included
Transportation and Mobile Sources						
Gas Construction Off-road equipment	Emissions from Off Road Vehicles	Scope 1	I.3.1	5,827	5,879	Included
Gas Agricultural Off-road equipment	Emissions from Off Road Vehicles	Scope 1	I.5.1	1,230	1,243	Included
Diesel Agricultural Off-road equipment	Emissions from Off Road Vehicles	Scope 1	I.5.1	1,495	1,512	Included
Diesel Construction Off-road equipment	Emissions from Off Road Vehicles	Scope 1	I.3.1	1,547	1,561	Included
Diesel Commercial Transportation	On Road Transportation	Scope 1	II.1.1	108,717	108,847	Included
SC bus-gasoline transportation	On Road Transportation	Scope 1	II.1.1	31,551	31,685	IE
Gas Commercial Transportation	On Road Transportation	Scope 1	II.1.1	32,112	32,322	Included

Diesel Passenger Transportation	On Road Transportation	Scope 1	II.1.1	2,588	2,590	Included
SC bus-diesel transportation	On Road Transportation	Scope 1	II.1.1	51,087	51,098	Included
Gas Passenger Transportation	On Road Transportation	Scope 1	II.1.1	297,817	300,938	Included
Caltrain-gas 2017	Rail Transportation	Scope 3	II.2.3	0	0	NE
Caltrain-diesel 2017	Rail Transportation	Scope 3	II.2.3	2,068	2,087	Included
Commercial Energy Use						
Commercial and Industrial electricity usage	Emissions from Grid Electricity	Scope 2	I.2.2	956,679	980,317	Included
Commercial and Industrial Natural Gas Usage	Emissions from Stationary Fuel Combustion	Scope 1	I.2.1	99,654	99,945	Included
Solid Waste Facilities						
Santa Clara Waste Generation 2016	Waste Generation	Scope 3	III.1.2		25,724	Included
Water and Wastewater						
CSJ/CSC RWF methanol	CO2 Emissions from the Use of Fossil Fuel Derived Methanol	Scope 3	III.4.2	0	0	NE
RWF energy use	Emissions from Wastewater Treatment Energy Use	Scope 3	VI.1	24,206	24,292	Included
CSJ/CSC RWF combustion of digester gas	Emissions from the Combustion of Digester Gas	Scope 3	I.3.1		155	NE
CSJ/CSC RWF BOD5	Fugitive Emissions from Septic Systems	Scope 1	III.4.1		150,275	NE
CSJ/CSC RWF	Nitrification/Denitrification Process N2O Emissions	Scope	III.4.2		3,534	NE

nitrification/denitrification	from Wastewater Treatment	3				
CSJ/CSC RWF BOD5 and removed BOD5	Process Emissions from Wastewater Treatment Lagoons	Scope 3	III.4.2		203,281	NE
CSJ/CSC RWF N2O effluent	Process N2O from Effluent Discharge to Rivers and Estuaries	Scope 3	III.4.2		4,699	NE
Industrial Energy						
Industrial Energy	Emissions from Grid Electricity	Scope 2	I.3.2	0	0	IE

*IE = Included elsewhere and NE = Not estimated (not included in this inventory)

2016 Community GHG Inventory

The population data used for this inventory was as follows:

- Population: 122,725
- Households: 45,903