



COUNTY OF SANTA CLARA
2020 County Operations Greenhouse Gas Inventory
February 2022



EXECUTIVE SUMMARY

The County of Santa Clara (County) completed the 2020 county operations greenhouse gas (GHG) emissions inventory as part of the County's commitment to climate action and sustainability. The 2020 GHG inventory includes activity and emissions from the following sectors: Buildings and Facilities, Employee Commute, Fleet Vehicles + Reimbursed Employee Miles, and Solid Waste + Closed Landfills. Using the Local Government Operations Protocol (LGOP) and accounting for the County's local fuel cell and renewable energy generation programs to calculate emissions, the total 2020 county operations emissions were 86,748 MTCO_{2e}. This represents a 24% decrease from 2019 emissions of 114,737 MTCO_{2e}, a 34% decrease from 2015 county operations emissions of 132,358 MTCO_{2e} and a 29% decrease from baseline year 2010 emissions of 122,696 MTCO_{2e}.

Buildings and facilities emissions decreased 4% from 2019 and decreased 42% from 2010. Emissions related to employee commute decreased 38% from 2019 and 7% from 2010. Vehicle fleet emissions decreased 14% from 2019 and 35% from 2010. Reimbursed employee miles decreased 35% from 2019 and 41% from 2010. Solid waste increased 14% from 2019 and decreased 42% from 2010. Closed landfills decreased 81% from 2019 and 85% from 2010.

To continue to meet the Climate Protection and Defense goals of the County's Sustainability Master Plan, the County should review and implement policies, plans, and programs on an ongoing basis to identify additional opportunities to reduce emissions and conserve resources. The County is currently assessing feasibility and potential actions to accelerate the County's current carbon-neutral by 2045 goal for operations. The key policies that need to be implemented in each sector to achieve this target include:

1. **Facilities and Energy:** Transition natural gas equipment at existing County facilities to electric alternatives by 2030.
2. **Employee Commute:** Expand telecommuting opportunities that are client-focused and department-specific for County employees.
3. **Fleet Vehicles:** Transition County fleet to zero emissions vehicles by 2030.
4. **Solid Waste:** Prepare a waste stream characterization study for County operations and County unincorporated areas and create a Zero Solid Waste Plan.

A NOTE ABOUT 2020

2020 emissions are estimated to be 24% less than 2019 as result of the continued implementation of the County's Sustainability Master Plan and variations in the County's operations due to the COVID-19 pandemic. The pandemic disrupted normal County operations and resulted in the temporary closure of some community facilities as well as the more intensive use of the County's hospital system. As a result of this variation, energy use and waste emissions increased while fleet and employee commute emissions decreased. Most significant to emissions reductions was that 33.7% of County employees were able and encouraged to work from home throughout the year. As a result, employee commute emissions decreased 38% as compared to 2019.

Although 2020 emissions may not be representative of a normal year of County operations, it does demonstrate the benefits of implementing transportation demand measures, as well as how the intensity of facility use (i.e. reduced hours of operation and limited programming) directly affects activity data and emissions.

2020 SNAPSHOT



Buildings and Facilities

- Sector Emissions = 33,565 MTCO₂e
- 39% of total emissions
- Emissions decreased 4% since 2019 and decreased 42% since 2010
- Electricity emissions account for -6% of the emissions associated with buildings and facilities, while natural gas accounts for 90%, fuel cells -2% of emissions, and refrigerants 2%



Employee Commute

- Sector Emissions = 36,809 MTCO₂e
- 44% of total emissions
- Emissions decreased 44% since 2019 and 16% since 2010
- Employee commute VMT decreased 46% in 2020, as compared to 2019, and 1% as compared to 2010
- Emissions reductions from 2019 resulting from local COVID-19 shelter-in-place orders in 2020



Fleet Vehicles

- Sector Emissions = 6,196 MTCO₂e
- 7% of total emissions
- Emissions decreased 14% since 2019 and 35% since 2010

Reimbursed Employee Miles

- Sector Emissions = 562 MTCO₂e
- 0.6% of total emissions
- Emissions decreased 35% since 2019 and decreased 41% since 2010



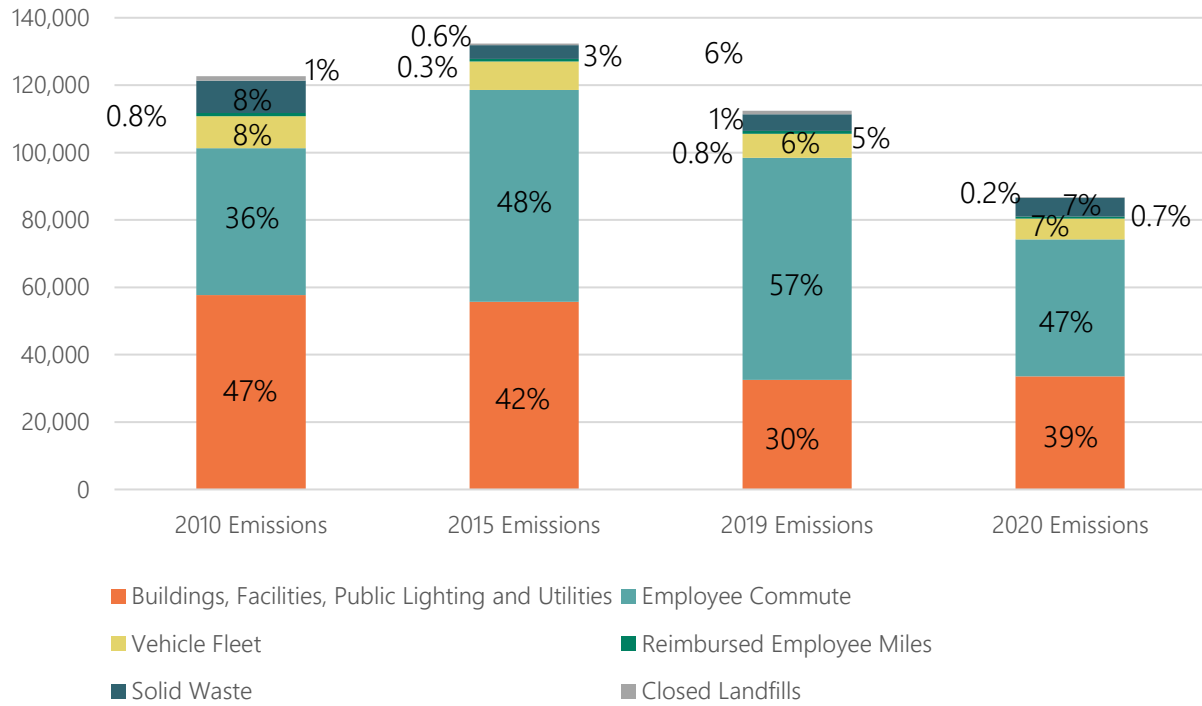
Solid Waste

- Sector Emissions = 5,553 MTCO₂e
- 6% of total emissions
- Emissions increased 14% since 2019 and decreased 41% since 2010

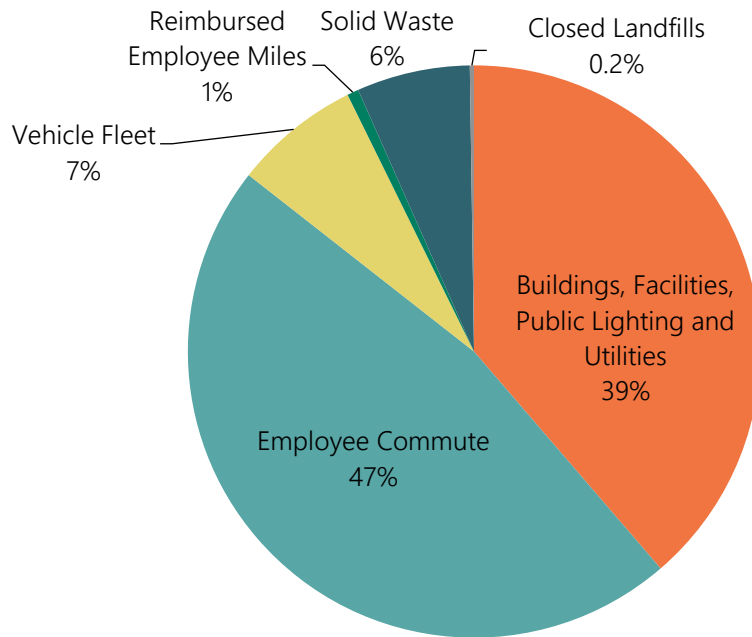
Closed Landfills

- Sector Emissions = 203 MTCO₂e
- 0.2% of total emissions
- Emissions decreased 81% since 2019 and 85% since 2010

Total Annual Emissions by Sector 2010-2020



2020 Emissions by Sector



INTRODUCTION

The County of Santa Clara (County) completed the 2020 county operations greenhouse gas (GHG) emissions inventory as part of the County's commitment to climate action and sustainability. Emissions inventories help government leaders understand the sources and magnitude of GHG emissions that are generated from various activities associated with County operations. Emissions accounting standards and protocols are used to compile, synthesize, analyze, and report emissions data at the county operations scale.

The Santa Clara County GHG inventory is an important tool for showing progress toward the goals and targets established in the newly adopted *County of Santa Clara Sustainability Master Plan (SMP)*. The 2021 SMP includes strategies and solutions to support the following four priorities: advance Climate Protection and Defense, safeguard Natural Resources and the Environment, improve Community Health and Well-Being, and cultivate a regionally vibrant, Prosperous and Just Economy.



The SMP includes the following Climate Protection and Defense County operations and facilities targets related to GHG emissions across inventory sectors:

- Reduce greenhouse gas (GHG) emissions from the County's operations, facilities, vehicles, and equipment below 2010 levels with a 13.5% reduction every five years from 2020 through 2050.
 - Achieved: 29% reduction from 2010.
- Decrease the percentage of County employee single-occupancy vehicle (SOV) commuters by at least 10% below the 2020 Employee Commute Survey levels by calendar year 2022.
 - In progress: 3.6% of employee commute VMT is non-SOV. This is a decrease from 2019, likely from the changing commute patterns due to COVID-19.
- Divert 100% of achievable waste from landfills including recyclables and organics.
 - In progress: 64% diversion of recyclables; organics accounting methods are being developed.

The SMP establishes the County's baseline for county operations emissions as calendar year 2010. In addition to the 2010 inventory, inventories have been completed for calendar years 2005, 2015, and 2019. This allows for the County to track trends and progress toward its climate commitments over the past 15 years, which is valuable in reviewing the effectiveness of past programs and acting strategically going forward. The 2020 inventory was developed to help the County track progress towards its climate commitments and to position the County to compare emissions in relation to the County's new SMP. The 2020 inventory primarily follows the Local Government Operations Protocol (LGOP) developed by the California Air Resources Board, California Climate Action Registry, ICLEI and the Climate Registry. Some exceptions were made to address specific, unique local conditions regarding emissions related to local electricity generation. Calendar year 2020 was chosen to analyze a year with many variations in County operations and employee work conditions, to allow further comparison and align inventories with the timeframe of the SMP.

KEY FINDINGS

- Santa Clara County operations emitted 86,748 MTCO_{2e}, a reduction of 44% from 2005, 29% from 2010, 37% from 2015, and 24% from 2019.
- Employee commute sector is the largest contributor to total emissions, accounting for 47%.
- Employee commute vehicle miles traveled (VMT) decreased 40% in 2020, as compared to 2019, 31% compared to 2015, and increased 9% as compared to 2010. The decrease in 2020 is the result of employees working remotely and/or on condensed schedules because of the COVID-19 pandemic. The average number of commute days decreased in 2020 to 2.13 days per week.
- The second largest contributor to total emissions was the buildings and facilities sector, which accounted for 39%.
- Electricity emissions account for -6% of the emissions associated with buildings and facilities (due to the County's purchase of Renewable Energy Credits), while natural gas accounts for 90%, fuel cells -2% of emissions, and refrigerants 2%.¹
- Vehicle fleet (7%), solid waste (6%), reimbursed employee miles (0.6%), and closed landfills (0.2%), make up the remaining 2020 county operations emissions.



¹ The negative sector emissions associated with electricity and fuel cells are a result of being offset by RECs and the fuel cell SGIP accounting methodology.

2020 EMISSIONS INVENTORY RESULTS SUMMARY

Using the Local Government Operations Protocol (LGOP) as well as accounting for the County's local fuel cell and renewable energy generation programs to calculate emissions, total 2020 County operations emissions were 86,748 MTCO₂e, as a result of the following sectors: buildings and facilities, employee commute, reimbursed employee miles, fleet vehicles, solid waste and closed landfills. This represents a 24% decrease from 2019 county operations emissions of 114,737 MTCO₂e, 34% decrease from 2015 county operations emissions of 132,358 MTCO₂e and a 29% decrease from baseline year 2010 emissions of 122,696 MTCO₂e. Table 1 and Figure 1 provide a comparison of 2010-2020 county operations emissions and trends by sector.

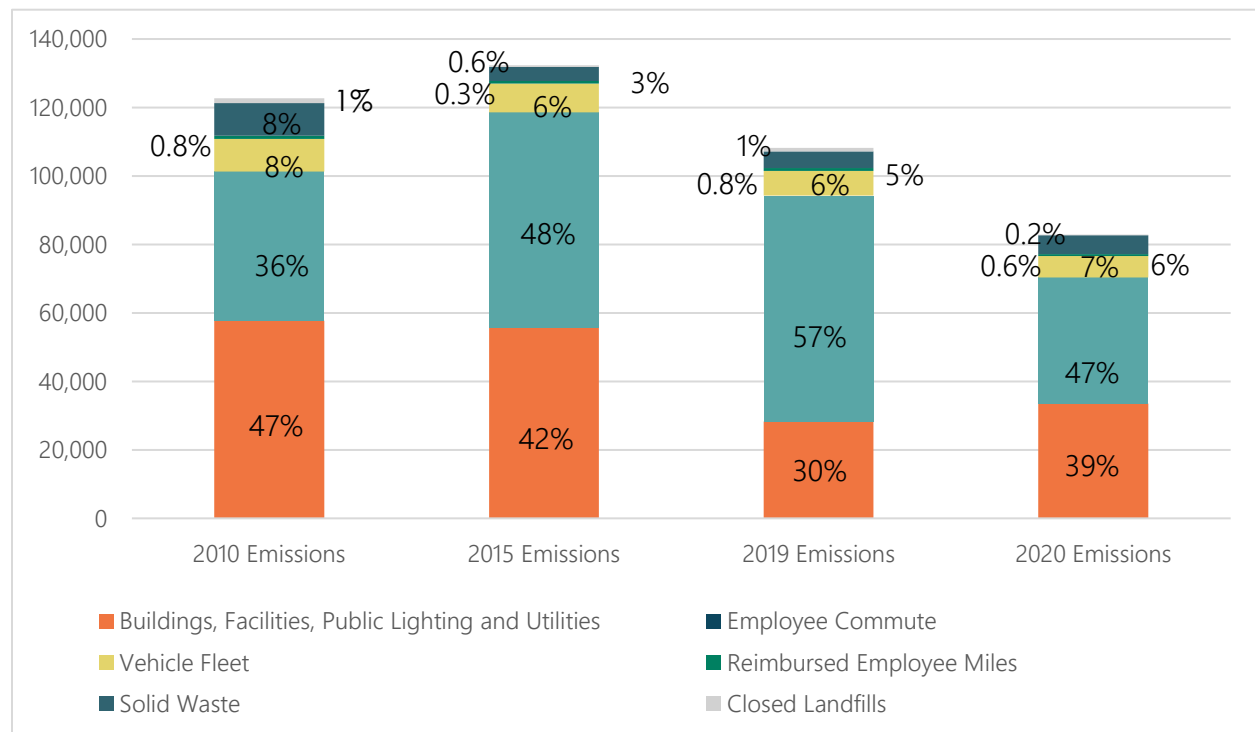
These emissions estimates take into consideration the County's two energy programs:

1. Fuel Cells: Rather than using a standard emissions factor for natural gas combustion, as per the LGOP, the GHG emissions from the County's fuel cell installation were completed in accordance with the California Public Utilities Commission Self-Generation Incentive Program (SGIP) methodology.
2. Renewable Energy Credits (RECs): To offset any remaining electricity use that was not 100% renewable, the County applied locally generated RECs or purchases of unbundled RECs. These renewable energy credits allow the County to meet its goal of a zero-emission energy system and using energy from 100% renewable sources, not just carbon neutral sources.

Table 1. Total Annual Emissions by Sector 2010-2020

Sector	2010 Baseline Emissions (MTCO ₂ e)	2015 Emissions (MTCO ₂ e)	2019 Emissions (MTCO ₂ e)	2020 Emissions (MTCO ₂ e)	Percent Change: 2010 - 2020	Percent Change: 2015 - 2020	Percent Change: 2019 - 2020
Buildings, Facilities, and Utilities	57,740	55,702	34,850	33,565	-42%	-40%	3%
Employee Commute	43,577	62,882	65,905	40,669	-7%	-35%	-38%
Vehicle Fleet	9,466	8,428	7,193	6,196	-35%	-26%	-14%
Reimbursed Employee Miles	951	765	866	562	-41%	-27%	-35%
Solid Waste	9,564	4,117	4,869	5,553	-42%	35%	14%
Closed Landfills	1,398	463	1,054	203	-85%	-56%	-81%
Total	122,696	132,358	114,737	86,748	-29%	-34%	-24%

Figure 1. Total Annual Emissions by Sector 2010-2020

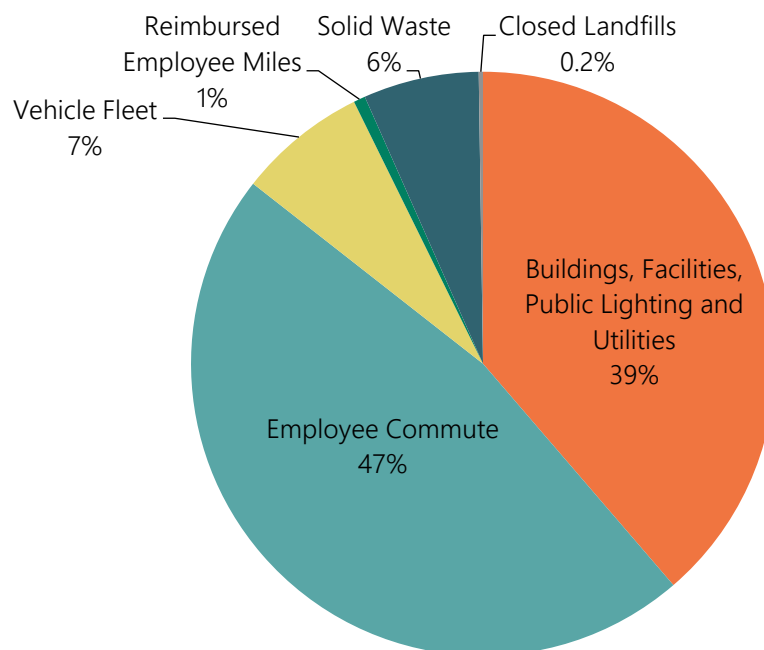


2020 EMISSIONS INVENTORY RESULTS BY SECTOR

Figure 2 shows the 2020 GHG emissions profile for the County of Santa Clara County operations by sector. The emissions breakdown is as follows: employee commute (47%), buildings and facilities (39%), and vehicle fleet (7%) continue to make up the majority of county operations emissions. Solid waste (6%), reimbursed employee miles (0.6%), and closed landfills (0.2%) make up the remaining County operations GHG emissions. The 2020 emissions profile differs from previous years for two main reasons. First, employee commute emissions decreased substantially as a result of remote work during the pandemic and second, an increase in building energy use emissions.

Overall, buildings and facilities emissions decreased 4% from 2019 and 42% from 2010. Emissions related to employee commute decreased 38% from 2019 and 7% from 2010. Vehicle fleet emissions decreased 14% from 2019 and 35% from 2010. Reimbursed employee miles decreased 35% from 2019 and 41% from 2010. Solid waste increased 14% from 2019 and decreased 42% from 2010. Closed landfills decreased 81% from 2019 and 85% from 2010.

Figure 2. 2019 Emissions by Sector



Buildings and Facilities

Buildings and Facilities Energy Consumption

The buildings and facilities sector accounts for the emissions from energy consumption as well as GHG reductions resulting from the County's fuel cells and the purchase and generation of renewable energy credits (RECs). The buildings and facilities sector made up 39% of the total County operations emissions in 2020. As summarized in Table 3 below, emissions in the buildings and facilities sector decreased 42% from 2010-2020 and 4% from 2019-2020.

Table 2. Buildings and Facilities Sector Consumption and Emissions by Source

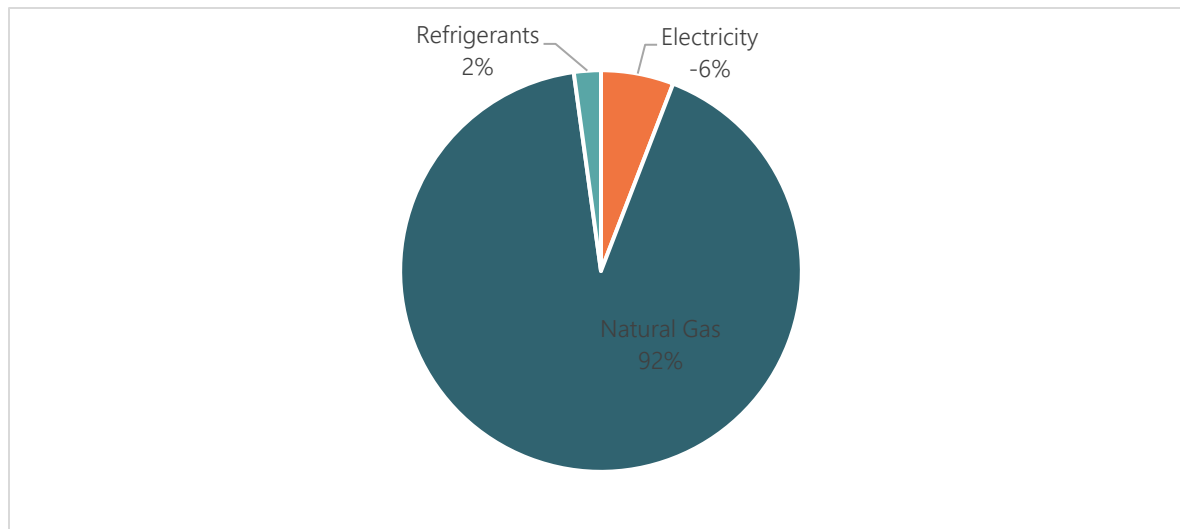
	Electricity		Natural Gas		Fuel Cells	Total Emissions
	kWh	MTCO ₂ e	Therms	MTCO ₂ e	MTCO ₂ e	MTCO ₂ e
2010	130,535,120	26,348	5,633,742	29,899		56,247
2015	133,630,040	20,115	7,078,490	37,566	-974.6	55,702
2019	151,207,862	53	6,263,313	33,337	-898	32,492
2020	144,820,058	-2,232	6,589,371	35,073	-803	32,866
% Change 2019-2020	-4%	-4296%	5%	31%	-11%	1%

Note: PG&E 2018 emissions factor used as a proxy for 2020, which is not yet available.



Figure 3 shows the total annual buildings and facilities sector emissions broken down by subsector. Natural gas emissions account for the largest proportion of emissions (90%), electricity (-6%), and refrigerants (2%).

Figure 3. Buildings and Facilities 2020 Emissions by Source



Fuel Cells

In 2014, the County installed four Bloom Energy fuel cells at several County facilities. The fuel cells convert natural gas to electricity through an electrochemical reaction. The ICLEI Local Government Operations Protocol (LGOP), recognized as the industry standard for municipal operations GHG inventories, requires that an emissions factor is applied to fossil fuel (e.g. natural gas) consumption assumed to be for direct combustion. However, in the context of emissions from fuel cells, the California Public Utilities Commission (CPUC) has made a series of findings and decisions that differ from the LGOP methodology. The 2015 inventory calculated fuel cell emissions using a method that is consistent with the CPUC findings and decisions for fuel cell emissions calculations.

County Actions Towards Building Decarbonization

Completed energy efficient lighting retrofits at 1.8 million square feet of County real estate. Over the 15-year lifetimes, these upgrades are projected to reduce electricity usage by over 46 million kilowatt-hours and save the County \$5,243,758 in electricity costs.

Currently developing a retro-commissioning program that will "tune-up" County building systems to operate in a more efficient manner beginning in Summer 2022.

6 County facilities have received certification under the U.S. Green Building Council's LEED System.

To maintain consistency with the approach used for the 2015 and 2019 inventories, the 2020 inventory combines data sources based on CPUC findings and decisions and input from County of Santa Clara to report emissions associated with the fuel cells. The fuel cells were partially funded by the CPUC Self-Generation Incentive Program (SGIP). The SGIP provides incentives to support existing, new, and emerging distributed energy resources that are determined by the CPUC to have a net greenhouse gas emissions reduction in California. At the time the fuel cells were installed, the CPUC had determined that the SGIP should compare a threshold emission factor of 379 kg CO₂/MWh (835.6 lbs CO₂/MWh) against the low-end emissions factor of a given technology to determine that technology's eligibility for incentives. The model of Bloom Energy fuel cells installed at County facilities have a low-end emissions factor of 735 lbs CO₂/MWh, which qualified them for SGIP rebates. The fuel cells produced 17,455.36 MWh of electricity in 2020. Table 3 below calculates the greenhouse gas emissions reduction impact of the County's fuel cells using the CPUC's SGIP methodology.

Table 3. Emissions Avoided from the County's Fuel Cells Using the CPUC SGIP Methodology

	Emission Factor (lbs CO ₂ /MWh)	Emission Factor (MT CO ₂ /MWh)	2019 Electricity Generated (MWh)	2019 Emissions (MT CO ₂ e)
SGIP Eligibility Emissions Factor	835.6	0.379	17,455.36	6,615.58
Fuel Cell Manufacturer's Low- end Emission Factor	735	0.333	17,455.36	5,812.63
Avoided Emissions				-802.95

The County is using **renewable energy** to power its facilities, which reduces GHG emissions and costs!

- ✓ Installed of 15.7 megawatts of clean renewable energy producing solar photovoltaic systems.
- ✓ Completed power purchase agreements for 1.9 MW of renewable solar PV produced electricity, as well as 2.6 MW of clean electricity producing Fuel Cells. The savings from these initiatives is estimated to be \$11 million over 20 years.
- ✓ Installed six ground-mounted and carport solar photovoltaic systems built at County-owned properties in 2019 with electricity generating capacity of 11.24 megawatts and 20 million kilowatt-hours (kWh) of renewable electricity per year.

Renewable Energy Production + RECs

Although not included in the County's emission inventory per the LGOP, the County produced renewable energy through several County-owned solar installation throughout 2020. In total, the County produced 26,354,442 kWh of electricity across its solar projects. This carbon-free renewable electricity offsets the amount of electricity that the County must purchase from utilities, thus reducing costs and emissions. Table 4 below shows the energy production of each of the County's solar installations.



Table 4. Annual Electricity Production from County Solar Installations (kWh)

Solar Project	kWh
1555 Berger Drive, San Jose CA 95131	1,397,803
701 Abel Street, Milpitas CA 95035	1,477,006
55 W Younger Avenue, San Jose 95110	1,881,009
1993 McKee Road, San Jose CA 95116	1,154,371
751 S Bascom Road, San Jose CA 95128	1,137,640
7475 Camino Arroyo, Gilroy CA 95020	747,368
2310 North First Street, San Jose CA 95131	558,405
2314 North First Street, San Jose CA 95131	711,248
500 Tully Road, San Jose CA 95111	664,790
985 Hellyer Ave, San Jose CA 95111	3,588,165
9505 Malech Road, San Jose 95138	5,862,666
19050 Malaguerra Avenue, Mogan Hill CA 95037	679,787
555 Church Avenue, San Martin CA 95046	1,869,263
2500 Cunningham Avenue, San Jose CA 95148	1,595,424
783 Amanda Drive, San Jose CA 95136	3,029,497
Total	26,354,442

Additionally, the County purchased 88,461,000 kWh in unbundled RECs in 2020 to offset its 86,456,068 kWh of nonrenewable electricity usage.

Refrigerants

As summarized in Table 5 below, emissions from refrigerants used in County buildings and facilities decreased 32% from 2010 to 2020. Refrigerants are important to include in GHG inventories as they often contain greenhouse gases that have a greater global warming potential than carbon dioxide. Emissions were calculated by determining the pounds of refrigerants consumed by the County in 2020 and applying the appropriate emissions factor as established by the IPCC Fifth Climate Assessment report.

Table 5. Annual Refrigerant Consumption and Emissions

Refrigerant Type	Refrigerant Consumed per Year (MT/year)	Global Warming Potential (GWP)	Emissions (MT CO ₂ e)
R-408A	0.0000	2,430	0.00
MO-99 (R-438A)	0.0454	2,059	93.39
R-22	0.2976	1,810	538.58
R-407C	0.0227	1,624	36.83
R-123	0.0100	79	0.79
R-507	0.0340	3,985	135.57
R-401B (MP-66)	0.0000	15	0.00
R-401A	0.0408	18	0.73
R-410A	0.0113	1,924	21.82
Total			828

Employee Commute

As summarized in Table 6 below, emissions in the employee commute sector decreased 16% from 2010 to 2020. The 2020 inventory uses the same methodology as 2019. Emissions were calculated using a distance-based method. The California Air Resources Board (CARB) 2020 EMFAC model for Santa Clara County emissions factor is applied to the annual commute VMT. Due to the pandemic, the average number of commute days per week as 2.13. The 2020 inventory annualized VMT using 49.4 weeks to account for county employee holidays and vacation time.

Table 6. Employee Commute Sector Consumption and Emissions 2010-2020

Year	Annual VMT	Total Emissions (MTCO ₂ e)
2010	93,391,727	43,577
2015	148,159,643	62,882
2019	169,552,643	65,905
2020	101,973,293	40,669
% Change 2010-2020	9%	-16%
% Change 2019-2020	-46%	-44%

The County of Santa Clara offers employees a variety of **alternative transportation programs** meant to improve commuting to and from work.

- ✓ The County has installed 304 EV chargers at county facilities
- ✓ The County provides a free VTA SmartPass to all county employees
- ✓ There is secure bike parking for employees at county facilities and two bike repair stations

The overall decrease in employee commute emissions is driven by emissions reductions from employees teleworking during COVID-19 shelter-in-place orders. Although the average commute distance did not change much between 2019 and 2020, the number of commute days decreased from 4.75 days to 2.13 days per week in 2020. This reduction in emissions shows the effectiveness of transportation demand management programs that include robust telework policies. Table 7 below shows the proportion of 2020 employee commute VMT by fuel type.

Table 7. 2020 Annual Employee Commute VMT by Fuel Type

Fuel Type	Annual VMT	% VMT by Fuel Type
Biodiesel: B-20	5,030	0.01%
Compressed Natural Gas (CNG)	88,764	0.10%
Diesel	1,297,802	1.46%
Hydrogen Fuel Cell	100,879	0.11%
Electric	3,327,755	3.75%
Gasoline	72,210,811	81.30%
Hybrid (gasoline/electric)	7,708,885	8.68%
Hybrid Electric (plug in)	907,576	1.02%
Other	47,437	0.05%
Transit + bike/walk	3,123,990	3.52%
Total	88,818,930	100%

Note. The 2020 VMT shown in Tables 6 and 7 differ as a result of extrapolation based on the average commute distance of the number of survey respondents who provided vehicle fuel type information versus commute distance. Fewer respondents provided fuel information so the annual VMT estimate in Table 7 is lower.



Reimbursed Employee Miles

As summarized in Table 8 below, emissions in the reimbursed employee miles sector decreased 41% from 2010 to 2020 and 35% from 2019 to 2020. The reimbursed employee miles sector made up less than 1% of the County's total county operations emissions in 2020. Similar to employee commute emissions, the 2020 inventory utilized the distance-based method to estimate emissions by determining annual reimbursed VMT and applying the CARB 2020 EMFAC model for Santa Clara County. The decrease in emissions from reimbursed employee miles is likely due to the increased number of employees working remotely because of the pandemic.

Table 8. Reimbursed Employee Miles Sector Consumption and Emissions 2010-2020

Year	Annual VMT	Total Emissions (MTCO ₂ e)
2010	2,436,063	951
2015	2,271,773	765
2019	2,227,502	866
2020	1,408,247	562
% Change 2010-2020	-42%	-41%
% Change 2019-2020	-37%	-35%

Fleet Vehicles

As summarized in Table 9 below, emissions from the vehicle fleet sector decreased by 35% from 2010 and 14% from 2019. Fleet vehicles make up 7% of the County's total 2020 operational emissions.

Table 9. Vehicle Fleet Sector Fuel Consumption and Emissions 2010-2020

Year	Diesel Consumption (gal)	Gasoline Consumption (gal)	E85 Consumption (gal)	CNG Consumption (GGE)	Hydrogen Consumption	Total Emissions (MTCO ₂ e)
2010	107,518	833,694	0	219	0	8,596
2015	124,219	794,203	25	2,446	0	8,428
2019	53,941	747,405	0	5,276	32	7,193
2020	57,128	631,702	0	3,046	60,202	6,196
% Change 2010-2020	-47%	-24%	-	1289%	-	-35%

The overall decrease in vehicle fleet sector emissions is being driven by the transition away from the use of fossil fuels. Between 2010 and 2020, the County is transitioning many vehicles to ZNE compressed natural gas and hydrogen.

Solid Waste and Closed Landfills

Solid Waste

As summarized in Table 10 below, emissions in the solid waste sector decreased 42% between 2010 and 2020 but increased 14% between 2019 and 2020. The solid waste sector made up 7% of the County's total operations emissions in 2020. Table 10 also shows the updated emissions from waste sent to landfill from 2010-2015 to reflect the new best practice of using the 20-year global warming potential (GWP) of methane (84), rather than the 100-year GWP (28), per IPCC's Fifth Climate Assessment. This method also aligns with the State's determination that methane is a potent short-lived climate pollutant as per Senate Bill 1383 Short-Lived Climate Pollutants.

Table 10. Solid Waste Consumption and Emissions 2010-2020

Year	Landfilled Waste (tons)	Total Emissions (MTCO ₂ e)
2010	5,844	9,564
2015	2,516	4,117
2019	3,280	4,869
2020	3,432	5,553
% Change 2010-2020	-41%	-42%
% Change 2019-2020	5%	14%

The decrease in solid waste sector emissions between 2010 and 2020 is directly correlated with a decrease in solid waste sent to landfill. The decrease in landfilled waste from 2010 to 2020 was due to increased recycling and compositing efforts, most likely a result of implementing the Zero Waste Policy for County Operations and Facilities adopted by the Board of Supervisors. The amount of landfilled solid waste increased from 2019 as result of increased waste generated by the county hospital system, which required additional weekly service.

Closed Landfill

As summarized in Table 11 below, emissions in the closed landfills sector decreased 85% between 2010 and 2020 and decreased 81% between 2019 and 2020. The closed landfills sector made up 0.2% of the County's total county operations emissions in 2020. Similar to solid waste, Table 10 also shows the updated emissions from waste sent to landfill from 2010-2015 to reflect the new best practice of using the 20-year global warming potential (GWP) of methane (84), rather than the 100-year GWP (28), per IPCC's Fifth Climate Assessment.

Table 11. Closed Landfill Sector Consumption and Emissions 2005-2019

Year	Landfill Gas Collected (cf)	Total Emissions (MTCO ₂ e)
2010	5,365,200	1,398
2015	1,778,700	464
2019	4,042,500	1,054
2020	779,394	203
% Change 2010-2020	-85%	-85%
% Change 2019-2020	-81%	-81%

The 85% decrease in closed landfill sector emissions between 2010 and 2020 is directly correlated with an 85% decrease in landfill gas collected at the closed Hellyer landfill.

RECOMMENDATIONS

To continue reducing emissions related to County operations, the County should continue to implement the programs and policies that conserve resources and cut emissions as laid out in the Sustainability Master Plan. The following recommendations are based on the 2020 inventory presented above and the Sustainability Master Plan.

Buildings and Facilities

- Maintain all County electricity accounts at 100% renewable electricity provided by SVCE and SJCE.
- Reevaluate the fuel cell program to determine the feasibility of using alternative clean fuels e.g. hydrogen or renewable natural gas.
- Commit to designing all new County buildings to be net zero and all-electric unless natural gas is required for specific uses.
- Transition natural gas equipment at existing County facilities to electric alternatives by 2030.
- Implement retro-commissioning, across County facilities. Retro-commissioning is a systematic process for analyzing and optimizing an existing building's systems' performance through operational and maintenance improvement measures.
- Utilize available energy performance contracts and utility incentive programs to retrofit existing facilities.
- Explore opportunities for battery installation or micro-grid development to increase the resilience of County facilities to electricity supply disruptions due to weather or public safety power shut offs.

Employee Commute

- Expand telecommuting opportunities that are client-focused and department-specific for County employees to increase the utilization of virtual first-service delivery for departments with jobs that can readily be performed remotely. After the County's COVID-19 shelter in place order, employee telecommuting jumped from 3.8% in February 2020 to 33.7% in June 2020. Continued telecommuting at this scale would result in preventing 33,800 MTCO₂e annually, which is the equivalent of removing 7,302 passenger vehicles from the road each year.
- Implement Transportation Demand Management (TDM) program with a focus on incentivizing active transportation and public transit including launching an employee-commuter shuttle pilot program from the Diridon Station to the Valley Medical Center at Bascom.

- Continue to complete a bike and pedestrian network across the County to allow for safe travel throughout the region.
- Provide secure bike parking at all existing County facilities.
- Include changing and shower facilities and secure bike parking in all new County buildings.
- Install EV charging stations (both for County employees/travel and for public use) where appropriate.



Fleet Vehicles + Reimbursed Employee Miles

- Transition County fleet to zero emissions vehicles by 2030.
- Promote the Driving to Net Zero program to deploy EV infrastructure throughout County municipalities.

Solid Waste

- Prepare a waste stream characterization study for County operations and County unincorporated areas and create a Zero Solid Waste Plan.
- Conduct internal outreach and education programs for all County employees and facilities, providing more information on appropriate e-waste, recycling, organics and food waste recycling, and hazardous material disposal.
- Contribute to regional SB 1383 compliance by providing locations for the application of compost for carbon sequestration in soil in partnership with the Santa Clara Valley Open Space Authority.

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2020 County Operations Greenhouse Gas Inventory

February 2022



*Prepared by the County of
Santa Clara Facilities and
Fleet Department and
Office of Sustainability*

